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U.S. Department of Energy

Environment, Safety, and Health



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Tiger Team Assessment of the Savannah River Site

June 1990

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U.S. Department of Energy

Environment, Safety, and Health



Tiger Team Assessment of the Savannah River Site

June 1990

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TIGER TEAM COMPLIANCE ASSESSMENT REPORT

TABLE OF CONTENTS

GLOSSARY OF ABBREVIATIONS AND ACRONYMS ix

PREFACE xv

EXECUTIVE SUMMARY ES-1

1.0 INTRODUCTION

1.1 PURPOSE 1-1
1.2 SCOPE 1-1
1.3 APPROACH 1-2

1.3.1 Pre-Assessment Site Planning 1-2
1.3.2 Onsite Activities 1-3
1.3.3 Reporting 1-3

1.4 SITE DESCRIPTION 1-5

2.0 KEY FINDINGS, NOTEWORTHY PRACTICES, AND CAUSAL FACTORS

2.1 ENVIRONMENT 2-1

2.1.1 Key Findings 2-1
2.1.2 Probable Causal Factors 2-1

2.2 SAFETY AND HEALTH 2-4

2.2.1 Key Findings and Noteworthy Practices . . . 2-4
2.2.2 Probable Causal Factors 2-6

2.3 MANAGEMENT 2-10

2.3.1 Key Findings and Noteworthy Practices . . . 2-10
2.3.2 Probable Root Causes 2-12

2.4 OSHA 2.4-1

3.0 ENVIRONMENTAL ASSESSMENT

3.1 PURPOSE 3-1
3.2 SCOPE 3-1
3.3 APPROACH 3-2
3.4 ENVIRONMENTAL ASSESSMENT SUMMARY (INCL. TABLE OF FINDINGS) 3-4

3.5	ENVIRONMENTAL ASSESSMENT FINDINGS	3-20
3.5.1	Air	3-20
3.5.1.1	Overview	3-20
3.5.1.2	Evaluation	3-23
3.5.1.3	Findings	3-25
3.5.2	Soils/Sediments/Biota	3-43
3.5.2.1	Overview	3-43
3.5.2.2	Evaluation	3-44
3.5.2.3	Findings	3-47
3.5.3	Surface Water/Drinking Water	3-51
3.5.3.1	Overview	3-51
3.5.3.2	Evaluation	3-53
3.5.3.3	Findings	3-58
3.5.4	Hydrogeology	3-96
3.5.4.1	Overview	3-96
3.5.4.2	Evaluation	3-99
3.5.4.3	Findings	3-101
3.5.5	Waste Management	3-114
3.5.5.1	Overview	3-114
3.5.5.2	Evaluation	3-116
3.5.5.3	Findings	3-119
3.5.6	Toxic and Chemical Materials	3-165
3.5.6.1	Overview	3-165
3.5.6.2	Evaluation	3-167
3.5.6.3	Findings	3-171
3.5.7	Quality Assurance	3-194
3.5.7.1	Overview	3-194
3.4.7.2	Evaluation	3-196
3.5.7.3	Findings	3-199
3.5.8	Radiation	3-209
3.5.8.1	Overview	3-209
3.5.8.2	Evaluation	3-211
3.5.8.3	Findings	3-217
3.5.9	Inactive Waste Sites and Releases	3-237
3.5.9.1	Overview	3-237
3.5.9.2	Evaluation	3-238
3.5.9.3	Findings	3-244
3.5.10	National Environmental Policy Act	3-253
3.5.10.1	Overview	3-253
3.5.10.2	Evaluation	3-255
3.5.10.3	Findings	3-259
3.5.11	Special Issues	3-273

4.0	SAFETY AND HEALTH ASSESSMENT	
4.1	PURPOSE	4-1
4.2	SCOPE	4-1
4.3	APPROACH	4-1
4.4	SAFETY AND HEALTH SUMMARY	4-4
4.5	SAFETY AND HEALTH FINDINGS AND CONCERNS	
4.5.1	WASTE MANAGEMENT FACILITIES	4-6
4.5.1.1	Organization and Administration	4-6
4.5.1.1.1	Overview	4-6
4.5.1.1.2	Findings and Concerns	4-8
4.5.1.2	Quality Verification	4-13
4.5.1.2.1	Overview	4-13
4.5.1.2.2	Findings and Concerns	4-15
4.5.1.3	Operations	4-22
4.5.1.3.1	Overview	4-22
4.5.1.3.2	Findings and Concerns	4-24
4.5.1.4	Maintenance	4-31
4.5.1.4.1	Overview	4-31
4.5.1.4.2	Findings and Concerns	4-33
4.5.1.5	Training and Certification	4-41
4.5.1.5.1	Overview	4-41
4.5.1.5.2	Findings and Concerns	4-43
4.5.1.6	Auxiliary Systems	4-51
4.5.1.6.1	Overview	4-51
4.5.1.6.2	Findings and Concerns	4-53
4.5.1.7	Emergency Preparedness	4-62
4.5.1.7.1	Overview	4-62
4.5.1.7.2	Findings and Concerns	4-64
4.5.1.8	Technical Support	4-73
4.5.1.8.1	Overview	4-73
4.5.1.8.2	Findings and Concerns	4-75
4.5.1.9	Security/Safety Interface	4-80
4.5.1.9.1	Overview	4-80
4.5.1.9.2	Findings and Concerns	4-81
4.5.1.10	Facility Safety Review	4-84
4.5.1.10.1	Overview	4-84
4.5.1.10.2	Findings and Concerns	4-86
4.5.1.11	Radiological Protection	4-89
4.5.1.11.1	Overview	4-89
4.5.1.11.2	Findings and Concerns	4-91

4.5.1.12	Personnel Protection	4-99
4.5.1.12.1	Overview	4-99
4.5.1.12.2	Findings and Concerns	4-101
4.5.1.13	Fire Protection	4-110
4.5.1.13.1	Overview	4-110
4.5.1.13.2	Findings and Concerns	4-112
4.5.1.14	Nuclear Criticality Safety	4-119
4.5.2	TRITIUM FACILITIES	4-120
4.5.2.1	Organization and Administration	4-120
4.5.2.1.1	Overview	4-120
4.5.2.1.2	Findings and Concerns	4-122
4.5.2.2	Quality Verification	4-128
4.5.2.2.1	Overview	4-128
4.5.2.2.2	Findings and Concerns	4-130
4.5.2.3	Operations	4-136
4.5.2.3.1	Overview	4-136
4.5.2.3.2	Findings and Concerns	4-138
4.5.2.4	Maintenance	4-145
4.5.2.4.1	Overview	4-145
4.5.2.4.2	Findings and Concerns	4-147
4.5.2.5	Training and Certification	4-151
4.5.2.5.1	Overview	4-151
4.5.2.5.2	Findings and Concerns	4-153
4.5.2.6	Auxiliary Systems	4-161
4.5.2.6.1	Overview	4-161
4.5.2.6.2	Findings and Concerns	4-164
4.5.2.7	Emergency Preparedness	4-170
4.5.2.7.1	Overview	4-170
4.5.2.7.2	Findings and Concerns	4-171
4.5.2.8	Technical Support	4-177
4.5.2.8.1	Overview	4-177
4.5.2.8.2	Findings and Concerns	4-179
4.5.2.9	Security/Safety Interface	4-184
4.5.2.9.1	Overview	4-184
4.5.2.9.2	Findings and Concerns	4-185
4.5.2.10	Site/Facility Safety Review	4-186
4.5.2.10.1	Overview	4-186
4.5.2.10.2	Findings and Concerns	4-188

4.5.2.11 Radiological Protection 4-192
4.5.2.11.1 Overview 4-192
4.5.2.11.2 Findings and Concerns 4-194

4.5.2.12 Personnel Protection 4-203
4.5.2.12.1 Overview 4-203
4.5.2.12.2 Findings and Concerns 4-205

4.5.2.13 Fire Protection 4-216
4.5.2.13.1 Overview 4-216
4.5.2.13.2 Findings and Concerns 4-218

4.5.3 SAVANNAH RIVER LABORATORY AND AVIATION SAFETY, MEDICAL SERVICES, PACKAGING AND TRANSPORTATION, AND EMERGENCY PREPAREDNESS 4-225

4.5.3.1 Organization and Administration 4-225
4.5.3.1.1 Overview 4-225
4.5.3.1.2 Findings and Concerns 4-228

4.5.3.2 Quality Verification 4-233
4.5.3.2.1 Overview 4-233
4.5.3.2.2 Findings and Concerns 4-235

4.5.3.3 Operations 4-241
4.5.3.3.1 Overview 4-241
4.5.3.3.2 Findings and Concerns 4-243

4.5.3.4 Maintenance 4-250
4.5.3.4.1 Overview 4-250
4.5.3.4.2 Findings and Concerns 4-252

4.5.3.5 Training and Certification 4-259
4.5.3.5.1 Overview 4-259
4.5.3.5.2 Findings and Concerns 4-261

4.5.3.6 Auxiliary Systems 4-265
4.5.3.6.1 Overview 4-265
4.5.3.6.2 Findings and Concerns 4-267

4.5.3.7 Emergency Preparedness 4-271
4.5.3.7.1 Overview 4-271
4.5.3.7.2 Findings and Concerns 4-272

4.5.3.8 Technical Support 4-278
4.5.3.8.1 Overview 4-278
4.5.3.8.2 Findings and Concerns 4-280

4.5.3.9 Nuclear Criticality Safety 4-286
4.5.3.9.1 Overview 4-286
4.5.3.9.2 Findings and Concerns 4-287

4.5.3.10	Security/Safety Interface	4-293
4.5.3.10.1	Overview	4-293
4.5.3.10.2	Findings and Concerns	4-294
4.5.3.11	Experimental Activities	4-297
4.5.3.11.1	Overview	4-297
4.5.3.12	Site/Facility Safety Review	4-298
4.5.3.12.1	Overview	4-298
4.5.3.12.2	Findings and Concerns	4-300
4.5.3.13	Radiological Protection	4-303
4.5.3.13.1	Overview	4-303
4.5.3.13.2	Findings and Concerns	4-306
4.5.3.14	Personnel Protection	4-318
4.5.3.14.1	Overview	4-318
4.5.3.14.2	Findings and Concerns	4-319
4.5.3.15	Fire Protection	4-322
4.5.3.15.1	Overview	4-322
4.5.3.15.2	Findings and Concerns	4-324
4.5.3.16	Aviation Safety	4-333
4.5.3.16.1	Overview	4-333
4.5.3.16.2	Findings and Concerns	4-334
4.5.3.17	Medical Services	4-339
4.5.3.17.1	Overview	4-339
4.5.3.17.2	Findings and Concerns	4-341
4.5.3.18	Packaging and Transportation (Sitewide)	4-344
4.5.3.18.1	Overview	4-344
4.5.3.18.2	Findings and Concerns	4-346
4.5.3.19	Emergency Preparedness (Sitewide)	4-361
4.5.3.19.1	Overview	4-361
4.5.3.19.2	Findings and Concerns	4-363
4.6	NOTEWORTHY PRACTICES	4-371
4.6.1	WASTE MANAGEMENT FACILITIES	4-371
4.6.2	TRITIUM FACILITIES	4-371
4.6.3	SAVANNAH RIVER LABORATORY	4-371
4.7	SYSTEM FOR CATEGORIZING CONCERNS	4-374
4.8	CATEGORIZATION AND TABULATION OF CONCERNS	4-376
4.8.1	WASTE MANAGEMENT FACILITIES	4-377
4.8.1.1	Categorization of Concerns	4-377
4.8.1.2	Tabulation of Concerns	4-380

4.8.2	TRITIUM FACILITIES	4-389
4.8.2.1	Categorization of Concerns	4-389
4.8.2.2	Tabulation of Concerns	4-391
4.8.3	SAVANNAH RIVER LABORATORY	4-398
4.8.3.1	Categorization of Concerns	4-398
4.8.3.2	Tabulation of Concerns	4-401
4.9	TEAM COMPOSITION AND AREAS OF RESPONSIBILITY	4-411
4.9.1	WASTE MANAGEMENT FACILITIES	4-411
4.9.2	TRITIUM FACILITIES	4-413
4.9.3	SAVANNAH RIVER LABORATORY	4-415
5.0	OSHA	
5.1	INTRODUCTION	5-1
5.2	PURPOSE	5-1
5.3	MAJOR OCCUSAFE FINDING AND RECOMMENDATIONS	5-2
5.4	TIGER TEAM ASSESSMENT	5-3
6.0	MANAGEMENT ASSESSMENT	
6.1	PURPOSE	6-1
6.2	SCOPE AND APPROACH	6-1
6.3	MANAGEMENT ASSESSMENT SUMMARY	6-2
6.4	MANAGEMENT ASSESSMENT FINDINGS	6-5
6.4.1	Management and Oversight of ES&H Activities	6-7
6.4.1.1	Overview	6-7
6.4.1.2	Findings	6-9
6.4.2	Performance Improvement Initiatives	6-24
6.4.2.1	Overview	6-24
6.4.2.2	Findings	6-26
6.4.3	Conduct of Operations	6-28
6.4.3.1	Overview	6-28
6.4.3.2	Findings	6-30
6.5	NOTEWORTHY PRACTICES	6-38
6.6	PROBABLE ROOT CAUSES	6-40
6.6.1	Probable Root Causes	6-42
6.6.2	Contributing Causes	6-45

APPENDICES

A.	Assessment Personnel and Biographical Sketches	A-1
B.	Environment Team Assessment Plan	B-1
C.	List of Site Documents	C-1
D.	Occusafe, Inc. Report of Survey for Compliance with OSHA	D-1

GLOSSARY OF ABBREVIATIONS AND ACRONYMS

α	Alpha Particles (Radiation)
ß	Beta Particles (Radiation)
ACL	Alternate Concentration Limit
ACM	Asbestos Containing Material
AIHA	American Industrial Hygiene Association
ALARA	As Low As Reasonably Achievable
ANS	American Nuclear Society
ANSI	American National Standards Institute
ARAR	Applicable or Relevant and Appropriate Requirements
ARU	Acid Recovery Unit
ASME	American Society of Mechanical Engineers
ATD	Actinide Technology Division
AWAS	American Waterworks Association Standards
BDC	Beaver Dam Creek
BGI	Beta/Gamma Incinerator
BMP	Best Management Practice
BOD	Biological Oxygen Demand
BRP	Burning/Rubble Pit
C	Degrees Centigrade
CAA	Clean Air Act
CAR	Corrective Action Report
cc	Cubic Centimeters
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CF	Compliance Finding
CFR	Code of Federal Regulations
Ci	Curie
CIF	Consolidated Incineration Facility
CIIS	Chemical Inventory and Information System
CMP	Chemicals, Metals, and Pesticides Pits
COE	Corps of Engineers
CORPS	U. S. Army Corps of Engineers
CPAF	Cost Plus Award Fee
cpm	Counts Per Minute
CSWE	Central Services Works Engineering
CTF	Chemical Transfer Facility
DCG	Derwed Concentration Guide
DETF	Dilute Effluent Treatment Facility
DOE	U. S. Department of Energy
DOE/EH	U.S. Department of Energy/Environment, Health, and Safety
DOE/HQ	U.S. Department of Energy/Headquarters
DOE/SR	U.S. Department of Energy/Savannah River Operations Office

DOP	Dioctyl Phthalate
DP	Office of the Assistant Secretary for Defense Programs
dpm	Disintegrations Per Minute
DPSOL	Du Pont Standard Operating Log
DPSOP	Du Pont Standard Operating Procedure
Du Pont	E. I. du Pont de Nemours & Co.
DWPF	Defense Waste Processing Facility
EA	Environmental Assessment
ECS	Environmental and Chemical Sciences, Inc.
ED	Enriched/Depleted (Uranium)
E&D	DuPont Energy and Environment Department
E&PD	Engineering and Projects Division
EHP	Environmental and Health Protection Department
EID	Environmental Information Document
EIS	Environmental Impact Statement
ELLT	Engineered Low-Level Trench
EM	Office of Environmental Restoration and Waste Management
EML	(DOE) Environmental Measurements Laboratory
EMS	Environmental Monitoring Section
EMSL	Environmental Monitoring Systems Laboratory
EP	Extraction Procedure
EPA	Environmental Protection Agency
EPS	Environmental Protection Section
ES	Environmental Science
ES&H	Environment, Safety, and Health
ESH&QA	Environment, Safety, Health, and Quality Assurance
ETF	Effluent Treatment Facility
ETI	Environmental Testing, Inc.
ETS	Environmental Technology Section
F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FDA	Food and Drug Administration
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FMC	Four Mile Creek
FMF	Fuel Material Facility
ft^2	Square Feet
$ft^3/yr.$	Cubic Feet Per Year
g	Gram
GAO	U. S. Government Accounting Office
GCD	Greater Confinement Disposal
ha	Hectare
HAW	High-Activity Waste
HEPA	High-Efficiency Particulate Air (Filter)
HLW	High-Level (Hazardous) Waste

HP	Health Protection
HPO	Health Protection Operations
HW	Hazardous Waste
IH	Industrial Hygiene Group
IGB	Indian Grave Branch
INPO	Institute of Nuclear Power Operations
IT/FS	Interim Treatment/Storage Facility
ILW	Intermediate-Level Waste
INEL	Idaho National Engineering Laboratory
ITP	In-Tank Precipitation
K	Kilo (1000)
Kg	Kilogram
Km	Kilometer
l	Liter
LAW	Low-Activity Waste
LDR	Land Disposal Restrictions
LETF	Liquid Effluent Treatment Facility
LLRDF	Low Level Radiological Disposal Facility
LLW	Low Level Waste
LSS	Liquid Scintillation Solutions
LTRC	Lower Three Runs Creek
m	Milli (1/1000)
µ	Micro (10^{-6})
MB	Meyers Branch
mCi	Millicurie (1/1000 Curie)
µCi	Microcurie (10^{-6})
mg	Milligram (1/1000 Gram)
mgd	Million Gallons Per Day
ml	Milliliter
µg	Micrograms (10^{-6})
mR	Milliroentgen (1/1000 Roentgen)
mrem	Millirem (1/1000 Rem)
µR	Microroentgen (10^{-6} Roentgen)
mCi/l	Millicurie Per Liter
MCL	Maximum Contaminant Level
MSDS	Material Safety Data Sheet
MW	Mixed Waste
MWMF	Mixed Waste Management Facility
MWSF	Mixed Waste Storage Facility
NBS	U. S. National Bureau of Standards
nCi	Nanocurie (10^{-9} Curie)
NCR	Nonconformance Report
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants

NFMF	Naval Fuel Materials Facility
NFPA	National Fire Protection Association
NIM	Nuclear Incident Monitor
NMPD	Nuclear Materials Processing Division
NPH	Normal Paraffin Hydrocarbon
NOD	Notice of Deficiencies
NOV	Notice of Violation
NPDES	National Pollutant Discharge Effluent Systems
NQA-1	Nuclear Quality Assurance-1
NRC	Nuclear Regulatory Commission
NRDC	Natural Resources Defense Council
NSPS	New Source Performance Standards
O&G	Oil and Grease
ORDP	Organic Removal Demonstration Plant
OSHA	Occupational Safety and Health Administration
OSR	Operational Safety Requirements
OSWER	Office of Solid Waste & Environmental Response
p	Pico (10^{-12})
PCB	Polychlorinated biphenyl
pCi	Picocurie (10^{-12} Curie)
pCi/l	Picocuries Per Liter
PCS	Procurement Control System
PE	Professional Engineer
PHEF	Precipitate Hydrolysis Experimental Facility
PIP	Performance Improvement Plan
PM-10	Particulate matter < 10 um in aerodynamic diameter
PMT	Program Management Team
PP	Par Pond
ppb	Parts Per Billion (= mg/l or mg/hg)
ppm	Parts Per Million (= mg/l or mg/hg)
PSD	Prevention of Significant Deterioration
PuFF	Plutonium Fuel Forms Facility
PVC	Polyvinyl Chloride
PWITSF	Process Waste Interim Treatment and Storage Facility
QA	Quality Assurance
QACC	Quality Assurance Coordination Committee
QC	Quality Control
R	Roentgen
R&D	Research and Development
RBOF	Receiving Basin for Off-Site Fuels
RCF	Refractory Ceramic Fibers
RCRA	Resource Conservation and Recovery Act
RMW	Radioactivity Mixed Waste
RTA	Request for Technical Assistance
RTF	Replacement Tritium Facility
RWBG	Radioactive Waste Burial Ground

SAR	Safety Analysis Review
SARA	Superfund Amendments and Reauthorization Act
SC	Steel Creek
SCDHEC	South Carolina Department of Health and Environmental Control
SCHWMR	South Carolina Hazardous Waste Management Regulations
SCE&GC	South Carolina Electric and Gas Company
SCUSTR	South Carolina Underground Storage Tank Regulations
SLB	Shallow Land Burial
SMARTS	Specifications and Management Applications for Regulated Tank Systems
SME	Slurry Mix Evaporator
SPCC	Spill Prevention Control and Countermeasure (Plan)
SR	Savannah River Operations Office
SRAT	Surry Receipt Adjustment Tank
SRC	Savannah River Construction
SREL	Savannah River Ecological Laboratory
SRL	Savannah River Laboratory
SRP	Savannah River Plant
SRS	Savannah River Site
SSB	Soil/Sediment/Biota
T	Temperature
TB	Tims Branch
TBP	Tributyl Phosphate
TCA	Trichloroethane
TCE	Trichloroethylene
TCM	Toxic and Chemical Material
TLD	Thermoluminescent Dosimeter
TOC	Total Organic Carbon
TOH	Total Organic Halogens
TNX	Trinitroxylene
TRU	Transuranic
TSA	Technical Safety Appraisal
TSCA	Toxic Substances Control Act
TSD	Treatment, Storage, and Disposal
TSP	Total Suspended Particulates
TSS	Total Suspended Solids
U.S.	United States
UOR	Unusual Occurrence Report
USEPA	United States Environmental Protection Agency
USFS	U.S. Forest Service (at SRS)
USGS	United States Geological Survey
UST	Underground Storage Tank
UTRC	Upper Three Runs Creek
VOC	Volatile Organic Compound

WIPP	Waste Isolation Pilot Plant
WM	Waste Management
WMT	Waste Management Technology
WSI	Wackenhut Services, Incorporated
WSRC	Westinghouse Savannah River Company

PREFACE

This draft document contains findings identified during the Tiger Team Compliance Assessment of the U. S. Department of Energy Savannah River Site (SRS), located in three counties (Aiken, Barnwell and Allendale), South Carolina. The Assessment was directed by the Department's Office of the Assistant Secretary for Environment, Safety, and Health (ES&H) and was conducted from January 29 to March 23, 1990.

The Savannah River Site Tiger Team Compliance Assessment was broad in scope covering the Environment, Safety and Health, and Management areas and was designed to determine the site's compliance with applicable Federal (including DOE), state, and local regulations and requirements. The scope of the Environmental assessment was sitewide while the Safety and Health assessments included site operating facilities (except reactors), and the sitewide elements of Aviation Safety, Emergency Preparedness, Medical Services, and Packaging and Transportation.

The Savannah River Site Tiger Team Compliance Assessment is one component of a larger, comprehensive DOE Tiger Team Compliance Assessment program planned for more than 100 of the Department's operating facilities. This assessment is part of a ten-point initiative announced on June 27, 1989, by the Secretary of Energy, Admiral James D. Watkins, Ret., to conduct independent oversight compliance and management assessments of the ES&H programs at DOE facilities. The objective of the initiative is to provide the Secretary with information on the current ES&H compliance status of DOE facilities, root causes for noncompliance, adequacy of DOE and site contractor ES&H management programs, response actions to address the identified problem areas, and DOE-wide ES&H compliance trends and root causes.

March 1990
Washington, D.C.

EXECUTIVE SUMMARY

This report documents the results of the Tiger Team compliance assessment of the Savannah River Site conducted from January 29 to March 23, 1990. The purpose of the assessment was to provide the Secretary of Energy with a report on the status of Environment, Safety and Health (ES&H) Programs at the U. S. Department of Energy's (DOE's) Savannah River Site (SRS). The site, located in three counties (Aiken, Barnwell, and Allendale) in western South Carolina, is operated for the Department by the Westinghouse Savannah River Company (WSRC).

The Tiger Team compliance assessment was conducted by a team comprised of professionals from DOE, contractors, and consultants.

Assessment Overview

The assessment did not identify any problems at the Savannah River Site which warranted curtailment or cessation of site operations. The Management and Organization Subteam cited 13 findings and the Environment Subteam cited 101 findings. There were 294 Concerns in the Safety and Health area, 11 of those Concerns were Category II that require immediate attention to formulate corrective action plans and to initiate immediate corrective measures. The Team also identified areas which will require additional attention to achieve full compliance with regulatory or DOE requirements.

The openness, forthrightness and cooperative spirit of the Savannah River Operations Office (DOE-SR) and the WSRC contributed substantially to the ability of the Team to complete the assessment effectively and in a reasonable time. Furthermore, the assessment was facilitated by a high quality self-assessment which was conducted by WSRC prior to the beginning of the Tiger Team compliance assessment. The self-assessment was found to be a comprehensive treatment of major sitewide compliance concerns and plans for corrective actions. These concerns and associated causes were validated during the course of the assessment.

The SRS Tiger Team Compliance Assessment was conducted during a period of transition and dramatic change at the site and this report presents a snapshot of the conditions which were found during this time. These changes were observed to be impacting profoundly on all aspects of site operations. After 40 years as Management and Operating contractor at SRS, E. I. du Pont de Nemours & Co. (Du Pont) was replaced by the WSRC on April 1, 1989. The previous contract with Du Pont was on a Cost Plus No Fee basis while WSRC is operating the site on a Cost Plus Award Fee (CPAF) incentive basis with the DOE. This change of contractors followed several years of intense criticism leveled at site operations by DOE and a number of highly respected review panels. Such criticism focused primarily on the contractor's

failure to stay abreast of and implement appropriate commercial nuclear and national consensus standards and criteria to assure that operations were conducted in a safe and environmentally acceptable manner. Investigations of several incidents involving reactor operations highlighted how far the site had fallen behind the commercial nuclear industry.

Concurrent with the change in the SRS M&O contractor, other important changes were occurring in the DOE which added further urgency and focus to the changes needed at the site. Secretary of Energy James D. Watkins announced a series of Departmental policies and initiatives in the spring and summer of 1989 as a framework for cultural change which clearly delineated his expectations that the Department would manage and operate its facilities in compliance with environment, safety, and health requirements. Based on the Secretary's policies and guidance from DOE Headquarters components and the DOE-SR, a new concept was created by SRS management for conducting activities at the site.

WSRC has implemented a consolidated organization that integrates previously disaggregated elements into a unified management structure. This structure should facilitate the implementation of new policies and requirements at the site. Also, additional managers and staff, many with commercial nuclear or nuclear navy experience, have been brought to SRS to fill key management and support positions particularly in the Reactor Restart Program. Clearly there is strong top management commitment for cultural change at SRS. Such commitments supported by a variety of initiatives appear to provide a sound framework for achieving the following future objectives:

- establishment of a closer working relationship with DOE, oriented toward meeting customer needs,
- achievement of compliance with both the letter and spirit of applicable DOE requirements, and
- achievement of excellence through continuous improvements in all areas.

Numerous self-assessments and performance improvement plans have been initiated which include the reactor restart program, the development of a sitewide hierarchical set of policies and procedures, and the establishment of nuclear material processing facilities which meet or exceed commercial nuclear industry standards for safety, operations, training, and maintenance. Several key performance improvement initiatives have been developed and are being implemented such as the Westinghouse Total Quality concept, the Reactor Operations Management Plan (ROMP), and the Nuclear Materials Processing Division (NMPD) Performance Improvement Plan (PIP) among others. Systems are

being established within the Management Integration Department to ultimately provide management with the tools to track and assess WSRC commitments. Of special significance is the Westinghouse Total Quality concept that is being introduced at the WSRC site using Corporate resources and an experience base of nearly 10 years. Although the complete institutionalization of this concept is expected to take place over the next 2-3 years, it should provide the framework and methodology through which WSRC and DOE-SR will be able to effect a positive cultural change in the future.

DOE-SR has also conducted a general self-assessment and has identified a number of specific weaknesses which need to be corrected to improve the performance of its management and oversight responsibilities. Initiatives have been planned and implemented, in part, to improve the DOE-SR organization and management structure, training and qualifications of staff, and ownership and accountability aspects of their role by locating staff at the facilities.

Environment Subteam

The environmental assessment identified 35 findings representing compliance issues and 66 findings concerning realization of acceptable Best Management Practices. This assessment indicates that for a facility of the size and type of operations of the SRS, the environmental programs have focused on many of the fundamental compliance issues and have been mostly successful in their resolution. Management of the environmental program is still faced with recurring compliance deficiencies and environmental contamination issues (e.g., M-Area groundwater contamination, radiological contamination in the Savannah River Swamp and Creek Plantation Swamp, radioactive and mixed waste tanks, the inactive waste disposal sites, facility decommissioning and decontamination) that will be a part of the long term environmental management efforts. An increased emphasis on integrating formal regulatory interpretations in a progressive manner will be needed for these issues.

The Environment Subteam identified four key findings which represent actual or potential compliance findings with regard to Federal and state regulations, or DOE Orders. Those findings involve: 1) deficiencies in the waste management program; 2) failure to meet State water pollution control requirements; 3) inadequate monitoring of radiological releases; and 4) deficiencies within the SRS quality assurance activities. Following is a discussion of these key findings.

Deficiencies in the Waste Management Program were associated with the handling and storage of hazardous wastes, and failure to meet routine Resource Conservation and Recovery Act (RCRA) administrative requirements. Furthermore, the storage and generation of Land Disposal Restricted (LDR) wastes are issues.

Failure to meet State water pollution control requirements was based on the lack of a comprehensive assessment of 11 minor thermal discharges to streams site-wide, as required by South Carolina Department of Health and Environmental Control (SCDHEC); unresolved fish kill issues, which must be resolved prior to restart of reactors discharging to L-Lake and PAR Pond; and inspection and protection of the drinking water systems that potentially could pose health risks.

Specific deficiencies were found relative to the monitoring of radiological releases. The lack of technical specifications for effluent monitoring at K, L, and P-Reactors, inadequacies in monitoring for tritium in liquid effluents, and the lack of proper documentation to support tritium release data were observed as serious deficiencies in the radiological monitoring program.

The overall quality assurance program has not been fully implemented. The environmental assessment concluded that there is a lack of documented quality assurance plans for environmental monitoring and surveillance programs, untimely reporting of environmental protection appraisals, and deficiencies in the oversight and review of environmental data.

There appears to be a good understanding of the key issues, most of which have been previously identified through external reviews and self-assessments performed by DOE-SR and WSRC. Most of these key issues are being actively pursued, such as discussions on the Federal Facilities Agreement (FFA), to satisfy requirements of Section 120 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which involves active dialogue among DOE-SR, the U.S. Environmental Protection Agency (EPA) Region IV, and the SCDHEC, even though such discussions have been affected by unresolved differences between the EPA and SCDHEC. In addition, a Federal Facilities Compliance Agreement (FFCA) is being actively pursued by SRS regarding RCRA facilities and corrective actions with satisfactory progress being made.

The Environment Subteam identified one noteworthy practice. DOE-SR has produced a well organized and researched, exceptionally detailed, easy-to-understand, Environmental Protection Program Guide. The Guide provides comprehensive information on the site-wide operation of the DOE-SR Environmental Division.

Safety and Health Subteams

Safety and health assessments of WSRC non-reactor facilities were performed by three Safety and Health (S&H) Subteams. These assessments included tritium facilities, selected waste management facilities, and the SRL facilities as well as the sitewide elements of Aviation Safety, Emergency Preparedness, Medical Services, Packaging and Transportation, and an Inspection for Occupational Safety and Health Act (OSHA) compliance. Collectively, the three S&H Subteams identified 294 Concerns. Eleven of the concerns necessitated immediate corrective action by the contractor.

The S&H Subteams expressed concerns in all but one of the health and safety disciplines examined during the appraisal. Seven of the most important generic concerns, based upon potential hazard and compliance considerations, are listed below:

- The SRS is not in compliance with many DOE Orders and standards. This results from the WSRC change in the Du Pont direction from an "intent to comply" to an actual compliance mode of operation.

- Key management initiatives defining duties, responsibilities, and accountabilities for sitewide compliance have not been fully integrated into a management system that can be used to assess and communicate WSRC's ability to meet commitments to DOE.

- Training deficiencies were observed in many areas including technical training for management and operations personnel. Other specific training deficiencies were noted for emergency response and fire protection personnel, responses to abnormaloperating conditions, and radiation workers.

- The transfer of technology and lessons learned both from within and outside the SRS is not effective in raising the safety and environmental awareness of staff. Areas of weakness include waste and effluent minimization, human factors considerations, and concerns identified with auxiliary systems.

- Many readily and easily correctable industrial Safety deficiencies persist and line managers are not trained to identify OSHA-type deficiencies and to eliminate these types of hazards. Some of these are serious, Life Safety Code nonconformances.

- The absence of trained emergency preparedness staff in the operating areas, facility deficiencies, the lack of "first responder" training, and the absence of an adequate drill program at the operating facilities level, are significant. Emergency preparedness implementation does not assure mitigating measures to prevent the escalation of small events and the protection of on-site personnel.

- Safety reviews and follow-up actions have not been performed by DOE-SR in a timely manner.

The 1970 Occupational Safety and Health Act (OSHA) requires DOE to enforce all standards at its facilities such that they meet or exceed existing OSHA regulations. As a part of this evaluation, an OSHA-type compliance inspection was performed at the SRS to assess workplace compliance with the safety and hygiene requirements of OSHA. This inspection resulted in more than 230 violations, many of which were promptly corrected by the contractor, however, several significant program deficiencies were identified. These deficiencies indicated that many common safety requirements have not been implemented by DOE-SR and the contractor. There is evidence of a move at SRS toward compliance with OSHA worker safety requirements. It was concluded that when workers, their supervisors, and DOE are fully trained and able to recognize and correct many of the noted common deficiencies in a timely manner, the goal of an improved worker safety program will become a reality at SRS.

The Safety and Health Program at the SRS is in the early stage of a sweeping transition. Policies and practices characteristic of industrial safety and health programs developed several decades in the past are being supplemented, and in many cases, replaced with the more comprehensive, technically-rigorous safety and health program required by DOE Orders and recent Secretarial directives. There were positive attributes noted during these appraisals including several noteworthy practices summarized later. In addition, boding well for the future, the interviews and interactions during these appraisals indicated a capable staff, including over 400 new "exempt" WSRC personnel, generally anxious to understand the changing requirements and expectations, and ready to accept direction and guidance to implement the necessary changes. This same capability and desire to comply with requirements are sustaining an adequate margin of safety in most day-to-day operations in this interim period.

In managing the change aimed at achieving the expected level of safety culture, WSRC is establishing several top level plans and programs. At its present state of development, this top level guidance appears to have the characteristics and substance necessary to meet DOE long-range expectations. However at this

point, the requirement and expectations have not been communicated to the line managers or workforce in sufficient detail to allow effective implementation. Systems are also not in place to measure expected performance effectively. These gaps in the evolution of the top down programs, combined with the apparent lack of a substantive interim strategy for identifying priority safety concerns needing short-term correction or compensatory action, have left a sometimes tenuous status quo. Day-to-day operations proceed on the strength of capable staff using approved segments of past procedures, but a good understanding, at the worker level, of necessary safety and health upgrades and the means to implement such upgrades, are lacking. Similarly, a number of good industrial safety practices are being carried on, but numerous violations of DOE Orders, OSHA regulations, and recognized good industrial practices continue.

Significant findings were identified in every area sampled during this appraisal. Although deficiencies are not unexpected from a comprehensive assessment of a complex site at this early stage of the transition, the extent of these results underscore the need for constant vigilance and monitoring of safety performance while long-term improvements are put in place. For example, extensive deficiencies in sitewide training, worker safety, quality assurance, radiation protection and emergency preparedness programs were cited; an improving but still markedly inadequate fire protection program was noted; lack of comprehensive safety and hazards analyses (site-wide) and the resulting lack of technical bases for design operation and maintenance of safety systems, were identified.

During the course of these assessments, the following noteworthy practices were observed in the Maintenance, Auxiliary Systems, Nuclear Criticality Safety, and Medical Services programs.

- The SRL has maintained a data base containing more than 200,000 entries ranging from minor equipment failures to incidents. This data base is considered to be invaluable as it provides failure frequency information for equipment and trend analysis which is useful for Probabilistic Risk Assessments and other safety analyses.

- In the new Waste Minimization Plan, operations will be backcharged for waste shipped. Most DOE contractors have initiated waste minimization plans, but most do not include a cost penalty to the waste generator. This practice is an effective way to encourage the minimization of generated wastes.

- Both DOE 5480.5 and ANSI/ANS-8.1-1988 mandate that computer programs to be used for nuclear criticality safety evaluations be validated against experimental data. This requirement has been carried out at the SRL in a comprehensive manner using validations that have included surveys of Plutonium-239, Uranium-235, and Uranium-233 critical experiments.

- The Westinghouse Medical Department has one of the most comprehensive substance abuse testing programs in the DOE contractor complex. It includes random testing of all employees, pre-employment applicants, and "for cause" testing.

- The computer program of the Medical Department performs administrative functions, such as scheduling, and tracks the health status of an employee through his/her entire career. It will form a valuable data base for epidemiologic studies.

Management and Organization Subteam

The Management Subteam conducted a review of management practices of non-reactor operations to assess the adequacy of DOE and WSRC ES&H Programs at the SRS. The three S&H Subteam reports and the Environment Subteam report were also reviewed to identify any additional issues that had sitewide implications and required senior management attention. The Management Subteam identified 13 findings, none of which was significant enough to cause an interruption of SRS activities. Six findings relate to Best Management Practices and seven involve Compliance. Most of the findings were previously identified in DOE-SR and WSRC self-assessments, and corrective actions are already underway or planned for many of the findings. The Management Subteam assessment of these findings resulted in the following summary conclusions:

- WSRC senior managers are strongly committed to excellence in SRS operations as demonstrated by the number and quality of critical self-assessments and performance improvement plans.

- The lack of detailed implementation strategies incorporating near-term goals, priorities, and performance indicators has led to differences in award fee and performance improvement expectations between DOE-SR and WSRC.

- The effectiveness of WSRC management oversight is diminished by the lack of an effective quality assurance program that provides independent evaluations of operations and management control systems.

- WSRC organizational and individual accountability for ES&H activities is being adversely affected by the absence of a complete set of clearly-defined authorities, responsibilities, and communication between organizational elements.

- DOE-SR has reorganized to provide improved oversight of SRS operations and is actively recruiting new personnel with commercial and naval nuclear backgrounds; however, understaffing and the lack of technical training are contributing to inconsistent technical interactions and insufficient oversight of SRS operations.

- WSRC managers, supervisors, and operators express a strong desire to improve Conduct of Operations; but performance deficiencies continue in areas such as procedural adherence and control of testing, maintenance, and operations.

- WSRC does not effectively use tracking, trending, "lessons learned," or root cause analysis systems to identify and correct deficiencies in a proactive manner.

- More timely and aggressive action is required at the facility level to implement INPO guidelines and industry "good practices."

WSRC has several initiatives underway designed to move the site into a compliance mode of operation and effect an overall change in the culture of the site, however, they are in an early state of implementation. WSRC now has the challenge of managing a significant level of change. Presently, the many new initiatives are not fully integrated and prioritized so they can provide management with a comprehensive approach to managing that change and assessing their ability to meet commitments, both internal and external to the WSRC. Management has not adequately communicated their plan for change to all levels of the organization to obtain a common sitewide commitment and direction under WSRC. Although many mid-level managers, supervisors, and operators express a strong desire to improve operations, many of these individuals lack the required knowledge of how to achieve such change. Of equal concern is the relatively slow pace with which WSRC is implementing immediate sitewide changes that do not require systems development or integration. This condition was observed in the operations area where opportunities for making immediate, high-impact changes, leading to improvements in the Conduct of Operations, have not been exploited.

The Management Subteam identified 13 findings that comprise the following deficiencies: lack of compliance with DOE Orders and requirements, inadequate oversight of ES&H activities, insufficient development and implementation of procedures within operating units, lack of a comprehensive sitewide training approach and implementation strategies for performance improvement initiatives, and poor definition of communications between responsibilities of organizational units. Following is a discussion of each of these deficiencies.

WSRC is not in full compliance with many DOE Orders and other regulatory requirements. In particular the areas of radiation protection, emergency preparedness, and maintenance were frequently cited as not being in compliance.

Both DOE-SR and WSRC are using a substantial number of tracking systems that are both duplicative and ineffective in providing DOE-SR and WSRC senior management with current ES&H commitment information. The effectiveness of WSRC oversight of ES&H activities has been diminished by the lack of an effective quality assurance program that provides independent evaluations of operations and management control systems. Overall it was concluded that DOE-SR has not provided sufficient oversight of ES&H activities due, in part, to understaffing and insufficient technical training of staff. Actions have been taken to correct this deficiency which include a recent reorganization directed at a more appropriate alignment of programs with DOE-Headquarters, assembly of a team of assistant managers with commercial nuclear and nuclear navy experience, location of some organizational units in the site facilities, and the use of outside support contractors for training and audit functions.

Although WSRC has established a hierarchical set of policies and procedures common to all organizations, the development of implementing procedures in the operating areas needs to be accelerated. The lack of procedural adherence identified in numerous previous assessments of NMPD as well as other areas of WSRC continues to be a major deficiency. The use of improper procedures and the conduct of some operations with the incorrect revision of procedures, indicate the need for management attention and an accelerated cultural change in this area.

ES&H and Quality Assurance (QA) training is not in compliance with DOE Orders and other regulatory requirements. Adequate training has not been provided to managers, supervisors, and other personnel. This deficiency was identified in several instances by the S&H Subteams.

Although positive performance improvement initiatives have been identified in many areas, several factors were found that have inhibited their timely implementation. DOE-SR and WSRC have not yet reached agreement on realistic near-term expectations; near-term and long-term implementation strategies have not been developed; and senior management expectations have not been effectively communicated down into the organization.

The accountability for ES&H activities has been adversely affected by the absence of a complete set of defined authorities, responsibilities and communication among SRS organizational elements. This was noted not only between DOE-SR and WSRC, but also with DOE-SR and the other SRS prime contractors.

Three noteworthy practices were identified. Two were associated with WSRC computer programs: Performance Criteria and Evaluation System (PCES) for radiation safety criteria and Compliance Matrix Program (COMAX) for facility design criteria. WSRC's incident reporting system Site Item Reportability and Issue Management (SIRIM) was also determined to be noteworthy.

Root Causes/Contributing Causes

An analysis of the concerns, findings, and supporting discussions in the five Subteam Reports was performed by the Management Subteam to identify the basic or root causes. Root Causes are defined as: a) those items which if corrected could prevent occurrence or recurrence of the situations and conditions that were found, and b) those specific/systemic factors that could cause or create conditions that may be less than adequate or could result in accidents or incidents.

The Management Subteam team analysis resulted in the identification of five root causes and two contributing causes which are enumerated below:

1. DOE-SR and WSRC are not effectively communicating management expectations, responsibilities, authorities, and accountabilities across and within organizations.

2. DOE-SR and WSRC management are not obtaining enough accurate information reflecting actual performance and status to determine all the actions necessary to meet commitments and expectations.

3. DOE-SR and WSRC are not providing sufficient training to their personnel in specific expectations, supervisory management skills, and management policies, programs, and procedures.

4. DOE-SR and WSRC have not agreed upon an implementation strategy incorporating near-term goals, priorities, and feedback mechanisms for performance improvement initiatives.

5. WSRC Quality Assurance organizations are not adequately proactive or effective in providing independent oversight.

Although not root causes, these contributing causes were identified to be of enough significance to highlight separately.

1. WSRC management does not always implement steps to ensure high standards are demanded and maintained. Where these standards are not being met, management does not always take on-the-spot effective corrective actions in order to promote their expectations.

2. WSRC management is not requiring effective system and process reviews for determining SRS risk/hazard assessments for facilities, personnel and equipment.

1.0 INTRODUCTION

On June 27, 1989, the Secretary of Energy, Admiral James D. Watkins, USN (Ret.) announced a ten-point initiative to strengthen environmental protection and waste management activities in the U. S. Department of Energy (DOE). A major initiative involves the conduct of Tiger Team Compliance Assessments at the Department's operating facilities. This report presents the Compliance Assessment of the Savannah River Site, South Carolina. The plant is owned and controlled by the DOE and operated by the Westinghouse Savannah River Company (WSRC).

1.1 PURPOSE

The purpose of the Savannah River Site Tiger Team Compliance Assessment is to provide the Secretary of Energy with concise information on:

- current environment, safety and health (ES&H) compliance status and associated vulnerabilities;
- adequacy of DOE and site contractor ES&H management programs;
- root causes for noncompliance; and
- response actions to address identified problem areas.

This information will be used to establish DOE-wide ES&H compliance trends and root causes. Correcting the root causes should lead to a higher level of excellence in DOE operations.

1.2 SCOPE

The scope of the Savannah River Site (SRS) Tiger Team Compliance Assessment was broad in scope covering the Environment, Safety and Health, and Management areas and included, but was not limited to, the following ES&H areas:

- compliance with applicable Federal, State , and local regulations, permits, agreements, and enforcement actions;
- compliance with DOE Order requirements for ES&H activities;
- adequacy of the DOE Savannah River Operations Office (DOE-SR) and the site Contractor's ES&H management programs, including planning, organization, resources, training, and relationships with regulatory agencies;

- conformance with applicable "best" and "accepted" industry practices; and

- identification of root causes.

The scope of the Environmental assessment was sitewide while the Safety and Health assessments included tritium facilities, selected waste management facilities, and the Savannah River Laboratory facilities as well as the sitewide elements of Aviation Safety, Emergency Preparedness, Medical Services, Packaging and Transportation and an inspection for Occupational Safety and Health Act (OSHA) compliance.

1.3 APPROACH

The Savannah River Site (SRS) Tiger Team Compliance Assessment was conducted in accordance with the Tiger Team Guidance Manual, February, 1990, together with Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites, January 1990, and followed accepted audit techniques. The assessment was conducted by a team of specialists managed by a Team Leader, a Management and Organization Subteam Leader, an Environment Subteam Leader, and three Safety and Health Appraisal Subteam Leaders. Each of the Subteams was comprised of technical specialists from other DOE offices and support contractors and consultants. Team members, their area of responsibility, and work-related experience are provided in Biographical Information sheets included as Appendix A.

A systematic flow down approach was implemented to perform the probable root cause analyses. This approach begins with the analysis and evaluation of detailed background information and assessment data that are analyzed by the individual Subteams to develop their findings and concerns. These individual findings are integrated by these Subteams through identification of causal factors. The last step in the process is a collective determination of a minimal set of probable root cause(s) for the findings and concerns identified by the Subteams.

1.3.1 Pre-Assessment Site Planning

Planning for the Savannah River Site (SRS) Tiger Team Compliance Assessment included the issuance of an introduction and information request memorandum. Federal and State regulators were invited to attend and participate in the pre-assessment meeting. The pre-assessment site visit by the Tiger Team leader, the Subteam leaders and other members of the team occurred on January 9 - 11, 1990. The Savannah River Operations Office (DOE-SR) and the Westinghouse Savannah River Company (WSRC) provided overviews of site operations and the ES&H program. Discussions were held to inform the site representatives about the scope and purpose of the

Tiger Team compliance assessment program and necessary support requirements (office space, materials and office equipment, administrative support, etc.) for the actual assessment. Regulatory representatives from the State of South Carolina attended the pre-assessment site visit.

1.3.2 On-Site Activities

The onsite activities for the assessment took place from January 29 to March 23, 1990. On-site activities included field observations, document reviews, review of previous audits and assessments, and interviews with DOE, contractor, and subcontractor site personnel. Personnel from Federal, state, and local regulatory agencies were also interviewed. An emergency exercise involving site personnel was conducted on February 28, 1990.

1.3.3 Reporting

Section 2 is an overall summary of the key Tiger Team compliance assessment findings, concerns and noteworthy practices that were identified by the three Subteams. Sections 3 through 6 contain the Environment, Safety and Health, OSHA, and Management findings, concerns, and violations.

For the Environment and Management and Organization Subteams, each finding is categorized as either "Compliance Finding" or "Best Management Practice (BMP) Finding." Compliance findings are conditions that, in the judgment of the assessment Subteam, may not satisfy applicable environmental or safety and health regulations, DOE Orders (including internal DOE memoranda, where referenced), enforcement actions, agreements with regulatory agencies, or permit conditions. BMP findings are derived from regulatory agency guidance, DOE Draft Orders, accepted industry practices, and professional judgment. Within these categories, the finding is prefaced by a statement of Performance Objectives. The Performance Objectives for Regulatory Findings are derived from promulgated regulations and final DOE orders, consent orders, agreements, and permit conditions. The Performance Objectives for BMP findings are derived from regulatory agency guidance, accepted industry practices, and professional judgment. The findings within each Chapter are not arranged in order of relative significance. In addition to these two types of findings, the Subteams identified practices that, in their judgment, may be noteworthy and have general application to DOE facilities and should be documented for the purposes of information transfer.

Technical Safety Appraisals (TSAs) were conducted by the Safety and Health (S&H) Subteams as part of the Tiger Team Effort. The TSAs are operationally focused evaluations. As such, a TSA appraises how safely a facility or site is being operated and the

condition of its equipment. The TSA format contained in the document, Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites, January 1990, was employed in order to maintain consistency and integrity in the TSA. The findings identified by the S&H Subteam were obtained in three ways: (1) observing routine operations, emergency exercises, and the physical condition of the site and facilities, (2) interviews with management, staff, operators, and craft personnel, and (3) reviewing policy statements, records, procedures, and other relevant documents. A concern addresses a situation that in the judgment of the S&H Subteam: (1) reflected less than full compliance with a DOE safety and health requirement or mandatory safety standard; (2) threatened to compromise safe operation; or, (3) if properly addressed, would substantially enhance the excellence of that particular situation even though that part of the operation was judged to have a currently acceptable margin of safety. Because of this last category for addressing the excellence of the operation, more concerns are reported than would result from a strictly compliance-oriented appraisal.

For the S&H Subteams, each Concern is supported by several findings and has the characteristics of being explicit, containing the problem, being measurable (auditable) and being justifiable. Each Concern is categorized by seriousness, potential hazard consideration and compliance consideration. Within these categories, the concern is prefaced by the statement of the Performance Objective in each discipline area. The Performance Objective and supporting Criteria used during the appraisal are pre-established as indicated in Section 1.3, "Approach."

In addition to identifying concerns, the S&H Subteams looked for exceptional practices in accomplishing Performance Objectives. The exceptional practices have been identified as "Noteworthy Practices" and are presented in Section 4.6 of this report. Other DOE facilities are encouraged to adopt these practices when they are applicable to their operations.

This assessment reflects a fixed point in time. As a result, improvements in the environment and safety and health areas that were planned, but were not completed at the time of the assessment, are identified as findings or concerns if the Subteam judged that failure to complete these improvements would have a significant impact.

The process taken to complete the assessment report includes submission of preliminary findings and concerns in a Draft Report to the Manager, DOE-SR, and the site contractors at the conclusion of the onsite assessment for review for technical and factual accuracy. Their review comments, suggested changes, and modifications, as well as input from other Secretarial Offices,

will be incorporated, as appropriate, into the final Savannah River Site Compliance Assessment Report.

The DOE-SR will prepare a draft Action Plan that addresses the concerns identified during the Tiger Team Compliance Assessment. The draft action plan will be submitted by the site through the Program Office to ES&H for their review and comment. The Secretary will approve the final Action Plan and direct its implementation.

1.4 SITE DESCRIPTION

The Savannah River Site (SRS) consists of 300 square miles (198,344 acres) of land located adjacent to the Savannah River in western South Carolina. The towns of Aiken, South Carolina; Augusta, Georgia; and Atlanta, Georgia, are 12 miles north, 16 miles northwest, and 150 miles west, respectively, from the site boundary. Figures 1-1 & 1-2 show the SRS and the surrounding region.

The Savannah River Project was established by the Atomic Energy Commission (AEC) in 1950. In that year, the AEC purchased over 200,000 acres of land from 1,600 separate owners and signed a contract with E. I. du Pont de Nemours and Co., Inc. (Du Pont) to design, construct, and operate the production facilities on the site. As the successor to the AEC, the Department of Energy (DOE) has responsibility for all site activities.

SRS was constructed to produce the basic materials used in the fabrication of nuclear weapons, primarily tritium and plutonium-239. The site consists of three operational nuclear materials production reactors (K, L and P); one reactor (C) in cold standby status; one reactor (R) in shutdown status; two separations areas (F and H) for processing irradiated materials; a closed heavy water extraction plant and a heavy water rework plant (D); a fuel and target fabrication facility (M); and the Savannah River Laboratory (SRL) a research and process development laboratory supporting production and clean-up operations.

Originally farmland, SRS also serves as a lumber and forestry research center managed by the U.S. Forest Service. The site also houses the Savannah River Ecology Laboratory (SREL), an environmental research center operated for DOE by the University of Georgia.

In 1972, the AEC designated SRS as the nation's first National Environmental Research Park. The site serves as a refuge for five endangered species of wildlife: woodstorks, bald eagles, red cockaded woodpeckers, shortnosed sturgeons and peregrine falcons. Other wildlife commonly found on the Site include alligators, white-tailed deer, wild turkeys and otters.

More than 20,000 people work at SRS. This includes approximately 400 DOE personnel; approximately 12,000 Westinghouse Savannah River Company (WSRC)/Bechtel employees; Wackenhut Services Inc. (WSI), a security force of nearly 1,000; and about 200 SREL and U.S. Forest Service personnel. The remainder, roughly 6,400, are construction and subcontractor employees. The annual SRS payroll is $500 million with approximately $200 million spent annually on local purchases of goods and services in the Central Savannah River area.

The SRS has been operated by the WSRC since April 1989 and consists of several key facilities. The Savannah River Laboratory (SRL) operations directly support production reactors and chemical processing facilities, provide development efforts that support waste handling and storage operations, and perform environmental and personnel monitoring. The SRL complex includes 33 permanent buildings and includes a full-scale semi-works facility, TNX. The TNX is currently reviewing and testing equipment for the Defense Waste Processing Facility. The main technical laboratory is Building 773-A and contains approximately 90 laboratory rooms where a variety of research and development activities are performed. Most of these rooms are equipped with hoods, gloveboxes and/or shielded facilities for handling radionuclides. There are two other laboratory buildings that house environmental bioassay and radiometric facilities. Support facilities for the technical laboratory include a health protection meters calibration facility, a standards laboratory, a heat transfer laboratory, radioactive liquid waste storage and shipping facilities, ventilation exhaust treatment, maintenance shops, and storage and office buildings. A naval fuels facility is also located in the SRL area.

The production of nuclear material has resulted in nuclear waste byproducts and hazardous waste. As of December 31, 1988, SRS has stored about 33.8 million gallons of radioactive high-level mixed waste in waste tanks. The high-level waste is in three forms: sludge, salt, and supernate (liquid). In addition to the high-level waste stored in the waste tanks, low-level waste is contained in a 195-acre burial ground site within SRS. Of these 195 acres, 76 acres have been filled. The remaining 119 acres are active burial grounds.

SRS has 51 subsurface tanks for storing and processing aqueous high-level radioactive waste. The H-Area Tank Farm contains 29 of these tanks and the F-Area Tank Farm contains the remaining 22 tanks. The high-level waste in these tanks is in an alkaline form to prevent corrosion of the carbon steel tanks.
Both Tank Farm Areas have evaporators that are used to concentrate the alkaline waste. Evaporation allows volume reduction of the liquid waste so that fewer tanks are needed.

Because of the possibility of waste leaking from the older tanks, a program to remove waste from those tanks has been instituted and is scheduled to be completed by 1997. Under this program, salt or sludge can be removed from the older tanks and treated. A sludge-processing system has been developed as part of this program.

The Effluent Treatment Facility (ETF) treats waste water, some of which is radioactive and some of which is chemically contaminated, from the 200-Area operations. The ETF processes waste water that was previously collected in seepage basins in the F- and H-Areas.

The Saltstone Facility and the Defense Waste Processing Facility (DWPF) are not currently in operation. The Saltstone Facility will be used to process the salt form of the waste previously in the waste tanks. Once the radioactive cesium has been removed from this salt, the Saltstone Facility will convert the salt into a form compatible with a special cement. The salt and special cement will then be mixed together and poured into engineered disposal vaults.

Beginning in 1992, radioactive sludge that remains in the waste tanks will be processed by the DWPF into logs of borosilicate glass. This action will suspend the radioactivity so that it is in a form safer to the environment.

There are a number of nuclear operations at the SRS including reactors to produce tritium, and the tritium facilities to process tritium and ship it off site. The mission of the tritium facilities is the maintenance of limited life components of the Department of Defense weapons stockpile. The facilities process new and recycled tritium, load reservoirs, and ship the completed product off-site.

There are three main tritium facilities: extraction and separation, loading and finishing (of reservoirs) including quality control of the finished product, and reclamation. The extraction process uses furnaces; the separations process involves low temperatures for cryogenic distillation; the loading process involves modestly elevated gas pressures. Accordingly, the hazards associated with the tritium operations include high temperatures, low temperatures, and elevated pressures in pipes and vessels. There is also the special hazard of handling tritium in both liquid and gas form, and the usual industrial (chemical and physical) hazards associated with manufacturing facilities.

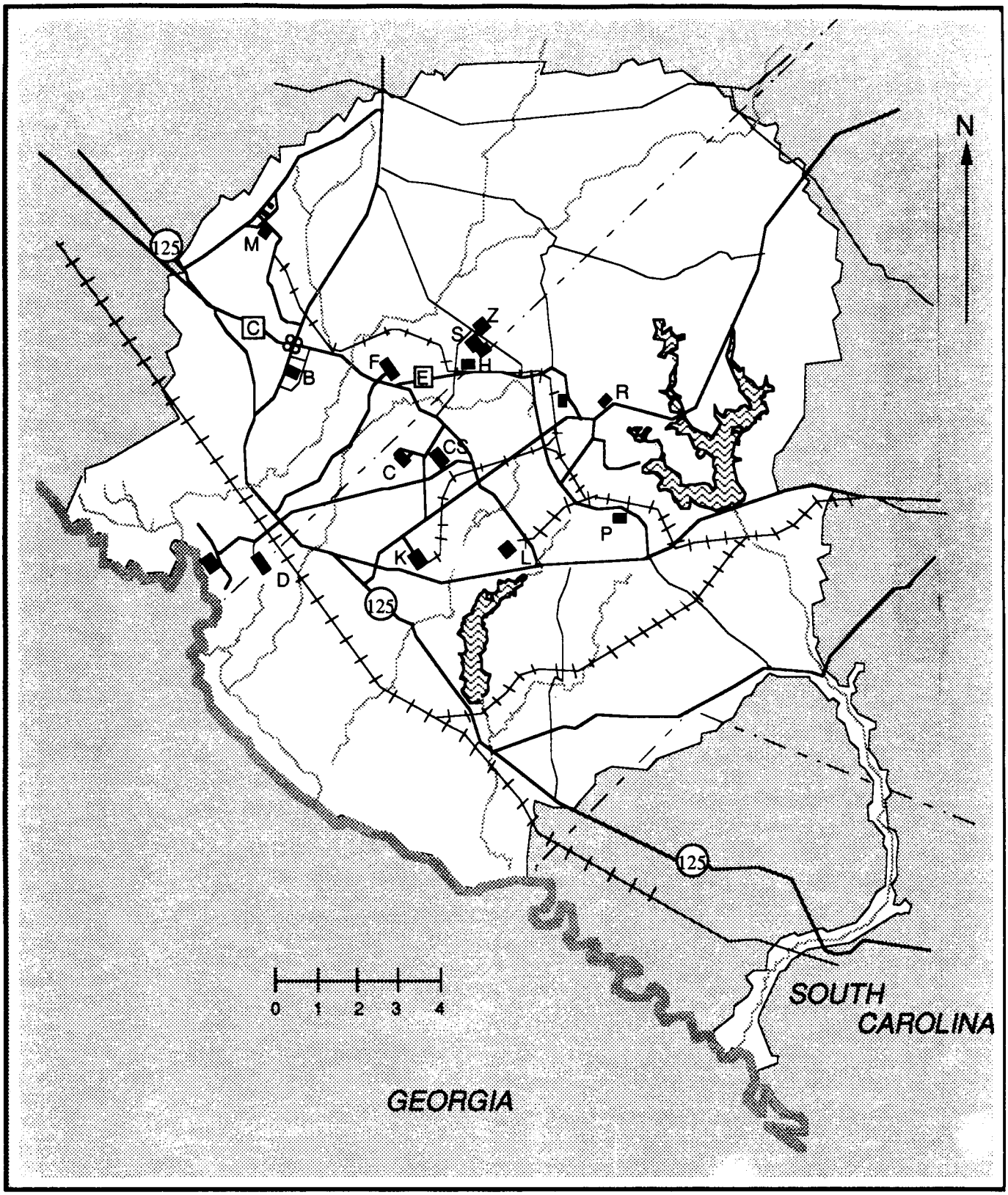

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Figure 1-1

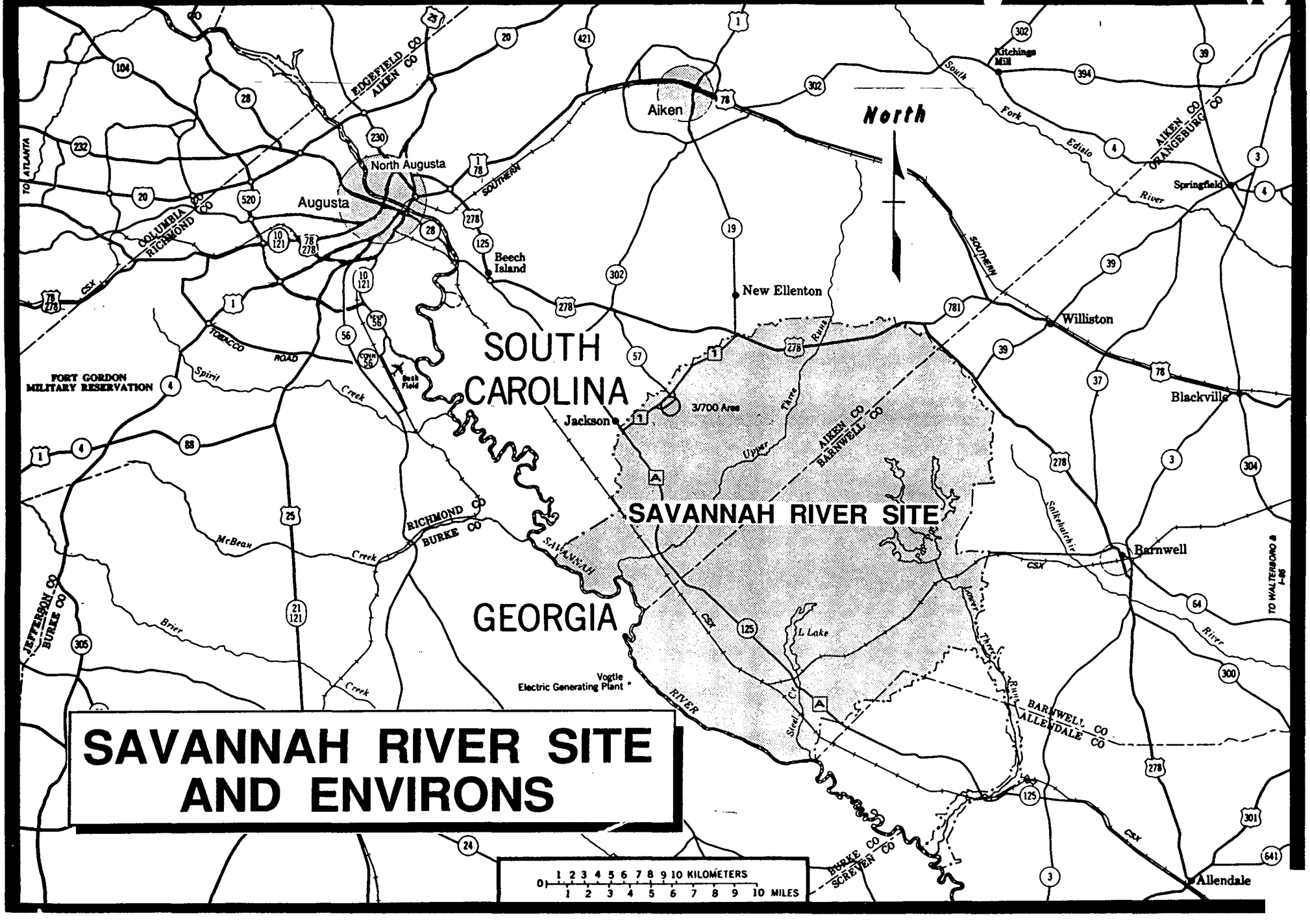

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Aiken
Augusta
North Augusta
Beech Island
New Ellenton
Jackson
Williston
Blackville
Barnwell
Allendale
Springfield
Kitchings Mill
FORT GORDON MILITARY RESERVATION
Vogtle Electric Generating Plant
3/700 Area
Upper Three Runs
Lower Three Runs
Steel Cr.
L. Lake
Spirit Creek
McBean Creek
Brier Creek
Shoulderbone Creek
Savannah River
EDGEFIELD CO
AIKEN CO
COLUMBIA CO
RICHMOND CO
BURKE CO
JEFFERSON CO
BARNWELL CO
ALLENDALE CO
ORANGEBURG CO
SCREVEN CO
TO ATLANTA
TO WALTERBORO & I-95
CSX
SOUTHERN
TOBACCO ROAD
0 1 2 3 4 5 6 7 8 9 10 KILOMETERS
0 1 2 3 4 5 6 7 8 9 10 MILES

Figure 1-2

2.0 KEY FINDINGS, NOTEWORTHY PRACTICES, AND CAUSAL FACTORS

2.1 ENVIRONMENT

2.1.1 Key Findings

The Environmental Assessment Subteam identified 4 key findings which represent potential compliance issues with regard to Federal and State regulations, or DOE Orders. The issues of concern are:

- deficiencies in the waste management program,
- failure to meet State water pollution control requirements,
- inadequate monitoring of radiological releases, and
- deficiencies within the SRS quality assurance activities.

The key findings have all been identified through previous external reviews and self-assessment initiatives performed by DOE-SR and WSRC. Corrective actions planned or currently underway at the SRS will contribute towards addressing these findings.

Several special issues were identified by the environment subteam. These issues relate to 1) a noteworthy practice for the DOE-SR, Environmental Division for development a well-organized, exceptionally detailed and easy-to-understand compilation of documents which provides a comprehensive description of how the environmental program is being managed, 2) best management practices on the lack of timely responses by DOE-HQ organizations and SRS for meeting regulatory schedules and commitments, and 3) best management practices relating to the lack of a comprehensive trend analysis and corrective action program to reduce system failures and environmental impacts.

2.1.2 Probable Causal Factors

The first key finding consists of several waste management findings related to deficiencies and/or issues associated with RCRA training, inspections, labeling and handling of hazardous waste; disposal of hazardous wastes; and storage of materials potentially subject to LDR. Some deficiencies have been encountered on a continuing basis relative to routine administrative RCRA requirements involving personnel training and records; facility inspections; and labeling, storage, and handling.

There are unresolved issues regarding the storage and generation of potential LDR wastes at the SRS. The SRS is storing radioactive mixed wastes restricted from land disposal and other materials which may be subject to RCRA requirements. There is uncertainty by SRS and DOE-HQ regarding the applicability of RCRA to these wastes and materials.

The SRS is working through a DOE RCRA Compliance Issues Work group to clarify the DOE position on applicability of RCRA to certain wastes and materials. Detailed information is not fully developed on these potential compliance issues.

There are several probable causal factors for this key finding. First, new regulatory requirements and uncertainty of regulatory interpretations by regulatory agencies, WSRC, DOE-SR, and DOE-HQ. Second, the WSRC has not completely implemented its waste management compliance program through effective oversight and clearly documented waste management guidance. Resolution of issues and regulatory interpretation with EPA and SCDHEC should facilitate implementation of this program.

The second key finding consists of several findings related to failure to meet State water pollution control requirements. The SRS has not conducted a comprehensive assessment for all thermal discharges as required by SCDHEC, has not completely resolved the fish kill issue, and has deficiencies involving protection for and inspection of drinking water systems in the 100-Areas.

The SRS has not completed an assessment for 11 minor thermal discharges nor had they provided an addendum report by March 15, 1990, as proposed in the January 22, 1990 draft settlement agreement between DOE-SR and SCDHEC. The SRS provided comments on the draft settlement agreement to SCDHEC on March 15, 1990 instead of the addendum. These comments pointed out that the requested information would take more time to develop.

The SRS and SCDHEC are still negotiating the resolution of the fish kill issues. The SRS is expected to study a number of alternatives to mitigate fish kills from thermal discharges. Resolution of the fish kill issue is needed prior to restart of the reactors and discharging to L-Lake and Par Pond.

In some areas, the drinking water systems are not adequately inspected and protected from potential contamination sources or unauthorized access. SCDHEC has indicated that this may potentially become a health risk in all 100-Areas.

There are several probable causal factors associated with this key finding. They can be attributed to the lack of formality in developing regulatory interpretations, incomplete and rapidly

changing interpretations of regulatory requirements, inadequate facility upgrades, and inadequate oversight of facilities.

The third key finding consists of several findings related to inadequate monitoring of radiological releases. The specific deficiencies include the lack of technical specifications for effluent monitoring at K-, L-, and P-Reactors; lack of tritium monitoring on liquid effluents prior to their release; and inadequate documentation to support Tritium Facility airborne emissions data.

There are several probable causal factors associated with this key finding. The probable causal factors for these deficiencies can be attributed to inadequate implementation of DOE policy, inadequate management oversight, and inadequate procedures.

The fourth key finding consists of several findings related to deficiencies within the SRS quality assurance activities. The specific deficiencies include the lack of documented quality assurance plans for environmental monitoring and surveillance programs, the lack of timely environmental protection functional appraisal reporting, and deficiencies in oversight of environmental data.

There are several probable causal factors associated with this key finding. The probable causal factors for these deficiencies can be attributed to inadequate policy implementation, time constraints being inconsistent with the complexity of appraisal reports, and inadequate personnel training and supervision relative to the development of environmental data.

The environmental assessment concluded (as did DOE-SR and WSRC in their self-assessment) that the SRS is affected by a number of environmental compliance deficiencies. These deficiencies vary in terms of their magnitude and risk, as described in this report. The management of the major deficiencies has been resolved in a responsible and successful manner. Most compliance problems are addressed in a prompt and open manner; however, followup on the adequacy of corrective actions need to be improved.

2.2 SAFETY AND HEALTH

2.2.1 Key Findings and Noteworthy Practices

The three Safety and Health Subteams expressed concerns in all but one of the safety and health disciplines examined during the appraisal. The most important generic concerns, based upon potential hazard and compliance considerations, are listed below.

- Savannah River Site (SRS) is no in compliance with many DOE Orders and standard. This results from the WSRC change in the Du Pont direction from an "intent to comply" to an actual compliance mode of operation.

- Key management initiatives defining duties, responsibilities, and accountabilities for sitewide compliance have not been fully integrated into a management system that can be used to assess and communicate WSRC's ability to meet commitments to DOE.

- Training deficiencies were observed in many areas including technical training for management and operations personnel. Other specific training deficiencies were noted for emergency response and fire protection personnel, responses to abnormal operating conditions, and radiation workers.

- The transfer of technology and lessons learned both from within and outside the Savannah River Site is not effective in raising the safety and environmental awareness of staff. Areas of weakness include waste and effluent minimization, human factors considerations, and concerns identified with auxiliary systems.

- Many readily and easily correctable industrial safety deficiencies persist and line managers are not trained to identify OSHA-type deficiencies and to eliminate these types of hazards. Some of these are serious, Life Safety Code nonconformances.

- The absence of trained emergency preparedness staff in the operating areas, facility deficiencies, the lack of first responder training, and the absence of an adequate drill program at the operating facilities level are significant. Emergency preparedness implementation does not assure mitigating measures to prevent the escalation of small events and the protection of on-site personnel.

- Safety reviews and follow-up have not been performed by the DOE Savannah River Operations Office (DOE-SR) in a timely manner.

The following Noteworthy Practices were observed in the Maintenance, Auxiliary Systems, Nuclear Criticality Safety and Medical Services programs.

- Savannah River Laboratory has maintained a data base containing more than 200,000 entries ranging from minor equipment failures to incidents. This data base is considered to be invaluable as it provides failure frequency information for equipment and trend analysis which is useful for Probabilistic Risk Assessments and other safety analyses.

- In the new waste minimization plan, operations will be backcharged for waste shipped. Most DOE contractors have initiated waste minimization plans, but most do not include a cost penalty to the waste generator. This practice is an effective way to encourage the minimization of generated wastes.

- Both DOE 5480.5 and ANSI/ANS-8.1-1988 mandate that computer programs to be used for nuclear criticality safety evaluations be validated against experimental data. This requirement has been carried out at the Savannah River Laboratory in a comprehensive manner using validations that have included surveys of Plutonium-239, Uranium-235, and Uranium-233 critical experiments.

- The Westinghouse Medical Department has one of the most comprehensive substance abuse testing programs in the DOE contractor complex. It includes random testing of all employees, pre-employment applicants, and for cause testing.

- The computer program of the Medical Department performs administrative functions such as scheduling, and also tracks the health status of an employee through his/her entire career. It will form a valuable data base for epidemiologic studies.

2.2.2 Probable Causal Factors

The probable causal factors for the concerns identified in the three safety and health reviews conducted as a part of this Tiger Team review are based on analysis of common concerns from these reviews and the conclusions of the Team Leaders and the EH Senior Managers with input from the Management Team. They are intended to provide some insight to underlying causes which, if properly addressed, would correct many of the health and safety concerns. The probable causal factors are not presented in any order of priority as they should be viewed as having equal value.

Probable Causal Factor

Integrated Management systems are not fully developed and/or implemented.

Discussion

WSRC has progressed toward identifying and developing needed technical and administrative management systems. The health and safety reviews, however, found many holes and gaps in specific aspects of various systems thereby making them less effective. Areas of concern are summarized as follows:

- A comprehensive procedure development system is not yet in place.
- Integrated programs for Maintenance, Packaging and Transportation, Emergency Preparedness, Training, Industrial Hygiene, Quality Assurance, Criticality Safety, and Fire Protection are lacking in development and/or implementation.
- Safety reviews of facility modifications, maintenance work requests and operating procedures are not being accomplished.
- Lessons learned are not being shared through the complex.
- Documentation of responsibilities have not yet been clearly delineated.
- Processes to assure compliance with DOE Orders have not evolved. Order compliance is a decentralized function with few management directions.

Probable Causal Factor

A comprehensive strategy to bring about a new more formal conduct of operations culture has not been totally developed, communicated or implemented.

Discussion

The top layers of WSRC management understands and can articulate the desired goal of a more formal conduct of operations culture. When viewed from the prospective of the worker and some middle managers there is confusion over roles and responsibilities, and what they should be going to bring about these changes. The following findings and conclusions address this factor:

- WSRC planning has not prioritized action to be accomplished or defined milestones for measuring accomplishments.

- Expectations have not been clearly defined and communicated to the worker, little significant change has occurred in the way work is done on the floor. WSR efforts have focused on planning and organization with little emphasis on bringing about changes at the worker levels.

- Understanding about the new conduct of Operations vary. Some employee groups do not believe the compliance oriented discipline of operations applies to their work activity.

Probable Causal Factors

There is a lack of technical understanding of how to achieve excellence in certain areas.

Discussion

WSRC in its self assessment has identified technical areas needing evaluation and improvements. The S&H teams could, in almost every area reviewed, find a technical issue which had not been adequately evaluated. Some were mutually recognized by the team and WSRC personnel as failure to comply to the orders, while for others such recognition could not be achieved. The importance of many of the concerns was not understood by WSRC personnel until the team member explained how the deficiency compromised facility or personnel safety. The number of findings developed by the S&H teams in this category raised concerns about the technical understanding at the operating level to achieve the excellence in operations. The following summarizes some of the concerns:

- Technical issues in a number of areas are not being evaluated. These involved single issues like double containment the evaluation of the amount of material beyond the HEPA filters, and testing of HEPA filters; to broad ranging issues like application of the Life Safety Code, Safety Analyses Reports, Operational Safety Requirements, instrument calibration, the types of maintenance to be performed, and use of Lock and Tag; to entire discipline areas (emergency preparedness, transportation, fire protection, industrial safety, health physics, and industrial hygiene, involving a number of concerns.

- There is limited upward flow of information to management regarding issues and concerns in the workplace from the workers point-of-view. Management needs to say more strongly they want to hear the bad news.

- The qualifications and knowledge of employees were a concern at two of the reviewed facilities.

Probable Causal Factors

Responsibility and accountability for compliance with appropriate safety requirements is not being effectively communicated to line and staff.

Discussion

Effective implementation of a more disciplined and formal conduct of operations cannot be achieved until the same level of accountability throughout the organization is a part of the system as has been practiced at Savannah River over the years for industrial safety. Many of the basic elements like organizational assignments and job descriptions needed for a clear understanding of roles and responsibilities have not been fully developed. Expectations as to the relative roles of safety and operations to support such an accountability system is integral to its success. The analysis of the area yielded the following conclusions.

- Formal methods for dealing with failures to comply with more strict operating philosophies and discipline of operations are not uniformly known and enforced throughout the entire organization.

- Job descriptions with specifically defined responsibilities have not been fully developed.

- Ownership and responsibility for worker safety is not uniformly held at the lower management and worker level. Where ownership and responsibility for worker safety does exist, the thresholds are much too high.

- Corrective actions involving worker safety can often be effected immediately given the management resolve to deal with such issues as quickly and effectively as possible. There may be a tendency at SRS to capture deficiencies in larger corrective action schemes. This is ineffective for most worker safety problems which can often be readily fixed without significant outlay of resources or time for planning and integrating.

- The multilayers of organization could make accountability difficult to administer without a formal strategy.

Probable Causal Factors

Training is not being effectively used to effect changes by WSRC.

DiscussiOn

Training is viewed as an essential tool to effect the needed culture change at SRS and is therefore highlIghted here. The WSRC training effort, to date, appears to have focused on facilities and organization at the higher level without actually delivering much training to the workers on the floor. More attention to determining training needs and requirements at the local facilities is needed. Resources are not viewed as a problem at the corporate level. Conclusions determined from our analysis are as follows.

- Training at the WSRC corporate level and within the individual organizational groups is not receiving the needed priority to achieve changes at the working level.

- Training is less than adequate in several areas for supervisors and employees to meet Order requirements.

- Resources are not being properly allocated among the organizations.

- There is no integrated training program approach in keeping with the safety culture/philosophy WSRC wants to implement.

2.3 MANAGEMENT

2.3.1 Key Findings and Noteworthy Practices

The Savannah River Site (SRS) is in the early stages of sweeping cultural changes in management approaches and site operations. Westinghouse Savannah River Company (WSRC) senior managers are strongly committed to developing an environment at SRS where the culture is oriented towards (a) satisfying the customer's expectations, (b) complying with both the letter and spirit of DOE directives, and (c) achieving excellence in all aspects of site operations.

Evidence of WSRC responsiveness to DOE requirements and expectations is reflected in efforts to achieve compliance with DOE directives. WSRC is currently assessing the level of compliance with Secretary of Energy Notices, applicable DOE Orders, and referenced industry standards. WSRC is also rapidly developing and implementing a hierarchical structure of management systems, policies, and procedures to support compliance with DOE requirements.

The strong commitment to achieving excellence in SRS programs is demonstrated by both the number and quality of critical self-assessments and performance improvement initiatives. One key improvement initiative is the effort to establish a Total Quality culture for all WSRC activities. The WSRC Total Quality Program is based on the concept of continuous improvement and is being implemented through annual Quality Improvement Plans. Another important improvement initiative is the commitment to implement Institute of Nuclear Power Operation (INPO) guidelines in WSRC non-reactor as well as reactor facilities. The INPO guidelines will be used to establish standards of excellence in conduct of operations, maintenance, and training.

A significant amount of change has occurred in a compressed time frame, and difficulties associated with managing this change should not be unexpected. Although continuing deficiencies were found in some areas, significant improvements in many areas were evident. Additionally, the quality of the self-assessments and performance improvement initiatives should provide a sound basis for continuing improvements in all areas.

The Management Subteam conducted a review of site-wide management practices and Conduct of Operations in nuclear material processing facilities to assess the adequacy of DOE Savannah River Operations Office (DOE-SR) and WSRC ES&H programs at SRS. The three Safety and Health (S&H) Subteam reports, and the Environmental Subteam report were also reviewed to identify any additional issues that had site-wide implications requiring management attention.

The Management Subteam assessment resulted in the following summary conclusions:

- WSRC senior managers are strongly committed to excellence in SRS operations as demonstrated by the number and quality of critical self-assessments and performance improvement plans.

- The lack of detailed implementation strategies incorporating near-term goals, priorities, and performance indicators has led to differences in award fee and performance improvement expectations between DOE-SR and WSRC.

- The effectiveness of WSRC management oversight is diminished by the lack of an effective quality assurance program that provides independent evaluations of operations and management control systems.

- WSRC organizational individual accountability for ES&H activities is being adversely affected by the absence of a complete set of clearly defined authorities, responsibilities, and interfaces between organizational elements.

- DOE-SR has organized to provide improved oversight of SRS operations and is actively recruiting new personnel with commercial and Naval nuclear backgrounds; however, understaffing and the lack of technical training are contributing to inconsistent technical interactions and insufficient oversight of SRS operations.

- WSRC managers, supervisors, and operators express a strong desire to improve Conduct of Operations; but performance deficiencies continue in areas such as procedural adherence and control of testing, maintenance, and operations.

- WSRC does not effectively use tracking, trending, "lessons learned", or root cause analysis systems to identify and correct deficiencies in a proactive manner.

- More timely and aggressive action is required at the facility level to implement INPO guidelines and industry "good practices".

The Management Subteam also identified three Noteworthy Practices. Two were associated with WSRC computer programs: Performance Criteria and Evaluation System (PCES) for radiation safety criteria; and Compliance Matrix program (COMAX) for facility design criteria. The third noteworthy practice is WSRC's incident reporting system (Site Item Reportability and Issue Management - SIRIM).

2.3.2 Probable Root Causes

The Management Subteam conducted an analysis of the concerns, findings, and supporting discussions in all Subteam reports to identify the basic or root causes. The Management Oversight and Risk Tree (MORT) methodology was used to provide a disciplined and consistent analysis. The MORT methodology was supplemented by proven techniques such as Barrier Analysis, Change Analysis, and Causal Factors. Five root causes were identified for the findings and concerns:

- DOE-SR and WSRC are not effective communicating management expectations, responsibilities, authorities, and accountabilities across and within organizations.

- DOE-SR and WSRC are not obtaining enough accurate information reflecting actual performance and status to determine all the actions necessary to meet commitments and expectations.

- DOE-SR and WSRC are not providing sufficient training to their personnel in specific expectations, supervisory management skills, and management policies, programs, and procedures.

- DOE-SR and WSRC have not agreed upon an implementation strategy incorporating near-term goals, priorities, and feedback mechanisms for performance improvement initiatives.

- WSRC quality assurance organizations are not adequately proactive or effective in providing independent oversight of SRS operations.

2.4 OCCUPATIONAL SAFETY AND HEALTH

Under the 1970 Act that established OSHA, most DOE facilities are exempted from OSHA inspections. That Act, however, requires DOE to enforce all standards comparable to or more severe than OSHA regulations at its facilities. This assessment therefore included an OSHA_type inspection to evaluate the contractor's responsibilities for occupational safety and health at the Savannah River site (SRS). This OSHA-type inspection was conducted by OCCUSAFE, Inc., under contract to DOE and was performed as a compliance-type evaluation of SRS. The OCCUSAFE report is provided in Appendix D.

The OCCUSAFE team reached general conclusions concerning the industrial and construction safety and health programs. The number and type of OSHA violations found were significant and the respiratory protection program should receive close review by Westinghouse Savannah River Company management.

The Tiger Team Assessment of the two week OCCUSAFE workplace compliance inspection observed that over 250 violations were found, many of which were corrected by the contractor without apparently incurring significant costs. The assessment noted several program deficiencies along with recommendations for improvement. Finally, there is evidence of a move at SRS toward compliance with OSHA worker safety requirements. When workers, their supervisors, and DOE are fully trained and able to recognize and correct many of the noted common deficiencies in a timely manner, the goal of an improved worker safety program will become a reality at SRS.

3.0 ENVIRONMENTAL ASSESSMENT

This report presents the findings identified during the Environment, Safety and Health Compliance Assessment, conducted January 29 through March 23, 1990, at the U.S. Department of Energy's (DOE) Savannah River Site (SRS) in Aiken, South Carolina. The SRS is owned by DOE and has been operated by the Westinghouse Savannah River Company (WSRC) since April 1989. Other DOE-SR contractors to DOE at the SRS include the Wackenhut Services, Inc., University of Georgia - Savannah River Ecology Laboratory, U. S. Army Corps of Engineers, U. S. Forest Service - Savannah River Forest Station, and the University of South Carolina, Institute of Archaeology and Anthropology. The findings from this assessment have been provided to the DOE-SR and to WSRC for comment concerning the technical accuracy and for other information that may not have been provided to the team.

The SRS was operated by E. I. du Pont de Nemours and Company, Inc. (Du Pont) for DOE beginning with construction of the SRS in 1951 until March 31, 1989. Historically, Du Pont was not contractually required to comply with all DOE orders for pollution control and environmental protection. Most environmental and waste management requirements were addressed in accordance with Du Pont corporate policy and with suggestions provided by DOE. The SRS is currently required by contract to follow all applicable DOE Orders and Federal, state and local environmental laws and regulations.

3.1 PURPOSE

The purpose of the environmental assessment is to provide the Secretary of Energy with information on the current environmental regulatory compliance status and associated vulnerabilities of each facility, causal factors for noncompliance, adequacy of DOE and site contractors ES&H management programs, response action to address the identified problem areas, and DOE-wide ES&H compliance trends.

3.2 SCOPE

The scope of the Savannah River Site environmental assessment was comprehensive, covering all environmental media and applicable Federal, state, and local regulations, requirements, and best management practices. The environmental disciplines addressed in this assessment include air, soil, surface water, drinking water, hydrogeology, waste management, toxic and chemical mate-rials, radiation, quality assurance, and inactive waste sites. The assessment also addressed the National Environmental Policy Act and concerns that arose as special issues.

3.3 APPROACH

The environmental assessment at the Savannah River Site (SRS) was conducted in accordance with the Tiger Team Guidance Manual, February 1990, and followed accepted audit techniques. The Environmental Subteam Assessment Plan is provided in Appendix B.

The SRS environmental assessment was conducted by a team managed by a Subteam Leader from the Office of Environmental Audit, and technical specialists from DOE offices and support contractors. The names, responsibilities, affiliation, and biographical sketches of the team members are provided in Appendix A.

The SRS environmental compliance assessment was conducted by an interdisciplinary team of environmental specialists. The Environment Subteam evaluated the DOE-SR, WSRC and other contractor's activities at the SRS for compliance with applicable requirements, including the following:

- National Environmental Policy Act (NEPA)
- Resource Conservation and Recovery Act (RCRA)
- Solid Waste Disposal Act (SWDA)
- Comprehensive Environmental Response, Compensation and Liability Act (CERCLA)
- Superfund Amendments and Reauthorization Act (SARA)
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Safe Drinking Water Act (SDWA)
- Toxic Substance Control Act (TSCA)
- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA)
- Laws and regulations of the State of South Carolina
- Settlement agreements and orders issued by the State of South Carolina
- DOE Orders on environmental requirements

- Institute of Nuclear Power Operations (INPO) Guidelines for the Conduct of Operations at Nuclear Power Stations

- Institute of Nuclear Power Operations (INPO) Guidelines for the Conduct of Maintenance at Nuclear Power Stations

A pre-assessment site visit was conducted on January 10-11, 1990. The DOE Savannah River Operations Office (SR) and the site operating contractor, Westinghouse Savannah River Company (WSRC) provided an overview of site operations and of the ES&H program. Discussions were held to provide the site with the scope and purpose of the ES&H Compliance Assessment program and needed support requirements needed for the actual assessment.

The on-site activities for the environmental assessment took place from January 29 through March 23, 1990. On-site activities included: review of the DOE-SR and WSRC self-assessment information; observation of site operations; document review; interviews with DOE-SR and site contractor personnel, and personnel from Federal, State, and local regulatory agencies; and review of previous audits and assessments.

During the assessment many of the operations at the SRS were either temporarily shutdown, under construction, in a standby mode or operating at limited capacity. The status of specific facilities is: Operating mode -- 232-H Tritium Extraction Facility, 234-H Tritium Loading Facility, 238-H Reservoir Reclamation Facility, 321-M Fuel Fabrication, F/H-Area Effluent Treatment Facility, Receiving Basin for Offsite Fuel, 2F/2H-Tank Farm Evaporators, 320-M Li Target Fabrication; Shutdown mode -- 247-F Naval Fuel Materials Facility, R-Area reactor; F-Canyon, FB-Line, H-Canyon, HB-Line, New Special Recovery, Plutonium Finishing Facility, 1H/1F-Tank Farm Evaporators, L-,K-, and P-Reactors; 313-M Uranium Target Fabrication; Under Design or Construction -- 233-H Replacement Tritium Facility, Consolidated Incinerator Facility, Defense Waste Processing Facility, In-Tank Precipitation Facility, Saltstone.

The findings are presented under chapters identified by media (e.g., Air, Surface Water, Hydrogeology), or regulation (e.g., National Environmental Policy Act). Each finding is preceded by a Performance Objective. The Performance Objectives for compliance findings are derived from promulgated regulations, DOE Orders, consent orders, agreements, and permit conditions. The Performance Objectives for best management practice (BMP) findings are derived from regulatory agency guidance, accepted industry practices, plant procedures and professional judgement.

Section 2.0 contains a summary of the more significant environmental findings.

3.4 ENVIRONMENTAL ASSESSMENT SUMMARY

The SRS has made improvements in their environmental compliance status and have reduced the impacts from their operations in recent years. The environmental management has addressed and resolved many of the major deficiencies in a responsible and successful manner. However, conditions and situations continue to exist or recur where the SRS does not meet all applicable environmental requirements of RCRA, TSCA, CWA, SDWA and DOE Orders. Only minor deficiencies were noted in CAA, FIFRA, CERCLA, SARA, and NEPA.

The probable causal factors for these environmental deficiencies are: inadequate management oversight, lack of verification that corrective actions have been implemented, difficulty in keeping abreast of rapidly changing environmental requirements, inadequacy of staffing levels, and the lack of formality in developing regulatory interpretations. However, the SRS is continuing to make improvements in regulatory compliance via the development of compliance schedules and pursuing compliance or settlement agreements with Federal and State agencies.

A total of 101 findings were identified during the environmental assessment of the SRS. None of the findings warranted curtailment or cessation of operations. However, the team did identify many areas that will require additional attention to achieve full compliance with regulatory or DOE requirements. The major finding areas are described in the following discussions.

The primary shortfall in the SRS waste management program is the absence of a lead entity for all contractors and WSRC custodians. The WSRC coordinators are responsible for environmental compliance in specific areas or facilities. Environmental Protection Section (EPS) acts as a coordinator, furnishing guidance and provides an oversight function for the environmental program. DOE-SR provides the oversight for the remaining contractors. There is no central leadership with responsibility for the entire waste management program. The WSRC custodians have not received guidance from EPS that was completely responsive to adequately address all issues.

The existing contractual relationship and environmental investigation between DOE-SR, WSRC, and other DOE-SR site contractors has resulted in the incomplete development of site-wide waste management procedures applicable to all contractors. ALthough waste management activities are dispersed among WSRC and other

DOE-SR contractors, liability, particularly for hazardous and mixed waste management, is more focused since the SRS has only one EPA identification number. Current deficiencies relate to storage of mixed waste without a permit, lack of contingency plans, storage issues related to land disposal restricted waste, and container management practices. The SRS waste management efforts will continue to exhibit recurring deficiencies until an integrated program is established.

Overall, the SRS has a generally well developed and implemented National Pollutant Discharge Elimination System program. The compliance record has been greater than 99% over the past 5 years for meeting effluent limitations. While the program is currently operating satisfactorily, items were identified which may impact the continued success of the program. These include the lack of program plan documentation, incomplete definition of specific organizational responsibilities and the lack of consistent protocols across departmental lines.

Several issues are currently being addressed related to thermal impacts and subsequent fish kills and thermal stress to vegetation. The SRS has prepared mitigation plans which would reduce fish kills and proposed additional mitigation measures. These issues are being negotiated with the South Carolina Department of Health and Environmental Control (SCDHEC). Resolution of the fish kill issue is expected prior to start-up of the reactors.

The quality of the SRS drinking water meets primary standards, however, most systems cannot meet secondary standards. The drinking water systems were found to be in poor condition and substandard compared to current good engineering design. A project is in the design stage that will improve the 100-Area drinking water and fire protection systems.

The SRS conducts an extensive program to control releases of radioactive contaminants from its operations and monitors radionuclides emissions and the radiological status of the site environs. Significant airborne and liquid effluent sources have been identified, and appropriate controls and monitoring systems are installed. The predominant radionuclides in effluents are tritium (air and liquid releases) and Cs-137 (liquid releases).

The assessment identified numerous deficiencies in effluent monitoring systems and procedures. The system deficiencies are primarily related to air emission, sample extraction, and transport equipment design. These deficiencies are mainly in older systems; WSRC is aware of these deficiencies and has initiated plans for their correction. Procedurally, improvements in monitoring and control of liquid releases to satisfy ALARA

principles, recordkeeping for tritium airborne release calculations, and overall quality assurance is needed.

The overall SRS on-site environmental sampling and analysis activities are generating scientifically valid data as demonstrated by the results obtained on the intra- and inter-laboratory comparison programs. However, the lack of documented Quality Assurance Plans for the various SRS environmental monitoring programs make it difficult to evaluate the sampling and analysis activities unless the requirements have been established by external sources; i.e., state and/or Federal regulators. While some of the environmental sampling and analysis activities have appropriate documented procedures, there are many sampling and analysis activities for which there are either insufficient documentation to assure their quality or where procedures are outdated and/or do not reflect current practices. In addition, similar activities performed within different groups/divisions for site-wide programs are not internally consistent.

The DOE-SR interactions with the various regulatory agencies were examined. Federal, State and County regulators were invited to attend and participate in all assessment activities. Representatives from the SCDHEC attended the pre-assessment site visit in-briefing, and participated in several meetings and discussions at the SRS. Several assessment team members met with representatives of the U.S. Environmental Protection Agency, Region IV, in Atlanta, Georgia. These meetings and discussions were arranged to solicit the environmental concerns of each agency.

The SCDHEC concerns focused on: 1) harm to fish and the environment from thermal discharges, 2) the apparent unacceptable delays by DOE-HQ in submitting documents for regulatory purposes, 3) the delays during remediation of problems due to extremely long procurement times, 4) the reactor area drinking water system which may pose a health risk, 5) the lack of clear management accountability and control for underground utilities such as sewers, and 6) the inability of operators in charge of utility services to have line responsibility to control operations.

The EPA concerns focused on: 1) the past difficulties with a sometimes inflexible working relationship, 2) the excessive DOE-HQ review time for proposed agreements, 3) the failure to release the Environmental Assessment for the Consolidated Incinerator Facility; and 4) the desire to be briefed more thoroughly on the SRS 25 "gray issues".

The DOE-SR routine interactions with the EPA and SCDHEC, and other state regulating agencies have been very cooperative,

however, some strains in the relationship have occurred recently due to delays in reporting information. The SRS, EPA, and state agencies appear to have established a good working relationship. However, in some cases, conflicts have risen over differences in interpretation of requirements; in the opinion of EPA and SCHDEC, DOE-SR and DOE-HQ lack responsiveness to schedules and review periods. EPA stated that SRS had recently reversed its inflexible practices during negotiations. Neither EPA nor SCDHEC has met with a representative from line management or General Counsel of DOE-HQ.

The day-to-day environmental management of the SRS is a shared responsibility of the DOE-SR, WSRC and other contractors operating at the SRS. The DOE-SR has primary oversight responsibility. The environmental responsibility and obligations are handled by designated contractors as outlined in their contracts and subsequent agreements. However, DOE-SR is still examining the types of interrelationships that are needed to have an effective environmental program. Currently, there is some confusion between contractors about responsibilities, oversight roles and applicable requirements.

The staff of DOE-SR and WSRC are dedicated to successfully managing the environmental programs at the SRS. DOE-SR has augmented its environmental staff through the use of a support contractor, NUS Corporation. The overall SRS staffing level and experience of staff is currently insufficient to provide the leadership and management controls required to implement the current programs. In addition, the magnitude of required oversight is expanding under the various regulatory agreements and orders, and evolving DOE surveillance philosophy. Further, meeting existing program needs will continue to be challenge until recurring deficiencies are minimized.

LINE MANAGEMENT AND ES&H OVERSIGHT

As part of the assessment, the team reviewed several DOE-SR reports on environmental compliance, including the Monthly Environmental Compliance Reports required by Secretary of Energy Notice-7 (SEN-7), reports on appraisals, audits and walkdowns by the DOE-SR and WSRC. The purpose was to determine the adequacy of the SRS systems for conducting self-appraisals of ES&H.

The SEN-7 reports from DOE-SR are comprehensive, accurate, and current with only minor discrepancies noted. The reports generally reflect the existing guidance at a level above what is necessary to concisely assure achievement of the objectives set forth in the SEN-7.

Guidance provided by S-1 and EH-1 in August 1989 directs that each SEN-7 report is to address the adequacy of staff and the financial resources to meet all environmental requirements. The July 1989 through January 1990 reports contain no discussion of the adequacy of staffing and financial resources. The February 1990 report indicated that WSRC is still resource-limited. Increasing staff resources do not appear to be changing upwards as WSRC continues to lose experienced personnel at a rate comparable to new hires.

The SEN-7 notice specifies that the review and report preparation is to be performed solely by DOE employees. The DOE-SR Environmental Division initially developed the outline and baseline information contained in the report. DOE-SR provides the data analysis and reporting as required by SEN-7. The NUS Corporation currently compiles the DOE-SR input and generates the report for DOE-SR review and transmittal DOE-HQ. DOE-HQ has been informed and concurs with this process.

As a further effort at self-assessment, the DOE-SR ES&H staff is required to conduct appraisals, surveillance, audits and facility inspections as described in their Comprehensive Environmental Protection Evaluation Plan. However, these specific activities have not been recently performed because of the changeover of contractors on April 1, 1989, and recent loss of staff and time required to prepare for external audits.

DOE-SR did direct WSRC in July 1989 to establish a baseline compliance status by thoroughly assessing all SRS facilities.

DOE-SR ES&H staff have participated as observers on facility inspections performed by WSRC.

The WSRC has performed many operational self-assessments which have highlighted broad areas of potential environmental compliance issues and their plans for corrective actions in each area. The environment subteam review of these self-assessments agrees with these previously identified areas of concern. The WSRC self-assessments did identify many specific noncompliances in advance of the environmental assessment. However, it is believed that more specific examples of noncompliances would have been identified by WSRC had their self-assessments been more focused.

RISK ASSESSMENT AND PRIORITIZATION

Neither DOE-SR nor WSRC has any system or process to prioritize identified environmental problems and associated corrective actions based on objective criteria such as quantified assessment

of risks. Priorities appear to be set my mutual agreement, availability of resources, direction of DOE-HQ and certain external factors. Priorities are established for some projects through the preparation of the Five-Year Plan, the Waste Management Site Plan and the Environmental Implementation Plan. Most other priorities are driven by regulatory requirements.

DISCUSSION OF FINDINGS

The environmental assessment identified 35 findings representing compliance issues and 66 findings relating to acceptable best management practices. The environmental assessment identified no environmental conditions at the SRS that represent an undue risk to public health and the environment from the active operations reviewed. This assessment does indicate that for a facility of the size and type of operations of the SRS, the environmental programs have focused on many of the fundamental compliance issues and have been mostly successful in their resolution. Management of the environmental program is still faced with some recurring compliance deficiencies and environmental contamination issues (e.g., M-Area groundwater contamination, radiological contamination in the Savannah River Swamp and Creek Plantation Swamp, radioactive and mixed waste tanks, the inactive waste disposal sites, facility decommissioning and decontamination) that will be a part of the long-term environmental management efforts. A continuing emphasis on integrating formal regulatory interpretations in a progressive manner will be needed to resolve these issues. The key findings are discussed below.

The environmental assessment team identified 4 key finding areas which represent actual or potential compliance findings with regard to Federal and state regulations, or DOE Orders. Those findings concern: 1) deficiencies in the waste management program; 2) failure to meet State water pollution control requirements; 3) inadequate monitoring of radiological releases; and 4) deficiencies within the SRS quality assurance activities.

The key findings have all been identified through previous self-assessment initiatives performed by DOE-SR and WSRC. Corrective actions currently underway or planned at the SRS will contribute towards resolving these findings. Probable causal factors have been prepared for each key finding. Table 3.4-1 lists all the environmental findings.

CONDUCT OF OPERATIONS AND MAINTENANCE

The Institute of Nuclear Power Operations (INPO), a nuclear industry consortium, has developed a set of standard guidelines

for the conduct of business at nuclear stations. Included in this set of standards is the operations document "Guidelines for the Conduct of Operations at Nuclear Power Stations" (INPO 85-017). This document sets forth the nuclear industry's best practices and standards and is a yardstick to which a facility's operations can be gauged. Key elements of the operations guidelines are depart-ment organization and administration, shift routines and operating practices, control room activities, communications, training, investigation of abnormal events, notifications, equipment control, tagouts, independent verification, logkeeping, control of temporary modifications, shift orders, operations procedures, operator aids and postings, and equipment labeling. All of these elements require a high degree of formality and professionalism in order to achieve the ultimate goal of the highest performance standards.

The overall environmental assessment integrated a "Conduct of Operations" assessment into the field inspections. The guidelines were used in this case to assess the effectiveness and adequacy of the facility policy, procedures, and operations. Comparison of INPO guidelines against current operations is a good indicator to assess the current status of the facility. It was noted that until approximately one year ago, the site had no commitment to the conduct of operations. With the change of operating contractor to WSRC in April 1989, a commitment was made to formalize conduct of operations and begin a mode of "deliberate" operations in order to improve performance.

Some of the items found during the field inspections are detailed below. Procedures used at various facilities around the SRS were missing steps and did not provide enough detail to direct the worker in performance of a specific task, such as maintaining a chain-of-custody for a sample or for performing a required average loss/gain calculation. Another conduct of operations deficiency noted was in logkeeping. For example, logbooks that were supposed to document the same process in different areas did not require the same information and two log books at the same location contained inconsistent information. This leads to a question of formality and which of the logs is "official". Another example involved equipment tagging. INPO best practice calls for consistent and clear labeling of equipment and components. In one case equipment was either not tagged or tagged with unreadable labels. The last example deals with operator aids. There were cases of postings at equipment sites that contained inconsistent or wrong information, such as location, permit numbers, and operating parameters.

INPO has also developed a set of maintenance guidelines, "Guide-lines for the Conduct of Maintenance at Nuclear Power Stations"

(INPO 85-035), that are a recognized industry tool that can be used to compare a facility's maintenance performance against the best commercial industry practices and standards to date. Key elements of these guidelines are based on training; maintenance procedures; tools and equipment; planning, scheduling, and coordination of maintenance; procurement; maintenance history; and analyses of maintenance problems. All elements require a maintenance program that demands a team effort, professionalism on the part of everyone concerned, and a dedicated commitment by all to raising performance standards.

Until nearly a year and a half ago, the Savannah River Site did not have a maintenance program in place that was capable of measuring maintenance operations against the best maintenance practices of commercial nuclear utilities or industry standards. In June 1988, however, the DOE requested the SRS Reactor Programs to develop a comprehensive maintenance improvement plan. To accomplish this end, Reactor Maintenance within Reactor Programs (now Reactor Restart Division), adopted the INPO Guidelines for the Conduct of Maintenance at Nuclear Power Stations and developed a self-assessment process based on these guidelines. The first INPO based SRS maintenance self-assessment was initiated in the Reactor Restart Division in March 1989 and was completed in January 1990. The results of the self-assessment have been use to establish the foundation for the overall Maintenance Improvement Plan that will be issued the second quarter of Fiscal Year 90.

On the non-reactor side, WSRC issued on December 16, 1989, a comprehensive plan for improving the Nuclear Materials Processing Division (NMPD) entitled "Nuclear Materials Processing Division Performance Improvement Plan". The Performance Improvement Plan (PIP), based on numerous INPO guidelines and references to DOE Orders and American National Standards Institute (ANSI), was developed in an effort to improve the operating facilities under the purview of the NMPD-, Raw Materials, Separations, Tritium, and Waste Management. Other supporting organizations, such as Environmental, Safety and Health and Quality Assurance (ESH&QA); Savannah River Laboratory (SRL); and the Engineering and Projects Division (EPD) were not, however, included in the PIP. To date, there is no SRS site-wide environmental program plan that addresses the interrelationship between facility/equipment maintenance and implied or corresponding environmental consequences. Neither DOE-SR nor WSRC Environmental Protection Section (EPS) have developed an integrated program whereby reported accidents, incidents, and/or safety system failures are systematically reviewed and evaluated to identify recurring problems and their potential implications for environmental impacts. A corrective action and follow-up program is also not completely developed and

the corrective action not tracked. Where there have been system failures, maintenance has been predominantly reactive; predictive or preventative maintenance procedural measures are not the norm.

At the operating level, the environmental assessment found that maintenance procedures were generally available at each of the area facilities, though not always up-to-date, or adequately implemented by the responsible personnel. For instance, RCRA inspection logbooks were found missing at some facilities; where they were available, they were not always filled out correctly or completely. Some manifest inspection reports for offsite shipment of regulated hazardous wastes were found to contain erased or penciled-in changes. In some cases, the requisite RCRA training was inadequately administered.

In the area of toxic and chemical materials maintenance, there is a site-wide problem where secondary containers holding chemical substances have not been adequately labeled or marked to alert workers and emergency responders of container contents. In a number of other areas (H-Area, Central Shops, P-Area, M-Area, Tritium), Material Safety Data Sheets (MSDS) were not readily accessible. Where spills are concerned, necessary cleanup equipment and materials often were not available, not available in the proper variety or quantities to provide adequate spill diversion, detention, or cleanup, or not placed in close proximity to locations where chemical substances were stored. Further, there is presently no policy or procedures in place for the management of excess chemicals--either raw materials or chemicals with expired dates.

Although the team did not observe the operations of some production facilities, the review of many of the key activities was unaffected by the nonoperating status. The operating production facilities and the support activities such as waste management, wastewater and sewage treatment, remedial investigation/feasibility study activities, coal-fired steam plant operations, environmental and effluent monitoring, maintenance and construction activities were reviewed where possible.

TABLE 3.4-1

ENVIRONMENT SUBTEAM FINDINGS LIST

AIR

E-1	A/CF-1	Absence of Gasoline Misfueling Notices on Gasoline Pump Stands
E-2	A/BMP-1	Discrepancies in Permit Information
E-3	A/BMP-2	Lack of Updated Procedures for PM-10 Ambient Monitors
E-4	A/BMP-3	Format Inconsistencies Among Logbooks for Diesel Generators
E-5	A/BMP-4	Lack of Comprehensive Air Emissions Inventory and Climatological Database
E-6	A/BMP-5	Lack of Software QA Implementation Plan for Emergency Response and Dosimetry Dispersion Models
E-7	A/BMP-6	Deficiencies in the Meteorological Data Quality Assurance Program
E-8	A/BMP-7	QA Deficiencies in the PM-10 Ambient Air Monitoring Program
E-9	A/BMP-8	Inadequate Transmissometer Calibration Procedure and Implementation
E-10	A/BMP-9	Unrealistic Input Data for Dosimetry Modeling

SOIL/SEDIMENT/BIOTA

E-11	SSB/BMP-1	Inadequate Biological Study Protocol
E-12	SSB/BMP-2	Inadequate Assessment of Non-Radiological Contaminants in the Ambient Monitoring Program E-13 SSB/BMP-3 Inadequate Maintenance of Contaminated Soil Piles

SURFACE WATER/DRINKING WATER

E-14	SW/CF-1	Substandard Drinking Water Systems

E-15	SW/CF-2	Improper Abandonment of Drinking Water Wells
E-16	SW/CF-3	Breach of Containment Diking and Inadequate Procedures
E-17	SW/CF-4	Delays in Updating Spill Prevention Control and Countermeasure Plan
E-18	SW/CF-5	Failure to Meet the CWA Section 401 Certification Special Conditions Prior to Expiration
E-19	SW/CF-6	Lack of Final Evaluation of Impacts of Minor Thermal Discharges
E-20	SW/CF-7	Incomplete Resolution of the Fish Kill Issue
E-21	SW/CF-8	Fill of Wetlands Due to Uncontrolled Erosion
E-22	SW/CF-9	Improper disposal of excess chemical reagent and sample solution
E-23	SW/BMP-1	Inadequate Spill Containment
E-24	SW/BMP-2	Failure of M-Area Liquid Effluent Treatment Facility (LETF) to Maintain Only One Operating Log
E-25	SW/BMP-3	Inadequate Maintenance Management System
E-26	SW/BMP-4	Inadequate Labeling and Tagging
E-27	SW/BMP-5	Inadequate Chain-of-Custody Procedures for NPDES Sample Collection
E-28	SW/BMP-6	Inadequate Documentation of Comprehensive NPDES Program Plan
E-29	SW/BMP-7	Insufficient Monitoring of All On-Site Drinking Water
E-30	SW/BMP-8	Inadequate Documentation of Standard Operating Procedure (SOP) Requirements
E-31	SW/BMP-9	Nonrepresentative NPDES Sample Collection Sites

E-32	SW/BMP-10	Lack of Review of the NPDES Discharge Monitoring Report (DMR) by the Operator-In-Charge
E-33	SW/BMP-11	A Conflict in the Definition of Operator-In-Charge (OIC) and Other Operator Terms Exists in SRS Wastewater Treatment Facilities
E-34	SW/BMP-12	Inadequate Tracking of 404 Permit for Lost Lake
E-35	SW/BMP-13	Inadequate Site Use Coordination
E-36	SW/BMP-14	Lack of Erosion Control During D-Area Package Treatment Plant Construction

HYDROGEOLOGY

E-37	H/BMP-1	Untimely and Inadequate Submittal of Routine Reports to the Regulatory Agencies
E-38	H/BMP-2	Inadequate Analyses and Containment of Purged Water From Monitoring Wells
E-39	H/BMP-3	Inadequate Interim Stabilization of the Seepage Basins at the R-Reactor Area
E-40	H/BMP-4	Failure to Adhere to Established Procedures in Performing Hydrogeologic Investigations
E-41	H/BMP-5	Lack of Adherence to Defined Responsibility, Coordination, and Authority between the U.S.Army Corps of Engineers and the Savannah River Site

WASTE MANAGEMENT

E-42	WM/CF-1	RCRA Training Program Deficiencies
E-43	WM/CF-2	Deficiencies in Hazardous Waste Management Program at Wackenhut
E-44	WM/CF-3	Unpermitted Disposal of Hazardous Waste
E-45	WM/CF-4	Technical Violations of Inventory Procedures for Tank 722-4A
E-46	WM/CF-5	Lack of Permit for Storage of Mixed Waste

E-47	WM/CF-6	Instances of Inadequate Inspection of Containers and Tanks
E-48	WM/CF-7	Unapproved Storage of Waste Subject to the Land Disposal Restrictions
E-49	WM/CF-8	Inadequate Secondary Containment and Assessment of Tank Integrity
E-50	WM/CF-9	Deficiencies in Management of Waste Drums
E-51	WM/CF-10	Unavailable Contingency Plan
E-52	WM/BMP-1	Incomplete Implementation of Waste Minimization Program
E-53	WM/BMP-2	Delayed Consolidated Incinerator Facility Startup
E-54	WM/BMP-3	Inconsistent and Incomplete Spill Response Information in Permit Application
E-55	WM/BMP-4	Incomplete Manifesting of Hazardous Waste Shipments
E-57	WM/BMP-5	Inadequate Maintenance of Tank Farm Vaults
E-58	WM/BMP-6	Insufficient Administrative Controls to Preclude Introduction of Listed Waste to Area Tanks
E-59	WM/BMP-7	Deficient Underground Storage Tank Management Program
E-60	WM/BMP-8	Application of Waste Management Regulations to Nuclear Materials
E-61	WM/BMP-9	Deficient Oversight of Protocol Revision
E-62	WM/BMP-10	Inadequate Review of Staging and Satellite Area Locations and Surfaces
E-63	WM/BMP-11	Inadequate Policy and Procedures for Mercury Management
E-64	WM/BMP-12	Lack of Overall Environmental Compliance Program for Reactor Restart

E-65	WM/BMP-13	Deficiencies in Satellite Accumulation Area Operations

TOXIC AND CHEMICAL MATERIALS

E-66	TCM/CF-1	Failure to Meet Storage Time Limit Criteria for Mixed PCB Waste
E-67	TCM/CF-2	Inadequate Identification of PCB Concentrations in Oil-Filled Equipment
E-68	TCM/CF-3	Inadequate Secondary Containment and/or Separation for Chemical Storage
E-69	TCM/BMP-1	Inconsistent Identification of Empty Chemical Containers
E-70	TCM/BMP-2	Lack of Policy and Procedures on Management of Unused Toxic and Chemical Materials
E-71	TCM/BMP-3	Deficiencies in Type, Placement and Lack of Spill Cleanup Equipment
E-72	TCM/BMP-4	Inadequate Labeling of Chemical Storage Cabinets
E-73	TCM/BMP-5	Lack of Comprehensive Site-Wide Asbestos Management Program
E-74	TCM/BMP-6	Inaccessibility of Material Safety Data Sheets (MSDS)
E-75	TCM/BMP-7	Lack of Adequate Labeling of Secondary Containers of Chemical Substances

QUALITY ASSURANCE

E-76	QA/CF-1	Exceedance of Maximum Sample Holding Times
E-77	QA/CF-2	Deficiencies Within the Environmental Protection Functional Appraisal Program
E-78	QA/CF-3	Lack of Documented Quality Assurance Plans for Environmental Protection Programs
E-79	QA/CF-4	Deficiencies in Oversight of Sampling, Analysis,and Technical Data for SRS Environmental Protection Programs

E-80	QA/BMP-1	Inadequate Maintenance of Quality Assurance Records
E-81	QA/BMP-2	Incomplete and/or Deficient EMS Procedures

RADIATION

E-82	R/CF-1	Lack of Technical Specifications Which Address Radiological Effluent Monitoring Requirements
E-83	R/CF-2	Inadequate ALARA Process for Tritium Sources and Releases
E-84	R/CF-3	Radiological Guidelines for Unrestricted Release are not Consistent with DOE Requirements
E-85	R/CF-4	Inadequate Records for Tritium Facility Stack Release Determination
E-86	R/BMP-1	Lack of Comprehensive Environmental Effluent Monitoring Plans
E-87	R/BMP-2	Unauthorized Radiological Criteria and Inadequate Quality Assurance Program in Sanitary Landfill
E-88	R/BMP-3	Deficiencies in Air Emissions Sampling/ Monitoring Program
E-89	R/BMP-4	Inappropriate Radiological Criteria for Hazardous Waste/Mixed Waste Classification

INACTIVE WASTE SITES

E-90	IWS/CF-1	Failure to Address Inactive Hazardous Substance Sites In A Prompt Manner
E-91	IWS/BMP-1	Inadequate Reporting Procedures for Potential Hazardous Substance Sites
E-92	IWS/BMP-2	Inadequate Criteria and Documentation for the CERCLA Operable Unit List
E-93	IWS/BMP-3	Lack of a Consolidated Database to Track Site Investigation and Remediation Activities
E-94	IWS/BMP-4	Significant Issues Relevant to Federal Facilities Agreement (FFA) Negotiations that Impact Future CERCLA Compliance Status

NATIONAL ENVIRONMENT POLICY ACT

E-95	NEPA/CF-1	Outdated DOE-SR NEPA Implementation Plan
E-96	NEPA/CF-2	Deficiencies in Memoranda-to-File
E-97	NEPA/CF-3	Insufficient Level of NEPA Documentation for the Naval Fuels Material Facility (FMF)
E-98	NEPA/BMP-1	Inadequacy of Site EISs for Tiering
E-99	NEPA/BMP-2	Inadequate WSRC NEPA Procedures

SPECIAL ISSUE

E-100	SI/NWP-1	Environmental Protection Program Guide
E-101	SI/BMP-1	Inadequate Timely Responses by Department of Energy (DOE) - Headquarters (HQ) Organizations to Regulatory Schedules and Environmental Commitments
E-102	SI/BMP-2	Lack of a Comprehensive Trend Analysis and Corrective Action Program to Reduce System Failures and Environmental Impacts

3.5 ENVIRONMENTAL ASSESSMENT FINDINGS

3.5.1 Air

3.5.1.1 Overview

Atmospheric emissions from the Savannah River Site (SRS) can be divided into two categories - radiological and nonradiological. This section will concentrate on the nonradiological air pollutants produced at the SRS. Coverage of radiological air pollutants is found in the Radiation Section.

Nonradiological air pollutants emitted at SRS are controlled under the National Clean Air Act (CAA), the South Carolina Air Pollution Control Regulations and Standards (Regulation 61-62), and several DOE Orders. South Carolina Department of Health and Environmental Control (SCDHEC) CAA authority encompasses National Ambient Air Quality Standards (40 CFR 50), Prevention of Significant Deterioration (40 CFR 52), New Source Performance Standards (40 CFR 60), and National Emission Standards for Hazardous Air Pollutants (40 CFR 61). DOE Orders applicable to the control of non-radiological air pollutants include 5400.2A, 5480.4 and 5484.1.

Finally, in response to the need for controlling the atmospheric release of toxic chemicals, the State has proposed Toxic Air Pollution Standards which would apply to new sources and to modifications of existing sources.

The assessment consisted of a review of the documents provided by WSRC and interviews with personnel. These documents also were examined for evidence of the proper conduct of operations and of maintenance by the WSRC, DOE, and other organizations operating at the SRS. Additional information was obtained during meetings and telephone conversations with regulatory agencies and consultants or contractors who provide services to WSRC.

Visits were made to each SRS area where a permitted source was located or where an unpermitted source of nonradiological air pollutants was in operation. Unpermitted sources include those that are exempt (i.e., laboratory hoods or small sources) and are not required to be permitted. During these visits, inspections to verify compliance with permit conditions and examine entries in logbooks were performed. The ambient air quality monitoring program was assessed by examining the procedures manual for the program, checking data handling practices, and visiting one of the most heavily instrumented monitoring stations.

Another series of interviews and monitoring site visits was conducted in regard to meteorological monitoring, dispersion modeling, and emergency preparedness practices of the Environmental Technology Section (ETS). The siting of meteorological towers, the placement of meteorological instruments on the towers, and the calibration and maintenance of those instruments were assessed. Data handling procedures were reviewed with regard to how the data were selected for use in the dispersion models.

There were over 50 documents utilized in analyzing air quality covering such issues as SCDHEC regulations, air permits, site environmental implementation plans, quality assurance manuals, user's guides, computer printouts of dispersion modeling results, and manuals covering installation, calibration, and maintenance.

This air quality assessment produced one compliance finding and nine best management practices finding. The compliance finding involved the absence of misfueling notices on gasoline pump stands. The best management practice findings covered air permit information, PM-10 monitor procedures, diesel generator logbooks, planning for future air quality control reporting requirements, software QA for dispersion models, QA for meteorological data acquisition, QA for PM-10 data gathering, transmissometer calibration procedures, and dosimetry modeling data.

The Federal Clean Air Act regulates the allowed offsite concentration for six criteria pollutants: 1) particulate matter < 10 um in aerodynamic diameter (PM-10), 2) sulfur oxides, 3) nitrogen dioxide, 4) ozone, 5) carbon monoxide, and 6) lead. In addition to the above, South Carolina Department of Health and Environmental Control currently regulates the ambient offsite concentration for gaseous fluorides and total suspended particulate (TSP) which is measured as particles less than about 30 um in aerodynamic diameter. The SRS currently utilizes contractor assistance to monitor for PM-10, SO_x, NO_2, and O_3 at locations within the boundary.

The SRS operates an extensive network of meteorological measurement instrumentation which serves a multiplicity of purposes including dose predictions, emergency response modelling, and environmental impact modelling for nonradiological air pollutants to name a few. The equipment is mounted on nine onsite 200 ft. towers (A, C, D, F, H, K, L, P, and CS) as well as the offsite WJBF-TV tower located 19 miles NW of the geometric center of the SRS. Such variables as wind speed, horizontal wind direction, vertical wind direction, temperature and dew point are monitored and converted to digital signals which are transmitted to minicomputers located in the Weather Center in Bldg. 773-A.

A draft air pollution control standard for toxic air pollutants has been developed by SCDHEC. As currently drafted, this standard would require compliance by all new sources and within 2 years after the date it becomes effective by all existing sources of any toxic air pollutant. A number of the chemicals on the toxic air pollutant list are in use at SRS, in some cases as individual chemicals/compounds such as mercury, and in some cases as constituents in products used. A calculation by SRS personnel has shown that the mercury concentration at the plant boundary from mercury emission sources at SRS is below the 0.25 ug/m^3 maximum allowable concentration for mercury in the SCDHEC draft air toxic regulation.

The NESHAP mercury standard is specific to a few industrial and waste treatment processes and does not apply to any existing SRS process. Although not an emission standard, the emission limit for mercury in the SCDHEC regulations which triggers Prevention of Significant Deterioration review is 200 lb/yr.

The radiological waste disposal processes have several stacks and vents from which there is a potential for the emissions of mercury, particulates and benzene. It is estimated that mercury emissions from the ventilation of the entire field of high-heat waste tanks in H Area total 2-3 pounds per year. The ventilation of the evaporators also produces minimal amounts of mercury. The Effluent Treatment Facility (EFT) removes mercury from wastewater, but emissions of mercury to the air through the EFT's ventilating exhausts are negligible. At the DWPF in S Area, a fraction of the mercury which is in the incoming sludge will ultimately be emitted to the air. The SCDHEC construction permit for this facility limits the mercury emissions to 0.02 lb/hour. This limit is about 10 times larger than the actual emissions expected from this unit.

The Z Area Saltstone Process has an SCDHEC operating permit which regulates the particulate emissions from the equipment used in preparing the dry constituents of the grout. A 20% capacity limit is placed on the emissions from the silos, weight hopper, blender and feed bin.

At the In-Tank Precipitations (ITP) facility stacks from three sources - process tank, DWPF feed tank, and filter building stripper are expected to emit benzene limited to a total of 11.3 lb/hr by the SCDHEC construction permit. This hourly limit is equivalent to 38 tons per year, but the expected level of operations will produce only 24 tons per year of benzene at the ITP facility.

The slurry from the ITP facility goes to the Defense Waste Processing Facility (DWPF) where additional benzene will be emitted to the air during the processes associated with vitrification. The major benzene sources at the DWPF will be the melter, the acid hydrolysis vessel, and the formic acid vessel; minor emitters will be the benzene hold tank, the incinerator feed tank, the incinerator and the pump tanks. On its application for a permit to construct the DWPF, SRS estimated that the benzene emissions would total 35.9 tons/year. Revisions by WSRC in the portion of the hydrolyzed organic that reaches the melter and the amount of benzene in the melter off-gas have reduced the total expected emissions from 35.9 lb/yr to 20 lb/yr.

Active power plants on the site are located in A, D and H Areas, with the major one being in D Area. Boiler emissions in all three areas meet permitted emission limits by the use of 2% sulfur bituminous coal and particulate collection equipment. While maximum opacity is limited to 40% on all these boilers, only the D-Area boiler stacks are required to have continuous opacity meters.

No SCDHEC permits have been issued to cover SRS operations that produce fugitive emissions. This follows normal SCDHEC practices for new fugitive dust sources which have little offsite impact due to the large distance to the boundary.

Many of the fugitive dust sources existed prior to SCDHEC permit regulations and thus require no permit unless altered. Fugitive particulate emission sources at SRS include sandblasting, lead melting, and welding in the Central Shops Area; coal handling and ash handling for the power plants in A, D and H Areas; and earth moving, road watering and other construction activities at the burial ground and at scattered places around the SRS. Fugitive benzene emissions occur from valves on the PHEF in T Area.

3.5.1.2 Evaluation

In the past year the environmental coordination staffs have been expanded. These new staff members have capably assumed responsibility for much of the air pollution control duties in their respective departments.

Work needs to be done to bring the site up to a desirable level and constant surveillance will be needed as new equipment is started and reactors are restarted. However, plans and guidelines have been set and staff members are available to carry them out.

There is no regulatory requirement that the SRS operate an ambient air monitoring network for criteria pollutant concentrations since this is a task conducted at the State level. Therefore, one can conclude that SRS goes beyond the letter of the law in the operation of 5 onsite ambient monitoring stations. Furthermore, these stations have recorded no violations of the national or state ambient air quality standards for the pollutants measured during 1988 and 1989. Conduct of operations as applied to ambient monitoring includes adherence to a written sampling and analysis protocol. A review of conduct of operations suggests that filters used in PM-10 sampling are not equilibrated under rigorously controlled relative humidity conditions. Also, no use of blank filters is presently made in the PM-10 sampling program. The conduct of maintenance as applied to ambient monitoring equipment includes both maintenance and calibration issues. A review of conduct of maintenance suggests that while many written procedures exist and have been approved, the one for PM-10 has not been approved yet. Also, it has not been a practice to log the activities related to PM-10 filter handling at the monitoring stations.

A diligent effort to quantify the micrometeorology of the SRS has been in place for several years. Data are collected at many more sites than are required for regulatory purposes. The only deficiencies identified in conduct of operations and maintenance relate to: 1) reporting data recovery percentages; 2) anemometer calibration at high wind speeds; and 3) system loop check procedures and documentation.

The creation of a comprehensive site-wide air pollutant source inventory will begin this year. As planned by the EPS it will exceed compliance requirements and will provide a very useful data base for future expansions.

3.5.1.3 Findings

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/CF-1

ASSESSMENT FINDING TITLE: Absence of Gasoline Misfueling Notices on Gasoline Pump Stands

PERFORMANCE OBJECTIVE:

40 CFR 80.22(d), Regulation of Fuels and Fuel Additives, requires that every retailer shall display in the immediate area of each gasoline pump stand the following notice: Federal law prohibits the introduction of any gasoline containing lead or phosphorus into any motor vehicle labeled "UNLEADED GASOLINE ONLY".

FINDING:

There is a gasoline refueling station in F Area. It has two pumps, each of which dispense unleaded gasoline. No misfueling notice was displayed on these pumps or any place in the area. A cursory examination of two other refueling stations indicated that they had no refueling notices either.

DISCUSSION:

There are reported to be about ten gasoline refueling stations on the Savannah River Site. Based on this sample of three of those stations, it is probable that none of the refueling stations has a misfueling notice.

The WSRC attached the required misfueling notices to all the gasoline pumps on the site within two days after this finding was announced at a Tiger Team Daily Activities Meeting.

PROBABLE CAUSAL FACTORS:

Uncertainty of Regulatory Applicability.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-1

ASSESSMENT FINDING TITLE: Discrepancies in Permit Information

PERFORMANCE OBJECTIVE:

The information listed in air quality control operating permits should be consistent with the information listed in WSRC data bases, placed on equipment placards, or written on logbook covers.

FINDING:

The current F-Area air quality control operating permit from SCDHEC (A-44) does not specify an NO_x emission limit although this was a requirement in previous permits. Permit numbers, kilowatt ratings and locations of the diesel-powered generators, as listed in the SCDHEC permits, were frequently found to be inconsistent with the comparable information on placards attached to the generators and the listings of permits in the 8/1/89 Environmental Implementation Plan (A-48) and in an EPS compilation of 6/16/89 (A-49). Logbooks for these generators frequently had incorrect or incomplete permit information on their covers.

DISCUSSION:

The air quality control operating permits issued to the SRS have permit ID numbers, descriptions of the equipment and numbers of the building where this equipment is located. They also list the special conditions applicable to the equipment.

The current F-Area air operating permit does not specify an NO_x emissions limit for the Uranium Dissolution Process. Previous F-Area permits specified a 180 lb/hr NO_x emission limit for the F-Area separation process (A-46). WSRC Separations believes that the NO_x emissions limit for the F-area Uranium Dissolution Process is still in effect and that the complete operating requirements were not provided by SCDHEC in the current permit.

The discrepancies between diesel generator permit information and information in the Environmental Implementation Plan, in the EPS compilation and on placards at the generator sites were identified in most areas at SRS and for generators under the control of all organizations. Specific examples include: M-Area -- placard shows 00800-0055-03, but EIP list shows 00800-0055-05; P-Area -- EIP shows location as 183-2P, but generator is

at 183-3P; S-Area -- permit shows two generators with permit numbers 0080-0066-05 and -06, but these two generators are side by side with no placard to distinguish between them; K-Area -- generator (0080-0047-07) is listed on the EIP as being a 225KW diesel generator, but it is actually a 200KW generator; H-Area -- two generators had placards listing only 0080004 thereby omitting the last three numbers on the permit - 20 and 21; F-Area -- generator is listed as 0080-0045-21 in EIP list, but placard shows the permit number as 0080-0045-18. It appeared that sometimes WSRC may have been responsible for the discrepancies; in other cases, SCDHEC may have been responsible. Irregardless of the responsibility, the information should still be consistent in all listings and placards.

Discrepancies noted in the M-, S-, F-, and H-Area placards and logbooks have been corrected. Inter-office memorandums (e.g., A-46) have been written asking EPS to get consistency between WSRC and SCDHEC.

PROBABLE CAUSAL FACTORS:

Inadequate oversight, incomplete audits.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-2

ASSESSMENT FINDING TITLE: Lack of Updated Procedures for PM-10 Ambient Monitors

PERFORMANCE OBJECTIVE:

The set of procedures for the Ambient Air Quality Monitoring Program (DPSOP 271-4, document #A-47) covering the operation, maintenance and quality control procedures for the monitors used by WSRC should include procedures for all instruments currently being used. One of these instruments is the monitor for particulate matter which is less than 10 micrometers in diameter (PM-10). The procedures should direct that the operator must enter a record in the station logbook whenever the filters are changed.

FINDING:

The procedures for the ambient air quality monitoring program have not been updated to include DPSOLs for the PM-10 instruments. The procedures for the TSP instrument, which is being replaced by the PM-10 monitor, fail to require that the operator make entries in the station logbook whenever the filter is changed.

DISCUSSION:

The PM-10 instruments have been installed and operating in the Savannah River Site's ambient air quality network since October, 1987. During visits to sampling station 614-39G it was found that the station copy of the procedures did not contain anything covering the PM-10 monitor itself. There were procedures, forms, and checklists for the total suspended particulate (TSP) monitor. These have some similarities to those applicable for the PM-10 monitor. Zedek, the contractor that operates the ambient monitoring sites, was using the TSP forms for filling out the PM-10 monitor data.

Each of the PM-10 monitors onsite is operated for 24 hours every sixth day. The filters are removed after operation and replaced by new filters for the next run. These filters need to be tracked from their original weighing at the laboratory until their final weighing and storage. One aspect of this tracking should be entries in the station logbook covering the

installation and removal of the PM-10 filters with comments covering any unusual happenings.

At station 614-39G there were no entries in the station logbook indicating the times when the filters had been changed for the PM-10 or the TSP monitor prior to 10/87.
A revised set of procedures dated January 1990 was located in the Environmental Monitoring Section (EMS) offices, but the field station did not have a copy yet. The field station had a quality control document --"Q C Plan Ambient Air Quality Monitoring Program" dated January 15, 1985.

PROBABLE CAUSAL FACTORS:

Inadequate oversight, ineffective Supervisory Controls.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-3

ASSESSMENT FINDING TITLE: Format Inconsistencies Among Logbooks for Diesel Generators

PERFORMANCE OBJECTIVE:

Good management practices require that important information be placed in the logbook for a diesel-powered generator including the permit number, kilowatt rating, and location of the generator as well as a record of the operation of the generator, especially the generator run time. Logkeeping must follow good operational practices (A-51).

FINDING:

Not all diesel-generator logbook entries meet the intent of the permit requirements nor the letter of the guidelines issued by the Environmental Protection Section (A-53). The procedures used in filling out the logbooks were inconsistent and did not always meet good quality control practices.

DISCUSSION:

The most recent set of operating permits issued by South Carolina Department of Health and Environmental Control (SCDHEC) to cover diesel-powered generators specifies that logbooks be kept for each generator. Guidelines for contents and format of the diesel generator logbooks have been formulated by the EPS.

A key objective by SCDHEC in requiring logbooks for the diesel generators was that the SCDHEC inspector during the inspection could easily verify the cumulative number of hours that the generator had been run from January 1 of the year to the date of inspection. All of the diesel-generator logbooks list each date the generator was run and the time for which it was operated on that date, but only a fraction of the logbooks contain an entry of the year's cumulative time of running as part of each record of generator operation. A cumulative-time entry would benefit the inspector.

Some logbooks include space for comments on operation; others do not. Some logbooks have a full set of descriptive data about the generator on the outside and inside of the logbook cover; others do not. Each generator should have its own logbook.

Good quality control practices prohibit the use of white-out to correct entries. Operators' initials should be paired with the operators' names at some place in the front of the logbook.

PROBABLE CAUSAL FACTORS:

Ineffective supervisory controls for implementing policies and inadequate oversight.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-4

ASSESSMENT FINDING TITLE: Lack of Comprehensive Air Emissions Inventory and Climatological Data Base

PERFORMANCE OBJECTIVE:

Good management practice requires a list enumerating and describing each stack, vent and fugitive-emission source in every area including both active and inactive stacks. A climatological data base should also be compiled to describe on-site winds at a height of 10 meters.

FINDING:

A site-wide comprehensive list and map which identify and describe all the stacks, vents, and sources of fugitive emissions is not available. No compilation of hourly wind data covering a year of onsite observations at 10 meters (the height generally used in models by air pollution control agency permit reviewers) is available for the Savannah River Site.

DISCUSSION:

Biennially the Environmental Protection Section (EPS) reports to the SCDHEC the air pollutant emission amounts for sources which have air quality operating permits. Under Section 313 of the Superfund Amendments and Reauthorization Act, EPS must also submit to the USEPA a report "R" listing the total emissions of selected toxic chemicals released at the SRS each year. A report of the total radionuclide emissions is required yearly.

With the increasing regulation of air toxics and with the restarting of operations, SRS is planning to compile a comprehensive data base describing its emission sources so that annual emission reports can be easily prepared and site-wide dispersion models can be run. Both active and inactive stacks will be included in the inventory. Stack data such as coordinates, height, inside diameter (or cross-sectional area), exit temperature and velocity (for active stacks) should be specified to aid in dispersion modeling. The source inventory can be expanded to include emissions rates and types of past emissions for inactive stacks. A map of each area and building roof in the area is needed to help in the identification of emission points.

The EPS is currently evaluating contractor proposals for the compilation of a comprehensive emission inventory for the SRS.

The increasing monitoring and regulation of air toxics will be accompanied by dispersion modeling of these emissions. The emission points for these pollutants are generally not from 200-foot stacks but from heights nearer the ground. Modeling of them has been done using 10-meter winds from Bush Field in Augusta (A-9). A more representative set of wind data for use in the EPA-approved models, such as the Industrial Source Complex model, could be compiled from wind measurements taken by the SRS meteorological network. Either the climatological tower in the Central Shops area or the television-tower site west of SRS could provide the necessary year (or five years, if convenient) of hourly data at a height of 10 meters or thereabouts.

PROBABLE CAUSAL FACTORS:

Inadequate policy.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-5

ASSESSMENT FINDING TITLE: Lack of Software QA Implementation Plan For Emergency Response and Dosimetry Dispersion Models

PERFORMANCE OBJECTIVE:

Good management practice requires the implementation of site QA plans (A-1, A-2) at the Section level by establishing and utilizing written configuration control procedures for computerized dispersion models for concentration and dose predictions. These procedures should include at least the following: 1) a formalized sign-off procedure by management for any model change, 2) a written list a changes for each version of the model, and 3) a requirement that the model description and use documentation be released at the same time as the software itself.

FINDING:

There are no written QA implementation plans regarding configuration control of the dispersion and dosimetry models for which they are responsible.

DISCUSSION:

A traceable configuration control program will have many benefits not the least of which is providing visibility of the technical approach being used at SRS to many professionals both inside and outside the SRS. This will enhance the transfer of information so that others will be more quickly in a position to offer constructive critiques aimed at pursuing excellence in technical approach.

PROBABLE CAUSAL FACTORS:

Inadequate program implementation.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-6

ASSESSMENT FINDING TITLE: Deficiencies in the Meteorological Data Quality Assurance Program

PERFORMANCE OBJECTIVE:

There are three performance objectives pertaining to three specific issues. The performance objectives are:

- ANSI/ANS-2.5-1984 (final), DOE Order 5400.xy (draft), and Rev. 1 (draft) to NRC Regulatory Guide 1.23 each indicate that a recovery rate of 90% is required for meteorological data. These data are essential to guide an emergency response and to determine compliance with concentration and dose based standards; consequently, a high recovery rate is necessary.

- The anemometers to measure wind speeds at the nine area towers as well as at the WJBF-TV tower should be calibrated over the expected range of wind speeds. The wind tunnel used to calibrate these anemometers (located in Bldg. 735-7A) has the capability to produce a maximum centerline speed of 56 mph; thus the anemometers should be calibrated from 1.5-56 mph.

- Formal quality assurance procedures for meteorological equipment calibration need to be approved. Such draft procedures currently exist (ETSP T100, T101, and T102) but are not yet approved.

FINDING:

There are three specific issues all related to the general topic of Quality Assurance for meteorological data:

- It is not a common, scheduled practice to report the data recovery percentages for meteorological data collected from the nine area towers as well as from the WJBF-TV tower,

- The anemometers are not calibrated over the range of wind speeds available in the wind tunnel (1.5 - 56 mph). Current practice is to stop the calibration at about 25 mph and assume linearity in the calibration curve beyond 25 mph,

- Data collected during the loop check performed from each meteorological tower equipment room are not currently recorded. This loop check essentially verifies the electronic signal from the wind measurement equipment, through the acquisition equipment, over the transmission lines, through the central computer, and back to the equipment building at the tower.

DISCUSSION:

Meteorological data are essential to SRS operations as they provide input to guide emergency response decisions. In addition they provide input to dispersion and dosimetry models.

The quality of meteorological data is in some measure determined by the reported amount of good data recovered. Any report designed to discuss format and calculation procedures related to data recovery will address such difficult issues as: 1) the definition of "bad data" which should not be counted as recovered data, and 2) whether a 90% recovery is required for instruments on only one or on all towers.

All anemometers are calibrated in the wind tunnel over a range extending only to about 25 mph. The mph versus voltage curve is found to be very linear from 1.5 to about 25 mph, and is therefore assumed to follow this same linear relationship above 25 mph. There is no reason to make this assumption from 25 to 56 mph since this range can also be calibrated in the tunnel. The loop check is a critical test since some equipment like the analog-to-digital converters at each tower equipment building are not calibrated along with the meteorological equipment itself. Naturally it also checks the functionality of the modems and the integrity of the transmission lines.

There has been no formal DOE requirement to bring the issue of data recovery to the forefront; however, when DOE Order 5400.xy becomes final that situation will change. Regarding the issue of wind tunnel calibration, the strong linearity of the calibration curve from 1.5 to about 25 mph led to a certain confidence in extrapolation beyond 25 mph even though calibration equipment afforded the capability for measurement rather than inference. Finally, regarding the issue of loop checks and formalized calibration procedures in general, the services of an expert outside contractor were required.

PROBABLE CAUSAL FACTORS:

Inadequate policy and procedures.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-7

ASSESSMENT FINDING TITLE: QA Deficiencies in the PM-10 Ambient Air Monitoring Program

PERFORMANCE OBJECTIVE:

There are two management practices to be addressed. First, it is good management practice to bring blank filters to the site, install them in the monitors, and then immediately remove them and package for shipment to the laboratory. In this fashion, any addition of particulate during handling or from the gasket itself as well as any loss of filter fibers via adhesion to the gasket can be quantified. Second, CFR Title 40, Part 50, Appendix J, Reference Method for the Determination of Particulate Matter as PM-10 in the Atmosphere, requires equilibration of tare and final filters for 24 hrs. under controlled temperature and humidity conditions.

FINDING:

No filter blanks are currently being employed at the ambient air sampling stations for PM-10 at SRS. In addition, the equilibration of tare and final filters in the Durham, NC laboratory is not rigorously controlled.

DISCUSSION:

While the USEPA does not yet specifically require the use of blanks for PM-10 sampling, it is good laboratory practice to do so. Such additional thoroughness can identify problems in shipment, handling, and gasket integrity before they go on too long. Such problems discovered late can cast suspicion on a substantial amount of previously collected data.

The tare and final filters used in the ambient air monitoring stations at SRS are conditioned and weighed in a subcontractor laboratory in Durham, NC. Temperature and humidity are regulated only by the office air conditioning system. While this system is satisfactory for temperature control, it is inadequate for continuous relative humidity control. The strategy employed at the analysis facility to circumvent this limitation involves waiting for a relatively constant period of relative humidity before attempting to weigh the filters. Unfortunately, this strategy does not guarantee that the relative humidity during tare weighing is the same (within acceptable tolerances) as the relative humidity during final filter weighing. Likewise,

reweighs of final filters for quality purposes may not occur at the same relative humidity.

PROBABLE CAUSAL FACTORS:

Regarding the first issue, there is no regulatory or procedural requirement to use blanks in filter analysis. Regarding the second issue, the current method of relative humidity control used by the subcontractor is a tradeoff between cost and technical excellence.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-8

ASSESSMENT FINDING TITLE: Inadequate Transmissometer Calibration Procedure and Implementation

PERFORMANCE OBJECTIVE:

Good management practice requires accurate and detailed transmissometer calibration procedures for all makes and models of transmissometers used at SRS. Calibration frequencies should be documented, adhered to, and supportable with calibration logs kept in the area instrument maintenance laboratory. Calibration equipment should be handled as delicate tools.

FINDING:

A review of transmissometer calibration for the D-Area boilers revealed inadequacies in the following areas: 1) lack of approved calibration procedure, 2) technically unsound approach in the existing draft procedure, 3) improper handling and storage of calibration equipment, 4) unsubstantiated accuracy of calibration lenses, and 5) incomplete calibration logs.

DISCUSSION:

The following is a more detailed discussion of problems in the transmissometer calibration at the D-Area power plant:

- The draft calibration procedure for the Dataset Model 900-A Opacity Meter (WSRC Manual Y4.1) is replete with typographical errors and references to electrical components not shown on the figures and contains no calibration schedule,

- A dataset Model 900-A Opacity Meter has been operating on Boiler #3 in D-Area since June 2, 1988 and another unit is currently being installed on Boiler #2, yet the calibration procedure is still in draft form,

- The draft procedure, which comes directly from the vendor, incorrectly uses a certified smoke reader as the calibration reference in the case where calibration occurs when the boiler is operating,

- The calibration lenses for the Contraves Goerzes transmissometers currently on Boiler stacks 1 and 4 at D-Area

are stored unpackaged with other lenses and tools in a box, a bucket, and the bottom of a metal drawer.

- The calibration lenses for the Contraves Goerzes transmissometers have opacity values hand-etched into the lens mounting; however, the legibility of the values is poor and the accuracy of the etched values is not substantiated with and documentation, documentation, and

- The calibration log in the D-Area calibration laboratory shows no calibration after August 1988 for the transmissometer on Boiler stack 3 even though semi-annual calibration is the stated standard.

Referring to item 3 in the above list, the use of an individual as a calibration reference in the case where calibration occurs which smoke in exiting the stack is improper even though this is the suggested method in the Datatest manual. The test for a certified smoke reader permits one value out of 50 to be missed by as much as 15 percentage points (i.e. a reading of 30% could be an actual 45%). The vendor may be able to determine how a controlled signal input can be used for calibration when smoke is in the stack.

PROBABLE CAUSAL FACTOR:

A combination of inadequate personnel training along with a lack of adequate written procedures may have contributed to the problems with transmissometer calibration.

ASSESSMENT DISCIPLINE: Air

ASSESSMENT FINDING NUMBER: A/BMP-9

ASSESSMENT FINDING TITLE: Unrealistic Input Data for Dosimetry Modeling

PERFORMANCE OBJECTIVE:

Good management practice requires that each data item which serves as input to the dispersion and dosimetry models be as realistic as possible. When a range of values are equally plausible for a given variable, then the environmentally conservative value should be selected. The environmentally conservative value is the range extreme which produces the highest predicted concentration.

FINDING:

Unrealistic values for roughness height and radioisotope release height were used in the 1988 annual modelling of dose with the Airdos-EPA code required by 40 CFR Part 61, Subpart H.

DISCUSSION:

Below is a discussion of both unrealistic and realistic values for roughness height and release height:

- The roughness height used to define the logarithmic profile of wind speed with height was selected as 1 cm when a forested terrain like the SRS would be better represented with a value in the 20-100 cm range (A-3), and

- The height of all the radionuclide releases was set at 10 m although a significant portion was actually emitted at 62 m with most of the remainder emitted at ground level.

The predicted average annual concentration (144 pCi/cubic meter) of tritium for 1988 at the SW boundary (the point of maximum predicted concentration) were about a factor of 1.6 to 2.2 higher than actual annual average measurements made at A-14 and the D-Area. Consequently, one can conclude that for the particular set of circumstances that occurred in 1988, the chosen input was on the whole environmentally conservative. Nevertheless, it is best to use the most realistic input possible as circumstances can change from year to year.

The impact of increasing the roughness height at SRS will be to increase the predicted dose with large increases in dose expected from ground level sources and very small increases in dose from sources above 10 m. The impact of increasing the release height from 10 to 62 m for 98.6% of the tritium and lowering it to zero for the remainder has not been calculated but is anticipated to lower the predicted dose at the boundary line.

PROBABLE CAUSAL FACTOR:

Lack of technical and regulatory guidance and resources.

3.5.2 Soils/Sediments/Biota

3.5.2.1 Overview

The purpose of the soils/sediments/biota (SSB) portion of the environmental assessment of the Savannah River Site (SRS) is to assess the environmental monitoring program status with respect to these media; to evaluate the potential for an actual contamination of these media by radiological and nonradiological constituents; and to review the monitoring of these media with respect to applicable guidelines and regulations listed below:

The general approach to the SSB assessment included observation of known or suspected soil contamination areas, assessment techniques, and sampling procedures. Interviews were conducted with Health Protection (HP), Savannah River Laboratory (SRL), and Savannah River Ecology Laboratory (SREL) personnel responsible for the environmental monitoring program, decontamination and decommissioning activities and environmental restoration activities. Documentation associated with SSB activities was reviewed. These documents include the annual environmental monitoring report, the DOE Environmental Survey Preliminary Report, reports characterizing facility specific SSB investigations, DOE Orders (See Table 3.5.2.1), and procedures manual.

The SRS is geologically located in the South Carolina sand hills and upper coastal plain resource area. Upland soils consist primarily of Dothan, Fuquay, Troup, Blanton, Norfolk and Orangeburg series. Wetland soils types include Pickney, Shellbluff and Tawcaw. These soils are underlain by the sand clay loam and clays of the Barnwell and McBean terraces.

These terraces range in age from 30 to 45 million years. The unsaturated zone at the SRS is relatively thin. Typically the unsaturated zone is 2.5 to 5 feet thick down to 20 feet. Commonly during the year the saturated zone extends to the ground surface.

Sediment at the SRS occurs in streams, lakes, ponds and wetlands. Approximately 25% of the area of the site is wetlands. Major water bodies include L-Lake, Par Pond and the Savannah River Swamp. Five major streams drain the site including Upper Three Runs, Four Mile Creek, Steel Creek, Pen Branch, and Lower Three Runs. Sediment derived from the site has deposited in the deltas of these creeks contiguous with the Savannah River Swamp.

The SRS consists of both uplands pine and mixed pine and hardwood forests and hardwood bottomlands. Uplands vegetation consist

primarily of loblolly pine, longleaf pine (which has been extensively cultivated by the USFS) as well as some oak, poplar and hickory. Bottomland hardwoods include sweetgum, yellow-poplar, maple, tupelo and ash with extensive cypress/tupelo hardwoods in the Savannah River Swamp. The wetlands and uplands forest support a diverse and thriving wildlife population including large game mammals, waterfowl and protected species: red cockaded woodpecker, woodstork, American alligator, and occasionally bald eagle.

Soil, sediment and biota are analyzed routinely for radioactive material. Soils have been taken on a nonroutine basis for specific investigations on the site. The majority of these sampling efforts have been carried out as a part of contaminant assessment and investigations. The specifics of these investigations and the types of contaminants found in the soil are detailed in the contaminant investigation reports. The Inactive Waste Site section deals with sites that could have or may have resulted in soil contamination. Sediments in some creeks, deltas and portions of the Savannah River Swamp have been sampled as well, and are found in some cases to be contaminated with radioactive material.

There is one off-site contamination area attributed to SRS. This is the Creek Plantation Swamp downstream of SRS, in which sediments are contaminated with higher than background levels of radioactive material for the surrounding area.

Wildlife are sampled annually to determine onsite and off-site contamination of radionuclides. These species include fish and seafood, deer, wild hogs, ducks, furbearers, turtles, and vegetation.

Hazardous non-radioactive substances which may exist in on-site soils include primarily volatile organics and heavy metals. However, soils are not routinely monitored for nonradioactive constituents. In addition, some soils have also been contaminated by petroleum products from fuel spills but these areas are typically documented and/or cleaned up. On-site sediments and biota are monitored annually for hazardous, nonradioactive constituents. Sampling for mercury is included in the annual monitoring of fish and organic compounds in sediments. Mercury is analyzed in fish from both on-site streams and lakes as well as the Savannah River. Fish tissue analyses do not exceed the Food and Drug Administration (FDA) limits for mercury (1.0 ppm).

Specific non-routine evaluations of potential contaminant impacts are conducted on an as-needed basis at the request of DOE or

facility custodians. The Savannah River Ecology Laboratory (SREL) is the primary research organization involved with these evaluations.

3.5.2.2 Evaluation

At present, no comprehensive site-wide environmental monitoring plan exists. Presently, the Environmental Monitoring Section (EMS) must review the DOE Order requirements and establish the annual monitoring program. The Environmental Monitoring Plan is being developed and will provide the rationale for the monitoring, selection of parameters, locations and media sampled. This plan is due for completion in approximately one to two years.

The standard operating procedures for conducting the monitoring activities are included in DPSOP 271-1. The utilization and application of these procedures appear to be accomplished satisfactorily, as determined through interviews of monitoring personnel and managers and observation of monitoring in the field. Data is reviewed by the analytical subcontractor, EMS, the Environmental Protection Section (EPS), and DOE-SR. Documentation of monitoring results are maintained with the EMS main file. The SRS training program for monitoring personnel is consistent with good industry practice. The program requires individuals to take eight hours of training per year in environmental monitoring. Field sampling techniques and procedures were performed per DPSOP 271-1.

SRL and selected subcontractors have responsibility for monitoring on the behalf of facility/area custodians, as required by specific permits. It is the responsibility of SRL to obtain documentation of subcontractors and protocols from subcontractors to ensure compliance with DOE Orders, DPSOPs, and EPA protocol. SRL has a qualified staff for supervision of subcontractors, preparation and evaluation of contract awards, and to conduct in-house studies. However, it appears more communication is needed between SRL and custodians to improve the timely review and interpretation of data. Instances have been identified where studies have been computed prior to anticipated permit requirements (e.g., stream ecology evaluations and toxicity testing of the A-014 outfall).

Numerous SSB evaluations are conducted by SREL which are not compliance driven but arise as concerns by DOE-SR or WSRC. These evaluations are initiated based on issues associated with potential impacts of past or present practices; i.e., recovery of wetlands vegetation from thermal impacts. Many of these studies

are ongoing with long-term databases. The data from SREL projects and programs are communicated to DOE-SR monthly.

Industry best management practices were also used as a comparison tool. The SSB portion of the assessment identified three best management practice findings dealing with (1) the characterization of soil/sediment contamination areas sitewide, (2) soil contaminant control, and (3) the biological assessment specific to the F- and H-Area seepage basin closure plan.

TABLE 3.5.2-1

List of Applicable Soils/Sediments/Biota Regulations/Requirements/Guidelines

Regulations/ Requirements/ Guidelines	Section/Title	Authority
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
DOE Order 5400.5	Radiation Protection of the Public and the Environment	DOE
(DRAFT) DOE Order 5400.xy	Radiological Effluent Monitoring and Environmental Surveillance	DOE
DOE Order 5484.1	Environmental Protection, Safety and Health Protection Information Reporting Requirements	DOE

3.5.2.3 Findings

ASSESSMENT DISCIPLINE: Soils/Sediments/Biota

ASSESSMENT FINDING NUMBER: SSB/BMP-1

ASSESSMENT FINDING TITLE: Inadequate Biological Study Protocol

PERFORMANCE OBJECTIVE:

Good management practice requires that background locations be established when environmental assessments are made of potential contaminated sources to aquatic systems.

FINDING:

The biological study for F and H-Area seepage basins did not include standard background control locations which would properly indicate impacts of the seeps to the ecology of Four Mile Creek.

DISCUSSION:

A biological study was conducted in Four Mile Creek in partial fulfillment of the F and H-Areas Seepage Basins RCRA Part B permit application. In partial fulfillment of the permit application, Alternate Concentration Limits (ACL) were requested for heavy metals detected in seep water. To demonstrate the lack of impact of the heavy metals to Four Mile Creek and verify the ACLs, a biological assessment was conducted. The biological study compared existing biological data from a single Four Mile Creek station, some distance downstream of the seeps, to other existing data from on-site and off-site creeks. Typically, impacts are assessed from upstream control areas, and at points adjacent to potential contaminant and downstream of sources.

The biological report was generated from existing data rather than from a specific designed study. The conclusions to this report were questioned by the State and not considered acceptable to demonstrate the lack of impact to the environment from hazardous constituents from the basins. Additional biological studies are proposed to evaluate the impacts of the F and H-Areas seepage basin in an RTA (request for technical assistance) from WMT to SRL. Specifically proposed studies will include toxicity, community structure, and bioaccumulation of heavy metals in fish which will more thoroughly assess the impacts of the basins to the environment.

PROBABLE CAUSAL FACTORS:

Inadequate supervision and procedure.

ASSESSMENT DISCIPLINE: Soils/Sediments/Biota

ASSESSMENT FINDING NUMBER: SSB/BMP-2

ASSESSMENT FINDING TITLE: Inadequate Assessment of Non-Radiological Contaminants in the Ambient Monitoring Program

PERFORMANCE OBJECTIVE:

U.S. DOE Order 5400.1, page 6, Section 5.a states DOE policy as follows: "DOE is committed to good environmental management of all its programs and at all its facilities to correct existing environmental problems, to minimize risks to the environment or public health, and to anticipate and address potential environmental problems before they pose a threat to the quality of the environment or public welfare."

FINDING:

The ambient soil monitoring does not adequately address non-radioactive contaminants, and sediment monitoring does not properly identify potential transport of non-radiological contaminants.

DISCUSSION:

Soils, sediments and biota are monitored annually for radionuclides in accordance with Draft DOE Order 5400.XY "Radiological Effluent Monitoring and Environmental Surveillance". The Draft Order 5400.XY outlines a number of requirements for the surveillance of radiological effluent release. DOE Order 5481.1 identifies in more detail the reporting requirements for both radiological, and nonradiological monitoring. The Annual Environmental Report is the summary of monitoring for the site including sample locations, parameters, frequency and results. Radiological sampling for soils includes annual sampling at F- and H-Areas, the SRS boundary, and at the 100-mile radius locations. Sediment is sampled annually from nine SRS stream locations and six Savannah River locations. Vegetation is monitored quarterly at the plant boundary, 25-mile radius, 100-mile radius, and out-side the Burial Ground, and monitored annually at the separation areas, seepage basins, and inside the burial ground fence. Wildlife, fish, seafood, deer, hogs, and other species are monitored annually.

Non-radiological monitoring of soil/sediment consists of annual sampling of seven stream locations and two river locations. The sediment samples are analyzed for organic compounds but not inor-

ganic compounds such as heavy metals, cyanide, etc. The only other routine analysis of potential migration of inorganic contaminants from the site is analysis of mercury in fish. Due to the history of use of the site, heavy metal contaminants may be present in the soil and sediment and potentially transported off-site or impacting biological receptors.

DOE Order 5400.1: General Environmental Protection Program and 5484.1 identify the analytical requirements for soil, sediment and biota for non-radiological contaminants. Soil and sediment analysis for inorganic contaminants is incomplete.

PROBABLE CAUSAL FACTORS:

Inadequate implementation of site policy.

ASSESSMENT DISCIPLINE: Soils/Sediments/Biota

ASSESSMENT FINDING NUMBER: SSB/BMP-3

ASSESSMENT FINDING TITLE: Inadequate Maintenance of Contaminated Soil Piles

PERFORMANCE OBJECTIVE:

Good management practice requires maintenance of soil piles to prevent runoff.

FINDING:

The contaminated soil excavated from the H-Area Seepage Basins was stored adjacent to the basins without sufficient covering to prevent runoff.

DISCUSSION:

The soil at the seepage basins will be ultimately placed back into the seepage basins during closure. The soil should be adequately covered during the interim to prevent runoff from occurring and potential contamination migration. The area around the soil piles is periodically monitored however, plastic covering was observed to be exposing areas of contaminated, disturbed soil which may be eroded to Four Mile Creek.

PROBABLE CAUSAL FACTORS:

Improper follow-up of established policy.

3.5.3 Surface Water

3.5.3.1 Overview

The purpose of the surface water portion of the environmental assessment was to review issues related to waste water, drinking water, rivers, streams, and wetlands. Issues reviewed relate to compliance with environmental regulations promulgated under the Clean Water Act (CWA) and Safe Drinking Water Act (SDWA) and conformance of site related operations and maintenance activities with the Institute of Nuclear Power Operations (INPO) guidelines.

The general approach to the surface water assessment included personnel interviews, document reviews, and onsite observations. Interviews were conducted with Westinghouse Savannah River Corporation (WSRC), and DOE-SR staff, as well as other site tenants responsible for environmental oversight, and site operations. Discussions were also held with U.S. EPA and South Carolina Department of Health and Environmental Control (SCDHEC) staff responsible for environmental compliance. Document reviews included identification and examination of 1) permits and permit applications, 2) sampling and analysis reports, 3) standard operating procedures, 4) training and maintenance records, and 5) operational journals and logs. Typical review activities included evaluation of the adequacy of the various water and waste water treatment facilities, and appraisal of procedures and plans for erosion control, river and stream monitoring, and spill prevention control and countermeasure implementation. Environmental compliance and operations conformance issues were evaluated based on the applicable surface water regulations, requirements, DOE Orders and guidelines listed in Table 3.5.3-1.

Effluents from SRS facilities discharge through point source outfalls which are regulated by SCDHEC under the National Pollutant Discharge Elimination System (NPDES). Currently, 76 permitted outfalls are included under NPDES Permit Number SC0000175. The NPDES program is administered by WSRC. The original permit was issued to DOE-SR January 1, 1984. A renewal application was submitted by SRS in June 1988, which is pending State approval.

The existing Spill Prevention Control and Countermeasure (SPCC) plan and Best Management Plan (BMP) for controlling, classifying and reporting spill events to DOE is the responsibility of WSRC, Environmental Protection Section (EPS). They coordinate the development of the site wide SPCC and BMP plans.

Currently, there are seventeen sanitary waste water treatment facilities and twenty-seven drinking water systems at SRS, sixteen of which are considered to be major drinking water

systems. These facilities are operated by Power and maintained by the local areas' Program Management Team (PMT) Works Engineering maintenance organization.

Key industrial waste water treatment facilities including F/H-Area tank farms, the F/H-Area Effluent Treatment Facility (ETF), Saltstone, Defense Waste Processing Facility (SWPF), the M-Area Dilute Effluent Treatment Facility (DETF) and TNX industrial waste water treatment facilities were inspected. These facilities are operated and maintained by various PMT organizations.

Each area or facility custodian is responsible for controlling or minimizing soil erosion. Road specifications, maintenance, and erosion control are the responsibility of CSWE. Soil erosion and land reclamation in all forested areas are the responsibility of the USFS.

The thermal mitigation program addresses major and minor thermal discharges. The major thermal effluents include the K, L, and P reactors and the D-Area powerhouse. Minor thermal discharges include the smaller powerhouse effluents and other cooling waters.

SCDHEC and DOE entered into a Consent Agreement on January 3, 1984 (Administrative Consent Order 84-4-W), that required DOE to complete comprehensive studies of thermal effects of all operations at SRS. As a result of the Consent Order, a Thermal Mitigation Study and Comprehensive Cooling Water Study (CCWS) was conducted. These studies recommended construction of a recirculating cooling tower for K-reactor and increased water flow to the D-Area powerhouse. Cooling towers were not recommended for L-reactor and P-reactor. Instead, a CWA Section 316 demonstration for the receiving water bodies of these reactors was conducted. SCDHEC has provisionally accepted the 316(a) and (b) demonstration for PAR Pond and a 316(a) demonstration for L-Lake is complete and has tentative approval by SCDHEC.

Two draft settlement agreements have been proposed by SCDHEC for minor thermal mitigation and fish kills. The draft settlement agreement concerning fish kills orders DOE to report all fish kills, and evaluate and select a plan to eliminate fish kills. For minor thermal mitigation, WSRC must identify and evaluate the impacts of all discharges with historic thermal violations.

At present the site-wide program to address wetlands protection is covered under NEPA's Environmental Evaluation Checklist System (EECS). EPS has administrative oversight responsibilities for

the Wetlands Protection Program. The Environmental Monitoring Section (EMS), SRL and SREL are responsible for monitoring and research in the Savannah River Swamp and wetlands onsite.

SRS's efforts to conform to INPO conduct of operations and maintenance guidelines is being established through various programs at each PMT. PMT operations and maintenance organizations are forming INPO standards committees, Measurement and Test Equipment maintenance programs and programs to update their standard operating procedures and Work Management System (WMS) databases. Many operational units have maintenance coordinators to schedule corrective and preventive maintenance and engineering project coordinators to provide efficient and effective turn over of construction projects to operations and maintenance. Pilot studies are underway to address historical maintenance records tracking by system and to begin to implement predictive maintenance programs.

3.5.3.2 Evaluation

The NPDES program at the SRS was found to be generally well developed and implemented. This is supported by the very good compliance record (greater than 99% over the past 5 years) and the ability to anticipate and submit appropriate permit renewal and modification applications in a timely manner. Management commitment and the presence of knowledgeable and competent personnel in key positions appear to be the contributing factors to the effectiveness of the present program. While the program, as presently administered, is operating satisfactorily, items were identified which may impact the continued success of the program. These include the lack of program plan documentation, incomplete definition of specific organizational responsibilities and the lack of consistent protocols across departmental lines.

The river and stream monitoring program at SRS adequately fulfills the requirements as set forth in applicable regulations. Through the existing monitoring network, the impact of SRS operations on the water quality of the Savannah River and onsite streams and aquatic environment can be evaluated. WSRC staff involved with the project are experienced, well trained and have a good understanding of their responsibilities within the program.

The spill prevention control and reporting program was found to be good. In most cases employees observed were aware of the need to prevent, contain, and notify appropriate personnel for spills. Classification of spills (those observed) were within the stated regulations and followed site procedures. In general, when PMT personnel were questioned on their response to a spill event,

they demonstrated good training and awareness of procedures. However, in the 100-Area some employees could not readily produce their facilities spill response plan or the plan was a mixture of new and older editions.

At the sanitary wastewater plants, personnel had a good grasp of both operating and maintenance procedures. Each plant is visited once each shift by a licensed operator. Equipment maintenance and check-out services are normal, cleanliness and attention to safety exceed normal.

Although the quality of the site's drinking water meets primary standards, most systems cannot meet secondary standards. The drinking water systems were generally found to be in poor condition and substandard compared to current good engineering design. A project is planned that will improve the 100-Area drinking water systems. It will also improve the fire protection systems which are presently deficient in capacity and can not meet existing reliability standards. Power environmental personnel are experienced, well trained and appear to have a good understanding of their responsibilities within the drinking water program.

The industrial wastewater treatment facilities in operation are generally in good condition. Waste management and PMT staff and operators responsible for these facilities are experienced, adequately trained and appear to have a good understanding of their responsibilities within the waste water treatment programs and facilities. The procedure for batch discharge to the NPDES outfall from the M-Area DETF was observed and appeared to be well understood and effectively implemented by operating personnel. The tag and lock out procedures for M-Area DETF operations appeared satisfactory. Training and maintenance records at the M-Area DETF were reviewed and found to be complete.

During visits to F/H-Area ETF and TNX industrial wastewater treatment facilities operating staff were found to have a good understanding of their systems. Operating procedures were in place and being used. Training and maintenance records were reviewed and found to be complete. However, operating valves for various equipment in the F/H-Area ETF were not sufficiently labeled to assure the proper operation of the plant systems. Saltstone, DWPF and other related industrial waste treatment facilities are not presently in operation. These facilities are currently undergoing design construction or initial check-out.

Efforts are being made to control erosion and sedimentation on-site. Major construction efforts include detailed erosion control plans prepared by Central Shops QA personnel. Apparent

shortcomings in the erosion and sediment control program relate to the lack of central site-wide authority for the review of site-use plans and the lack of a site-wide erosion control plan. EPS has recently established a staff position to develop a site-wide erosion and sedimentation control program.

The thermal impacts from SRS discharges appear to be comprehensively addressed by Environmental Impact Statements (EIS) and site-specific studies. Minor thermal effluent will be addressed through negotiations of the settlement agreement and the NPDES permit application.

The fish kill issue is being negotiated through the settlement agreement process. It appears that an agreement will be established to resolve this issue. DOE/WSRC has presented a fish kill mitigation plan which would significantly reduce fish kills and additional mitigation measures have been proposed. Resolution of the fish kill issue is expected prior to start-up of the reactors.

The wetlands protection program is generally effective, however, deficiencies in permit tracking and implementation of erosion control measures were identified. SRS has been involved in the research, protection and conservation of wetlands.

INPO maintenance guidelines call for maintenance activities to play a primary role to ensure safe and reliable operations. Certain elements of the INPO conduct of operations and maintenance guidelines are presently being integrated into SRS programs. However, maintenance records for various drinking water and industrial wastewater treatment facilities were found to be inaccurate with outdated data, equipment listings were incomplete and maintenance reports were misleading. As-built drawings were not up to date. The existing operation and maintenance review process also did not provide complete analysis and history of facility operations.

The Surface Water portion of the environmental assessment identified nine compliance findings and fourteen best management practice findings. The compliance findings relate to inadequacies in drinking water systems, spill prevention planning and other Clean Water Act issues. The best management practice findings are similar to the compliance findings with the additions relating to maintenance issues, and the NPDES sampling program.

TABLE 3.5.3-1

Applicable Surface Water Regulations/Requirements/Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
40 CFR Part 112	Oil Pollution Prevention	EPA
40 CFR Part 117	Determination of Reportable Quantities for Hazardous Substances	EPA
40 CFR Parts 122/125	National Pollutant Discharge Elimination System	EPA
40 CFR Part 136	Test Procedures for the Analysis of Pollutants	EPA
40 CFR Parts 141/142	National Primary Drinking Water Regulations	EPA
40 CFR Part 143	National Secondary Drinking Water Regulations	EPA
40 CFR Part 403	General Pretreatment Regulations	EPA
40 CFR Part 433	Effluent Guidelines and Standards for Metal Finishing	EPA
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5484.1	Environmental Protection, Safety and Health Protection Information Reporting Requirements	DOE
DOE Order 5400.XY	Radiological Effluent Monitoring and Environmental Surveillance	DOE
DOE Order 5400.5	Radiation Protection of the Public and the Environment	DOE

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE Order 5480.1B	Environment, Safety, and Health Program for the Department of Energy Operations	DOE
DOE Order 5482.1B	Environment, Safety, and Health Appraisal Program	DOE
Code of Laws of South Carolina, Title 48, Chapter 1	South Carolina Pollution Control Act	SCDHEC
South Carolina Code of Regulations, Chapter 61	South Carolina Water Classification Standards	SCDHEC
South Carolina Rules and Regulations, Title 61, Chapter 9	South Carolina NPDES Permit Regulations	SCDHEC
South Carolina Code of Regulations, Chapter 61, Regulation 76	South Carolina Waste Water Treatment Regulation	SCDHEC
South Carolina Code of Laws, R.61-58 to R.61-58.8	South Carolina Primary Drinking Water Regulation	SCDHEC
Code of Law of South Carolina, Title 48, Chapter 43	South Carolina Hazardous Substances Act	SCDHEC
South Carolina Administrative Consent Order 84-4-W	Thermal Mitigation	SCDHEC
Aiken County Ordinance 74-10-37	Sediment Control Ordinance	Aiken County
INPO 85-017	Guidelines for the Conduct of Operations at Nuclear Power Stations	INPO

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
INPO 85-038	Guidelines for the Conduct of Maintenance at Nuclear Power Stations	INPO

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-1

ASSESSMENT FINDING TITLE: Substandard Drinking Water Systems

PERFORMANCE OBJECTIVE:

- Current State of South Carolina Primary Drinking Water Regulations (R.61-58, May 1981) require that new or modified drinking water systems meet the State specified design standards.

- Good engineering practice and State policy require that drinking water systems should be upgraded to meet current industry standards to minimize health risks.

FINDINGS:

Many of SRS's drinking water systems are over 30 years old and need upgrading to meet current industry standards and expected changes in primary MCLs (Maximum Contaminant Limits). Specific sub-findings are listed below:

- Many of SRS's drinking water distribution systems do not meet current design standards. SRS facilities include unlooped distribution pipe mains and inadequate numbers of valves for proper flushing and isolation. (BMP)

- SRS is not currently performing annual inspections of some of its backflow prevention devices per state regulations. (CF)

- SRS currently lacks an approved sitewide, coherent drinking water cross-connection control program. (BMP)

- Ground-level drinking water reservoirs in the 100-Areas are not properly protected against potential sources of contamination. (CF)

- Water reservoirs in a number of areas, including, but not limited to B- and CS-Areas are not properly protected against trespass by unauthorized employees. (CF)

DISCUSSION:

Although present primary drinking water MCLs are being met, many aspects of the drinking water systems need upgrades to meet current acceptable design. For example, distribution systems should

minimize dead end piping lines by looping all mains and limiting the lengths of small dead end lines whenever practical. In addition, sufficient valves shall be supplied to properly flush dead end lines and to provide isolation of water mains so that inconvenience and sanitary hazards will be minimized during repairs. During inspections of the drinking water systems in the A-, D-, and K-Areas, schematic drawings of these drinking water systems were reviewed. All of these systems contained non-looped mains with few flushing and isolation valves.

SCDWS and good safety standards require that there shall be no connection between the drinking water distribution system and any pipes, pumps, hydrants, or tanks whereby unsafe water or other contamination materials maybe discharged or drawn into the system. No cross connection between a public water supply and any supply, sewer, or waste line shall be established unless an approved backflow prevention device is installed. Each backflow prevention device shall be tested by a certified tester after installation and before use by a customer. Each of these devices shall be tested at least once annually by a certified tester. The current sitewide listing of SRS's backflow prevention devices (SW-135) and their inspection record clearly shows that some devices have not been tested since 1985. In addition, installation and inspections dates were missing from records on other devices. In an interview with the A-Area Power manager, it was expressed that they did not have a certified tester to perform their inspections for their area, but obtained the use of a certified tester from another area as needed. Although SRS Power coordinated an extensive sitewide survey of existing backflow prevention devices and potential cross-connections in 1979 and 1981, a sitewide survey to update this information was not requested until June 1989. The Separations Area program environmental manager, was initially unaware of the existing survey. A follow-up with the Separations Area program environmental manager indicated that other separation personnel were working on the current survey, but their records identified a different number of backflow prevention devices in the H-Area than the purported sitewide list supplied by Power. A comprehensive backflow prevention devices and cross connect program for a large complex site at SRS requires a sitewide coordinated effort to guarantee the timeliness of the site's backflow prevention devices inventory to assure proper inspection and maintenance per state regulations. At present, a comprehensive sitewide backflow prevention device program does not exist. However, an unapproved draft document of a sitewide Cross-Connection Protection Program, dated 2/5/90 (SW-135), does exist.

The drinking water storage reservoirs in the 100-Areas except R-Area are substandard. SCDWS requires that the top of drinking water ground-level reservoirs shall not be less than two feet above normal ground surface and that possible sources of contamination must be kept at least fifty feet from the reservoir. In addition, SCDWS requires that reservoirs will be protected from unauthorized access. During an inspection of the K-Area drinking water system, a number of potential sources of contamination were noted: 1) the top of the drinking water reservoir was at ground level; 2) the single wall concrete barrier between the drinking water reservoir and the service water reservoir are not routinely inspected for cracks and may not have been inspected for many years; 3) a diesel oil fueled emergency generator was within 30 feet of the reservoir; 4) access to the reservoir area was open and the manhole to enter the reservoir was locked; and 5) the system showed signs of poor housekeeping and maintenance (e.g., leaking valves and packing glands). SRS Power and SCDHEC indicated that this facility was typical of all the 100 areas drinking water systems except R-Area.

During an inspection of the CS-Area drinking water system it was noted that access to the water towers were not fenced and locked. During another inspection of the B-Area drinking water system it was noted that access to the water treatment mixing tanks and the elevated tower were open and unlocked. These observations indicate insufficient protection against unauthorized access by employees.

In 1985 SRS determined in a sitewide study that the physical condition of the drinking water mains in some areas were sufficiently corroded to recommend their immediate replacement. Replacement of some of these mains has been completed in some areas.

In 1989 SRS received funding to improve the 100-Area drinking water distribution and storage facilities (Project No. S3026 - Fire, Safety and Domestic water Systems). Design work has begun. It should be noted that another part of this project will improve the areas fire protection systems which are deficient in capacity and would not meet existing reliability standards. The expected completion date for this 100 area replacement project is 1994.

In 1989 SRS began an extensive review of their drinking water systems comparing their existing systems to the State of South Carolina's Primary Drinking Water Regulations. This review (SW-102) (EPD-PED-900155) summarizes additional differences between State Regulations and the existing systems and notes; for example, that the existing distribution systems do not meet

American Waterworks Association Standards for piping, valves and jointing. A Power self-assessment (SW-101)(EPD-POD-904014) also noted that there was an insufficient number of state certified level "C" operators in D-Area drinking water treatment facility. In addition, State regulators (SCDHEC), DOE-SR, and WSRC have not clarified the requirements for updating existing systems and for obtaining operating permits. The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues.

PROBABLE CAUSAL FACTORS:

Lack of upgrade of aging equipment.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-2

ASSESSMENT FINDING TITLE: Improper Abandonment of Drinking Water Wells

PERFORMANCE OBJECTIVE:

Current State of South Carolina Primary Drinking Water Regulations (R.61-58.2, pg. 38)(May 1981) require that permanent and test hole wells be properly abandoned using aquifer sealing criteria such as fill or bridging.

FINDING:

SRS is not properly abandoning their wells to minimize the potential for contamination.

DISCUSSION:

Proper well abandonment procedure implementation is needed to minimize possible contamination from all pathways including inter-aquifer migration and surface waters by cap seals and filling and/or bridging with cement and concrete at sub-surface levels. During an inspection of the F Area drinking water system, it was noted that a recently abandoned drinking water well was sealed from surface water contamination only by a welded steel cap. It apparently had not been sealed by cement and/or concrete fill and/or bridging per Power specifications (SW-137) and state regulations to assure no cross-contamination from aquifers at different levels.

In November 1987, SRS Power identified twenty-eight production wells which had been abandoned with only welded steel caps (SW-136) and recommended that a project be consider for the proper abandonment of these wells per Power Technology specifications, which meets the requirement of the State's Regulations. Several wells have now been abandoned per WSRC standards.

The 1987 DOE Environmental Survey of SRS identified a category II finding which noted the potential for ground water contamination from abandoned wells. However, SRS's November 1987 reply indicated that a program to grout old wells was in place. Yet, present practices for well abandonment may not be meeting SRS specifications and state regulations.

SRS's 2/5/90 Action Plan for resolution of DOE-HQ environmental survey findings again noted a program in place to properly abandon old wells. Yet, an interview with Power Operations environmental personnel revealed that no recent progress could be reported on the proper abandonment of their older wells. In addition State regulators (SCDHEC), DOE-SR, and WSRC have not clarified requirements including scheduling for well abandonments.

The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues.

PROBABLE CAUSAL FACTORS:

Inadequate policy implementation and oversight.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-3

ASSESSMENT FINDING TITLE: Breach of Containment Diking and Inadequate Procedures

PERFORMANCE OBJECTIVE:

Federal Regulation 40 CFR 125.102-104, as promulgated under the Clean Water Act (CWA), requires that any facility whose ancillary operations could reasonably be expected to discharge toxic, hazardous or any pollutant which may result in significant amounts reaching waters of the United States shall develop and implement a best management practices program which prevents, or minimizes the potential for, the release of these substances. In addition, Federal Regulations 40 CFR 260.10 and 265.194 under RCRA requires that the operator of hazardous waste facility tank systems must use appropriate controls and practices to prevent spills and overflows from containment systems/dikes.

FINDING:

SRS personnel have not taken the appropriate actions to control or implement procedures to prevent the potential for spills due to temporary breaches in containment dikes caused by maintenance.

DISCUSSION:

On January 31, 1990 during an inspection of the F-Area waste tank farm, it was observed that a containment curbing/dike near Tank 47 contained a large gap due to maintenance work on an underground steam line. No temporary containment devices or barriers were in place to prevent an accidental discharge due to this temporary gap.

This curbing/dike is not primarily used to control rainwater run-off, but it has as its primary use containment of potential spillage from 100-Area de-ionizer trailer trucks during transfer operations to Tank 47. This open gap condition does not conform to appropriate controls and practices to prevent spills and overflows from containment systems/dikes.

In addition, Waste Management Technology personnel indicated in a follow-up interview, that the management personnel responsible for this area were unaware of any written procedure which delineated the actions to be taken during maintenance effecting dikes/curbing. SRS responded to this observation on February 15, 1990, by placing sand bags across the gap.

PROBABLE CAUSAL FACTORS:

Inadequate management oversight and inadequate procedures.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-4

ASSESSMENT FINDING TITLE: Delays in Updating Spill Prevention Control and Countermeasure Plan

PERFORMANCE OBJECTIVE

Federal Regulation 40 CFR 112.3, as promulgated under the Clean Water Act (CWA), requires that a Spill Prevention Control and Countermeasure Plan (SPCC) be updated every 3 years and within 6 months whenever facility changes would materially change the potential for oil spills to the environment.

FINDING:

The SPCC plan is not scheduled to be updated until after the regulatory deadline for accomplishing this task expires.

DISCUSSION:

Any facility whose operations could reasonably be expected to discharge oil in harmful quantities into navigable waters of the United States shall prepare, implement and maintain an SPCC plan and update as required by 40 CFR 112. The existing SPCC plan was last updated in April of 1987. A contract to update this plan was just issued in January 1990 with a scheduled completion of July 1990. (SW-153)

PROBABLE CAUSAL FACTORS:

Inadequate management planning and oversight.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-5

ASSESSMENT FINDING TITLE: Failure to meet the CWA Section 401 Certification Special Conditions Prior to Expiration

PERFORMANCE OBJECTIVE:

The 404 permit issued to SRS for Lost Lake is contingent upon certification by the State via its 401 Water Quality Certification. Compliance with the State 401 Certification special conditions for Los Lake activities requires revegetation back to natural conditions.

FINDING:

Revegetation of Los Lake back to "natural" conditions was not completed prior to expiration of the 404 permit without application for extension. The 404 permit was contingent upon special conditions of the State 401 Certification.

DISCUSSION:

The M-Area basin drained to Los Lake prior to closure in 1985 and contaminated Lost Lake sediments primarily with heavy metals. During the closure of the M-area seepage basin, a 404 permit was required as a part of the remediation of contaminated sediments in Lost Lake. Contaminated sediments were excavated from Lost Lake in the spring of 1989. The 404 permit was contingent upon two requirements included 1) excavation of contaminated sediments after Los Lake was completely dry and 2) deposit clean fill material in Los Lake that must be graded and revegetated to allow it to revert to its natural state similar to other Carolina Bays... The 404 permit expired in June 1989 before the remediation activity was complete.

The M-Area closure plan includes a plan for the revegetation of Lost Lake, per conditions of the State 401 certification. The 404 permit was allowed to expire prior to completion of the planned activity. A plan for revegetation was prepared by the USFS in November 1989.

Recently (2/28/90) a request for extension of the 404 Permit "86-4B-123 Lost Lake" was prepared by the DOE Environmental Division to the Charleston District Corps of Engineers (COE).

The Charleston COE had not been on-site for the purpose of inspection of Lost Lake since the expiration of the permit.

PROBABLE CAUSAL FACTORS:

Failure to obtain 404 Permit extension until 401 certificate conditions were met.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-6

ASSESSMENT FINDING TITLE: Lack of Final Evaluation of Impacts of Minor Thermal Discharges

PERFORMANCE OBJECTIVE:

Consent Order 84-4-W in 1984 ordered DOE to complete comprehensive studies of the thermal effects of all operations at SRS upon the waters of the State of South Carolina. The recent draft Settlement Agreement (January 22, 1990) requires identification of minor thermal discharges and evaluation of their impacts.

FINDING:

SRS has not conducted a comprehensive assessment for minor thermal discharges as per the draft settlement agreement. The State had requested that the effects of all minor thermal discharge be evaluated. A Notice of Violation 6/1/88 indicated that a greater level of detail of evaluation was needed for 11 minor thermal discharges than provided in previous reports.

DISCUSSION:

The draft settlement agreement of 1/22/90 from the State of South Carolina, identifies the chronology of the minor thermal mitigation issue as follows:

1. DOE is authorized to discharge treated wastewater from various process operations in accordance with conditions of the NPDES Permit #SC0000175 issued December 15, 1983.

2. DOE, unable to comply with the thermal limitations contained in the NPDES permit, agreed to Consent Order #84-4-W requiring a comprehensive study of the thermal effects of all SRS operations upon the waters of the State.

3. It was further agreed in the Order, that all outfall temperature requirements would be superseded by specific limits set in the Order for Par Pond, Steel Creek, Beaver Dam Creek and Four Mile Creek until DOE completed the thermal studies and the remedial action plan(s).

4. The "Thermal Mitigation Study, Compliance with Federal and S.C. Water Quality Standards" was prepared and submitted in accordance with the Order in October 1984.

5. In conjunction with the Thermal Mitigation Study, DOE committed to determine the cumulative effects, through a Comprehensive Cooling Water Study (CCWS) from the intake and thermal discharges on the major on-site streams, Par Pond System, Savannah River, and Savannah River Swamp. Implementation of the CCWS occurred in 1983 with an initial report published in 1985. The data contained in this report was supplemental in evaluating mitigation alternatives for SRS thermal discharges with the overall study to be completed in a report to be finalized in 1987.

6. The thirty-eight (38) outfalls with thermal requirements were for the most part monitored though not limited while these studies were conducted. DOE had labeled each Discharge Monitoring Report (DMR) with thermal parameters as "temperature monitoring temporarily superseded by Consent Order #84-4-W."

7. Of the 38 outfalls with thermal limits, the large volume outfalls (C, K, and D-Powerhouse) are on a compliance schedule in the amended Order #84-4-W. Of the remaining thirty-five (35), eleven (11) have been reported exceeding the thermal limitation on the DMRs. These are not on compliance schedules.

8. The fact that the Thermal Mitigation Study and the first report of the CCWS did not evaluate mitigative measures for the at least eleven (11) outfalls mentioned above, prompted SCDHEC staff to relay concerns in a meeting on January 28, 1988. DOE assured SCDHEC that all "minor" discharges would be addressed in the final CCWS to be submitted in May 1988.

9. The final CCWS was submitted in May 1988. From SCDHEC's review, it has been determined that the document only addressed cooling water discharges from the reactors (C and K) and the D-Area powerhouse. The other "minor" cooling water discharges were not addressed individually at the points of discharge.

10. On June 1, 1988, a Notice of Violation was sent to DOE stating SCDHEC's position that DOE was in violation of the Order for failure to study the thermal effects of all operations and implement appropriate remedial

action to achieve compliance with the thermal regulations in the permit.

11. The Notice further stated that because the studies had been completed and in accordance with the conditions of the Order, all temperature requirements in the NPDES permit were in effect as of June 1, 1988 with the exception of those outfalls for which appropriate plans of action had been addressed under Order Amendments.

12. DOE submitted a report on January 16, 1989, which described the wastewater flow paths of discharges with thermal requirements.

13. A show cause conference was held on January 20, 1989, and the above facts were discussed between SCDHEC and DOE.

However, the scope of the CCWS was originally approved by the State without an indication of its inadequacy to assess the minor thermal discharges. Also the CCWS did assess the relative health of site streams and Savannah River. In addition some of the discharges have had infrequent thermal violations over the past several years.

On January 22, 1990 SCDHEC submitted a draft Settlement Agreement to DOE which orders DOE to:

1. On or before March 15, 1990, submit an addendum to the report, dated January 10, 1989, entitled "Thermal Assessment and National Pollutant Discharge Elimination System (NPDES) Outfall Characteristics at the Savannah River Plant (SRP)." The addendum shall identify those noncompliant outfalls with respect to thermal limitations, and provide actual field measurements to demonstrate whether impact occurs from these greater than 90F, but have demonstrated no impact as well as a schedule of corrective action for any outfall exceeding 90F and identified as causing an impact.

2. Within thirty (30) days of the effective date of this Settlement Agreement, pay fifty-five thousand dollars ($55,000.00) to SCDHEC.

At this time SRS reports that comments to the draft Settlement Agreement have been sent as of March 15, 1990. There appears to be a lack of understanding early in the thermal mitigation process regarding the need to evaluate all, versus major thermal discharges. WSRC reports that negotiations with SCDHEC as a part

of the NPDES negotiations may resolve the thermal compliance issue for minor thermal discharges by two methods: 1) relocation of compliance monitoring points at the end of engineered ditches or at the confluence with streams and 2) evaluate those streams which do not meet thermal limits at newly designated compliance monitoring points for a balanced biological community.

"The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues."

PROBABLE CAUSAL FACTORS:

Different interpretation of regulatory requirements (Consent Order 84-4-W).

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-7

ASSESSMENT FINDING TITLE: Incomplete Resolution of the Fish Kill Issue

PERFORMANCE OBJECTIVE:

Sections 48-1-90 of the South Carolina Pollution Control Act holds liable any person who discharges pollutants (including thermal) into waters of the State which destroy fish, shellfish, aquatic animals, wildlife or plants indigenous to waters of the site.

FINDING:

A number of fish kills have been recorded in L-Lake and Par Pond due to thermal effluent. The SCDHEC has requested plans to eliminate fish kills in these two water bodies.

DISCUSSION:

DOE has submitted 316 (a & b) demonstrations for Par Pond, and a 316 (a) demonstration for L-Lake to indicate that a balanced biological community exists in Par Pond, regardless of the fish kills. The SCDHEC has not indicated that they have approved the L Lake 316(a) demonstration. In addition, as the lake has not stabilized, the affect of the thermal discharge is not clear. Additional sampling has been agreed to by SRS. The lake at this time does not have a stable indigenous population. SCDHEC contends that fish kills in either water body are unacceptable and require plans to eliminate fish kills. SRS is working on mitigation options and disagrees with SCDHEC interpretation of its regulation. SCDHEC has sent a draft Settlement Agreement to DOE, January 22, 1990 indicating that DOE shall notify the SCDHEC within 24 hours of a fish kill and submit options to eliminate fish kills followed by selection of a plan and scheduling the implementation of a plan to eliminate fish kills. SRS has not submitted a plan to eliminate fish kills from these water bodies but is negotiating the interpretation of the regulations with SCDHEC. At present L and P Reactor startups are schedules for fall of 1990 and spring 1991, respectively. To avoid future violations, the issue of fish kills will need to be resolved prior to reactor start-up.

SRS contends that a balanced biological community is being maintained as illustrated by the 316(a) demonstrations which are approved (contingent upon elimination of fish kills) by SCDHEC.

It is the position of SRS, pursuant to Section 316(a), that limited fish kills are acceptable as long as a balanced biological community is being maintained. SRS contends that significant mitigation of fish kills can be accomplished by a number of alternative actions, however, plans or alternatives have not been submitted for elimination of fish kills. SCDHEC contends that the interpretation of the law is that no fish (including a single fish) shall be destroyed (killed) by pollutants, including thermal discharges. SCDHEC is required to uphold the law by the State's interpretation. The SCDHEC recognizes a number of factors that nullify the significance of the fish kills: (1) there is no public access and use of these fish, and (2) that some fish are killed by water intake which is not a violation.

The SRS is aware of the issue outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of negotiating this issue with the Environmental Quality Manager of the Water Quality Assessment and Enforcement Division.

PROBABLE CAUSAL FACTORS:

Changing regulatory requirements and interpretations.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-8

ASSESSMENT FINDING TITLE: Fill of Wetlands Due to Uncontrolled Erosion

PERFORMANCE OBJECTIVE:

Compliance with Section 404 of the Clean Water Act. Section 404 of the Clean Water Act "Permits for Dredged or Fill Material" part (f)(2) requires that any discharge of dredged or fill material into the navigable waters incidental to any activity having as its purpose bringing an area of the navigable waters into a use to which it was not previously subject, where the flow or circulation of navigable waters may be impaired or the reach of such waters be reduced, shall be required to have a permit under this section.

FINDING:

Soil has eroded from the K-Area Emergency Cooling Water Basin Spoil pile to the floodplain and potentially the wetlands adjacent to the headwaters of Indian Grave Creek.

DISCUSSION:

The K-Area spoil pile was created during construction of the K-Area emergency cooling water basin approximately 35 years ago. Attempts have been made to control erosion by tree plantings, but have failed due to low quality soil. Over the years the pile has been eroded by rainfall runoff down slope to the adjacent tributary of Indian Grave Creek. The eroded soil has been deposited in the floodplain adjacent to the creek potentially covering wetlands over an area possibly greater than one acre. At present a reclamation plan has been prepared by the USFS and a contractor for the reclamation is currently being selected for the K-Area spoil pile project. The reclamation plan will require review for adequacy of mitigation of impacts to wetlands. A jurisdictional determination of wetlands in the floodplain is required by the Corps of Engineers before this can be considered a violation.

PROBABLE CAUSAL FACTORS:

Inadequate oversight and supervision.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/CF-9

ASSESSMENT FINDING TITLE: Improper Disposal of Excess Chemical Reagent and Sample Solution

PERFORMANCE OBJECTIVE:

The South Carolina Pollution Control Act prohibits the disposal of chemical contaminants into the environment of the State except as in compliance with a permit issued by the Department of Health and Environmental Control.

FINDING:

Small amounts of chemical reagents and sample solutions used in the field analysis of surface water samples are disposed of directly into the Savannah River and other onsite streams.

DISCUSSION:

Dissolved oxygen measurements are presently performed on samples collected from the Savannah River and other onsite streams using the Winkler Method. This procedure calls for the use of various chemical reagents including manganous chloride, potassium iodide, sodium thiosulfate, starch solution and sulfuric acid. Excess solution, created during rinse and chemical addition steps in the procedure, was observed to be dumped directly into the Savannah River. Discussions with sampling personnel revealed this to be the standard procedure at other stream sampling locations as well. While the volume of the discharges is minimal (less than 500 milliliters) and the impact to the environment is negligible, this practice is not in accordance with the South Carolina Pollution Control Act.

A second concern in using the Winkler method under field conditions is the unnecessary handling of the chemicals, particularly sulfuric acid, and the potential for exposure to field personnel. Direct readout instrumentation for the determination of dissolved oxygen is available and is commonly used throughout the industry. Use of such equipment would eliminate the discharge of the sample solution to the environment and eliminate unnecessary handling of hazardous chemicals.

PROBABLE CAUSAL FACTORS:

Inadequate oversight and procedures.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-1

ASSESSMENT FINDING TITLE: Inadequate Spill Containment

PERFORMANCE OBJECTIVE:

Good management practice dictates timely implementation of appropriate spill containment. Federal Regulation 40 CFR 125.102-104 and 40 CFR 112.1-112.7 and South Carolina Hazardous Substances Control Act 906:0141 requires that any facility whose operations could reasonably be expected to discharge oils, toxic, hazardous substance or any pollutant which may result in significant amounts reaching waters of the United States shall develop and implement a best management practices program which prevents, or minimizes the potential for, the release of these substances. Appropriate containment such as sufficiently impervious dikes, curbing and conduit should be used.

FINDING:

Curbing/dikes and conduit do not exist or are inadequate at numerous locations around the SRS site.

DISCUSSION:

During an inspection of the F-Area drinking water treatment system it was noted that no curbing existed around the chemical feed tanks used for water treatment which were located immediately adjacent to a floor drain. The chemicals used are listed as hazardous substances under the Clean Water Act (CWA). Best management practices under the CWA require that a curbing or other means should be employed to minimize the potential for release.

SRS responded by placing sandbags around the floor drain near the chemical feed tanks. The existing drinking water treatment system including chemical feed tanks for this area is scheduled for replacement with a new system with appropriate containment.

The following list includes other locations where inadequate containment exist: acid storage area near 773-A and sewer manhole, Building 733-1A oil drum storage area, 3000 gallon capacity above ground diesel oil tank in the C-Area near Building 191-C, and cold feed truck and train unloading facility at 222-F near the storm drain. Other sites where inadequate containment exist are identified in SRS's Spill Prevention Control and

Countermeasure (SPCC) plan and Best Management Practices (BMP) plan for future construction.

The dilute wastewater streams from M-Area production facilities are currently routed to an underground process sewer to the Dilute Effluent Treatment Facility (DETF) in Bldg. 341-M. The process line has experienced leaks. A new, overhead process sewer line is under design, and will be installed by 1992. SRS operating procedure changes and a new maintenance contract are being instituted to reduce the probability of process sewer leaks. This sewer has experienced three leaks to the ground since 1983. The latest leak occurred in December 1989.

In addition, the DOE 1987 Environmental Survey Report noted in its surface water category II finding number two that uncontrolled discharges of pollutants to surface waters was possible from several areas at SRS.

PROBABLE CAUSAL FACTORS:

Inadequate accountability and outdated design.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-2

ASSESSMENT FINDING TITLE: Failure of M-Area Liquid Effluent Treatment Facility (LETF) to Maintain Only One Operating Log

PERFORMANCE OBJECTIVE:

The State has mandated that one operating log be included at each plant. This requirement is outlined in NPDES Permit No. SC0000175 a SCDHEC Memorandum dated March 13, 1985, and a SCDHEC/Du Pont meeting held on June 11, 1986 (CP-86-124).

Standard Industry Practice is to have one bound operating log at each Wastewater Treatment Plant wherein the Operating Staff, responsible for the operation and maintenance of said facility make entries of status.

FINDING:

M-Area Effluent Treatment Plant maintains two bound operating logs.

DISCUSSION:

Operating logs generally include recording alarm conditions, operating adjustments/changes, key maintenance status, unusual items to report, signature of licensed operator or the licensed shift supervisor, signature of operator in-responsible-charge, routine equipment maintenance, repair or replacement and similar issues. The log is available and readily accessible to anyone and located at a central "control" point in each facility.

M-Area Effluent Treatment Plant maintains what they refer to as the OIC log and a separate operating log. The OIC log is to show the State when they inspect and is always available. The so called Operator-In-Charge (OIC) {WSRC's definition} signs the log whenever he visits the facility. This OIC is the sole licensed operator to be held accountable for the operation and maintenance of the plant in accordance with the permit (this is not the property graded licensed operator in charge of each shift). The alternate B Operator (who is the properly graded licensed operator in charge of each shift) also signs the OIC log. A second bound operating log is maintained with operator notations.

Having two bound operating logs is contrary to standard industry practice and the intent of the SCDHEC/DuPont meeting June 11,

1986. There should be only one of log which contains all pertinent information. Log entries include recording alarm conditions, operating adjustments/changes, key maintenance status, unusual items to report, signature or operator in-responsible-charge, routine equipment maintenance, repair or replacement and similar issues. The log is available and readily accessible to anyone and located at a central "control" point in each facility.

Among other things this (one) bound log offers the incoming shift personnel the opportunity to review status and condition of the plant. Telephone discussions by the assessment team with SCDHEC representatives clarified their intent for only one long.

PROBABLE CAUSAL FACTORS:

Inadequate oversight.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-3

ASSESSMENT FINDING TITLE: Inadequate Maintenance Management System

PERFORMANCE OBJECTIVE:

Good maintenance management practices requires up-to-date records on equipment, personnel, and maintenance activities.

FINDING:

Inaccurate and insufficient data, inconsistent maintenance reports, and failure to analyze historical maintenance activities have occurred.

DISCUSSION:

INPO maintenance guidelines call for maintenance activities to play a primary role to ensure safe and reliable operations. To assure this goal maintenance requires a well organized, planned, scheduled and coordinated effort according to equipment needs and priority.

Some key elements in a good maintenance program include organizational elements to promote efficiency and effectiveness, qualified and trained maintenance personnel, guidance to ensure adequate goals, support tools and equipment, accurate and current procedures, control, test and calibration of maintenance procedures and equipment, maintenance history and analysis programs to reduce recurring maintenance and resolve root causes. During an inspection of the A- and D-Area drinking water systems it was noted that: 1) tracking of instrument calibration was handled differently at these facilities; 2) the maintenance planning manager in the D-Area was unaware of any report sent to him which summarized the calibration schedule and history of the instrumentation in the D-Area drinking water and waste water neutralization system control room; 3) operator actions during a recurring alarm showed poor maintenance of the flow controller/strip chart for the waste water neutralization system in the D-Area. In addition, the recurring alarm indicated a potential design problem.

During an inspection of the K-Area drinking water system it was noted that: 1) system showed signs of poor housekeeping and maintenance. (e.g., leaking valves and packing glands); 2) The K-Area Power unit manager indicated that the present Work

Management System (WMS) reports did not contain sufficient information to provide an efficient feedback on the status of a systems maintenance history and scheduling. (SW-208)

During interviews with the Separations Engineer (SE) maintenance coordinator and after reviewing several reports (SW-117 and 149) it was noted that 1) one report listed as the responsible maintenance person in Power someone who transferred from the assignment some months ago; 2) two different reports listed significantly different maintenance tasks to be performed under the same maintenance Work Request Order number; 3) maintenance history reports indicated that certain Preventive Maintenance (PM) items were either not being done annually per their schedule or the system had not identified the PM task in a consistent way; and 4) other WMS reports which were to show detailed descriptions of work performed during maintenance activities were inadequate for follow-up.

SRS has plans to update the WMS maintenance tracking system in 1990 including provisions for systems maintenance history reporting and rescheduling tasks from the date the work was originally scheduled versus from the date the work was completed.

SRS Power is developing a separate data base which will hopefully be coordinated with WMS to provide control and calibration of Measure and Test Equipment (M&TE) under its custodianship.

PROBABLE CAUSAL FACTORS:

Inadequate policy implementation and oversight.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-4

ASSESSMENT FINDING TITLE: Inadequate Labeling and Tagging

PERFORMANCE OBJECTIVE:

Good management practice requires consistency between written procedures and field conditions to assure proper operations and minimization of safety hazards.

FINDING:

Operating valves for various equipment in the F/H Effluent Treatment Facility were not sufficiently identified to assure minimal risk for the proper operation of the plant systems. Operators were expected to compensate for existing shortcomings.

DISCUSSION:

INPO Conduct of Operations guidelines advise that references to components should exactly match drawing and label plate identifiers. It also notes that operators should not be expected to compensate for shortcomings in procedures such as confusing or inaccurate information.

During an inspection of the F/H waste water Effluent Treatment Facility it was observed that operating valves on numerous systems were tagged with "temporary" tags. The tags in some cases had only recently been replaced, yet some, exposed to weathering, were barely readable. Operating procedures in this facility referenced valve tags extensively citing single line system sketches. Directions had been issued and noted in the plant's operating log that operating procedures should not be performed if the operator could not clearly identify valve tags or if valves were untagged.

PROBABLE CAUSAL FACTORS:

Insufficient oversight and procedures.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-5

ASSESSMENT FINDING TITLE: Inadequate Chain-of-Custody Procedures for NPDES Sample Collection

PERFORMANCE OBJECTIVE:

Documentation covering ES&H activities, including procedures, must be adequate to assure activities are performed in a manner which will result in compliance with specific program requirements. (DOE Order 5482.1B, Section 10g)

FINDING:

Formal chain-of-custody procedures for the collection of sanitary wastewater NPDES outfall compliance samples do not provide sufficient detail to assure the custodian accountability and sample security of all samples.

DISCUSSION:

Existing procedures for the collection of sanitary wastewater NPDES outfall samples (DPSOP 212) simply instruct the sample collector to "Fill out the chain-of-custody record, have signed by shipping, and retain one copy." Adequate detail is not provided relative to specific responsibilities, critical terms and definitions, direction for completing the chain-of-custody form, required records and references. WSRC has since prepared and approved an interim chain-of-custody procedure for the collection of sanitary wastewater NPDES outfall samples through the existing Field Procedure Change (FPC) process. Previous audits, such as the "Water Pollution Control Programs: National Pollutant Discharge Elimination System (NPDES) Functional Appraisal", 1988, also noted this deficiency. The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues.

PROBABLE CAUSAL FACTORS:

Insufficient program oversight and follow-up of prior NPDES program review findings.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-6

ASSESSMENT FINDING TITLE: Inadequate Documentation of Comprehensive NPDES Program Plan

PERFORMANCE OBJECTIVE:

Program responsibilities and protocols should be clearly defined and documented in sufficient detail so as to minimize confusion between responsible parties, enhance program consistency and continuity, and assure continued compliance. (DOE Order 5482.1B, Section 10g)

FINDING:

There is no single comprehensive program document or program plan which adequately describes the program organization, specific responsibilities, and specific activity protocols.

DISCUSSION:

The NPDES program, administered site wide by WSRC, relies on several functional organizations to perform compliance-related activities. While the overall program is meeting regulatory requirements, there is presently not a comprehensive program plan which defines the overall program structure, the inter- and intra-departmental responsibilities or specific protocols for performing the essential functions of the program. Presently, the Environmental Protection Section (EPS) is responsible for regulatory compliance oversight, providing assistance to the responsible organizations for permit application or modification and the interpretation of regulations and for the preparation and submittal of the required compliance monitoring reports. The Environmental Monitoring Section (EMS) is responsible for the collection of all compliance NPDES samples except the sanitary wastewater outfalls. The Power Department is responsible for compliance sampling on these outfalls. In addition to EPS, EMS and Power, several other organizations are the actual custodians of the outfalls themselves.

As a result of the complex organization and overlapping responsibilities, coupled with the lack of documentation, the program currently lacks the continuity and consistency desired. The potential for deficiencies as a result of these inconsistencies may be increased in the future. The Environmental Implementation Plan discusses organizational responsibilities in general terms but lacks the definition of

specific responsibilities within the departments and the activity protocols which would assure program continuity. WSRC is presently developing such documentation through the EPS, Environmental Compliance Manual. The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues.

PROBABLE CAUSAL FACTORS:

Insufficient oversight and follow-up of previous audit findings.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-7

ASSESSMENT FINDING TITLE: Insufficient Monitoring of All Onsite Drinking Water

PERFORMANCE OBJECTIVE:

Owners/operators of drinking water systems are responsible for protecting the health of those consuming the water and for the performance of monitoring to assure the quality of water is within acceptable limits. National Interim Primary Drinking Water Quality Standards 40 CFR, Part 141)

FINDING:

Eleven of the 27 onsite drinking water systems have not been and are not routinely sampled for the primary drinking water quality parameters.

DISCUSSION:

There are 27 separate drinking water systems on the SRS. Twenty-six of the 27 systems use ground water as their water source. The remaining system, at D-Area uses Savannah River water.

The drinking water monitoring program meets the minimum regulatory requirements. Power Operations currently monitors all 27 domestic water systems for bacteria and residual chlorine. In addition, the 16 largest systems are sampled by Power and analyzed for a number of parameters including those in the Primary Drinking Water Standards and the organic compounds currently regulated or proposed for regulation. The present sampling, which is not on a formal schedule, has been conducted every 12 to 14 months during the past several years. Power has reviewed their sampling program and has determined that the 1990 sampling will include all 27 drinking water systems onsite. The SCDHEC samples, which are analyzed for bacteria and some chemical constituents, are collected from the 14 major onsite systems. Volatile organic sampling is conducted by SCDHEC under contract to DOE-SR.

While not required per regulation, it remains good management practice to have characterized the drinking water quality of all systems relative to the drinking water standards.

The operator of the drinking water system is responsible for the water quality and the protection of the health of the consumers.

In view of the known and potential for groundwater contamination at the SRS, it is appropriate that all systems be characterized relative to the primary drinking water standards with the results formally documented.

PROBABLE CAUSAL FACTORS:

Inadequate policy towards monitoring drinking water quality.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-8

ASSESSMENT FINDING TITLE: Inadequate Documentation of Standard Operating Procedure (SOP) Requirements

PERFORMANCE OBJECTIVE:

Specific documentation of key activities in the NPDES sampling program is required or needed in the sample collection and pH calibration procedures. (WSRC-3Q1-3, Sections 3340 and 4110)

FINDING:

Documentation, as required in WSRC-3Q1-3 (formerly DPSOP 271-1), is not being completed in full.

DISCUSSION:

The procedure specifies "calibrate instruments and record results... ." It was observed that the back-up pH instrument calibration, while actually performed, was not recorded in the appropriate log book. Similarly, internal WSRC telephone communications of NPDES noncompliances are not documented as specified in the SOP. Written communications of the noncompliances are transmitted following the telephone notifications, however, presently no reference to the call is included to document that the phone notification was indeed made. Such reference is going to be included in future notification memos to provide a record of the telephone notifications.

Review of the data, following receipt from the laboratory, is required per the SOP. These reviews are being performed, however, there is presently no record kept to document them having been done. Although there is no specific requirement in the SOP to document the reviews, a record of the review is needed to verify that the reviews are being performed per the SOP.

The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues.

PROBABLE CAUSAL FACTORS:

Inadequate attention to detail in the procedure. Inadequate procedure.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-9

ASSESSMENT FINDING TITLE: Nonrepresentative NPDES Sample Collection Sites

PERFORMANCE OBJECTIVE:

NPDES compliance monitoring samples must be collected at sites that are representative of the effluent stream. (South Carolina Water Pollution Control Act, WSRC-3Q1-3)

FINDING:

NPDES sample collection locations in some cases are not conducive to the collection of representative samples.

DISCUSSION:

NPDES compliance samples must be representative of the permitted discharge. Several existing NPDES sample locations are physically configured such that they may contribute to noncompliances. During what was identified as "normal" flows, several discharge sampling locations were observed to be prohibitively shallow. Typically, the outfalls are a ditch, sometimes improved with a stainless steel channel installed, and other times unimproved with rock and sandy/silty stream beds. While no noncompliances have been observed directly as a result of this, sampling under these conditions introduces the potential for disturbing the bottom sediments, introducing them into the sample and causing noncompliances due to elevated total suspended solids (TSS). Flow estimates at these sites are also very difficult under these conditions. Those outfalls that have been improved, provide much better flow measurement capabilities and improved sampling points. In some cases, the "NPDES Sample Here" sign is located such that the sample must be collected from a small substream or stagnant area of the discharge stream, again potentially nonrepresentative of the effluent discharge. No documentation was found supporting the representativeness of the sample inlet location with respect to the overall effluent discharge stream. On the larger effluent streams (i.e. L-Lake inlet), with the sample inlet near the shoreline, the potential for a nonuniform distribution of contaminants across the width of the stream exists.

PROBABLE CAUSAL FACTORS:

Inadequate criteria for selection of locations for sampling.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-10

ASSESSMENT FINDING TITLE: Lack of Review of the NPDES Discharge Monitoring Report (DMR) by the Operator-in-Charge

PERFORMANCE OBJECTIVE:

Standard Industry Practice requires that the Licensed Operator in-responsible-charge sign or at a minimum review the monthly compliance report commonly referred to as the monthly NPDES or discharge monitoring report (DMR). The State requires that an "Operator of Record" analogous to the WSRC's Operator in Charge (OIC) be responsible for the operation of the Wastewater Treatment Plant (WWTP) (SCDHEC Memo dated March 13, 1985 and permit #SC0000175, pg 78 of 79 item 27).

FINDING:

The Operator In Charge (OIC) (WSRC's definition), or the sole operator-in-responsible charge (standard industry definition) does not review the monthly NPDES Discharge Monitoring Report.

DISCUSSION:

The Site has a standardized process of preparing the monthly DMR. The Environmental Protection Section (EPS) receives letters of certification for flow quantities from the non sanitary and sanitary waste treatment facility Project Management Team (PMT's) and DMR effluent analysis results from a certified laboratory. EPS then compiles the monthly DMR. The DMR analysis and the final DMR are not routinely sent to the OICs.

The M-Area Effluent Treatment Facility (ETF) OIC does not review the NPDES monthly report. They do, however, have an atypical effluent discharge, wherein, the treated effluent holding tank is analyzed, compared to limits, signed by a certified operator before the monthly (once on average) discharge to the NPDES outfall. During this discharge the outfall is sampled. It is this certified analysis that is reported in the DMR.

The OIC at the F/H Area ETF does not have a written policy or procedure of reviewing the DMR Report, however, he does review it monthly due to personal initiative.

The OIC of the Sanitary Wastewater Treatment Facilities does not formally review the DMR effluent results. The report is available for review if he chooses to do so.

There is a sitewide (SRS) procedure wherein the Project Management Team (PMT) (custodian or owner) signs a certification memorandum that verifies the flow. Other than providing flow quantities to the Environmental Protection Department (EPS) for inclusion in the monthly NPDES report, this certification is of little value.

The Environmental Protection Agency and SCDHEC require that a Vice President or President of privately owned or operated wastewater treatment plants (WWTPs) sign the monthly NPDES report. Although in compliance with the regulations, the procedures have an inherent or built in flaw in that the results are never viewed by the individual, who, through certified licensing, is responsible for the effluent compliance.

The proper procedure would be for the OIC to receive the monthly discharge analysis or the DMR soon after it is prepared. This will allow the OIC to verify the information, offer corrections to the final DMR, and make adjustments in operating strategies as may be required.

PROBABLE CAUSAL FACTORS:

Inadequate resolution of regulatory issues.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-11

ASSESSMENT FINDING TITLE: A Conflict in the Definition of Operator-in-Charge (OIC) and Other Operator Terms Exists in SRS Wastewater Treatment Facilities

PERFORMANCE OBJECTIVE:

A uniform definition of various terms used in the NPDES permit is necessary for effective NPDES compliance.

The State (SCDHEC) has made it a requirement that a licensed operator be present and responsible for the operation and maintenance of respective treatment plants within the permit requirements. The sanitary treatment plants are the only plants that do not require coverage by a licensed operator on each shift. The SCDHEC requires visits to ensure proper operation and agreed that a once-per-day visit is adequate at SRS. The other facilities, such as TNX, M Area LETF and F/H Area ETF require that a licensed operator be present on each shift. These requirements and others make it necessary to have uniform understanding of terms.

FINDING:

Definitions of various terms such as; OIC, alternate OIC, designated OIC, and other terms are confusing. These terms must be defined, conform to the permit conditions or otherwise be formally agreed to by the regulators, established as standard procedures and communicated to all personnel.

DISCUSSION:

SCDHEC interprets the meaning of; and responsibilities of; the OIC differently than the Site personnel. Numerous discussions were conducted with SCDHEC. SCDHEC defines the OIC as the person in-charge on each shift. The site personnel define the OIC as the person who is licensed and in charge of proper operation and maintenance of the facility. SCDHEC defines this person as the properly graded operator on each shift who is operating the facility. The operator of record is the one person held accountable for the plant operation. This individual can also be the OIC if they are operating the facility, on shift, and responsible for that shift.

There are different interpretations within departments of WSRC and between WSRC and DOE-SR. This was evident during telephone discussions with SCDHEC on March 1,2,6, 1990; a telephone conversation with DOE-SR on March 2, 1990; and a meeting with WSRC's Counsel, EPS, and RMET held on March 7, 1990.

Resolution and agreement on terminologies are paramount to the conduct of business in a manner consistent with meeting permitted effluent conditions and; the NPDES permit requirement page 78 on permit SC0000175, the SCDHEC memorandum dated March 13, 1985, and the Settlement Agreement Number 86-95-W page 4.

WSRC has prepared a DRAFT program entitles; "WSRC Environmental Systems Certified Operator Policy, Draft, February 7, 1990." This policy, once finalized and approved will assist in the resolution of this issue.

PROBABLE CAUSAL FACTORS:

Inadequate resolution of regulatory issue and lack of certified operators.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-12

ASSESSMENT FINDING TITLE: Inadequate Tracking of 404 Permits for Lost Lake

PERFORMANCE OBJECTIVE:

Good management practices requires adequate tracking of all regulatory permit conditions.

FINDING:

Currently there is inadequate tracking of CWA Section 404 permits.

DISCUSSION:

The CWA Section 404 permit issued to DOE for Lost Lake expired June 1989. Approximately one year prior to that, an "Environmental Appraisal Report: Discharge of Dredged or Filled Material Construction Affecting Navigable Waters Functional Appraisal", July 1988, made the finding regarding lack of tracking of 404 permits. It stated: "DuPont's permitting compliance activities meet the requirements of the State. However, it is not evident that activities related to permits are being tracked." A permit tracking system is available for construction and wastewater permits. However the 404 permit for Lost Lake was not included in this data base. Thus the 404 permit expiration date for Lost Lake was neglected. Responsibility for tracking the permit was with the operating contractor. However the Lost Lake 404 permit has overlapping language with the M-Basin Closure Plan regarding Lost Lake thus, it appears that the Closure Plan was assumed to satisfy both requirements. The Closure Plan in fact includes a plan for land reclamation which includes revegetation. The land reclamation plan has been prepared by the USFS for WSRC and DOE, November 1989 entitled "M-Basin/Lost Lake Rehabilitation Project on the Savannah River Site". However, in addition to the USFS, SREL may be considered for the project.

PROBABLE CAUSAL FACTORS:

Inadequate followup and oversight, inadequate policy implementation.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-13

ASSESSMENT FINDING TITLE: Inadequate Site Use Coordination

PERFORMANCE OBJECTIVE:

Good management practice requires the involvement of all responsible parties in initial site use planning.

FINDING:

Site use coordination between US Forest Service and WSRC is inadequate.

DISCUSSION:

The US Forest Service is partially responsible for erosion control, land reclamation, wetlands protection, and other activities which may be directly impacted by WSRC activities. Activities include proposed disposal of spoil (excavated soil) from the emergency basins to areas under reclamation by the Forest Service. Specifically, the K-Area emergency storage basin spoil pile has a contract awarded for reclamation of this area. Simultaneously, SRS has approved a site use permit for the K-Area emergency storage basin to be lined, which requires coordination to protect restored spoils pile. The plans included disposal of these spoils on the old spoil pile which will be in direct conflict with the Forest Service Contract to reclaim the area. The site use request did not adequately alert the Forest Service of spoils disposal.

WSRC has indicated that the USFS as a designated coordinating land user is a part of the formal DOE/WSRC site use permit application process. Some exceptions may occur in cases of informal circulation which have limited distribution or in the case of an amendment under priority review.

PROBABLE CAUSAL FACTORS:

Inadequate policy integration.

ASSESSMENT DISCIPLINE: Surface Water/Drinking Water

ASSESSMENT FINDING NUMBER: SW/BMP-14

ASSESSMENT FINDING TITLE: Lack of Erosion Control During D-Area Package Treatment Plant Construction

PERFORMANCE OBJECTIVE:

Considerations of Aiken County Ordinance for Sediment Control include, among others: 1) Temporary...structures to control runoff are used to protect areas subject to erosion during the period of development or land use change and 2) Provisions are made to effectively accommodate the increased runoff caused by the changed soil and surface conditions. While exempt from this Ordinance, SRS does use it as a model.

FINDING:

No erosion or sediment retention structures were observed in association with the construction of the package treatment plant at D-Area.

DISCUSSION:

The construction permit for the D-Area package wastewater treatment requires that the construction of the facility meet all NPDES requirements for discharge D-001(a) which includes total suspended solids (TSS) to a limit of 30 ppm. Also, an permitted NPDES stormwater monitoring outfall (D-004) is within approximately 100 feet of the construction. No erosion control structures were in place to assure compliance for this project. Through standard site practice, an erosion control plan was not required due to the small size of the project. EPS is seeking additional staffing to prepare erosion control policy and to identify deficiencies in site erosion control plans.

PROBABLE CAUSAL FACTORS:

Lack of established guidance and procedures.

3.5.4 Hydrogeology

3.5.4.1 Overview

The purpose of the groundwater portion of the environmental assessment at the Savannah River Site (SRS) is to evaluate the current overall compliance status of groundwater protection, monitoring, and remediation activities at the site as they relate to the requirements of the Resource Conservation and Recovery Act (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), appropriate U.S. Department of Energy (DOE) Orders, State environmental statutes and regulations, settlements agreements, and consent orders. In addition, the groundwater program is also being assessed in terms of best management practices.

To assess the groundwater protection and monitoring program, interviews and discussions were held with the lead organizations responsible for aquifer protection, the Environmental Protection Section (EPS), the Environmental Monitoring Section (EMS), and the Power Engineering Section. In addition, interviews and discussions were held with personnel from the Savannah River Laboratory (SRL), the Environmental Reactor Assessment Group of the Reactor Restart Division (RRD) and independent contractors. Activities associated with well drilling, maintenance, and abandonment as well as water sampling and sample analyses, and data management were examined both in the field (when appropriate and possible) and through interviews for determining consistency with established procedural methodology and protocols. Particular emphasis has been placed on the quality assurance and quality control of data gathering. The third component of the assessment was document review and evaluation of previous studies dealing with hydrogeologic site characterization, known or potential contamination, monitoring programs, and current or planned remedial activities.

Numerous studies have been made and are continuing to be performed to improve the understanding of the stratigraphic framework and the dynamics of the hydrogeologic system underlying the Savannah River Site. The Savannah River Laboratory (SRL) currently has programs in geological sampling, groundwater monitoring, and aquifer modeling to aid in a further understanding of the complex system. Although depositional environments, hydrogeology, and stratigraphic boundaries are relatively well known, there is considerable variation within the units and, as a consequence, interpretations vary considerably from one investigation to the next. Hydrogeologic boundaries tend to transcend stratigraphic boundaries and this adds to the complexity, particularly when attempting to model the dynamics of the groundwater system. There is, however, general agreement

that there are four aquifers on a local scale beneath the site and that the upper two merge into a single aquifer on a regional basis.

Large quantities of groundwater have been and are currently being used for drinking water, process water, and noncontact cooling water at the Savannah River Site (SRS). Components of the groundwater system at the site (33 known locations) are contaminated with hazardous and/or radioactive wastes as a result of past waste disposal practices. Groundwater remediation activities have only been required at one site, the A/M-Area. All current identified contaminant plumes in the groundwater have no immediate potential for migrating from the site, and are currently undergoing assessment and/or remediation. The groundwater system under the SRS is currently being monitored for both radiological and nonradiological components through a well monitoring program encompassing over 1000 wells. Approximately 100 additional monitoring wells/year are scheduled for installation to further aid in the detection and assessment of groundwater contamination from past or current waste management practices. The number of wells and number of years are dependent on results of RCRA Facility investigations, status of the groundwater monitoring for the permitted units, identification of new waste sites, and extent of required corrective actions. Requirements stipulated in the Federal Facilities Agreement are also factors which will determine the number and rate of installation of monitoring wells to the groundwater monitoring network. These planned monitoring wells will take the form of installations adjacent to existing facilities where there is a potential for groundwater impact and installation at new manufacturing, process, or waste management facilities prior to construction and startup.

The primary sources of groundwater contamination in the A/M Area include process waters disposed of in seepage basins, direct discharges to unlined ditches, leaking sewer lines and a leaking solvent storage tank. In addition, considerable contamination has resulted from landfilling operations at the Old Burial Grounds, the Mixed Waste Management Facility, the sanitary landfill and other land disposal units. Also, seepage basins are still in use (e.g., reactor seepage basins) and no hazardous basin has yet been certified closed under RCRA. Monitoring for groundwater contamination is currently being carried out or is planned for at RCRA Interim Status Facilities or at RCRA Facilities Investigation (RFI) sites (sites which will require a RCRA Facility Investigation).

Groundwater protection, monitoring, and remediation at the Savannah River Site are essentially driven by identified waste sites regulated under the RCRA and the CERCLA and the main thrust

of the program is directed to this activity. Under the South Carolina Hazardous Waste Management Regulations, RCRA groundwater monitoring and remediation activities are conducted in a phased manner and include detection monitoring, assessment monitoring, compliance monitoring, and corrective action effectiveness monitoring. Groundwater monitoring is also conducted at the high level radioactive waste tanks, at leaking underground storage tanks requiring corrective action, at the Reactor Seepage Basins, at the Reactor Disassembly Basins, at off-site locations to confirm lack of impacts, and in support of regional groundwater studies and development of baseline hydrogeologic investigations.

The only groundwater remediation program currently being undertaken at the Savannah River Site is in the A/M-Area where several units of the aquifer system have been contaminated with halogenated organic degreasing solvents (primarily trichloroethylene and tetrachloroethylene). The primary sources of the contamination have been identified as an unlined surface impoundment in the M-Area designed to settle and contain metals discharged from the main operations area and from activities associated with operational process studies of at the Savannah River Laboratory. A Final RCRA Part B Permit, Revision 2 (SCDHEC Hazardous Waste Permit SC1890 008 989) was issued in 1987 which required closure of the M-Area settling basin, post-closure care for the M-Area Hazardous Waste Management Facility, and a corrective action program for removal of chlorocarbons from the groundwater (Aquifers 4, 3, and Aquitard 2). Chlorocarbons are being removed from the shallow aquifer by a series of recovery wells that remove water from the formation and process it through an air stripper column which removes the chlorocarbons from the water. The water is then discharged through a permitted NPDES outfall. The chlorocarbons are vented to the atmosphere via a permitted stack. The post-closure care permit calls for a 30 year program of maintenance and monitoring at the M-Area location. Closure of the impoundment commenced in 1988 and has now been completed. Groundwater monitoring and full scale groundwater remediation by air stripping has been conducted since 1985. A Part B Permit, Revision 3 was submitted to SCDHEC to increase the flow to the current air stripper, to install two supplemental recovery systems to tap other portions of the contaminant plumes, and to extract organics from the unsaturated soils above the water table. The proposed revisions to the A/M-Area corrective action program will better address the contamination problem in this area. However, expectations are that revisions/additions to the program will occur as new data becomes available.

Trichloroethylene contamination has also been detected in the deep aquifer (Aquifer 2, Black Creek Unit). Aquitard 2, which acts as an effective barrier to vertical flow throughout most of

the site, thins or is eroded to almost zero thickness beneath the SRL site and apparently has allowed contamination to enter this deeper aquifer. It is the only known contamination of Aquifer 2 at the Savannah River Site. Under the recently submitted Revision 3 of the M-Area Part B Permit Application, SRS states that its intention is to further assess the extent of contamination to the Black Creek aquifer and to define the scope of remediation activities. Investigation will include soil gas surveys, monitoring well installations, and geologic descriptions.

3.5.4.2 Evaluation

The Savannah River Site has developed a groundwater management program which addresses the protection, monitoring and remediation of the groundwater system. It includes a groundwater monitoring program which appears capable of detecting any future groundwater contamination from past or future operational activities and includes a positive program for future siting of monitoring wells in relation to preexisting identified waste sites and/or future waste streams. The site has extensive subsurface well control in support of site characterization. In addition, the on-site Savannah River Laboratory has an ongoing research program of baseline hydrogeologic investigations which serve as a framework for operational decision making involving the groundwater system.

The current groundwater monitoring systems, assessments and remediation efforts, however, cannot yet be considered complete. Monitoring systems at RFI sites have not been proposed and/or installed and some existing systems are still not capable of determining the full extent of contamination. It is expected that additions and revisions to groundwater programs will occur as new data becomes available.

Groundwater contamination at SRS is the result of past and current waste management practices which include discharges from the reactor disassembly basins, burial ground and sanitary landfill. The current waste management program is designed to assess any additional impacts on the groundwater system. The basin closure program (RCRA permitted or interim permitted sites) is designed to prevent further migration of contaminants from identified source sites into the system and the assessment of known or potential contamination locations is being addressed under the RCRA/RFI program or will be addressed under CERCLA in the Federal Facilities Agreement. Although additional contaminants from identified waste sites may migrate into the groundwater, current efforts under compliance agreements should result in mitigation of the groundwater contamination problem.

Routine sampling of monitoring wells and drinking water locations are conducted by the Environmental and Health Protection Department. The number of monitoring wells on site is extensive and the site has a relatively sophisticated data base tracking and flagging system to aid personnel in quality assurance and control, sample scheduling, interpretation of data, and trend identification. Groundwater Protection flagging criteria are based on detection limits, background levels, and EPA drinking water standards. As additional monitoring wells are drilled, the program incorporates them into the system.

Groundwater remediation by air stripping has been conducted since 1985 and the site has submitted a revision to its RCRA Part B permit to increase both the magnitude of air stripping and an increase in the number and location of the wells intercepting the contaminant plume. The contamination, although from more than one point source, is being managed as a single unit. Management of remediation of the unit has been aided by the installation of a Geographical Information System (GIS) system which not only can be utilized as an interpretative tool but can also, with its associated database, provide text and graphical documentation for timely compliance reporting. Modeling of the plume geometry and its contaminants combined with projected cleanup levels fall within the framework of the permitted 30 year program.

The primary codification of procedures and specifications for drilling, sampling, analysis, and maintenance of the groundwater monitoring system is developed in DPSOP 254, Hydrogeologic Data Collection Methods, Procedures, and Specifications. It standardizes, to the extent possible, all activities associated with subsurface investigations ranging from permits and general procedures, through well installation and abandonment specifications to sampling and analysis and aquifer test procedures. It is organized into discrete chapters which can be revised on an "as needed" basis. The document meets or exceeds general industry standards in terms of thoroughness and is up to date with most chapters revised as late as 10/01/89.

The groundwater assessment did not develop any compliance findings related to the protection, monitoring, or remediation of the groundwater system at the Savannah River Site. Best management practice findings relate to 1) inadequate and untimely submittal of routine reports to the regulatory agencies; 2) inadequate analyses and containment of purge water from monitoring wells; 3) inadequate interim stabilization of surface materials at the R-reactor area seepage basins; 4) observation of inadequate procedure, protocols, and health and safety measures during field monitoring well sampling, and 5) lack of adherence to defined responsibility and authority between the U.S. Army Corps of Engineers and the SRS.

3.5.4.3 Findings

ASSESSMENT DISCIPLINE: Hydrogeology

ASSESSMENT FINDING NUMBER: H/BMP-1

ASSESSMENT FINDING TITLE: Untimely and Inadequate Submittal of Routine Reports or Permit Applications to the Regulatory Agencies

PERFORMANCE OBJECTIVE

Under best management practices and conditions outlined in the South Carolina Department Health and Environmental Control (SCDHEC) regulations the DOE contractor for the Savannah River Site is required to submit adequately prepared permit applications for hazardous waste management units.

In addition, the regulations also require routine monitoring well analytical reports to be submitted to the South Carolina Department of Health and Environmental Control (SCDHEC) within the specified time frames outlined by South Carolina Hazardous Waste Regulations (R.61-79.264 and R.61-79.265), conditions outlined in the Part B permits, or amendments to the Administrative consent order (ACO 85-70-SW) following the sampling period.

FINDING:

Routine environmental monitoring reports to regulatory agencies have been delayed. Not all reports are submitted to the regulatory agencies within the time period specified by the South Carolina Hazardous Waste Management Regulations, conditions outlined in Part B permits, or amendments to Administrative Consent Order (ACO 85-70-SW). In addition, the quality and completeness of some of the Part B permit submittals has been less than adequate.

DISCUSSION:

On May 1, 1987, the U.S. Department of Energy (DOE) and the South Carolina Department of Health and Environmental Control (SCDHEC) entered into a Settlement Agreement (87-27-SW) requiring DOE to submit a revised RCRA Part B Permit Application for the F and H Area Seepage Basins to include corrections to the Notice of Deficiencies (NOD) described in the November 21, 1985 review. On August 16, 1988, DOE submitted the revised RCRA Part B Permit Application which was improved but still incomplete in regard to the groundwater information. SCDHEC concluded that DOE was in violation of Section 44-56-130 of the 1976 South Carolina Code of

Laws, as amended for failure to submit a revised RCRA Part B Permit Application for F- and H-Areas Seepage Basins correcting the deficiencies as described in SCDHEC's November 21, 1985 NOD and in the Settlement Agreement (87-27-SW) (HD-21).

According to discussions with SCDHEC and the notice of deficiencies (NOD) from the review of the RCRA Part B post closure Permit application for the Mixed Waste Management Facility and the F- and H-Area Seepage basins, the geology of the site has not been adequately characterized. A settlement agreement (87-27-SW) discusses some of the major deficiencies in the RCRA post closure Part B Permit application submittal. Some of the deficiencies included failure to include complete closure and post-closure plans, failure to include a complete summary of groundwater monitoring data obtained during the interim status period, failure to adequately identify, in the RCRA Part B, the uppermost aquifer and aquifers hydraulically interconnected beneath the facility property including groundwater flow direction and rate and the basis for such identification, and for failure to include an adequate description of the plume(s) of contamination that have entered the groundwater (HD-21).

According to WSRC, the revised post-closure permit applications for the F- and H-Area Seepage basins and the Mixed Waste Management Facility will include a complete description and interpretation of the geology and hydrology in the area which includes all three facilities. The characterization will include lithologic cross sections, structure and isopach maps. Lithologic zones will be correlated and preferential flow pathways interpreted in terms of structure and depositional facies (HD-87).

Due to the voluminous numbers of monitoring wells (approximately 470) within the groundwater monitoring system, delays in submittal of quarterly monitoring reports to SCDHEC have occurred. According to discussions with the SCDHEC, normal response time for the facility's submittal of quarterly monitoring reports is 90 days following the end of the quarter.

According to Westinghouse, Groundwater Quality Assessment Report for the F- and H-Areas and Mixed Waste Management Groundwater Quality Assessment reports have been submitted to SCDHEC from one week to one month after the due date. Other non-RCRA compliance reports have been submitted late. One Notice of Violation (NOV) was recently issued to DOE by the Compliance Section of SCDHEC for failure to submit a groundwater report for the Sewage Sludge Land Application Site at the F- and H-Areas. WSRC has requested extensions from SCDHEC for the last two monitoring reports for the M-Area, which is under a corrective action program. Even though there are over 235 monitoring wells in the M-Area network,

generally, these reports have been submitted on time due to the fewer constituents which are required for monitoring and less technical requirements in the submittals.

In order to ensure the submittal of adequately prepared and reviewed monitoring reports, WSRC conducts a stringent Quality Control and Quality Assurance program. WSRC contracts monitoring well sampling to a team of four individuals who are responsible for the quarterly regulatory-required sampling of the wells. WSRC has indicated that to ensure Quality Control and consistency in the sample acquisition, its contractor has limited the number of personnel responsible for the monitoring wells. In addition, to ensure Quality Control WSRC utilizes a limited number of laboratories for analyses. Following receipt of data, the data is verified for accuracy and the laboratory is contacted and told to reanalyze samples which may have resulted in false positive results. Following receipt of the data, the data is transmitted to the custodian for preparation of the report. The report is then submitted to DOE for review and returned to the custodian for finalization and submittal to the regulatory agency.

According to WSRC, the site Groundwater Coordinator's office has initiated a review of the problems associated with the late submittals of reports to the SCHDEC. Preliminary identification of causes which have resulted in the late submittals to meet regulatory deadlines include the analytical data acquisition and Quality Assurance (QA) phases of the report preparation process. WSRC is currently evaluating strategies for streamlining these phases of the process (HD-87).

The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues.

PROBABLE CAUSAL FACTORS:

The probable causal factor is inadequate planning and development of schedules for timely submittals to regulatory agencies.

ASSESSMENT DISCIPLINE: Hydrogeology

ASSESSMENT FINDING NUMBER: H/BMP-2

ASSESSMENT FINDING TITLE: Inadequate Analyses and Containment of Purged Water from Monitoring Wells

PERFORMANCE OBJECTIVE:

The U. S. Environmental Protection Agency (EPA) and the Department of Energy's Environmental Guidance Division have issued directives on the management of contaminated groundwater as a hazardous waste. On November 13, 1986 EPA issued a directive (OSW Policy Directive No. 9481.00-6) that states that groundwater contaminated with a hazardous substance or waste constituent is considered to contain a hazardous waste but may not be a hazardous waste itself. It would be considered a hazardous waste if it exceeded deminimis concentrations or if it failed the characteristics test. To date, EPA has not defined what constitutes deminimis concentrations (HD-17, HD-22, HD-23, and HD-87). Groundwater, potentially contaminated with hazardous substances or hazardous constituents should not be discharged to the soil surface.

FINDING:

Purged water (the water evacuated from a monitoring well prior to sample collection) from a newly installed well or from existing wells is discharged directly to the ground prior to analyses.

DISCUSSION:

The purge water has routinely been discharged to the ground due to the volume (up to 300 gallons per well) and due to the low concentration of hazardous constituents and radioactivity. However,the site contains all purged water from wells located within the burial ground and Mixed Waste Management Facility due to the documented groundwater contamination.

During a multimedia inspection of the SRS in 1987, EPA and SCDHEC stated that "groundwater evacuated from wells prior to sampling should not be discharged onto the ground without assurance that the water does not pose a potential threat to human health or the environment. Evacuated water should be collected and properly disposed, or work should be performed to determine that the evacuated water is acceptable for discharge to the ground. At a minimum, evacuated groundwater should not be discharged immediately adjacent to monitoring wells" (HD-27).

Due to the uncertainty associated with sampling wells for the first time, the purged water should be containerized and analyzed. In the event concentration of constituents or radioactivity indicates that the groundwater should be treated as a hazardous waste, the purged water should be disposed of properly to ensure protection of human health and the environment. The WSRC has developed a Purged Water Management program (submitted to DOE-SR, 2/23/90) which establishes hazardous waste and health protection requirements as action criteria (HD-17 and HD-87).

The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues.

PROBABLE CAUSAL FACTORS:

The probable causal factor is insufficient policy and supervision.

ASSESSMENT DISCIPLINE: Hydrogeology

ASSESSMENT FINDING NUMBER: H/BMP-3

ASSESSMENT FINDING TITLE: Inadequate Interim Stabilization of the Seepage Basins at the R-Reactor Area

PERFORMANCE OBJECTIVE:

DOE Order 5820.2 contains guidelines for managing DOE low-level waste including closure (HD-34). DOE policy states that "DOE-low-level waste operations shall be managed to protect the health and safety of the public, preserve the environment of the waste management facilities, and ensure that no legacy requiring remedial action remains after operations have been terminated." According to DOE Order 5820.2, DOE Program organizations shall identify contaminated facilities, document the potential for reuses and recovery of materials and equipment, and develop schedules for decommissioning them (HD-88). During the interim stabilization and while remedial alternatives are being determined for the basins, good management practice requires prevention of continuing releases from the seepage basins via infiltration from allowing precipitation to enter through the emulsion cover and cap.

FINDING:

Cracked asphalt emulsion and vegetation growing upwards through the cap and cover were observed at the R-Reactor Seepage Basins. In addition, fire ant mounds were observed along the perimeter of the asphalt covering.

DISCUSSION:

There are six seepage basins located in R-Area. The basins received liquid radioactive wastes including tritium, Cr-52, Co-51, Co-60, Zn-65, Sr-89, Sr-90, I-131, Cs-137, Cs-134, and other beta-gamma fission products from the R-Reactor sumps, tanks, disassembly basin and drums. Most of the radioactivity in Basin 1 occurred when an experimental fuel element failed in the R-Reactor Disassembly Basin and the water was discharged to the basins. The levels of radioactivity discharged to all basins is approximately 200 Ci of Sr-90, 1000 Ci of Cs-137. Most of the radioactivity was contained in basin 1. The basin was removed from service and backfilled in January 1958. Basins 2 through 5 were removed from service and backfilled in 1960. A herbicide and asphalt emulsion was applied to the soil surface above the five basins. A kaolinite dike which extended down to the clay layer and a cap were installed at Basin 1 and the northwest end

of basin 3 to contain lateral movement of the radioactivity. Basin 6 was last used in 1964 and was backfilled in 1977. The monitoring wells in the area surrounding the monitoring wells are screened in the water table. Strontium-90 has been detected in the samples from the wells in excess of EPA drinking-water standards (8 picocuries per liter) (HD-34). In 1975, radioactivity levels up to 3,400 picocuries per liter (primarily Strontium-90) were detected in monitoring well RSE 13 on the east side of basin 1. The increased activity appears to be from the migration of contamination through a construction sewer line which had been abandoned after completion of the R-Area reactor (HD-67). According to WSRC, a soil investigation is planned for the area along the pipe to determine the extent of the contamination. The groundwater is monitored quarterly for gross alpha, nonvolatile beta and tritium activity (HD-4).

In 1986, a DOE audit made a finding relating to inadequate asphalt covering around basins 1 through 4. The covering was found to be inadequate for the prevention of rainwater percolation and vegetation control (HD-34). According to the Reactor area representative, the asphalt covering had been repaired since the 1986 audit.

During this assessment, vegetation was observed growing up through the asphalt. In addition, fire ant mounds were observed along the perimeter of seepage basin 1. The radiation meter indicated 25,000 counts per minute were emanating from the soil which had been brought to the surface from the underlying soil by the ants.

During a rainfall the soil could potentially runoff resulting in transport of hazardous substances away from the area. The ant holes and vegetation also provide a pathway for percolation of rainwater during which would create a vertical gradient for downward migration of the radioactivity.

PROBABLE CAUSAL FACTOR:

The probable causal factors include inadequate maintenance, lack of oversight and poor planning.

ASSESSMENT DISCIPLINE: Hydrogeology

ASSESSMENT FINDING NUMBER: H/BMP-4

ASSESSMENT FINDING TITLE: Failure to Adhere to Established Procedures in Performing Hydrogeologic Investigations

PERFORMANCE OBJECTIVE:

Good management practice require the establishment and use of procedural methods of acceptable hydrogeologic investigation data collection and selected environmental testing protocols. In addition, it is site policy to manage and coordinate hydrogeologic data collection, evaluation, and reporting through the office of the Site Groundwater Coordinator at the SRS.

FINDINGS:

WSRC does not always adhere to established procedures in performing hydrogeologic investigations including those for decontamination, sample integrity and acquisition, health and safety, and water level measurement.

DISCUSSION:

The protocol for decontamination of monitoring well sections and appurtenances ensures that contamination is not introduced into the aquifer to be monitored. The drilling contractor at the Burma Road Rubble Pile did not take appropriate measures to ensure that the submersible pump was decontaminated properly. The contractor was steam cleaning the pump on dirty plastic sheeting. The sheeting became muddy from the water and the pump was in contact with the dirty water. The contractor corrected this after the auditors made the observation to the WSRC personnel on site.

The decontamination of the Hydropunch (a sampling device to take discreet groundwater samples), was not followed according to the procedures outlined in the draft DPSOP 254. The procedures do not specify the step of air drying between the isopropyl alcohol rinse and the distilled water rinse. When the subcontractor was questioned about the observation, a different procedure was shown to the auditor. The procedure was a subcontractor document for field activities which contained the Hydropunch manufacturer's recommended protocol. WSRC personnel in the field were unaware of the change in procedure (HD-2). According to WSRC the air drying step will be added to the final version of DPSOP 254.

During acquisition of samples for the radiological parameters in the F-Area Tank farm, several deficiencies were noted. According to DPSOL 271-1-325, the sampler is required to wear gloves during the sampling (HD-18). During the collection of one of the samples, one sampler was observed taking the sample container for field measurements without wearing a glove. During another phase, the sampler realized that he had placed the glove on the wrong hand, removed it, blew into it to reverse the direction of the fingers and put it on again.

In addition to the above deficiencies, inadequate sampling equipment was used by the sampling team. The procedures also suggest that new bailer line should be used between wells to prevent cross contamination. The same line was used between the several wells that were sampled during the observation period. In addition, the water level indicator was not working adequately during the sampling event. The sampler had to repeatedly insert the probe down the well casing because the light on either of the two water level indicators was not working. When the samplers were asked what were they expected to do in the event a rupture in the waste transfer lines occurred while they were sampling, they did not know. This question was later posed to the first line supervisor in the F-Tank farm area. The supervisor stated that all personnel are instructed in health and safety procedures when present in the area and in the event of an emergency an alarm would sound and instructions over a loud speaker would instruct personnel what to do.

The assessment team observed water level measurement procedures by the SRL sampling team. The wells are used for water level measurements for research and are not monitored for regulatory purposes. The DPSOP 254 requires measuring the water level to the nearest 0.01 foot. The sampler was approximating the 0.01 foot since the tape was in 0.05 increments. According to WSRC, DPSOP 254 procedures are being revised to require that a folding ruler or steel tape be used to determine the measurement to the nearest 0.01 foot.

PROBABLE CAUSAL FACTORS:

The probable causal factors include ineffective supervisory controls for implementing policies, procedures, and directives.

ASSESSMENT DISCIPLINE: Hydrogeology

ASSESSMENT FINDING NUMBER: H/BMP-5

ASSESSMENT FINDING TITLE: Lack of Adherence to Defined Responsibility, Coordination, and Authority between the U.S. Army Corps of Engineers and the Savannah River Site

PERFORMANCE OBJECTIVE:

Under the U.S. Department of Energy (DOE) Order 5482.1B and DOE-Savannah River Order 100X.1A, DOE is to ensure that the environmental, safety, and health protection (ES&H) programs at SRS are adequate and to verify DOE contractor compliance with program requirements.

There are protocol documents in place which describe the relationship between the U.S. Army Corps of Engineers (COE), the U.S. Department of Energy (DOE), and its maintenance and operations contractor at the Savannah River Site. Currently, the WSRC is the operating contractor, and in the past DuPont was the operating contractor. The protocol states that the WSRC will serve an integral role as the DOE-SR technical representative. Among the responsibilities, DOE-SR will provide overall management of the program and WSRC will provide, where applicable: 1) detailed basic data (baseline facility/equipment requirements), 2) site clearance information, 3) work restriction information, 4) special safety requirements, 5) plant and engineering standards, 6) environmental permitting requirements and 7) any other information necessary for the COE completion of a project.

FINDING:

The U.S. Army Corps of Engineers (COE) and the Savannah River Site do not adhere to defined policy of operation which delineates authority, coordination, and responsibility for conducting operations in a consistent manner.

DISCUSSION:

On January 10, 1989, the Corps of Engineers (COE) notified DuPont E+E (the SRS maintenance and operation at the time) that a COE drill rig was onsite and ready to begin work on soil borings at the 488-D Ash Basin and the proposed Central Records Facility Building. The COE had not submitted a task specific Program Plan. A Program Plan was prepared and submitted with tentative approval to begin work pending review of the plan through routine

channels. No Health and Safety Plan or Soil Boring Plan had been submitted (HD-28). The plans are not specifically required under the DOE, SRS and COE protocol agreement but proper coordination with site operations is a good management practice.

On January 12, 1989, a Safety and Performance audit on the COE drilling crew was conducted by a DuPont contractor. Several deficiencies to site-wide environmental, safety and health protocols were noted. Examples of these deficiencies include: 1) There was no sheet of plastic under the drill rig to contain oil leaks, fuel spills, or other contaminants, 2) Trash (food wrappers) on the ground around the drill rig, 3) Neither the drill crew nor the technical oversight (also COE) had ever had a safety orientation for working at SRS; 4) No fire extinguisher was at the work site; 5) One worker wore safety glasses with no side shields; 6) No SRS inspection sticker was on either the drill rig or the water truck; 7) The Work Clearance Permit had not yet been signed by any of the drill crew or oversight; 8) The drill crew and technical oversight appeared to be generally unfamiliar with drilling safety procedures as practiced at the site.

Following the inspection, copies of the audit were routinely submitted to DuPont Safety for transmittal to DOE-SR and to COE. DOE-SR's response to the observed violations referred to the protocol in place at the time of the inspection and reasons for deviation from SRS drilling protocols which are only required "where applicable" (HD-74 and HD-85). The responses for items by number included: 3) "There is no requirement for the COE to have a SRP/DuPont safety orientation, as this is accomplished by the approved COE Safety Plan"; 4) "a fully charged extinguisher was immediately placed onsite": 5) "the COE Safety Plan does not require side shields to safety glasses for the situation observed (actually, no work was in progress during the inspection)"; 6) "SRP inspection stickers are not required on COE or COE contractor's operating equipment, as the COE does its own equipment inspections". According to a DOE-SR memorandum following the inspection, dated January 19, 1989, DOE instructed SRP to "get out of the COE drilling rig inspection business but expected the COE to pick up the slack D-83)" 7) "The work clearance permit was onsite, but had not been signed for the day; signing was immediately completed"; 8) "The drill crew and technical oversight representative were not required to be familiar with SRS/DuPont safety procedures, but were familiar with COE safety procedures, under the approved COE safety plan" (HD-74).

Regarding the response to the "approved COE Safety Plan", there is no documentation regarding an approved safety plan. However, the proposed Safety Management Plan for COE activities at SRS

states that safety glasses with permanent side shields is required protection. Therefore the worker was not familiar with the COE safety plan (HD-73).

On January 19, 1989, DOE-SR-Safety personnel wrote a memorandum to DOE-SR-Project Engineering Division stating that the consensus was "that SRP should not conduct inspections of the COE work sites and equipment but the COE should perform these audits or inspections" (HD-63). The DuPont safety personnel received a call from DOE-SR with instructions that no DuPont representatives were to conduct any more audits on the COE drilling operations (HD-28).

On January 17, 1989, the COE was observed by SCDHEC using wastewater from the 488-D coal flyash basin as make up drilling fluid for soil investigations at the site. The SCDHEC inspector stated that "in his opinion" the use of wastewater for soil borings may be in violation of South Carolina Well Standards and Regulations. It was later determined that the soil boring operations were exempt from South Carolina Well Standards and Regulations (R.61-71), code of the State of South Carolina of 1976, as amended which requires "potable" water to be used in preparation of drilling fluid and required avoidance of any procedures which could result in contamination of an aquifer (HD-74 and HD-79).

The use of non-potable water for subsurface investigations is contrary to SRS drilling protocols which require all drilling operations to utilize potable water for make-up water or water for drilling mud mixing. The soil borings were conducted for improvement of the dike around the D-Area ash basins. There had been three borings to depths up to 45 feet below the soil surface. The water table in the area is at approximately 6 feet. According to DOE-SR, the plant standards requiring the use of potable water for subsurface investigations had not been provided to the COE prior to initiation of the work (HD-74 and HD-82). Subsequent analyses of the wastewater from the flyash basins indicated that the values for iron, manganese, and pH exceeded Drinking Water Standards (HD-81). The risk of groundwater contamination from this practice was contrary to DOE-HQ's mission to reduce environmental risks.

There is an existing safety plan which is currently in place for COE activities at the SRS. The forward of the 1986 revised draft of the COE proposed Safety Management Plan for Corps activities at the SRS states that "every predesign and preconstruction conference will include a safety discussion and representatives of DOE-SR and DuPont will be solicited to furnish any special safety features which they feel must be incorporated into a project. Whenever a COE project is located in the proximity of

DuPont operations, every effort will be made to make the mutual safety programs compatible such that the safety programs of all parties are not contravened. All COE work will be subject to the review or overview of DOE-SR and will be subject to any changes or special conditions requested by DOE-SR (HD-73)."

During the time of this audit, the COE was in the process of installing a potable water well (905-20P) in the vicinity of P-Area Reactor. During the preconstruction conference, WSRC had provided comments concerning the drilling plan. One of the issues noted was that it was not clear whether the COE intends to comply with all relevant sections of the document "Drilling Safety Management Requirements, Savannah River Plant", and if not which sections does the COE not intend to follow (HD-9). On February 8, 1990, the audit team observed the COE conducting the drilling of the P-Area potable water well (905-20P). The COE site manager stated that he still owed a written response to WSRC's comments on the COE Domestic Well Drilling Plan. As of February 24, 1990 the COE had not submitted written responses. In a meeting with the COE, the COE site manager indicated that he felt that the comments were verbally addressed in the kick-off meeting prior to commencement of the work and he was delinquent in not providing the minutes of the meeting.

The Technical Safety Appraisal (TSA) Waste Management team identified personnel protection program concerns (PP.1-3) which are consistent with the deficiencies observed in DOE oversight of drilling operations conducted by the COE. The performance objective states that facility organization and administration should ensure effective implementation of the personnel protection program. According to the TSA concern, the site construction and industrial safety policies are not administered in a consistent manner. There is no established central point of authority and a consolidated safety program has not been defined.

PROBABLE CAUSAL FACTOR:

Lack of policy for integration of site contractor responsibilities.

3.5.5 Waste Management

3.5.5.1 Overview

The purpose of the waste management portion of the environmental assessment of the Savannah River Site (SRS) was to evaluate the facilities' past, present, and proposed activities related to hazardous, radioactive, mixed, and solid waste management. Within each of these four categories there are a variety of waste streams requiring numerous storage, treatment, and disposal techniques. Additionally, the management of underground storage tanks (UST) containing regulated waste or petroleum product was also evaluated.

The SRS waste management program was evaluated against the regulations, orders, and guidance summarized in Table 3.5.5-1. The general approach to the waste management assessment included a review of pertinent documentation, interviews, and facility observations. The documents reviewed are identified in the "List of Site Documents" Appendix C. Interviews were conducted with staff from the Department of Energy-Savannah River Operations Office (DOE-SR), Westinghouse Savannah River Company (WSRC), the U.S. Forest Service-Savannah River Station, Bechtel Savannah River Inc., Wackenhut Services Inc., U.S. Army Corps of Engineers, University of Georgia, Savannah River Ecology Laboratory, EPA Region IV, and South Carolina Department of Health and Environmental Control (SCDHEC).

Several key aspects of the onsite waste management program were examined by other subteams within the Environment Subteam. Inactive waste sites and RCRA closures were assessed by the inactive waste site group. Ash disposal basins and sewage sludge lagoons were evaluated by the surface water group and groundwater monitoring pertaining to RCRA sites was evaluated by the hydrogeology group.

Waste streams at the SRS are found in two principal modes; containerized waste and large storage tanks grouped in tank farms with associated piping. Wastes are generated from nuclear material processing and site support activities. Hazardous and mixed wastes are accumulated in satellite areas or 90-day accumulation points (known at SRS as staging areas) in containers, drums, or B-25 boxes. Waste from these satellite and staging areas are subsequently stored in RCRA permitted or interim status storage areas.

Wastes are also accumulated and or stored in above and below-ground tanks. SRS has stored about 33.8 million gallons of high-level mixed wastes in underground storage tanks in F- and H-Areas. In addition, approximately 100,000 gallons and 1.2

million gallons of mixed wastes are also stored at Savannah River Laboratory (SRL) and M-Area, respectively. Residues resulting from the excavation of petroleum underground storage tanks are typically stored in the vicinity of the tank excavation. Wastes are treated in evaporators, wastewater treatment systems (ETF and DETF), and the D-Area Powerhouse. Wastes are disposed of in the Radioactive Waste Burial Ground and the sanitary landfill.

Future waste management plans include the construction and operation of the Consolidated Incineration Facility (CIF) and the Process Waste Interim Treatment and Storage Facility (PWITSF). The construction of the Defense Waste Processing Facility (DWPF) is nearing completion and is expected to begin 18 months of cold runs in September 1990. In addition, the Saltstone Facility is constructed, permitted, and expected to begin processing waste in the spring of 1990.

During this assessment the site was in a "warm-standby" status and, therefore, the operating conditions may not have been representative of normal waste management activities. While the amount of operations waste produced during standby is at a minimum for most facilities, the receipt of waste at the storage and disposal areas has not been significantly reduced. Maintenance and construction activities which have increased during standby include waste material storage reduction, equipment replacement, decontamination activities, and facility modifications. Some of these activities have been in direct response to previous audits and assessments.

This assessment included a review of onsite generation, accumulation and transportation of hazardous, radioactive, mixed, and solid waste and an inspection of waste management units and USTs. Specific areas are identified in the Assessment Plan (Appendix B). The waste management facilities inspected include those identified in the SRS Resource Conservation and Recovery Act (RCRA) Part A and Part B Permit Application, the WSRC list of Satellite and Staging Areas, the site sanitary landfill, petroleum USTs, and radioactive substance underground storage tanks. In addition, planned waste management activities such as the Consolidated Incineration Facility (CIF) and waste minimization proposals were also considered by reviewing the site waste minimization plan and the RCRA Part B Permit Application for the CIF.

The Working relationships between the WSRC Environmental Protection Section (EPS), the SRS custodians and contractors, and the DOE-SR were examined. Both the DOE-SR and EPS supply guidance and interpretation on regulatory compliance issues to the site custodians and contractors. However, regulatory interpretation from the DOE-SR goes through EPS before being

disseminated to WSRC custodians. In contrast, other DOE-SR site contractors receive guidance directly from DOE-SR.

3.5.5.2 Evaluation

The primary strength of the SRS waste management program is the expertise of the staff. The WSRC staff interviewed were well acquainted with existing state and federal regulations and the relationship between regulatory requirements and site operations. For the most part, SRS contractors interviewed were also well versed in pertinent regulatory issues.

The primary shortfall in the SRS waste management program is the absence of a lead entity for all DOE-SR contractors and WSRC custodians. The WSRC custodians are the individuals responsible for environmental compliance in specific areas or facilities. EPS acts only as a coordinator, furnishing guidance upon request. DOE-SR provides oversight for individual contractors. There is no central leadership with responsibility for the entire SRS site-wide waste management program. WSRC custodians have not received guidance from EPS that was completely responsive to adequately address all issues.

As owner of the site, DOE-SR should take the lead to assure an integrated and effective waste management program is implemented among all contractors on the site. Despite the complicated contractual relationship between DOE-SR, WSRC, and other site contractors, it is only rational for site-wide procedures, not just WSRC procedures, to be developed and followed. Although activities are dispersed among WSRC and other site contractors, liability, particularly for hazardous and mixed waste management, is more focused since the site has only one EPA ID number. In addition, since it is assumed by WSRC custodians and contractors that wastes can only be sent offsite by Waste Management Operations (WMO), a mediator with authority is necessary to ensure that overall waste management functions properly.

The waste management assessment identified ten compliance findings and fourteen BMP findings. The compliance findings relate to the storage of mixed waste in the HLW tanks, storage of mixed waste without a permit, and the lack of a hazardous waste contingency plan. The compliance findings also relate to inspection procedures, storage issues related to LDR waste, and container management practices.

The best management practices findings relate to delays in the startup of the CIF, the sitewide UST program, solid/hazardous waste characterization for mercury and nuclear material (product), and several elements of the waste minimization plan. The best management practices also relate to the management of

satellite areas and the absence or deficiencies noted in procedures and maintenance.

The increased use of satellite accumulation areas has helped the site meet RCRA generator requirements but may create some potential problems. Operators of satellite accumulation areas may need to meet some of the more salient RCRA generator requirements including: training, preparation of a contingency plan, and inspections. A lack of training, inspecting, and contingency planning makes SRS's reliance on satellite accumulation areas less protective of human health and the environment.

To comply with existing state and federal regulations, waste management operations require well defined and effectively administered policies and programs addressing day-to-day conduct of operations and maintenance. To assess conduct of operations and maintenance, staff performance was observed on the job, standard operating procedures and logs were audited, and RCRA training programs were reviewed.

SRS staff was observed during routine daily operations. Tank farm operators were interviewed and observed while performing routine operations and inspections. Interviews were structured to determine how well the operators understood their job and the functioning of their particular facility. Custodians of satellites and staging areas were also interviewed.

A variety of procedures and operating logs exist on the site for daily operations of RCRA regulated facilities and activities. Daily log books were inspected in the control room at each facility. Current and archived tank farm daily inspection logs were audited. In general, inspection logs were filled out completely with only sporadic instances of items not being checked-off or reviewed. Generally accepted QA practices have not been implemented. For some facilities, daily inspection records were missing. Records of onsite waste transport were inspected and found deficient in sign offs by transporters. Manifests for offsite shipment inspection reports were found to contain numerous penciled in changes.

Documentation of RCRA training and facility inspections were audited and several findings were made. The content of the RCRA training was sufficient, however, scheduling of training was deficient and some staff members lacked training. Some required training documentation was incomplete.

In general, progress in regulatory compliance, as evidenced by past audits is notable. Considerable development of documentation, procedures, training, and management organization remain to be accomplished.

TABLE 3.5.5-1

Applicable Waste Management Regulations/ Requirements/Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
DOE Order 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE Draft Order 5400.XY	Radiological Effluent Monitoring and Environmental Surveillance	DOE
DOE Order 5484.1	Environmental Protection, Safety and Health Protection Information Reporting Requirements	DOE
DOE Order 5482.1B	Environmental Safety and Health Appraisal Program	DOE
South Carolina R.61-79.124 through R.61-79.270	Hazardous Waste Management Regulations	SCDHEC
South Carolina R.61-92.1 through R.61-92.16	Underground Storage Tank Control Regulations	SCDHEC
40 CFR 260 to 268, Part 220 and 280	Regulations for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	EPA
INPO 85-017	Guideline for Conduct of Operations at Nuclear Power Stations	INPO
INPO 85-038	Guideline for Conduct of Maintenance at Nuclear Power Stations	INPO

3.5.5.3 Findings

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-1

ASSESSMENT FINDING TITLE: RCRA Training Program Deficiencies

PERFORMANCE OBJECTIVE:

Personnel training for hazardous waste management must be conducted in accordance with SCHWMR R.61-79.265.16. Personnel must be trained in appropriate waste management procedures, including implementation of the contingency plan. New employees must be trained within 6 months after the date of their employment and annually thereafter. The documents that must be maintained as training records include 1) job titles and names of employees filling each job related to the program; 2) written job descriptions including requisite skills, education, or other qualifications and duties of these employees; and 3) written description of the type and amount of both introductory and continuing training that employees receive.

FINDING:

Training programs do not meet all the requirements of R.265.16.

DISCUSSION:

The documents required in R.265.16 were not available:

(1) Job titles of each position related to hazardous waste management and the name of the employee filling each job [R.265.16(d)(1)].

(2) A written job description for each position listed in paragraph above including the requisite skills, education, or other qualifications, and duties of employees assigned to each position [R.265.16(d)(2)].

(3) A written description of the type and amount of both introductory and continuing training that will be given to each person filling a position cited in [R.265.16(d)(1) and (d)(3)].

Two instances were found where annual training requirements were not met:

(1) SRL 776-A staff received RCRA training on November 29, 1988. This same group of employees did not receive training again until late January and February of 1990.

(2) Based on training records current through January 3, 1990, 12 personnel assigned to Waste Management (F and H Areas) have not received the required RCRA training.

These two instances may be indicative of site-wide deficiencies in staff RCRA training.

PROBABLE CASUAL FACTORS:

Inadequate policy implementation.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-2

ASSESSMENT FINDING TITLE: Deficiencies in Hazardous Waste Management Program at Wackenhut

PERFORMANCE OBJECTIVE:

SCHWMR R.61-79.260 through 265 requires the proper identification, labeling, and management of hazardous wastes.

FINDING:

Wackenhut's waste management program was not in accordance with the requirements of SCHWMR for identification, labeling, and container management of hazardous wastes. Three of four satellite accumulation areas were being mismanaged.

DISCUSSION:

An area designated as a Satellite Accumulation Area contained two 55 gallon drums. The drums were located on the western corner of the concrete pad in front of Wackenhut's Helicopter Hanger. One drum was labeled "Hazardous Waste - Oil," the other drum was unlabeled and contained JP-4 and water. This situation can easily allow exceedence of 55 gallon limit for a satellite accumulation area. A Satellite Accumulation Area in the vehicle maintenance area containing waste oil was being managed per SCHWMR.

Wackenhut's Chief Helicopter Mechanic described the source of the waste JP-4 as 1) JP-4 and water from the underground JP-4 storage tank, 2) JP-4 from the catch basin in the bottom of the fuel transfer pit, 3) JP-4 and water from the helicopter fuel test drain, 4) JP-4, when fuel pump repairs require draining the fuel tank, and 5) rainwater collection sump found on the helicopter pad.

Solvent contaminated rags were being accumulated in two areas in galvanized metal trash cans. One site was observed at the munitions area, the other was identified by the Environmental Safety Specialist. The containers in the munitions area were not labeled nor were there any designations that these were satellite or staging areas.

PROBABLE CAUSAL FACTORS:

Inadequate procedures and oversight.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-3

ASSESSMENT FINDING TITLE: Unpermitted Disposal of Hazardous Waste

PERFORMANCE OBJECTIVE:

SCHWMR R.61-79.260 through 268 stipulates that hazardous waste cannot be disposed without a permit or interim status. South Carolina Sanitary Landfill Permit IWP-087A restricts SRS from disposing hazardous waste in the Sanitary Landfill.

FINDING:

Hazardous wastes have been disposed of in the Sanitary Landfill and the Low Level Radiological Disposal Facility (LLRDF) without a RCRA permit or interim status.

DISCUSSION:

Prior to January 19, 1990, rags and wipes contaminated with F solvents were disposed of as a non-hazardous waste in the SRS sanitary landfill and the LLRDF. The SRS had received verbal guidance (undocumented) from EPA-HQ that rags and wipes were not mixed waste in 1984. On January 18, 1990, SCDHEC provided a copy of an internal EPA-Region IV memorandum which designated solvent contaminated rags as hazardous waste. In addition EPA Region IV enforcement staff verbally indicated at a February 16, 1990 meeting that solvent contaminated rags have always been regulated in Region IV. SRS has handled solvent contaminated rags as hazardous waste only since the receipt of the January 18, 1990 correspondence from SCDHEC. SRS notified SCDHEC of the presence of rags contaminated with F solvents in the Sanitary Landfill and the LLRDF on February 23, 1990. SRS verbally notified SCDHEC of the solvent rag issue in early January 1990 and a teleconference was conducted on January 26, 1990 to discuss the issue in further detail.

The disposal of hazardous waste, including rags and wipes contaminated with F listed solvents is regulated under SCHWMR. The cited regulation requires either interim status or a permit for hazardous waste disposal. Neither the Sanitary Landfill nor the LLRDF have had interim or permit status. As a result, SRS did not meet the requirements of R.264 or 265.

In addition, SRS disposed of hazardous waste subject to the land disposal restrictions as described in R.268.30. It is unknown if

the disposed wastes would meet the treatment standards specified in R.268.41.

Although the act of disposal does not meet the requirements of SCHWMR, remediation of the two sites is, in effect, already addressed because both the sanitary landfill and the LLRDF are included in the SRS RCRA Facility Investigation.

PROBABLE CAUSAL FACTORS:

Changes in the interpretation and application of regulations by EPA Region IV and SCDHEC and lack of recognition of a significant hazardous waste issue by SRS.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-4

ASSESSMENT FINDING TITLE: Technical Violation of Inventory Procedures for Tank 722-4A

PERFORMANCE OBJECTIVE:

The South Carolina Underground Storage Tank Regulations, SCUSTR R.61-92.8, stipulate requirements for the performance of product inventories and for recordkeeping. Product inventories are to be accomplished with a gauge or gauge sticks. Losses or gains are to be averaged for each five consecutive readings or once a week and an investigation must be performed when a loss or gain occurs which exceeds a threshold value.

FINDING:

The inventory procedures for Tank 722-4A do not include the reconciliation of losses or gains after five consecutive readings.

DISCUSSION:

The sitewide SMARTS manual recommends substance inventory procedures for tanks onsite. Included in the SMARTS manual is an inventory procedure. Building A-700 has developed their own inventory procedure which includes using a six foot rule to dip the 722-4A Tank on a daily basis. The procedure includes a requirement to notify the CSWE environmental coordinator in the event of a level change of 1/2 inch or more. However, the procedure does not include a requirement to perform average loss/gain calculations. The tank operator and the CSWE environmental coordinator indicated that no such calculation was performed. Of additional concern is the fact that on at least one occasion (12/8/89) for the period of record examined, a 1/2 inch loss in the tank was recorded by the operator, but the environmental coordinator was not contacted. WSRC has indicated that records exist in EPS files and notebooks that document SCDHEC concurrence that the subject inventory method "would meet the intent of the regulations".

PROBABLE CAUSAL FACTORS:

Policy implementation.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-5

ASSESSMENT FINDING TITLE: Lack of Permit for Storage of Mixed Waste

PERFORMANCE OBJECTIVE:

SCHWMR #R.61-79.262.34 specifies that a generator who accumulates hazardous waste for a period of time greater than 90 days must either have interim status or a permit.

FINDING:

SRS is storing mixed waste in F and H Canyons without either RCRA interim status or a RCRA permit.

DISCUSSION:

Silver nitrate-coated ceramic saddles are used as packing material in dissolver offgas reactors in the F and H Separations Canyons. There are 125 cubic feet of saddles stored in F and H Canyons. The silver saddles are considered EP toxic for silver based on process knowledge and tests performed on clean silver saddles by SRS. SRS indicated that approximately two 55 gallon containers per canyon would be generated every 5 to 10 years.

There are several thousand pounds of waste lead stored in the canyons which are now being moved to permitted storage. The lead is used for shielding and counterweights on jumpers and vessels. The lead shielding represents a minor percentage of the yearly generation rate. The counterweights consist of steel cylinders filled with lead shot. In 1987 SRS initiated a program to replace the lead shot with stainless steel shot during maintenance. It is estimated that approximately 100 cu ft/yr/canyon will be generated. At this replacement rate the counterweights will be removed from the canyons in about 10 years. The waste lead is considered EP Toxic for lead based on process knowledge (WM-36). These items are highly radioactive and cannot be quickly or easily removed from the canyons without significant exposure of the staff to radiation (WM-70). A draft settlement agreement being negotiated since December 21, 1989 with SCDHEC is expected to address the storage in excess of 90 days of waste lead and spent silver saddles.

The SRS is aware of the issue outlined in this finding as a result of its self-assessment initiatives.

PROBABLE CAUSAL FACTORS:

Inadequate policy implementation.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-6

ASSESSMENT FINDING TITLE: Instances of Inadequate Inspection of Containers and Tanks

PERFORMANCE OBJECTIVE:

Under Interim Status, the Savannah River Laboratory (SRL) is required to meet the requirements of SCHWMR R.61-79.265.195, Inspections. Included in the cited regulation is the requirement to inspect at least once each operating day: overfill/spill control equipment, the aboveground portions of the tank systems, data gathered from monitoring equipment, and tank construction materials. In addition, R.265.15 (b) (4) and 264.15 (b) (4) inspection requirements for containers specify that "areas subject to spills, such as loading and unloading areas, must be inspected daily when in use." The inspection results must be recorded, dated and signed and must be retained onsite for 3 years.

FINDING:

A review of inspection records at SRS indicates that SRL and managers of container storage areas did not meet the requirements for inspections.

DISCUSSION:

Tanks A, B, C, D, E, F, G, H, J and K at the SRL have Interim Status under RCRA. It was noted that SRL did not perform daily inspections for the tanks in 776-A. Inspections records were not found in the loose leaf log book for the following dates:

2/21/89, 10/27/89, 11/4/89, 11/5/89, 12/8/89, 12/9/89, 12/10/89, 1/19/90, and 1/22/90.

Subsequently, all of the inspection sheets except 11/4/89 have been located. The lack of at least daily inspections does not meet the requirements of R.265.195. (a) and (c). A review of the inspection records also indicated that the inspection forms used prior to 2/19/89 did not meet the inspection requirements with regard to the content of the inspection plan required by R.265.195 including: inspection of overfill and spill control equipment, and inspection of aboveground portions during trailer loading. This condition was resolved by DOE-SR oversight.

The SCHWMR require that areas subject to spills including loading and unloading areas at interim status container storage areas be

inspected daily when in use including 643-29G and TRU pads 6 through 13. This is also the case for permitted container storage areas (Buildings 709-G, 709-2G, 709-4G and 710-U). Daily inspections were not documented in the container storage areas when loading and unloading occurred. R.270.30 (a), Duty to Comply, stipulates that the permittee must comply with ...all applicable regulations promulgated pursuant to the act..." This would include the referenced daily inspection requirement. SRS has taken measures to insure documentation of daily inspections when loading or unloading occurs.

PROBABLE CAUSAL FACTORS:

Inadequate supervision.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-7

ASSESSMENT FINDING TITLE: Unapproved Storage of Waste Subject to the Land Disposal Restrictions

PERFORMANCE OBJECTIVE:

40 CFR 268.50 prohibits storage of LDR hazardous waste except for the purpose of accumulating such quantities of hazardous waste as are necessary to facilitate proper recovery, treatment, or disposal. In the event of an enforcement action within the first year of storage, EPA or approved State has the burden of demonstrating that this storage is not for the purpose stated above. Beyond one year, the generator has the burden of demonstrating that the storage is for the allowed purpose. Additionally, the requirement does not apply to wastes that meet the treatment standard or for which a variance has been granted. Currently, radioactive mixed waste (RMW) containing F listed solvents, dioxin containing wastes, and "California List" waste are prohibited from storage pursuant to 40 CFR 268.50.

FINDING:

SRS storage of the restricted wastes has not been solely for the purpose of accumulating sufficient quantities for proper recovery, treatment, or disposal.

DISCUSSION:

The applicability of LDR standards to DOE mixed wastes is an issue Department-wide. While the applicability of RCRA to mixed waste was clearly established by the byproduct rule of May 1, 1987 the first LDR rules, related to solvents and dioxins, were published earlier in 1986. LDR standards for California List waste were later published in 1987. The applicability of LDR rules were questioned, and DOE initiated discussions with EPA. When the First Thirds rule in August 1988, EPA clarified that remaining mixed wastes would not subject to LDR until the Third rule of May 1990. Further, EPA clarified that the earlier LDR rules applied to mixed wastes on their effective dates.

DOE recognized that the storage of mixed waste at many facilities may not meet existing LDR storage requirements. Therefore DOE resumed discussions with EPA which culminated in the execution of a September 1989 FFCA with EPA and the State of Colorado to bring the Rocky Flats Plant into compliance with existing LDR requirements. This FFCA required DOE to produce a National Report on Prohibited Wastes and Treatment Options that evaluated

the Department's existing treatment capacity for existing LDR wastes. This report was submitted to EPA on January 17, 1990. In addition, in December 1989, DOE sent a letter to EPA Headquarters that identified facilities that were believed to be out of compliance with existing LDR storage requirements. The Department is working with EPA to develop a strategy for negotiating FFCAs at the facilities to bring them into compliance with existing LDR storage requirements.

SRS will soon initiate negotiations with EPA and South Carolina for a Federal Facility Compliance Agreement (FFCA) to resolve compliance issues related to storage of the above referenced wastes.

The RMW stored at the SRS includes:

- several million gallons of mixed "California List" waste in F-and-H Tank Farms,
- an interim treatment/storage facility (IT/SF) Tank containing mixed F006 and "California List" waste, a third-third waste,
- container of rags contaminated with F listed solvents at the Naval Fuel Materials Facility,
- rags contaminated with F solvents on TRU Pads,
- containers of F001 and F002 spent solvents stored in building 709-2G, and
- tritiated mercury (WM-36, WM-66).

A separate but related issue pertains to the storage of restricted TRU wastes. A portion of the F solvent contaminated rags stored at the Naval Fuel Materials Facility (FMF) and F solvent contaminated rags stored on the TRU pads are TRU wastes which may be subject to the LDR storage requirement. However, the applicability of the storage requirement in these cases is not clear.

DOE is developing the Waste Isolation Pilot Plant (WIPP) as a disposal facility for TRU waste. In February 1989, DOE petitioned EPA for a "No Migration" exemption from the land disposal restrictions for WIPP. In light of these circumstances, DOE is working with EPA to clarify the LDR compliance status of TRU mixed waste.

Additional mixed wastes may also be impacted by the storage requirement when the "third-third" land disposal restrictions are

promulgated in May 1990. The storage requirements also impact newly generated restricted wastes. SRS has shut down operations that generate land ban wastes. A factor which may mitigate the significance of the storage requirement at SRS is EPA's proposal to interpret the storage requirement not to apply where storage precedes legitimate, protective treatment, recovery, or disposal (WM-67). However, until that interpretation is finalized, it appears that SRS is obligated to comply with the storage requirement as discussed above.

An additional concern pertains to actions which trigger the storage requirement for restricted wastes placed into storage prior to the LDR effective date. Wastes which are "actively managed" after they became LDR restricted, are subject to the storage requirement. Restricted TRU pad wastes (F001, F002, F003, F005, U002, U154, U161, U209, U211, U220, U226, and U239) and "California List" wastes in HLW tanks and the M-Area IT/SF which were placed in storage prior to the requirement dates could become subject to the storage requirement if they are "actively managed." Triggering of the storage requirement hinges on an interpretation of the term "actively managed." Active management has not been defined by EPA, and could include inter-tank transfers and or overpacking drums.

The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or SRS has plans to address these issues.

PROBABLE CAUSAL FACTOR:

Inadequate long-term waste management strategy.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-8

ASSESSMENT FINDING TITLE: Inadequate Secondary Containment and Assessment of Tank Integrity

PERFORMANCE OBJECTIVE:

Under SCHWMR, SRS is required to comply with R.61-79.265.191 (secondary containment) and R.61-79.265.193 (assessment of tank integrity) for the high-level waste (HLW) tanks in F and H-Areas that have RCRA Interim Status. The R.265.193 regulations require secondary containment systems consisting of either a liner, vault, double-walled tank, or equivalent device approved by the SCDHEC to meet certain requirements including, but not limited to:

- design, installation, and operation that must prevent releases and provide for the detection and removal of releases;
- secondary containment systems that must be capable of detecting and collecting releases and accumulation liquids until the collected material is removed;
- vaults that must be designed with chemically resistant water stops and a chemically resistant coating; and be able to contain 100% of the capacity of the largest tank;
- ancillary equipment that must be provided with full secondary containment.

In the event that the secondary containment system does not meet the requirements under R.265.191, the owner/operator is required to keep on file a written assessment reviewed and certified by a registered professional engineer (PE).

FINDING:

The Type I, II, and IV tanks in F- and H-Areas do not meet the requirements for secondary containment and assessment of tank integrity. A written assessment certified by a professional engineer is not on file.

DISCUSSION:

Of the 51 HLW tanks in H- and F-Areas, 50 tanks are regulated under RCRA Interim Status. Tank 50 is regulated under Section 48-1-110 of the South Carolina Pollution Control Act as an addendum to the F/H Effluent Treatment Facility (SC Industrial

Wastewater Permit No. 14,520). In addition, Tank 16 (a Type II tank) has been designated a Solid Waste Management Unit to be investigated under a site-wide RCRA Facilities Investigation (WM-12). There are five tank types designated: I, II, III, IIIa, and IV. There are 12 Type I tanks, 4 Type II tanks and 8 Type IV tanks. The remaining 27 tanks are Type III or IIIa tanks. The Type III and IIIa tanks meet the regulatory requirements of R.265.191 and .193 because they are double walled tanks (WM-63).

Nine of the tanks used to store sludge, salt, and supernate have leak sites (WM-82). This total includes five Type I tanks (1F, 9H, 10H, 11H, 12H) and all three Type II tanks (13H, 14H, 15H). In addition, three tank wall penetrations have been noted in Tank 20F. It should be noted that in some cases the number and location of the leak sites are unknown (WM-63).

Both Type I and II tanks are of a "cup in a saucer" design in that the secondary containment system consists of an annulus pan 5 feet high with a diameter 5 feet greater than that of the primary container and a concrete enclosure that encases the entire primary container and pan. Both tank types can be visually inspected with video cameras and visual surveys are considered the "most important and recurrent waste tank inspection" method (WM-63). However, it should be noted that only a portion of the Type I tanks (30%-40%) can be inspected because of the location of the inspection ports.

Type II tanks are constructed with a "sawtooth" joint in the concrete enclosure at the upper limit of the annulus pan. This sawtooth joint is not constructed with a water stop and reportedly is the mechanism whereby leakage from tank 16H escaped from the enclosure (WM-80). Approximately 75% of the wall area of these tanks can be visually inspected.

Type IV tanks are single-walled tanks constructed without an annulus pan. The tanks are surrounded with concrete structures. However, these structures do not contain waterstops and do not have a waterproof coating. Tank 20F has experienced a leak, however, waste did not leak out of the tank, rather groundwater leaked into the tank (WM-12).

An additional concern, pertaining to ancillary tank equipment, is the credibility of leak detection boxes used to monitor transfer lines in each tank farm. In the past, a leak has occurred in the core pipe and pipe jacket of a transfer line near Tank 37 which was not detected by the leak detection box system.

This breech of secondary containment led to the release of mixed waste which was eventually detected and reported to the state on 5/8/89. At that time SRS stopped using the transfer line in

question but the specific location of the leak has yet to be identified. Operators in each tank area have subsequently tested all leak detection boxes on active transfer lines and have requested SRL to develop alternate leak detection methods (WM-77).

Because Tanks I, II and IV do not meet the requirements of R.265.193, under R.265.191 the SRS is required to obtain and keep on file a written assessment of tank integrity "reviewed and certified" by an independent, qualified registered PE. SRS has had such an assessment performed by a PE, however, the assessment was never certified (WM-63).

The regulatory status of these tanks has been unclear because SRS had planned to request approval of the tanks as equivalent devices in 11/88 as part of the Part B Permit application for the tank farms. EPA Region IV directed SRS to pursue the issue in the CERCLA Federal Facility Agreement. The state told SRS to apply for a Pollution Control Permit for the tanks (WM-65). However, until the wastewater permit is obtained, SRS has elected to retain RCRA Interim Status for the tanks since RCRA Interim Status is the only "operating permit" available. As a result, the site is obligated to meet the requirements of RCRA Interim Status.

The SRS is aware of the issues outlined in this finding as a result of its self-assessment initiatives.

PROBABLE CAUSAL FACTORS:

Inadequate implementation of waste management policy and changes in regulatory requirements after tanks were constructed.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-9

ASSESSMENT FINDING TITLE: Deficiencies in Management of Waste Drums

PERFORMANCE OBJECTIVE:

RCRA and SCHWMR contain provisions for the management of waste drums that are designed to protect human health and minimize the potential for releases to the environment; specifically accumulation time, container integrity, and labeling.

FINDING:

Multiple observations were made of instances indicative of waste drum mismanagement with respect to accumulation points, packaging of waste for compatibility, and container integrity.

DISCUSSION:

Several instances of drum mismanagement were observed on the site. These observations relevant to several provisions of SCHWMR R.61-79.

1. Abandoned drum at 631-G pit. The drum found abandoned at the D-Area seepage basin contained oil contaminated with fluorene (2.3 ppm), acetone (1200 ppm), and PCBs (720 ppb total) as well as other listed organic constituent (WM-37). The drum was abandoned in November 1988 and was not managed until discovered in February 1990 during this audit. R.264.34 requires that waste stored for greater than 90 days be stored in a permitted facility with drum labeling and inspections (R.264.175 and R.265.175). The 90 day accumulation time started as soon as material was added to the drum.

2. Drums used to accumulate F006 filter cake from the Dilute Effluent Treatment Facility (DETF) in the 300 M-Area do not meet the satellite accumulation requirements of SCHWMR. The F006 filter cake is a sludge that is manually transferred by 55 gallon drum from the DETF to the Chemical Transfer Facility for pumping to F006 storage tanks. This material, as handled, is not covered under the South Carolina Water Pollution Control Act (NPDES) permit for the facility. The permit applies specifically to waste water at the point of discharge. Once the F006 filter cake is placed in the drum, it has left the wastewater treatment stream and should be regulated under SCHWMR at a satellite accumulation area. A satellite accumulation area has not been established in the

DETF where the F006 filter cake is collected in 55 gal. drums. WSRC takes exception to the assessment position on this finding and maintains that the drum transfer is an in-process transfer covered under the Waste Water Operating Permit. SCDHEC agrees with the WSRC position that the drums are in-process as long as they are not stored. Stored drums become hazardous waste.

3. A dented drum was used to store Freon in the 211-H Staging area. This drum never should have been used for recycled Freon. The Freon came from onsite construction activities (Bechtel) and was to be used for crane decontamination in H Area. SCHWMR requires that containers be in good condition (i.e., free of apparent structural defects), and the extent of damage to this drum was severe enough to preclude its used for waste disposal/recycling.

4. Bulging and rusted drums were observed in 710-U and 709-4G (RCRA Part B Permitted facility). SCHWMR requires that containers be in good condition (i.e., free of apparent structural defects). These drums had been segregated by WMO and require additional attention (venting for overpacking) for regulatory compliance.

   Some drums containing depleted uranium oxide across the site have also been noted as being rusted and require better management. This observation is reported here as a best management practice because it involves drum management. Drum integrity is a concern because of the large number of drums stored across the site containing depleted uranium oxide (UO_3). Many of these drums are old and show signs of external corrosion bringing into question their structural integrity. The depleted UO_3 may not be a listed or characteristic waste, but requires management because of its potential toxicity and as a radioactive material.

5. Incompatible chemical reagents declared as waste must be segregated when stored (R.264.17, Subpart A and 264.177, Subpart I). An inspection of drum records at the SRS Permitted facility for storage of hazardous waste (Building 709-G) indicated that incompatible chemical reagents were packaged in a 55 gal. drum bearing the designation 3-27. Some of the reagents stored in the drum included strong oxidizers such as silver nitrate, potassium permanganate, and ammonium nitrate. Boric acid and potassium hydroxide, both mutually incompatible, were also stored in the drum. Uranyl nitrate was also present, which is both an oxidizer and a radiological waste (mixed waste). The drum packaging form for drum 3-27 listed the chemicals placed in the drum, however, it did not list the amount. To manifest the waste

for off-site shipment, the amount (mass) of each chemical must be known. The storage of these compounds in a single waste drum is in violation of R.264.177 and Section II.G of the SRS RCRA Permit. The drum cannot be shipped in compliance with Department of Transportation regulations 49 CFR 170. WMO has taken quick action to resolve this issue.

6. A drum, observed in 709-4G Building (RCRA Part B Permitted facility), that contained trichloroethane was labeled TCE (drum Log No. 3-172). TCE is interpreted at other areas on site (SRL; 734-11A staging area) as trichloroethene, a different compound. In industry, TCE is the abbreviation used for trichloroethene (synonym = trichloroethylene). TCA is used in the chemical industry to designate trichloroethane, but may also designate the herbicide 2,4,5-trichlorophenoxyacetic acid. The audit team was interested in the exact contents of the drum because of the large number of drums containing trichloroethene in and around this particular drum.

   The use of a single acronym promotes clarity and uniformity. While site personnel may be comfortable with multiple designations for hazardous waste, the use of multiple designations is confusing and could also cause problems when the drum is manifested for off-site shipment.

PROBABLE CAUSAL FACTORS:

Lack of administrative oversight of staff in identifying waste, and interpretation and application of regulations.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/CF-10

ASSESSMENT FINDING TITLE: Unavailable Contingency Plan

PERFORMANCE OBJECTIVE:

Conformance with SCHWMR R.61-79.264.53(a) requires that a copy of the contingency plan and all revisions to the plan must be maintained at the facility.

FINDING:

A current copy of the RCRA Contingency Plan for K-Reactor was not available in the K-Reactor facility.

DISCUSSION:

Neither a RCRA Contingency Plan nor a current copy of a Spill Prevention Control and Counter Measure Plan, which would furnish much of the required contents of a contingency plan, were available in the facility. The exhibited spill plan, undated but scheduled to be updated before April 1, 1987, was outdated (the current version is April, 1987, DPSOP-87-1083).

According to WSRC, a current copy of the Spill Plan and copy of the Contingency Plan have been placed in the K-Reactor operations room.

PROBABLE CAUSAL FACTORS:

Lack of management oversight.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-1

ASSESSMENT FINDING TITLE: Incomplete Implementation Waste Minimization Program

PERFORMANCE OBJECTIVE:

A waste minimization plan should be implemented to reduce the generation and disposal of hazardous, mixed, radioactive, and nonhazardous wastes at the Savannah River Site (SRS). The plan should be developed in accordance with the requirements of DOE Orders 5400.1 (11-9-88), 5820.2A (9-26-88), and 5400.3 (2-22-89), as well as state and federal regulations SCHWMR.61-79 and RCRA Sections 3002 and 6002 and Westinghouse Corporate Policy and management Directive MD-E55 (1989).

FINDING:

Deficiencies in the SRS Waste Minimization Program, 12-89, include incomplete characterization and tracking, lack of short- and long-term goals, and handling of oils on site.

DISCUSSION:

A more thorough waste characterization process would allow SRS to segregate waste oils into the recently established regulatory categories: hazardous waste fuel, used oil fuel, and off-specification used oil fuel.

Short- and long-term goals and objectives are lacking for all wastes with the exception of the short-term LLW goal. Selection criteria need to be prioritized and the management policy should be finalized. Selection of departmental waste coordinators is incomplete. The waste coordinators and other SRS personnel have not received adequate formal training in waste minimization. Better coordination is needed between SRL waste minimization projects and the impacted SRS operating departments. Requests for approval of purchase of chemicals, DPSOL 40-5-105 and OSR 4-456, are not routed to waste management. Through coordination of sort is required to effect WMO's waste management objectives, both waste minimization and providing for safe and environmentally acceptable handling, storage and disposal of wastes.

The waste disposal chargeback system is expected to be implemented as planned in April 1990 to create a better awareness of the cost effectiveness of waste minimization. The planned recycling program for sanitary wastes (e.g., aluminum, glass,

paper, paperboard, and plastics,) is expected to be implemented as soon as practical. An individual incentive system may be needed to encourage all SRS personnel to minimize waste generation.

PROBABLE CAUSAL FACTORS:

Incomplete policy implementation.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-2

ASSESSMENT FINDING TITLE: Delayed Consolidated Incinerator Facility Startup

PERFORMANCE OBJECTIVE:

Design and construction activities associated with the Consolidated Incineration Facility (CIF) must meet the requirements in DOE Order 6430.1A (General Design Requirements), NEPA, and SCHWMR R.61-79.264 and 270.

FINDING:

Because of uncertainties in the implementation of DOE Order 6430.1A, it is likely that the CIF startup will not meet the April 1992 milestone date. Delays in the startup date range from

9 months to several years.

DISCUSSION:

DOE Order 6430.1A (1989) requires that a safety analysis of a potential benzene storage tank failure be conducted to evaluate potential releases based upon the assessed risk to the operators, the public, and the environment. If needed, design modifications should be conducted to mitigate excess risk. If modifications to the CIF were made it would also necessitate amendments to the RCRA Part B Permit application currently under review by EPA and SCDHEC. These modifications could delay the CIF startup 13 to 14 months (WSRC presentation to DOE, January 31, 1990). Early on, the SCDHEC and EPA (Region IV) provided an informal, overly optimistic 18-month permit timetable that was adopted by SRS without additional margin. It is estimated that 9 months must be added to the current permit schedule. Due to changes in the facility hazard classification, it may be necessary to upgrade the present EA into an EIS, which could add a substantial time delay of 1 to 3 years to the CIF startup date.

PROBABLE CAUSAL FACTORS:

Changes in DOE policy.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-3

ASSESSMENT FINDING TITLE: Inconsistent and Incomplete Spill Response Information in Permit Application

PERFORMANCE OBJECTIVE:

Good management requires that permit applications contain consistent information. Upon approval the conditions of the permit become regulatory requirements.

FINDING:

The RCRA Part B permit application for the M-Area Process Waste Interim Treatment and Storage Facility (PWITSF) contains conflicting spill response information.

DISCUSSION:

The Part B permit application contains conflicting guidance for managing spills from the PWISTF. The guidance is inconsistent regarding handling spills and clean-up of waste materials. Sampling these materials prior to sending them to the PWISTF tanks was specified in some instances but not in others. There was no mention of the sampling protocol to be used when returning materials to the tanks.

In one instance the guidance was to return materials either to the PWISTF tanks or to DETF, but no guidance was given for determining which one was appropriate.

Examples of inconsistent guidance are as follows:

- Part G, Contingency Plan, of the application directs that all spilled materials will be returned to the PWITSF tanks (pgs XI.G-12 and 13).
- In Part D, process information, spilled materials from 35,000 and 500,000 gallon tanks are to be temporarily stored as mixed waste in drums until they can be sampled and eventually returned to PWISTF tanks (pgs XI.D-24 and 25).
- In Part E, groundwater monitoring, the following statements are found: 1) waste material or contaminated rainwater will be pumped from the truck loading sump either to the DETF for treatment or to the PWISTF tanks;

2) waste slurry leaks from the inlet pipe of tanks onto the ground and contaminated soils will be temporarily stored in drums in building 341-1M; and 3) any waste slurry spilled on floor or in sump pit of storage facility is pumped into PWITSF tanks.
This observation is limited to the permit application and does not reflect current operation.

PROBABLE CAUSAL FACTORS:

Incomplete review of permit application.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-4

ASSESSMENT FINDING TITLE: Incomplete Manifesting of Hazardous Waste Shipments

PERFORMANCE OBJECTIVE:

Fulfill requirements for manifesting hazardous wastes specified in SCHWMR R.61-79.261 through 265.

FINDING:

Manifesting of hazardous wastes do, technically, meet the SCHWMR requirements. However,

- incomplete forms are received at Waste Management
- notification of on-site receipt is only provided for accountable radioactive waste; and
- procedures for processing and tracking off-site manifests were not available.

DISCUSSION:

Under SCHWMR 262.10(b) a generator who treats, stores, or disposes of hazardous waste onsite needs to comply with only limited provisions of 262.40, Recordkeeping. The manifesting of waste, R.262.22, is not required for sites with single EPA I.D. numbers and onsite disposal. However, generators at individual facilities at the SRS are considered as "owners" of the waste they produce and have transported for disposal. Completion of the manifest cycle with receipt notification by Waste Management (WM) would fulfill generator responsibilities for disposal.

The movement of hazardous wastes from the generator to WM is specified in DPSOP 138-16. The generator utilizes OSR-3, Hazardous Waste Storage/Disposal Record, to transfer hazardous wastes to WM. The generator is not informed when or if a waste relinguished to on-site transportation reaches its destination.

Completion of forms prior to receipt by WM is essential for accurate and defensible records.

Documentation reviewed indicated that procedures for obtaining signatures at the generating facility and after transportation are not being followed. For example, radioactive solid waste record form, OSR 7-375, from Building 241-F was not signed by

transportation and the blue copy was not retained by the generator. Also, OSR 7-375 from 241-H did not have the clearance to transport signature.

For off-site shipments of hazardous wastes, WM utilizes a hazardous waste manifest as specified by R.262.32 and DPSOL 7096-13. A WM representative signs the manifest on behalf of the DOE during the final inspection of an off-site shipment. The EPS representative obtains the SRS copy of the manifest which is signed by the transporter's representative acknowledging receipt of the manifested wastes. EPS performs the required tracking and distribution of manifests as required by SCHWMR. A review of WM's file of manifests showed numerous hand and type written corrections. Most of their corrections were not initialed and none were dated. Procedures were not available for review.

PROBABLE CASUAL FACTORS:

Lack of complete procedures.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-5

ASSESSMENT FINDING TITLE: Inadequate Maintenance of Tank Farm Vaults

PERFORMANCE OBJECTIVE:

Good management practice requires that secondary containment systems be maintained to minimize the infiltration of precipitation.

FINDING:

The maintenance of the SRL 776-A tank farm vault is inadequate. Cracks in interior vault walls and the openings in the pipe gallery allow surface water to enter the vault. The joint located on the Northeast (NE) wall of the containment vault, Building 341-1M, has not been sealed. This BMP was also noted during a previous SCDHEC inspection in March, 1989.

DISCUSSION:

The SRL 776-A tank farm consists of 11 tanks used for the storage of mixed waste. The tanks are situated in a concrete vault. Several groups of tanks are separated by common interior vault walls. A registered Professional Engineer and SCDHEC have determined that the vault is in compliance with the SCHWMR R.61-79.265.193 regulation for containment and detection of releases (WM-74). However, maintenance of the vault system calls into question whether best management practices are being followed.

SRL staff members indicated that the pipe galleries which feed laboratory wastes into the tank farm serve as a conduit for rainfall runoff to enter the tank vault. Due to the lack of tank capacity for removal and storage of the rainwater, as much as 54" of precipitation has accumulated in one "cell" of the vault in the past. This is a particular problem when F-Canyon, the processor of 776-A liquid waste, is shut down.

In addition, an interior, common wall in the vault has significant cracks and imperfections. SRL had the entire vault examined by video camera in November 1989. The videos indicate that the crack in Cell VII has a wet appearance. SRL staff speculated that the source of the liquid was probably rainfall runoff accumulations in the adjacent cell.

Building 341-1M contains six 35,000-gallon tanks containing F006 wastes. The secondary containment consists of a concrete basin

approximately 6 ft deep. The joint located at the SW entrance to the building was recently sealed with a white caulking material. A similar joint located on the opposite (NE) wall of the basin was not sealed.

PROBABLE CAUSAL FACTORS:

Inadequate maintenance requirements.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-6

ASSESSMENT FINDING TITLE: Insufficient Administrative Controls to Preclude Introduction of Listed Waste to Area Tanks

PERFORMANCE OBJECTIVE:

SCHWMR R.61-79.261.3 (a) (2) (iii) specifies that a solid waste could be considered a hazardous waste if it were mixed with one or more "listed" hazardous wastes. Solid wastes or "characteristic" hazardous wastes mixed with "listed" hazardous wastes would continue to be considered hazardous waste even if treated to below the characteristic thresholds unless the mixture was delisted pursuant to R.260.20 and 22.

FINDING:

The procedures used to preclude the introduction of listed hazardous waste into tank systems at SRL, H-Area, and F-Area Tank Farms are insufficient.

DISCUSSION:

"Listed" waste includes commercial chemical products, off-specification species, container residues, and spill residues of the items listed in Subpart D of R.260. The phrase "commercial chemical product" also describes formulations in which the chemical is the sole active ingredient. Many of the commercial chemical products found on the "P" and "U" list are found in laboratories at both SRL and in Buildings 772-F and 771-F (WM-). This issue has been reviewed with the regulatory agencies in the past (WM-74).

The SRL waste drains discharge to the SRL tanks. Tank contents are periodically pumped and trucked over to the F-Area tank system. The laboratory drains for Buildings 772-F and 771-F also discharge to the F-Area tank system. Intertank transfers occur between the F- and H-Area tanks. If listed wastes were discharged into the F-Area tank system the entire volume of wastes held in the F- and H-Area Tank Farms would be considered a listed hazardous waste under the "mixture rule" cited above. The present waste management program at the site and the management strategy for wastes to be produced by the Saltstone and DWPF facilities relies on the fact that the wastes being treated are only hazardous due to RCRA "characteristics". Should the wastes treated by the aforementioned facilities be considered a listed

hazardous waste, Saltstone and DWPF wastes would have to be handled as hazardous wastes unless they are delisted.

The laboratory procedures manual from both the SRL and the 772-F and 772-1F Buildings discuss the exclusion of "hazardous materials", and RCRA characteristic type wastes, but they do not include a comprehensive list of the "P" or "U" wastes which should be excluded from the laboratory drain systems. In addition, neither manual establishes the fact that formulations in which the "P" or "U" chemical is the sole active ingredient should also be excluded from the laboratory drains.

PROBABLE CAUSAL FACTORS:

Insufficient administrative controls.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-7

ASSESSMENT FINDING TITLE: Deficient Underground Storage Tank Management Program

PERFORMANCE OBJECTIVE:

Compliance with the South Carolina Underground Storage Tank Control Regulations (SCUSTCR), R.61-92, which specify requirements for preventing leaks and releases from underground tank systems used to store regulated substances (augmented by federal regulations set forth in 40 CFR 280), and SCHWMR R.61-79 and 40 CFR Parts 260 to 280 which regulate underground tanks used to store hazardous wastes.

FINDINGS:

The underground storage tank (UST) management program has not been updated to address changes in state and federal UST regulations. It does not include procedures for sampling and analyzing tank excavation sites, and handling contaminated soil and water resulting from tank excavations. Directives to site staff addressing procedural changes in the manual have not always reached responsible staff in the field.

DISCUSSION:

The underground storage tanks on the SRS are regulated by a variety of mechanisms including state equivalent RCRA, federal RCRA, CERCLA, and civil and administrative agreements/orders. These regulations provide for the notification of the existence of underground storage tanks; requirements for design, installation, and operation; and ensuring that releases from underground storage tanks are reported, monitored and cleaned-up, if necessary. SRS is utilizing a manual titled, "Specifications and Management Applications for Regulated Tank Systems (SMARTS)" to manage underground storage tanks on site.

Despite the formality of the referenced mechanisms, a subset of the underground storage tanks on site, those underground storage tanks used to store petroleum products and hazardous substances, (referred to here as USTs) have the greatest potential to be mismanaged because various aspects of the UST program are subject to interpretation by both SRS and the regulators. As a result, WSRC must establish and continually update UST management procedures to ensure that the UST management program is consistently applied across the site and to ensure that state and federal regulations and guidance is addressed.

Environmental Protection Section (EPS) staff recognize the need to update the SMARTS manual and the site-wide underground storage tank program. EPS has retained a contractor to perform this work. In the interim, changes in both state and federal regulations, as well as guidance from regulatory authorities need to be addressed in the present underground storage tank management program.

Although EPS staff have attempted to update the UST management procedures with memorandum, letters, and informal communications to SRS custodians, these communications have not always been successful in addressing issues of concern. For example, EPS prepared a memorandum which modifies the tank inventory procedures established in the SMARTS manual (WM-78). However, at least two UST custodians (CSWE and Power Operations) did not receive the memorandum.

Communications breakdown has also led to inconsistencies between different custodian's UST programs. For example, once an UST is excavated, CSWE and Power Operations follow different soil sample collection procedures. CSWE collects duplicates at all sample locations and completes a sample chain of custody form. Power Operations does not replicate any sample and does not complete a chain of custody form. This lack of sampling QA for one UST custodian could lead to questions regarding the adequacy of contaminated soil removal from UST excavations in the future and calls into question the adequacy of the site-wide UST management program.

An additional issue of concern pertains to the disposition of residues resulting from UST excavation. Guidance for the management of such residuals is either nonexistent or inconsistently applied across the site. EPS has provided guidance on contaminated soil clean-up levels as recommended by SCDHEC (WM-77). "Clean" soil can be returned to the excavation and soil contaminated below a total petroleum hydrocarbon (TPH) and/or benzene, xylene, toluene (BTX) threshold can be disposed in the SRS sanitary landfill. However, other than stockpiling this soil there is no procedure for the handling of soil contaminated above the BTX and/or TPH threshold.

Approximately 1,000 cubic yards of soil are stockpiled at three locations on site: R Reactor, near the sanitary landfill, and in the Central Shops area. Soil at each site is stockpiled on a plastic liner. Additionally,soil at Central Shops is covered with plastic, however, soil stockpiled at both the landfill and R Reactor are not covered with plastic. Berms have been constructed to minimize contaminated surface water runoff, however, there is no site-wide procedure specifying that the

stockpiled soil should be covered or that the soil and the berms should be inspected.

There is currently no procedure specifying how water accumulations in tank excavations are to be addressed. In some cases this has led to questionable practices. The excavation for tank 681-9G filled with rainwater which when tested in January 1990 had a flash point below 140 degrees fahrenheit (WM-82). According to SCHWMR 261.21, the liquid accumulation in the excavation would be considered a hazardous waste. Power Operations staff indicated that they are arranging for the liquid accumulation to be sampled and tested for flash point. However, as of 3/1/90, the excavation was still filled with liquid despite the fact that the liquid is a potentially hazardous waste and despite the fact that the liquid accumulations are preventing the backfilling of the excavation. On 3/7/90, WSRC staff indicated that the water was pumped out, placed in containers in a hazardous waste staging area, and that the excavation was backfilled.

PROBABLE CAUSAL FACTOR:

Lack of policy and procedures.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-8

ASSESSMENT FINDING TITLE: Application of Waste Management Regulations to Nuclear Materials

PERFORMANCE OBJECTIVE:

Good management practice may require the identification and application of state and federal waste management regulations to nuclear materials where applicable.

FINDING:

Certain nuclear materials may be subject to regulation under RCRA/SCHWMR because of the presence of hazardous waste components.

DISCUSSION:

WSRC and DOE-SR have recognized that RCRA/SCHWMR may apply to certain nuclear materials. These materials include:

1. Off-site spent fuels,
2. On-site spent fuel,
3. Nuclear Material scrap, and
4. Depleted uranium oxide/yellow cake.

DOE-SR raised the issue of RCRA applicability to these materials to DOE-HQ. These issues are under evaluation by DOE-HQ and will be addressed as part of a DOE-HQ workgroup.

PROBABLE CAUSAL FACTORS:

Unresolved complex compliance issues.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-9

ASSESSMENT FINDING TITLE: Deficient Oversight of Protocol Revision

PERFORMANCE OBJECTIVE:

Revised procedures should be implemented at the time they are issued or authorized for use by management.

FINDING:

In two instances, procedures undergoing revision were issued on a date listed on the form and then not implemented in the field until considerable time had passed.

DISCUSSION:

Procedures receive a signoff and issue (or approval) date before they have completed all aspects of review and signoff. At 341-1M, DPSOL-341-498 Rev. 6 was reissued on 10/25/89 but was not utilized until 12 days thereafter. In effect, Rev. 5 was used 12 days after being superseded by Rev. 6. At the H-Area tank farm, DPSOL 241-H 905 Rev. 21 was approved on 1/4/90, but was not used in the field until 2/13/90. The method for revising procedures should allow adequate time to obtain all appropriate sign offs and have printed copies distributed in the field for use. Use of an issue date and an implementation date would allow adequate time for managerial review.

Where revisions to procedures are editorial or purely administrative in nature, the delay in the implementation of revised procedures has minimal impact. These types of changes can be handled in normal review and revision cycles. If revisions address substantive changes regarding operations or safety, a mechanism is in place for filing an amendment addressing the revision that is then attached to the procedures used in the field. This mechanism allows management to make "on the spot" changes to procedures that require a prompt response.

PROBABLE CAUSAL FACTORS:

Lack of oversight of document revision procedures regarding QA.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-10

ASSESSMENT FINDING TITLE: Inadequate Review of Staging and Satellite Area Locations and Surfaces

PERFORMANCE OBJECTIVE:

According to SCHWMR R.61-79.265.31, facilities must be designed, constructed, maintained, and operated to minimize the possibility of a fire, explosion, or any unplanned sudden or nonsudden release of hazardous waste.....to air, soil, or surface water which could threaten human health or the environment. Good management practice requires that generator accumulation areas also minimize the possibility of any unplanned release to the environment.

FINDING:

Deficiencies exist in staging and satellite storage locations and surfaces in the reactor and nonreactor areas. SRS requirements for locations and surfaces of these storage areas are also inconsistent.

DISCUSSION:

Locations and surface conditions for storage, staging, and satellite areas vary at SRS. A satellite area containing a drum of waste oil, handled as hazardous waste at SRS, at the 232-H Building was located near (approximately 2 feet) an electrical switching box. A B-25 storage area (west side 232-H) and a waste oil staging area at the L Reactor were located near storm sewers. The temporary B-25 staging area at the FMF was partially located on a gravel surface (since the visit, B-25S have been moved to WM).

A program is currently underway at the K, L, and P Reactors to replace the asphalt surface staging areas with concrete diked surfaces for waste oil. Nonreactor areas do not have a review program for storage, staging, and satellite area locations and surfaces. The development of a similar site-wide policy for non-reactor areas could reduce the possibility of releases to the environment and increase safety.

PROBABLE CAUSAL FACTORS:

Policy and implementation procedure is inconsistent site wide.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-11

ASSESSMENT FINDING TITLE: Inadequate Policy and Procedures for Mercury Management

PERFORMANCE OBJECTIVE:

Good management practice requires the development of policies and procedures for the site-wide management of mercury.

FINDING:

There are no policies or procedures developed for the site-wide management of mercury at the SRS. Liquid mercury is currently stored in satellite areas at:

- Tritium Facility in H-Area,
- 221-H Facility in H-Area, and
- SRL Glass Shop.

Mercury will also be separated and collected from the operation of the DWPF.

DISCUSSION:

Tritium Facility Mercury

Liquid mercury contaminated with radioactive tritium (a mixed waste) is stored in two 35-gallon drums at the Tritium Facilities in separate satellite areas, Buildings 232-H and 234-H. The drums are approximately two-thirds full with a total volume of 48-50 gallons.

As mercury pumps are replaced in the Tritium Facility, the amount of mercury in storage will increase. To minimize the amount of additional mercury placed in storage, mercury pump replacement activities have been curtailed. It is estimated that the total volume of mercury from pump replacement could be accommodated in the two existing drums.

200-Area Mercury

Mercury is recovered from liquid wastes sent through the 200-Areas separations and waste management evaporator systems in order to reduce the mercury discharges to the F/H-Effluent Treatment Facility (ETF).

This mercury is collected in mercury traps, contained in one liter plastic bottles, and stored in the H-Area, 221-H Facility. Currently, 75 pounds of mercury is in storage to be reused as a catalyst in the separations process. The H-Area Separations Canyon can normally use all of the recovered mercury in a year. This mercury is assumed by SRS to be a reclaimed product and will be used as a catalyst in the separations process.

SRL Mercury

Dirty mercury, containing non-hazardous and nonradiological contamination, is accumulated in a satellite area at the SRL Glass Shop. The mercury is collected from old switches, broken thermometers, and other on-site sources. A reclamation process, which includes acid washing and vacuum distillation, is used to clean the mercury. Approximately 66 containers (660 lbs.) of clean mercury collected over a 6 year. period are currently stored at the SRL. This mercury has been offered to other SRS departments and to off-site facilities

DWPF Mercury

The DWPF, when operational in 2 to 3 years, is expected to extract approximately 9,000 lbs/yr of mercury from the processing of HLW. The radiological content of this mercury has not been evaluated. This mercury may be partially used in separations processing as a catalyst or may be made available for sale off site. SRS's current position is the same for this mercury as for the mercury recovered from the evaporator systems in the 200 Area. Separations can only use an estimated 3,600 lbs/yr as a process catalyst, leaving 5,400 lbs to accumulate.

Tritiated mercury may be acceptable for processing in the DWPF, but this has not been evaluated.

Certainly, the potential exists for the accumulation of large amounts of mercury at the SRS during the operation of the DWPF. General policies for the future handling and specific procedures for current inventories of mercury have not been developed.

Planned actions by WSRC specific to mercury management include:

- further characterization of stored mercury,
- proposed formation of a site-wide mercury disposal team, and
- examination of practical mercury disposal/recovery/use methods.

PROBABLE CAUSAL FACTORS:

Inadequate policy and procedures.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-12

ASSESSMENT FINDING TITLE: Lack of Overall Environmental Compliance Program for Reactor Restart

PERFORMANCE OBJECTIVE:

Good management practice requires that overall environmental compliance activities be managed and coordinated to ensure that all program elements are integrated.

FINDING:

Overall environmental compliance by a single group has not been included as part of the reactor restart and operation review. Areas of specific environmental responsibility have been divided among several groups. Additionally, a summary of environmental issues relating to reactor restart is not currently specified on a single documented list that is available for assessment purposes.

DISCUSSION:

Several groups within WSRC have responsibilities for the examination of environmental compliance associated with reactor restart and operation. The departments within the Reactor Restart Division are primarily responsible for environmental compliance management at the reactors. Overall environmental compliance is documented in the following reports:

1) DOE-Operational Readiness Review,
2) WSRC-Operational Readiness Review,
3) Reactor Assessment Modifications Review, and
4) Reactor Restart EIS.

The Operational Assessment, Reactor Assessments Department, is responsible for the routine environmental compliance requirements. Operational Assessment also reviews modifications to the reactors for compliance as requested by Safety Assessment in Operational Readiness Review. Previous audits of environmental items related to reactor operations have not revealed non-compliances that would affect operations. Non-operational environmental items have been noted in previous audits.

The Reactor Issues Management, Technical Director Department, has developed a list of issues requiring resolution with the assignment of restart and post-restart priorities. These issues

were developed from past audits conducted at the reactors. Environmental items of concern are furnished to Issues Management by Operational Assessment. Each issue is assessed to determine if further environmental evaluation is needed.

The Reactor Restart Program reviews specific environmental compliance requirements prior to reactor operation. Annual environmental appraisals and reviews are conducted with the reactive correction of discoveries. The proactive development of procedures to document areas of responsibility, provide guidance, and describe operations for environmental compliance has been initiated although manpower is limited and the task has not been completed.

An environmental impact statement for reactor restart is being prepared. Impacts associated with restart are expected to be addressed.

A review of all environmental compliance requirements and the implementation of those requirements prior to reactor operation by a single group with defined responsibilities and authority would provide program assurance and equivalent integration with other restart operations.

PROBABLE CAUSAL FACTORS:

Implementation of best management practices and existing DOE Order and policy.

ASSESSMENT DISCIPLINE: Waste Management

ASSESSMENT FINDING NUMBER: WM/BMP-13

ASSESSMENT FINDING TITLE: Deficiencies in Satellite Accumulation Area Operations

PERFORMANCE OBJECTIVE:

RCRA wastes may be accumulated to specified volumes in designated areas before they are subject to additional regulatory provisions. These areas, referred to as satellite accumulation areas, are to be established near the point of generation of the waste streams and to be controlled by the generator of the waste.

SCHWMR R.61-79.262.34 (1) "A generator may accumulate as much as 55 gallons of hazardous waste .... in containers at or near any point of generation where waste initially accumulate, which is under the control of the operator of the process generating the waste..."

FINDING:

In several instances, waste was accumulated in areas designated as satellite accumulation points, but, in fact, the waste materials were brought to the satellite accumulation areas from locations away from the immediate vicinity of the satellite accumulation area. Weekly inspection records and contingency plans are not required for satellite areas and therefore are not available.

DISCUSSION:

Several facilities at the SRS accumulate waste in satellite areas without supporting staging areas. Only staging areas are subject to the requirements of R.16-79.264. This distinction leaves these facilities without procedures or documentation in the management of waste materials. All satellite areas are managed by an assigned custodian.

Waste (dirty) mercury is accumulated at SRL in Building 773, at a satellite accumulation area where it is eventually purified by distillation. Sources of dirty mercury include excess reagent, broken thermometers, or other laboratory waste accumulated from the entire laboratory complex. The processed (clean) mercury is recycled as a product. There are approximately 660 lbs.of clean mercury being stored adjacent to the satellite accumulation area.

Waste oil is accumulated from the 300-M Area at the 313-M satellite accumulation area. Under South Carolina Regulations

and recent modifications to RCRA, uncontaminated waste oil is no longer regulated as hazardous waste. Waste oil collected for energy recovery, however, continues to be managed under RCRA guidelines for satellite accumulation and staging areas. Waste oil suitable for incineration is accumulated from the M-Area at one common site for the entire 300 M-Area. While the operation of these specific satellite accumulation areas could appear to be in noncompliance with RCRA guidance, the practice of using satellite accumulation areas is reasonable and prudent for the waste stream.

SREL has four satellite areas serving four different waste generating processes. The containers used to accumulate these waste were three-55 gallon drums and an enclosure for a small container. There was no staging area to support these satellite areas, hence SREL had not implemented the more stringent requirements for staging areas.

The Tritium Facility, primarily buildings 232-H and 234-H, has eight satellite storage areas for the accumulation of tritiated oil and tritiated mercury. These include:

- Line 3 Truck Port area, 232-H, with approximately 30 gallons of tritiated oil in 6 gallon containers;
- tritiated oil in a 55-gallon drum outside 232-H;
- tritiated mercury collected in a 35-gallon container in the 232-H vault, approximately two-thirds full;
- tritiated oil in a 55-gallon drum collected outside the 234-H Building;
- Room 74A, U-Hood, in Building 234-H, two two-quart containers of oil;
- Room-69A Hood, in Building 234-H, thirteen three-liter containers of oil;
- 55-gallon drum of oil near the R Hood; and
- tritiated mercury collected in a 35-gallon container (approximately two-thirds full) located in the R-Hood.

Five of these satellite accumulation areas appear to be located away from the point of generation and control of the operator of the process generating the waste.

Further, disposal procedures for tritiated oil from the Tritium Facility, as planned, involve the on-site collection of the oil

(located inside 232- and 234-H) into 13 gallon "car-boys", placement in stainless steel cylinders (sealed by welding), and transport to WM. This process could be interpreted as the establishment of a temporary staging area and subject to the regulatory requirements of a staging area.

The collection of more than 55 gallons of hazardous waste will exceed the established regulatory criteria for a satellite area as defined in 262.34(c)(1). Paragraph 262.34(c)(2) prohibits accumulations over 55 gallons and allow three days for transfer to a permitted facility or 90 day storage after the 55 gallon limit is reached. In the absence of a staging area for 90-day storage, this requires the facility generators to transfer waste to WM in compliance with this requirement when the 55 gallon limit is exceeded. Current policies and procedures for approval and transfer of hazardous waste from these facilities to WM do not accommodate the three day requirement. These facilities also currently manifest waste to WM, which is not a required procedure for generators with on-site disposal facilities.

DOE-SR has sought and received guidance from SCDHEC concerning the general operation of satellite areas (WM-32). The guidance from SCDHEC does not specifically address the collection of single form wastes away from the point of generation, three-day reduction limitations, or the management of multiple containers and the total volume of waste in a satellite area (WM-118). In addition, this guidance recommends a "case by case" determination for "operator control" definition although SCDHEC believes SRS's interpretation is satisfactory. Maintaining only satellite areas exempts the facility from the requirement to conduct inspections of the satellite areas, keep records of these inspections, maintain contingency plans, and comply with most container management requirements. When considering the quantity and content of the wastes and the absence of procedural and safety guidance for satellite areas without staging areas, this is not a best management practice.

PROBABLE CASUAL FACTORS:

Incomplete implementation of best management practices.

3.5.6 Toxic and Chemical Materials

3.5.6.1 Overview

The purpose of the toxic and chemical materials (TCM) assessment was to evaluate SRS compliance with the Toxic Substance Control Act (TSCA); Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); Superfund Amendments and Reauthorization Act (SARA); DOE Orders; SRS procedures (DPSOPs/DPSOLs); and best management practices (BMPs). TCMs specifically regulated include polychlorinated biphenals (PCBs); (40 CFR 761), asbestos (40 CFR 763 and DHEC 61-86.1), and pesticides (40 CFR 152-186 and South Carolina Pesticide Control Act, Title 46, Chapter 13). In addition, bulk and small quantities of acids, bases, solvents, water treatment chemicals, fuels, and lubricating oils used at SRS are managed by the implementation of procedures contained in various DOE Orders and SRS DPSOPs/DPSOLs. SRS activities assessed included the purchase, inventory, distribution, storage, reporting, and record keeping of TCMs. Disposal activities for PCB's and asbestos were assessed as they are regulated by TSCA. The approach to conducting the assessments included 1) document reviews, 2) personnel interviews, 3) site inspections, and 4) conduct of operations and maintenance reviews at a representative number of SRS and contractor organizations.

The SARA Title III portion of the assessment evaluated the SRS's SARA Title III program with respect to: 1) inventorying of hazardous substances, 2) comparison of inventories to threshold planning quantities, 3) hazardous chemical inventory reporting, 4) emergency planning notifications, 5) emergency release notifications, and 6) toxic chemical release calculation and reporting.

TCMs are ordered by users through a chemical buyer in Procurement and Materials Management. TCMs are received and checked in by General Stores, recorded in a central inventory system, and distributed to the user. General Stores maintains stock levels of some products while some bulk TCMs are delivered directly to the user with only the paperwork going through General Stores. An exception to these procedures is the U.S. Forest Service-Savannah River Station (USFS) which orders and stores chemicals (e.g., pesticides, oils, and gasoline) through its own procedures. Wackenhut Services, Inc. also orders some chemical supplies through its own purchasing department.

The proper use, storage, and disposal of TCMs are typically the responsibility of the using organization (owner). However, if the user is a tenant in another SRS area, the area owner is ultimately responsible for tenant's TCM activities. Chemical coordinators assigned to user/owner organizations are responsible

for assuring that proper labeling, storing, and Material Safety Data Sheet (MSDS) distribution occurs.

The Industrial Hygiene (IH) Group within the Environmental and Health Protection Department's (EHP) Health Protection Technology Section maintains an inventory of hazardous chemicals used at SRS and, in cooperation with the Environmental Protection Section, is developing an automated MSDS inventory system. IH is also responsible for conducting bi-annual inspections of hazardous materials areas throughout SRS and must approve certain chemicals prior to acquisition by Purchasing.

The Environmental Protection Section (EPS) of EHP provides staff support for the implementation of environmental regulations at SRS. This includes relevant portions of TSCA and FIFRA dealing with PCBs, pesticides, and asbestos, as well as other related regulations that address TCM management.

During 1981-1982, a PCB inventory and sampling program was conducted for all oil-containing equipment. Equipment that contained PCBs in concentrations greater than 50 parts per million (>50ppm) was retrofilled with non-PCB oil (<50ppm). Subsequent maintenance operations found one retrofilled transformer that contained PCB-contaminated oils (50-499ppm) and three other transformers that had been overlooked by the 1981-1982 survey. Three bushings on a fifth transformer have also been found to contain PCB-contaminated oil. Transformers are now being re-sampled and analyzed for PCBs. Bushings were not sampled as part of the 1981-1982 inventory. The sampling and analysis of a representative number of transformer bushings is also being considered to better identify if all the bushings contain PCBs.

Eight drums of PCB/radioactively contaminated floor sweepings are stored in Building #643-29G as a result of a PCB spill in Building #320-M in 1985. Other PCB-contaminated equipment is stored at Building #643-7G. There has been only a modest amount of PCB disposal that has taken place in recent years, mostly fluorescent light ballasts.

Asbestos-containing materials (ACMs) occur throughout SRS facilities in pipe insulation, gaskets, and siding; but are only considered hazardous in a friable condition. Various SRS organizations are currently conducting ACM inventories and IH is developing a SRS-wide asbestos management plan. ACMs are removed by a contractor during renovation and maintenance. These activities are monitored by IH and inspected by South Carolina Department of Health and Environmental Control (SCDHEC). ACM disposal is performed at the SRS Solid Waste (sanitary) landfill in a trench dedicated to ACMs.

Pesticides (mostly herbicides and limited insecticides) are applied by or under the supervision of, state certified WSRC employees, USFS employees, and off-site contractors. Non-selective herbicides are applied on gravel areas, along railroad and powerline rights-of-way, and parking lots. Selective herbicides are applied on landscape grasses for weed control, and selected SRS areas are treated with insecticides for fire ant control. WSRC and USFS use contractor support during heavy workload periods. No restricted use pesticides are used by WSRC or USFS. The USFS uses herbicides for site preparation prior to planting and timber stand improvement during the early growing years after planting. Aerial herbicide applications (pellets) were discontinued by the USFS in 1983.

Various other TCMs are stored throughout SRS in bulk quantities, manufacturer's containers and secondary use containers. The TCMs subject to this portion of the assessment are stored in above ground tanks, drums, and storage cabinets. Drum storage is generally provided in building process areas or dedicated rooms and outside in dedicated buildings, sheds, or pads. Small quantities of TCMs are used in the manufacturer's container or a smaller secondary container such as flammable cans, palm presses, and plastic bottles. These secondary containers are stored in chemical cabinets when not in use.

SARA Title III, known as the Emergency Planning and Community Right-to-Know Act of 1986, is a stand-alone title of SARA. The act is intended to encourage and support emergency planning efforts at the State and local level, and provide citizens and local governments with information concerning chemical hazards present in the community. The act establishes four major requirements for facilities: 1) emergency planning notification, 2) emergency release notification, 3) reporting on hazardous chemicals present at the facility, and 4) toxic chemical release reporting.

3.5.6.2 Evaluation

The general administrative management of TCMs at SRS is well organized and addresses the applicable regulatory requirements of TSCA, FIFRA, South Carolina Pesticide Control Act DOE Orders, DPSOPs and DPSOLs. Regulatory compliance findings presented in this assessment represent issues that have been previously identified by WSRC. They relate to the management of PCB Wastes and the secondary containment of bulk TCMs, both of which are being currently evaluated by WSRC. Best management practice (BMP) findings are related to procedures that are either not being implemented currently or are being implemented inconsistently at SRS. BMP findings range from TCM related hands-on procedures to SRS-wide management programs.

TSCA primarily addresses record keeping requirements except for specific substances such as PCBs and asbestos. One area of TSCA record keeping that could apply to SRS involves recording of any allegations of adverse effects due to a particular substance used at SRS (TSCA Section 8c). While there are exceptions that apply to SRS, Du Pont previously maintained a policy that SRS was potentially subject to TSCA Section 8c record keeping. Current WSRC staff are aware of these requirements and have been trained in their application, but are not aware of any required regulatory compliance issues.

No SRS guidance currently exists for the management and disposition of excess TCMs. However, an Unused Chemicals Task Force has been established and is addressing this issue. Another ongoing SRS-wide project that will improve the management of TCMs is the consolidation of two TCM inventories to create the Chemical Inventory and Information System (CIIS) that will be cross-referenced by MSDS number to the procurement control system (PCS) operated by General Stores.

PCB management at SRS is currently being re-evaluated. While an effort has been made over the past eight years to assure that all SRS oil-containing equipment is non-PCB (<50ppm), it is apparent that additional efforts will be required. The most recent analysis of oil samples from transformers indicates PCB concentrations of <500ppm, a level at which many federal regulations for electrical equipment do not apply. However, past erratic analytical results (2 ppm - 7,745 ppm) indicate the need for a well designed-new sampling and analysis program with high level quality control. Transformers and capacitors with suspected PCB oil filled bushings are also considered in the new sampling program and a labeling scheme is being developed to distinguish the bushings from the main transformer body. SRS is also continuing to seek a resolution to the disposition of eight drums of radioactive PCB contaminated floor sweepings that have been stored in building 643-29G for more than one year as stipulated by TSCA (40 DFR 761.65).

Asbestos abatement and removal activities are well managed by individual SRS organizations and no deficiencies were noted. A site-wide management plan is being developed to coordinate these activities. IH is currently conducting an SRS-wide asbestos inventory and developing management plan. WSRC is also modifying its ACM disposal procedures to change the "dumping" to "placing" of ACMs in the landfill. This involves the redesign of landfill trenches to allow trucks to drive into the trench, and workers to remove the ACMs by hand from the truck to the trench.

The pesticide application programs of SRS and the USFS are managed in compliance with applicable FIFRA and SCDHEC

regulations. Applicator training and certification is conducted as required and pesticide storage areas are well designed state-of-the-art facilities. Record keeping and reporting requirements are in good order and equipment is maintained in good condition. No pesticide-related findings were identified during this assessment. However, pesticide application was not observed during the assessment, due to the time of year.

Improvements can be made in TCM storage and marking. Inadequate secondary containment involving secondary use containers, drum and aboveground tank storage was observed throughout SRS. Of these, the most serious concern involves areas where a series of tanks containing various TCMs share secondary containments. Documentation was reviewed for cases where co-mingling of incompatible TCMs occurred as a result of this situation. Another containment concern involves partial containment, or in some cases the lack of containment, for above ground storage tanks (mostly oil products). While regulatory requirements (40 DFR 112, SPCC Plans) exempt many above ground tanks in many SRS areas, it is considered a best management practice (BMP) to provide complete secondary containment for all above ground storage tanks. Plans to correct these conditions exist, but have not been given a priority status. A similar condition exists with drum and other small container storage. Many SRS areas have state-of-the-art drum storage facilities, while others store drums and other small containers where a spill would run off and potentially cause soil, and possibly water, contamination. Other noted deficiencies are "good housekeeping" matters relative to storage of empty containers, labeling of secondary use containers and TCM cabinets, improper identification or lack of spill equipment, and accessibility of MSDSs.

The SARA Title III program at SRS is thorough and complete. Review of the original DOE reporting files for calendar years 1987 and 1988 show that all reporting requirements have been met. The large data collection efforts required to complete SRS-wide inventories and chemical release estimates are accomplished through two task forces. One task force completes the chemical inventory to accomplish Tier II hazardous chemical inventory reporting requirements. The second task force completes chemical usage estimates and toxic chemical release reporting required under Section 313 of SARA Title III. No compliance or BMP findings were reported for the SRS Area Title III program.

Several activities were reviewed as part of the conduct of operations and conduct of maintenance assessment. These reviews were intentionally focused to identify site-wide trends. Receipt and distribution of sodium hypochlorite at SRS was observed to monitor the procedures and practices followed when manufacturer's TCM products arrive at General Stores. One hundred seventeen

(117) drums (15 gallon carboys) on thirteen pallets were received at the General Stores 713-A loading dock, entered in the computer system to generate a Receiving Report and Delivery Ticket, and moved by motorized hand-truck and forklift to the 713-A holding yard. Three pallets were then loaded on a SRS flatbed truck for delivery to two locations in F-Area. The activities observed represented good and safe handling of TCMs. It was noted, however, that the SRS delivery truck was not placarded "Corrosive." This has not been required in the past, but it is being considered for future implementation.

Transformer oil sampling was observed to evaluate the procedures followed for sample collection prior to PCB laboratory analysis. The sampling was conducted by a contractor at two 681-1G Pump House transformers (261-T2 and 262-T1). The samples were taken from the tap chamber valves; the transformer body had been sampled previously. Both samples were taken in a manner to produce a representative sample by purging approximately one quart of oil prior to sample collection. Care was taken to avoid cross-contamination of samples, however, gloves were not changed. Pre-prepared sterile bottles were used, but they were labeled in the field with a water-base ink pen. The samples were then placed in cold storage which could cause the label information to smear. The sampling procedures observed should produce a representative sample for PCB analysis.

An asbestos removal project at the P-Area Powerhouse (184-P Flash Tanks 1 & 2 and associated steamlines) was evaluated for compliance with applicable regulations and procedures. The project's files was reviewed at both the contractor's and EPS's offices. The files were found to contain all necessary documentation including National Emission Standards for Hazardous Air Pollutants (NESHAP) Notification to SCDHEC and personnel training, certification, and medical records. The project area was inspected prior to work-start during an ACM inspection of the entire P-Area Powerhouse conducted by the Power Technology Group. The project site was inspected again during the initial work area isolation. Shortly thereafter the project was put on hold due to change of priority. Based on the review and observations made, the project appears to be adequately designed to operate within the SCDHEC regulations and WSRC procedures.

Conduct of operations for the SARA Title III Task Forces were evaluated by attending meetings of each task force to evaluate the progress of the program for the 1989 reporting year. In addition, chemical coordinators for each SRS operating unit of were interviewed to check calculational packages and assumptions used in preparing inputs to the reports. All procedures and reports were determined to be adequate for regulatory compliance.

3.5.6.3 Findings

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/CF-1

ASSESSMENT FINDING TITLE: Failure to Meet Storage Time Limit Criteria for Mixed PCB Waste

PERFORMANCE OBJECTIVE:

The Toxic Substances Control Act (TSCA, 40 CFR 761.65(a)) requires that PCB waste materials in a "Storage for Disposal" Facility shall be disposed of within 1 year from the date of placement in storage.

FINDING:

Management of mixed PCB wastes at SRS does not meet the TSCA 1-year storage limit.

DISCUSSION:

Eight 55-gallon drums of radioactively contaminated (mixed) PCB floor sweepings stored at Building 643-29G have been in storage, awaiting disposal, for approximately 10 years; longer than the 1 year allowable under 40 CFR 761.65(a). Currently there is no approved mixed PCB waste treatment/disposal facility or alternative repository available to resolve this issue.

This is a DOE-wide problem that is being addressed by the DOE-HQ RCRA issues Workgroup. As part of this effort, the availability of treatment at other DOE facilities will be considered. At this time, adequate storage is provided for the SRS mixed PCB waste at Building 643-29G. This waste is included in the required annual report as required by 40 CFR 761.180 and storage records are retained at Building 724-7G.

SRS is aware of the issue outlined in this finding as a result of its self-assessment initiatives. SRS is in the process of correcting or is planning to address the issue.

PROBABLE CAUSAL FACTORS:

Lack of approved facilities to treat, or dispose of mixed PCB wastes.

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/CF-2

ASSESSMENT FINDING TITLE: Inadequate Identification of PCB Concentrations in Oil-filled Equipment

PERFORMANCE OBJECTIVE:

TSCA regulations require that certain PCB oil filled equipment (>500 ppm electrical and >50 ppm other) be properly inventoried, labeled, inspected, reported, transported, stored and disposed (40 CFR 761). SRS procedures cover the same regulations listed above but also apply to PCB-contaminated (50 ppm - 499 ppm) oil filled electrical equipment (DPSOL S-9549).

FINDING:

A 1981-1982 SRS oil-filled equipment survey and subsequent PCB/PCB-contaminated oil mitigation program has not adequately identified the current PCB concentration status of SRS oil-filled equipment.

DISCUSSION:

An inventory of oil-filled equipment at SRS was conducted during 1981 and 1982. This inventory intended to locate, sample and classify oil-filled electrical equipment as to its PCB content: Non-PCB (<50 ppm), PCB contaminated (50-499 ppm), or PCB (500 ppm); or non-electrical equipment PCB content (>50 ppm).

Based on the results of this effort, all PCB-contaminated and PCB oil-filled equipment was believed to have been retrofilled with non-PCB (<50 ppm) oil. However, recent routine maintenance and testing has identified three PCB-contaminated transformers(451-D, AT1; 451-D, AT2; and 451-D, AT3) that were not sampled during the 1981-1982. A fourth transformer (752-23A, S.N. F962475) has been sampled and analyzed several times producing a wide range of results (2 ppm to 7745 ppm) and using two analytical methods (EPA-600/4-81-045 and ASTM D-4059-83.

A fifth transformer (151-2L,T3) tested positive for PCBs (180 ppm, 223 ppm and 243 ppm) during maintenance of the transformer's three bushings. PCB contamination was limited to the three self-contained oil-filled bushings raising the question of whether the bushings should be considered as three separate pieces oil-filled electrical equipment. If considered separate, the bushings would require separate labeling in accordance with applicable regulations and procedures (40CFR 761.40 and DPSOL 158-2 4161). The bushings (or any other electrical equipment)

would be subject to 40CFR 761.40 if the PCB concentrations were found to be ≥500 ppm. SRS is assuming that the electrical equipment to be retested is PCB-contaminated as provided in 40CFR 761.

Approximately 700 oil-filled equipment items were included in the 1981-1982 inventory. Since that time an estimated 300 oil-filled items (mostly electrical) have been put into service at SRS. This estimate does not include transformer/capacitor bushings if they are to be considered separately. A PCB sampling and analysis program is currently in progress for the older electrical equipment to determine if PCB content is widespread or isolated. In addition to the sampling, new oil-filled equipment will be evaluated with respect to manufacturers PCB labeling and new oil-filled equipment will be sampled and analyzed for PCBs prior to startup unless the manufacturer supplied written certification that the equipment is PCB free.

A PCB Committee was formed to evaluate these issues after PCB-contaminated oil was found in the 752-23A transformer. The PCB committee recommended PCB sampling during routine maintenance which identified the additional PCB-contaminated equipment, including the bushings.

PROBABLE CAUSAL FACTORS:

- Some transformers were overlooked due to human error during the 1981-1982 inventory.
- Two methods of PCB analysis have produced varying results for one transformer.
- EPA's policies (regulations) do not clearly address the issue of transformer/capacitor bushings.
- SRS PCB procedures (DPSOL S-9549) do not fully address the issue of transformer/capacitor bushings.

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/CF-3

ASSESSMENT FINDING TITLE: Inadequate Secondary Containment and/or Separation for Chemical Storage

PERFORMANCE OBJECTIVE:

Several environmental regulations require that secondary containment be provided for aboveground chemical storage facilities, including both tanks and drums. These regulations include TSCA (PCBs, 40 CFR 761),FIFRA (Pesticides, 40 CFR 165) NOHSPCP (40 CFR 300), OSHA (29 CFR 1910), and CWA OPP (40 CFR 112). In addition, guidance for secondary containment at DOE facilities in general and specific SRS activities is provided by DOE Order and related SRS DPSOPs and DPSOLs.

Some secondary containment systems have been developed through the application of good management practices that may not be documented. The regulatory guidance documents and good management practices focus on providing secondary containment for oil and hazardous chemicals to prevent environmental contamination and danger to human health.

FINDING:

Some SRS chemical storage facilities do not provide adequate secondary containment and/or separation of incompatible materials to prevent environmental contamination and/or human health risks.

DISCUSSION:

Some secondary containment deficiencies were noted in three broad categories of chemical storage facilities: (1) cabinet storage, (2) drum storage, and (3) aboveground tank storage. Small glass chemical containers (liquids <5 gallons) were observed stored in a "flammable", "corrosive", "acids", "bases", or "chemicals" marked cabinet without some form of secondary containment such as plastic/rubber buckets or absorbent material. Some cabinets were also found to include incompatible chemicals stored in the same cabinet without any secondary containment.

Drum storage of toxic and chemical materials at SRS range from state-of-the-art dedicated buildings to edges of uncurbed asphalt pads. An occasional metal drum was observed stored directly on the storage area surface instead of being stored on wood pallets. Some oil storage facilities consisted of an old building either partially or totally dedicated to oil storage but lacking adequate containment. Drum storage facilities with adequate

containment (curbing) were also observed with drums positioned so that a spill would bypass the containment.

Inadequate containment for bulk aboveground storage tanks at SRS ranges from an incomplete containment structure for a single product/tank in a remote exterior setting to galleries of tanks containing various (some incompatibilities) products with inadequate containment in a confined interior setting. The latter of these situations represents a serious potential for the endangerment of human health. Three incident reports were reviewed that document situations in Building 211-F where the containment system contributed to a release of NO_x fumes that caused evacuation of a section of the facility and potential harm to employees. The H-Separations Canyon (211-H) containment system is scheduled to be evaluated during an upcoming Process Hazard Evaluation. Other SRS areas observed that may have similar containment problems are water treatment facilities (Power: domestic and boiler), H-Separations, DWPF, or LETF (341M).

Other inadequate containment observations for bulk chemical storage included cracked concrete, unknown sump discharge points, known sump discharge points that commingle incompatible substances, walls that are not contiguous with the floors and no containment.

Examples of secondary containment deficiencies observed for all three categories of chemical storage are presented in Table CF-3.

Deficiencies related to cabinet and drum storage relate to good management practices, while most bulk storage relates to compliance or best management practices.

PROBABLE CAUSAL FACTOR:

- Failure to correct known policy/regulation problems or to implement common good management practices.

TABLE CF-3

Examples of secondary containment and/or separation for chemical storage that do not meet regulatory requirements or best management practices

ITEM	LOCATION
NO SECONDARY CONTAINMENT/CO-MINGLING CHEMICALS	TECHNICAL STORES, ALCOHOL STORAGE D-032, ACID STORAGE SHED 773-A (B-WING-S.W. CORNER/ COURTYARD)
BACK DOOR WITH INCOMPLETE CONTAINMENT	TECHNICAL STORES, OIL STORAGE BLDG., 733-1A
BACK DOOR WITH INCOMPLETE CONTAINMENT	TECHNICAL STORES, PAINT BLDG., 733-A
MULTIPLE CHEMICALS OVER ONE SUMP	SRL FABRICATION LABORATORY
QUESTIONABLE FLOOR DRAIN DISCHARGE IN LABORATORY	SREL-LABS, 13A/B HWCTR
GLASS BOTTLES MIXED WITH OTHER ITEMS; NO CONTAINMENT; CO-MINGLING	H-POWER, 280-1H, WATER LAB
NO SEPARATE CAUSTIC CABINET, WEAK ACID AND BASE SOLUTION STORED IN SAME CABINET	ETF LABORATORY
3000 GAL. DIESEL TANK; NO BOTTOM CONTAINMENT	BEHIND C REACTOR (SOUTH) NEAR BLDG. 108-2
NO SECONDARY CONTAINMENT FOR BULK CHEMICAL STORAGE	BLDG. 772-F, SERVICE FLOOR
CO-MINGLING OF CHEMICALS AND OTHER MATERIALS	BLDG. 772-F; ESHQA, HP LABORATORY
NO SECONDARY CONTAINMENT FOR HYDRAZINE AND MANGANESE NITRATE SOLUTION DRUMS	H-SEPARATIONS
NO SECONDARY CONTAINMENT	INSULATION SHOP, CENTRAL SHOPS

INADEQUATE CONTAINMENT-DIESEL TANK BEHIND BLDG. (TANK MARKED 1000 GALS?); NO VALVE ON DRAIN PIPE	BLDG. 8514, NORTH SIDE, CENTRAL SHOPS
NO SECONDARY CONTAINMENT-GAS/VARSOL/ETC. 60-70 CANS OUTSIDE ON PALLETS	BEHIND BLDG. 8544, PAINT STORAGE BLDG., CENTRAL SHOPS
WATER/CHEMICALS ON FLOOR IN DARKROOM	EBASCO, BLDG. 8310, CENTRAL SHOPS
NO SECONDARY CONTAINMENT--20 TO 25 GAS CANS ON CEMENT PAD	BLDG. 8491-A AND SANDBLAST AREA, CENTRAL SHOPS
CO-MINGLING CHEMICALS IN MATERIAL STORAGE AREA	CARPENTRY SHOP, CENTRAL SHOPS
OIL CANS STORED OUTSIDE CONTAINMENT	STORAGE SHED BEHIND MACHINE SHOP, CENTRAL SHOPS (MILLWRIGHT SHOP)
USED BATTERY BOX-IMPROPER CONTAINMENT--NO PLUGS IN DRAIN	HEAVY EQUIPMENT REPAIR, CENTRAL SHOPS
INADEQUATE SECONDARY CONTAINMENT WATER SOFTENER TANKS	P-AREA WATER TREATMENT
SINGLE WALL TANKS/DAY TANK THAT LEAKED/SODIUM HYDROXIDE (NO CONTAINMENT)/SODIUM HYPOCHLORITE STORAGE ROOM (NO CONTAINMENT)	P-AREA WATER TREATMENT
POOR SECONDARY CONTAINMENT, LAB CABINET-COMMINGLED ACIDS/BASES	P-AREA WATER TREATMENT LAB
NO CONTAINMENT	P-AREA WATER TREATMENT CHEMICAL STORAGE ROOM
3000 GAL. DIESEL TANK PARTIAL CONTAINMENT	SOUTH OF P-REACTOR
NO CONTAINMENT, OUTSIDE OIL STORAGE	EAST SIDE OF P-REACTOR
NO CONTAINMENT	FOREST SERVICE OIL HOUSE, BLDG. 763-G

NO CONTAINMENT	FOREST SERVICE FLAMMABLE BLDG.
OIL DRUMS ON SIDE; NOT CONTAINED	M-AREA MAINT. DEPT. (313-M)
150 GAL. DIESEL TANK; NO CONTAINMENT	M-AREA (POWER) WATER PUMPHOUSE
TWO 55-GAL. DRUMS OF OIL; NO CONTAINMENT	DWPF AREA, CONSTRUCTION PIPE SHOP
500 GAL. DIESEL TANK; CONTAINMENT VALVE UNLOCKED	DWPF AREA, CONSTRUCTION OIL HOUSE
8 KEROSENE DRUMS/BATTERIES OUTSIDE, NO CONTAINMENT	RAILROAD CLASSIFICATION YARD, CSWE
NO CONTAINMENT	RAILROAD OIL HOUSE, CSWE
NO SEGREGATED CONTAINMENT FOR DAY TANKS (CO-MINGLING)	H-CANYON DAY TANKS AND OVERFLOW TANKS 181, 182, AND 183
OUTSIDE FREON TANK--NO CONTAINMENT	TRITIUM AREA, CONSTRUCTION-PIPE SHOP
5 DRUMS TEXACO OIL ON PALLET, NO CONTAINMENT	TRITIUM AREA, BLDG. 234-H, NORTH SIDE
PAINT BIN--NO SECONDARY CONTAINMENT	CSWE SHOPS, G-AREA
NO SECONDARY CONTAINMENT	CSWE SHOPS, COVERED FLAMMABLE STORAGE AREA IN YARD BEHIND 709-G

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/BMP-1

ASSESSMENT FINDING TITLE: Inconsistent Identification of Empty Chemical Containers

PERFORMANCE OBJECTIVE:

Good management practice requires the identification of empty chemical containers so that they can be readily distinguished from full containers.

FINDING:

Empty chemical containers and are not always readily identifiable as empty.

DISCUSSION:

It is common throughout industry to store empty chemical containers upside down or on their side and/or in areas dedicated to "empty drum storage" only, in addition to marking "empty". This promotes good container management practices and allows emergency responders to quickly determine if a drum is empty. No SRS guidance was identified that specifically addresses the positioning of empty chemical containers. Table BMP-1 presents examples where the empty status of drums was unclear.

PROBABLE CAUSAL FACTORS:

Lack of a consistent procedure for identifying empty chemical containers.

TABLE BMP-1

Examples of Inconsistent Identification of Empty Chemical Containers

ITEM	LOCATIONS
Unmarked empty carboys	P-Waterplant, Chemical Storage Room
Unmarked empty drums (Closely stored against other drums)	M-Area, Building 313 Recovery Room
Unmarked empty drums	M-Area, Building 313, Outside Storage pad
Improperly marked (Not marked empty) Filter cake drums	M-Area, Building 341-M
One empty unmarked drum	Construction Oil House DWPF Area
Empty in-process filter cake drums (not marked as empty)	M-Area, Bldg. 341-M, stored behind west side of Bldg.

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/BMP-2

ASSESSMENT FINDING TITLE: Lack of Policy and Procedures on Management of Unused Toxic and Chemical Materials

PERFORMANCE OBJECTIVE:

Good management practice requires the establishment and implementation of a policy and procedure for the timely management and disposition of toxic and chemical materials that are no longer needed for the purpose for which they were purchased.

FINDING:

There are currently no policies or procedures for the disposition of unused toxic and chemical materials.

DISCUSSION:

Unused chemical materials were found in several locations. Chemicals with expired dates were also observed. Most representatives of work areas were unaware of a policy or procedure for management and disposition of unused chemicals. Accordingly, they were uncertain if the chemicals should be disposed of or if some of the chemicals might be used by another work area for the same purpose, or another purpose, including those with expired dates. There was also a situation where non-routine use chemicals are being retained in the event that they may be needed in the future. Additional controls will be applied to non-routine use chemicals as the site-wide plans are implemented.

An Unused Materials Task Force has been formed at the Savannah River Site (SRS) and presented a proposal to management that was accepted on January 31, 1990, and is being implemented.

Examples of this finding that were observed are listed on the attached table (BMP-2).

PROBABLE CAUSE FACTORS:

Lack of procedures for unused toxic and chemical material management.

TABLE BMP-2

Examples of Unused Toxic and Chemical Materials

ITEM	LOCATION
NINE 5-GAL BUCKETS OF WATER BASED GRAPHITE LUBRICANT, VARIOUS DRUMS-ROOM D-046, 5 DRUMS OF WATER BASED CLEANER	SRL FABRICATION LAB
FIBER DRUMS OF D20, POOR CONDITION AND MARKING	C REACTOR-BLDG #105
CHEMICALS IN 2 CABINETS LABELED CHEMICAL STORAGE, 1 LABELED HAZARDOUS CHEMICAL STORAGE	ANALYTICAL LABS, ESHQA, SERVICE FLOOR, NORTH END
EXCESS CHEMICAL MATERIALS	INSULATION SHOP, CONSTRUCTION-CENTRAL SHOPS
"ORPHANED" CHEMICALS (ADHESIVES, EPOXY FILLER)	FINISH WOOD STORAGE AREA (SMALL ROOM NEXT TO CARPENTER SHOP), CONSTRUCTION, CENTRAL SHOPS
"ORPHANED" CHEMICALS/FLAMMABLE	REAR OF INSULATION SHOP, CONSTRUCTION, CENTRAL SHOPS
EXCESS MATERIALS (ION EXCHANGE RESIN, SODIUM SULFITE)	P POWERHOUSE, MAIN FLOOR OF WATER TREATMENT PLANT, BACK ROOM
EXCESS CHEMICAL MATERIALS	P POWERHOUSE, MAIN CHEMICAL STORAGE ROOM
EXCESS CHEMICAL MATERIALS	M AREA, REAGENT PREP LAB, ROOM 00118
EXCESS CHEMICAL MATERIALS	DWPF AREA, CONSTRUCTION-CHEMICAL STORAGE BLDG

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/BMP-3

ASSESSMENT FINDING TITLE: Deficiencies in Type, Placement and Lack of Spill Cleanup Equipment

PERFORMANCE OBJECTIVE:

Good management practice requires that the appropriate spill response equipment be placed in close proximity to potential spill sites.

FINDING:

Absorbent material and related equipment are not placed in close proximity to locations where chemical substances are stored, or are not available in the proper variety or quantities to provide adequate spill diversion, detention, and cleanup for workers and emergency responders.

DISCUSSION:

To be used in an effective and efficient manner, spill cleanup material and equipment needs to be placed in close proximity to chemical substance storage locations. With the proper material and equipment nearby, the amount of spill, and cleanup time/costs would be reduced.

Examples observed by the team are represented on the attached table (BMP-3).

PROBABLE CAUSAL FACTORS:

Lack of training and oversight of personnel at chemical storage locations.

TABLE BMP-3

Examples of Deficiencies in Spill Cleanup Equipment

ITEM	LOCATION
NO SPILL EQUIPMENT OBSERVED	SRL DO33 PAINT SHOP
NO SPILL EQUIPMENT (LOCKED IN ANOTHER BUILDING)	H POWER, 280-1H WATER LAB
INCOMPLETE SPILL EQUIPMENT, NOT IDENTIFIED AND PULLED TOGETHER	MISC STORES BLDG, CENTRAL STORES IN CENTRAL SHOPS AREA
NO SPILL EQUIPMENT	PAINT STORAGE BLDG, CONSTRUCTION-CONTRACT MATERIAL RESOURCES-CENTRAL SHOPS AREA
NO SPILL EQUIPMENT FOR GAS, VARSOL, ETC. (60-70 SMALL CANS ON PALLETS)	BEHIND BLDG 8544, PAINT STORAGE BLDG, CONSTRUCTION-CENTRAL SHOPS
SPILL EQUIPMENT NOT COMPLETE OR MARKED	PIPE SHOP, CONSTRUCTION-CENTRAL SHOPS
NO SPILL EQUIPMENT	P WATER TREATMENT STORAGE ROOM
NO SPILL EQUIPMENT	M AREA, BLDG 341-M FILTER CAKE COLLECTION ROOM
NO SPILL EQUIPMENT-OUTSIDE FREON DRUM	TRITIUM AREA, CONSTRUCTION-PIPE SHOP

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/BMP-4

ASSESSMENT FINDING TITLE: Inadequate labeling of Chemical Storage Cabinets

PERFORMANCE OBJECTIVE:

Good management practice requires that cabinets used for the storage of chemical substances should be appropriately labeled according to their contents.

FINDING:

Unlabeled or improperly labeled chemical storage cabinets at several locations are being used to store flammables and other materials.

DISCUSSION:

Various deficiencies were noted involving cabinets that are used to store many kinds of chemicals including flammables. Examples observed by the team are listed below:

- A brown metal cabinet with no markings used to store zinc chloride, and sodium hydroxide. Indications were that TCE had been stored in the cabinet in the past; an empty secondary container marked "TCE" was found in the cabinet. The cabinet was located in an open area next to the worker "break area" (EBSCO, Bldg #8310).

- A gray metal cabinet marked "Explosives" used to store flammable materials in a shop area, and containing caulk, adhesives, silicone, gasoline, enamel paint, etc. (Construction-Electric Shop, DWPF Area).

- A gray metal cabinet with no markings used to store freon (Tritium Facility, Tritium Laboratory).

Such storage areas are available to all individuals in the work area, and possibly to anyone who has access to the building or general work area.

The consequences of not labeling chemical storage cabinets, or of improperly labeling of storage cabinets, can be severe both for individuals at the work-site and for emergency responders.

PROBABLE CAUSAL FACTORS:

Lack of procedure for consistent labeling of cabinets throughout the site.

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/BMP-5

ASSESSMENT FINDING TITLE: Lack of Comprehensive Site-wide Asbestos Management Program

PERFORMANCE OBJECTIVE:

Good management practice requires a comprehensive management program that addresses asbestos identification, abatement, and disposal.

FINDING:

SRS has not established a comprehensive asbestos management program that includes a site-wide inventory of asbestos containing materials.

DISCUSSION:

Asbestos-containing materials (ACMs) are extensively contained in pipe insulation, general building insulation, gaskets, and siding. ACMs in the facilities do not necessarily pose a hazard. They are only considered hazardous in a friable condition. These materials are removed, as necessary, during renovation projects or normal maintenance and repair.

A written management plan has not been developed that states and implements SRS objectives for asbestos management based on SRS ACM inventory. Accordingly, the information and guidance required includes the current status and condition of all ACM in the form of a documented site-wide inventory of ACM showing its location and condition.

SRS is aware of this issue and is initiating a site-wide ACM inventory.

PROBABLE CAUSAL FACTOR:

Lack of policy requiring establishment of site-wide ACM management program, including an ACM inventory.

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/BMP-6

ASSESSMENT FINDING TITLE: Inaccessibility of Material Safety Data Sheets (MSDS)

PERFORMANCE OBJECTIVE:

DPSOL 40-5-117 states that MSDS must be maintained for all hazardous chemicals in the workplace. It further states that the MSDS must be readily accessible to employees, based on the OSHA Hazard Communication Standard.

FINDING:

MSDS are not readily accessible at some worksites.

DISCUSSION:

MSDS signs are posted at all work sites indicating the designated locations where MSDS are maintained. In most cases, the MSDS were kept in a central location in general proximity to one or more work sites. In some cases, however, MSDS are located at a sufficient distance away from work sites to raise a question of whether they are readily accessible.

Locations where this was observed by the team are listed in Table BMP-6.

PROBABLE CAUSAL FACTORS:

Lack of sufficient guidance in procedures regarding the placement of MSDS in work areas and at work sites.

TABLE BMP-6

Examples of Inaccessible Material Safety Data Sheets

ITEM	LOCATION
NO MSDS ACCESSIBLE (LOCATED IN ANOTHER BLDG)	H AREA POWER, 280-1H WATER LAB
NO ACCESSIBLE MSDS	INSULATION SHOP, CONSTRUCTION-CENTRAL SHOPS
NO ACCESSIBLE MSDS-KEPT ACROSS STREET IN POWER HOUSE	P-AREA POWERHOUSE, WATER TREATMENT LAB
NO ACCESSIBLE MSDS-IN ANOTHER BLDG	M-AREA, BLDG 341-M, LIQUID TREATMENT EFFLUENT FACILITY
OUTSIDE FREON TANK-MSDS IN NEARBY BLDG	TRITIUM AREA, CONSTRUCTION-PIPE SHOP

ASSESSMENT DISCIPLINE: Toxic and Chemical Materials

ASSESSMENT FINDING NUMBER: TCM/BMP-7

ASSESSMENT FINDING TITLE: Lack of Adequate Labeling of Secondary Containers of Chemical Substances

PERFORMANCE OBJECTIVE:

DPSOL 40-5-116, Revision 1, dated 9/3/87, titled Container Labeling requires that portable containers be labeled with an adequate manufacturer's label or plant label. The plant label must include the material name or identity of the material traceable to a MSDS. The plant label also requires a numerical hazard warning (diamond label).

FINDING:

Some secondary containers holding chemical substances for incidental use and local storage have not been adequately labeled/marked to alert workers and emergency responders of container contents.

DISCUSSION:

It is common practice throughout SRS, to remove selected quantities of chemical substances (including oils, gasolines, paints, etc.) from manufacturer's containers (the primary container) for placement in incidental use or local storage (secondary) containers. This practice facilitates the work effort and eliminates the need for transport of bulky containers around the worksite. Some of these secondary containers are not marked, or are improperly marked.

Most often, these secondary containers are placed in flammable/combustible storage cabinets or other cabinets for use over an unspecified period of time, and are available to all individuals at the worksite. Accordingly, the secondary containers should be properly labeled/marked with the name of the substance within the secondary container and with a numerical hazard warning (Hazardous Chemical Rating) diamond.

Examples observed by the team are listed on the attached table (BMP-7).

PROBABLE CAUSAL FACTORS:

Lack of training and oversight of personnel at chemical storage locations.

TABLE BMP-7

Examples of Lack of Labeling of Secondary Containers

ITEM	LOCATION
NO HAZCOM LABELS OR PARTIAL LABEL	SREL, LAB #187, LAB #00111, LAB 13A/B HWCTR
FIBER DRUMS DOWEX RESIN, POOR MARKING (FADED LABEL)	C REACTOR, BLDG 105
1 ONE-GAL CAN UNLABELED (ACETONE?)	ANALYTICAL LAB, ESHQA, STANDARDS LAB
QUESTIONABLE LABELING	ANALYTICAL LAB, ESHQA, BLDG 772, SERVICE FLOOR, BULK CHEMICAL STORAGE
3 QT. RED CAN-NO LABEL	ANALYTICAL LAB, ESHQA, HP LAB
1 SMALL RED CAN-NO LABEL (THINNER)	SIGN SHOP, CONSTRUCTION-CENTRAL SHOPS
UNMARKED (NO HAZCOM LABEL) CONTAINERS IN CABINET	EBASCO, BLDG 8310
3 TALL CANS UNMARKED	EBASCO, NORTH SIDE OF BLDG 8310, STORAGE SHED
1 GAL FLIP-TOP RED CAN-NO LABEL	P-AREA POWERHOUSE
UNLABELED DIESEL TANK	P-AREA REACTOR, 108 BLDG
OIL CAN W/NUMBER-NO NAME	STORAGE SHED BEHIND MACHINE SHOP, CONSTRUCTION-CENTRAL SHOPS
NO HAZCOM LABEL ON WORK CANS	FOREST SERVICE OIL HOUSE, 763-G
UNLABELED FLAMMABLES	FOREST SERVICE, FLAMMABLE BLDG
4 UNMARKED DRUMS	M-AREA, BLDG 313, CHEMICAL STORAGE

CONTAINERS NOT MARKED-FLAM CAB	M-AREA, BLDG 320-M
PLASTIC BOTTLES, NO HAZCOM LABELS	M-AREA, RESIN PREP LAB
UNLABELED GAS CAN	M-AREA, EXTRUDER ROOM, BLDG 320-M
4 RED CANS IN CABINET-NO LABELS	DWPF AREA, CONSTRUCTION-TRI-SHOPS S-4
2 UNLABELED GAS CANS	DWPF AREA, CONSTRUCTION-ELECTRIC SHOP
1 UNLABELED GAS CAN	DWPF AREA, CONSTRUCTION-TOOL ROOM
HYDRAULIC FLUID KEPT IN 2-LITER COKE BOTTLE-UNLABELED	DWPF AREA, CONSTRUCTION-PIPE SHOP
1 UNMARKED DRUM	DWPF AREA, CONSTRUCTION-OIL HOUSE
1 UNMARKED RED CAN	DWPF SHOP

3.5.7 Quality Assurance

3.5.7.1 Overview

The purpose of the quality assurance (QA) portion of the Savannah River Site environmental assessment was to evaluate the quality assurance in the environmental programs at the Savannah River Site (SRS). Quality assurance activities of both the Westinghouse Savannah River Company (WSRC) and the Department of Energy - Savannah River Operations Office (DOE-SR) were reviewed for compliance with regulatory requirements and DOE Orders and for adherence to best management practices.

The general approach to the QA assessment for the environmental protection programs at SRS included interviews with both DOE-SR and WSRC staff responsible for assuring the quality of the programs (e.g., managers, supervisors, QA/QC coordinators, field samplers and laboratory analysts). The assessment also included reviews of documents (e.g., DOE Orders, QA plans, and standard operating procedures) and audits of on-site field sampling and analysis laboratories and offsite subcontractor analysis laboratories.

The environmental monitoring program at the SRS is large and comprehensive. Extensive programs are conducted in both radioactive and nonradioactive monitoring to demonstrate compliance with applicable regulations and DOE Orders. The types of samples collected and analyzed for radioactivity include the following: air, thermoluminescent dosimeters, surface water, groundwater, milk, local food stuffs, wildlife, turtles, ducks, rainwater, soil, sediment and vegetation. The types of samples collected and analyzed for nonradioactive samples include air, surface water, groundwater, drinking water, and sediment.

Monitoring programs are coordinated by the Environmental Monitoring Section of the Environmental and Health Protection Department at SRS. Regulatory compliance is coordinated by the Environmental Protection Section at SRS. The various organizations involved with SRS environmental surveillance programs are as shown in Table 3.5.7-1.

The nonradiological ambient air monitoring program is coordinated by the Environmental Monitoring Section, and routine operation of the program is contracted to an offsite company. The Environmental Monitoring Section performs most radiological and nonregulatory water quality analyses. Environmental Monitoring Section facilities include sample receiving areas, radiochemical preparation laboratories, and radioanalytical counting rooms. A large portion of the regulatory monitoring programs is contracted to commercial laboratories.

The Environmental Protection Section of the Environmental and Health Protection Department is responsible for the oversight and coordination of site programs to protect the environment and ensure regulatory compliance.

The inhouse nonregulatory water quality program conducted by the Environmental Monitoring Section, monitors site streams and the Savannah River for chemicals, metals, and organics. The SRS Laboratories Department performs coliform bacteria analysis for this program.

Analyses for the regulatory National Pollutant Discharge Elimination System (NPDES) liquid effluent monitoring program are coordinated by the Environmental Monitoring Section and are contracted to commercial laboratories certified by the South Carolina Department of Health and Environmental Control (SCDHEC). The Environmental Monitoring Section handles sample collection and administration of analytical contracts. Power Operations handles sample collection at the waste water treatment plants. The Environmental Protection Section reviews and reports the data.

Sample collection, laboratory analyses, and data handling for the groundwater monitoring program (nonregulatory and regulatory) are contracted to off-site companies. Contracts are administered by the Environmental Monitoring Section. The Environmental Protection Section reviews and reports these data.

Drinking water analyses for a variety of chemicals are subcontracted to offsite laboratories by Power Technology. Total coliform analysis is performed onsite by the Laboratories Department. The Environmental Protection Section reviews and reports the required regulatory data.

River and stream waters and sediments are analyzed for pesticides, herbicides, and polychlorinated biphenyls by an off-site laboratory. The EMS handles the sample collection and administration of the analytical contract.

In addition to the surveillances and appraisals conducted for and by the on-site environmental sampling and analysis activities, the EMS maintains a QA/QC program at the SRS. This program is designed to continually monitor the scientific reliability, accuracy, and precision of reported laboratory data generated for and by the SRS's radiological and nonradiological monitoring programs. EMS laboratories and commercial laboratory subcontractors participate in interlaboratory comparisons. The EMS laboratories participate in the Quality Assessment Program (QAP) administered by the DOE Environmental Measurements Laboratory (EML) and in the Quality Assurance Division Program of

the U.S. Environmental Protection Agency (EPA) Environmental Monitoring Systems Laboratory/Las Vegas. All SRS environmental monitoring subcontractor laboratories that perform NPDES analyses participate.

EPA Water Pollution Study as required by SCDHEC. The SRS ambient air monitoring program, subcontracted to Zedek Corporation, participates in the EPA ambient air audit program.

The quality of nonradiological monitoring analytical data provided by subcontracted laboratories is checked by laboratory evaluation processes established by the EMS for subcontractors. The methods involved in these processes are as follows:

- periodic testing of the precision and accuracy of commonly analyzed inorganic and organic parameters using Environmental Resource Associates (ERA) quality control samples

- using on-site laboratory evaluations to ensure that technical competence is maintained and that required quality control programs are being applied by subcontractor.

3.5.7.2 Evaluation

WSRC sitewide quality assurance for environmental protection programs is performed by divisional and departmental quality assurance functions. Quality assurance reviews at the section level are also conducted. Divisional QA conducts surveillances while departmental QA conducts appraisals. Records indicate that divisional surveillances of the environmental sampling activities within the ESH&QA Division been conducted, but no records were available for the environmental sampling activities conducted within the Engineering and Projects Division. Departmental QA appraisal records indicate no appraisal activity by Environmental Health and Protection (EHP) in the environmental sampling and analysis areas, but for 1990 the EHP Department's appraisal schedule indicates an aggressive effort. The EMS conducts reviews of its sampling and analysis activities quarterly.

Overall the onsite environmental sampling and analysis activities are generating scientifically valid data as demonstrated by the results obtained on the intra- and inter-laboratory comparison programs. However, the lack of documented Quality Assurance Plans for the various site environmental protection programs makes it difficult to evaluate the sampling and analysis activities unless the requirements have been established by external sources; i.e., state and/or federal regulators. While some of the environmental sampling and analysis activities have

appropriate documented procedures, there are many sampling and analysis activities for which there are either insufficient documentation to assure their quality or where the procedures are outdated and/or do not reflect current practices. In addition, similar activities performed within different groups/divisions for sitewide programs are not internally consistent. Review of the EMS's interlaboratory performance and onsite laboratory evaluation program for subcontractor laboratories indicates that the program is well conceived, comprehensive, and contains all of the elements of statistical control to ensure accurate, precise, and comparable data. However, the essential elements of this program have not been translated to all of the SRS environmental protection programs that utilize subcontracted services for sampling and/or analysis.

General oversight by DOE-SR of the SRS environmental protection programs is coordinated by the Environmental Division's Environmental Compliance Branch (ECB). The Environmental Division (ED) conducted fourteen Functional Appraisals in FY 1988 but only five in 1989. Currently, seven appraisals are in the initial stages of planning for the first half of FY 1990. In addition, DOE-SR ED/ECB monitors the analytical results obtained by WSRC and subcontractor laboratories on interlaboratory performance evaluation samples and requires corrective action responses for deviant data.

Review of the DOE-SR Functional Appraisal of the SRS environmental protection programs showed that reports to the contractor are not being delivered within the time guidelines of the DOE Order 5482.1B. In addition the contractor responses back to the DOE-SR have not been within the time requirements of the DOE Order. Followup by DOE-SR for both the functional appraisal program and interlaboratory testing programs has not been documented or physically witnessed to verify satisfactory completion of corrective actions.

The QA assessment for the SRS environmental protection programs identified four compliance findings dealing with aspects of QA oversight, lack of QA plan documentation, sample holding times and deficiencies in the functional appraisal program. In addition, two best management practice (BMP) findings were identified dealing with QA records management and incomplete and/or deficient control of procedures.

TABLE 3.5.7-1

Monitoring Programs at SRS

Radiological Programs	Organizations Involved
Environmental Monitoring (Air, Surface Water, Groundwater, Food, Drinking Water, Wildlife, Rainwater, Soil, Vegetation, Sediment)	Environmental Monitoring Section
Nonradiological Programs	**Organizations Involved**
Air Monitoring	Environmental Monitoring Section Environmental Protection Section Operating Departments
Water Quality Monitoring	Environmental Monitoring Section Laboratories Environmental Protection Section
Drinking Water	Environmental Monitoring Section Power Technology Environmental Protection Section
Surface Water Monitoring (NPDES)	Environmental Monitoring Section Environmental Protection Section Operating Departments
Groundwater Monitoring (Nonregulatory & Regulatory)	Environmental Monitoring Section Environmental Protection Section Operating Departments SRL Interim Waste Technology

3.5.7.3 Findings

ASSESSMENT DISCIPLINE: Quality Assurance

ASSESSMENT FINDING NUMBER: QA/CF-1

ASSESSMENT FINDING TITLE: Exceedance of Maximum Sample Holding Times.

PERFORMANCE OBJECTIVE:

40 CFR 136 requires that the maximum holding time applicable to samples collected for volatile organic compounds is 14 days to analysis. The maximum holding time applicable to samples collected for pesticides is 7 days to extraction.

FINDING:

Sample receiving records at offsite subcontractor analytical laboratories show samples for volatile organic compounds have been received more than 14 days after the samples were collected. Records also show that samples for pesticides have been received more than 7 days after the samples were collected.

DISCUSSION:

Generally, these holding time violations have been associated with groundwater well samples that require testing for radioactivity prior to shipment to the analytical laboratory for analysis and that are found to exceed the DOT limit of 2 nCi/g (2000 pCi/ml) and must be shipped as radioactive samples. Radioactive shipments require additional paperwork and special packaging. SRS records showed that samples released for shipping were being held for shipment to maximize the number of samples shipped in a shipping container and apparently to minimize the amount of paperwork.

PROBABLE CAUSAL FACTORS:

Inadequate training and supervision regarding sample holding time requirements.

ASSESSMENT DISCIPLINE: Quality Assurance

ASSESSMENT FINDING NUMBER: QA/CF-2

ASSESSMENT FINDING TITLE: Deficiencies Within the Environmental Protection Functional Appraisal Program

PERFORMANCE OBJECTIVE:

DOE Order 5482.1B, requires that:

(1) a report will be prepared at the completion of each appraisal and transmitted within 30 days of the appraisal to the head of the organization appraised

(2) the appraised organization shall respond to the appraisal reports within 30 days and indicate what corrective action(s) will be taken, and

(3) that followup of the appraised organization's response will be made in writing in order that outstanding issues are closed out expeditiously.

FINDING:

(1) Draft reports on several Environmental Protection Functional Appraisal performed by DOE-SR were not transmitted to the WSRC within the required 30-day period.

(2) Responses by WSRC to Environmental Protection Functional Appraisals have not been transmitted to DOE-SR within the required 30-day period.

(3) No written followups to Environmental Protection Functional Appraisals were observed.

DISCUSSION:

(1) The draft report for the Environmental Appraisal Report for the Environmental Radiological Programs: Atmospheric Release, Effluent Monitoring Functional Appraisal performed on December 2-3, 1987 with an informal closeout on January 15, 1988 was not transmitted to the contractor until April 29, 1988.

The Draft Report for the Environmental Appraisal Report for the Water Pollution Control Program: National Pollutant Discharge Elimination System (NPDES) Functional Appraisal performed on August 23-25, 1988 within an informal closeout

on August 26, 1988 was not transmitted to the contractor, WSRC, until June 13, 1989.

(2) Corrective action responses for the Environmental Protection Functional Appraisal Report for the Environmental Radiological Programs: Atmospheric Release Functional Appraisal were requested by DOE-SR to be provided on November 28, 1988 were not transmitted to DOE-SR until May 5, 1989. Corrective action response for the Environmental Appraisal Report for Water Pollution Control Programs: National Pollution & Discharge Elimination System (NPDES) Functional Appraisal were requested by DOE-SR to be provided on November 8, 1989. Although WSRC requested an extension of the response time to December 1, 1989, the response was not transmitted to DOE-SR by WSRC until December 19, 1989.

(3) Specific instances of nonconformances to appraisal criteria noted in the Water Pollution Control Programs: National Pollution Discharge Elimination System (NPDES) functional appraisal conducted on August 23-25, 1988 were also observed during the DOE Tiger Team Assessment. These criteria are as follows:

Finding (RAFTS No. 07-01-88-0016-001):

Documentation is incomplete with respect to functional organization, responsibilities, and protocols for the NPDES program at the interdepartmental level and within E&E [DOE Order 5482.1B, Section 10.g., DOE Order 5700.6B, Section 9.d.].

Finding (RAFTS No. 07-01-88-0016-002):

Certain written procedures and guidance documents for SRP's NPDES monitoring program inaccurately reflect current requirements and/or are vague or contrary to standard operating practices [DOE Order 5482.1B, Sections 10.a. and 10.g., DOE Order 5700.6B, Section 9.d.].

Finding (RAFTS No. 07-01-88-0016-004):

Chain-of-custody practices and procedures for NPDES samples do not consistently ensure documented accountability for and/or security of all samples [DOE Order 5482.1B, Sections 10.c. and 10.g.; letter, S. R. Wright (DOE-SR) to A. G. Linton (EPA), 4/27/87].

Observations

HP audit procedures do not address auditing of subcontractors.

Many incomplete and deficient corrective actions have been identified, some separately, over the last year and a half. Satisfactory closure of findings has not always been achieved, despite the DOE-SR's Recommendations and Findings Tracking System (RAFTS). In addition there is no documented evidence that a physical check was conducted by DOE-SR personnel to confirm that corrective actions have been implemented.

PROBABLE CAUSAL FACTORS:

The magnitude and complexity of these reports takes longer than the DOE Order time limit requirement to develop the report and associated response. Inadequate followup.

ASSESSMENT DISCIPLINE: Quality Assurance

ASSESSMENT FINDING NUMBER: QA/CF-3

ASSESSMENT FINDING TITLE: Lack of Documented Quality Assurance Plans for Environmental Protection Programs

PERFORMANCE OBJECTIVE:

DOE 5700.6B requires plans and actions to assure quality achievement in DOE programs be established, implemented, and maintained so that programs are operationally successful.

FINDING:

Formal documented QA plans, i.e. implementation plans for the environmental protection programs, e.g. radiological and non-radiological environmental monitoring programs and for regulatory environmental monitoring programs, at the SRS are not available.

DISCUSSION:

The DOE Order states that DOE programs shall establish, implement, and maintain plans and actions to assure quality achievement so that programs are operationally successful. The definition of a DOE Program is an organized set of activities within a resource area having common objectives based on strategy set forth to meet assigned goals. It may include one or more projects and research and development activities in support of new, improved, or more efficient supply, or conservation systems or procedures.

Since the provisions of the Order apply to contractors performing work for the DOE, WSRC has not implemented this Order in its sitewide environmental protection programs. There is no evidence of documented QA plans, i.e. implementation plans, for the environmental (e.g., Radiological Environmental Monitoring, Air Monitoring, Water Quality Monitoring, Drinking Water, Nonregulatory Groundwater Monitoring Programs) and surveillance (e.g., Surface Water Monitoring (NPDES) and Regulatory Groundwater Monitoring Programs) protection programs.

There is a WSRC Site QA Plan which is applicable to all Site activities, however this finding addresses the lack of program specific QA plans, i.e. implementation plans.

PROBABLE CAUSAL FACTORS:

Inadequate policy implementation.

ASSESSMENT DISCIPLINE: Quality Assurance

ASSESSMENT FINDING NUMBER: QA/CF-4

ASSESSMENT FINDING TITLE: Deficiencies in Oversight of Sampling, Analysis, and Technical Data for SRS Environmental Protection Programs

PERFORMANCE OBJECTIVE:

DOE Order 5700.6B on Quality Assurance requires confirmation of quality attainment and quality assurance program effectiveness. This may be accomplished by various means, such as program reviews, and surveillance of specific activities or results of technical significance.

In addition, causes of significant deficiencies shall be identified and corrected to prevent recurrence.

FINDINGS:

(1) Followups to reviews of technical data for environmental protection programs are not documented.

(2) Technical oversight of consultant services for environmental protection programs is not rigorously applied and/or controlled.

DISCUSSION:

(1) Analytical results for DOE-EML and SCDHEC Quality Assurance Programs from both SRS and subcontracted analytical laboratories are reviewed by DOE-SR. In cases where discrepancies are noted and corrective actions are requested by DOE-SR, there is no documentation back to SRS that their assessment of the discrepancy and corrective action is acceptable. This "passive" follow-up, i.e., no news is good news, is an unsatisfactory mechanism to indicate DOE concurrence and can be perceived as lack of followup by DOE-SR.

(2) While the WSRC Procurement organization has procurement level requirements for consultant services, there is no evidence that these procurement levels are applied consistently to services contracted by the SRS organizations for the environmental protection programs.

In addition to the procurement requirements some areas have complemented these with additional program specific

technical oversight. Currently the EMS has specific technical oversight activities oriented in QC for several environmental programs in the nonradiological areas such as NPDES and groundwater programs. Other environmental protection related programs such as the drinking water program and the ambient air monitoring program currently do not have this higher level of technical oversight. This lack of SRS sitewide oversight coordination of technical oversight needs to be assessed for the SRS's environmental protection programs to ensure that subcontracted sampling, analysis, and the resulting technical data meet the DOE requirements.

PROBABLE CAUSAL FACTORS:

The physical size of the site itself and of the site's environmental protection programs makes coordination of oversight activities difficult.

ASSESSMENT DISCIPLINE: Quality Assurance

ASSESSMENT FINDING NUMBER: QA/BMP-1

ASSESSMENT FINDING TITLE: Inadequate Maintenance of Quality Assurance Records

PERFORMANCE OBJECTIVE:

The SRS QA Plan requires that recorded information, in written or printed form, shall be legible using black or blue black marking materials (ink is preferred). When a change in recorded information is required, a single line shall be drawn through the deleted information and the individual making the deletion shall initial and date the deletion.

FINDING:

Quality Assurance records, specially noted are laboratory and field data entries in laboratory and field notebooks/logbooks and work activity sheets, are not maintained according to the SRS QA Plan.

DISCUSSION:

At the SR Standards Laboratory recorded information on work activity sheets was in pencil. Improper deletions were observed in field records of the Environmental Monitoring Sections NPDES sampling team in laboratory records of the EMS's Environmental Radiochemical Analysis, Environmental Water Quality Analysis and Environmental Counting Laboratory Groups and in laboratory records of the Analytical Laboratories D-Area Laboratory. Some deletions were initialed, but not dated, many deletions had neither initials of the individual nor the date.

PROBABLE CAUSAL FACTORS:

Inadequate training and supervision regarding information in the SRS QA Plan and/or regarding the proper maintenance of QA records.

ASSESSMENT DISCIPLINE: Quality Assurance

ASSESSMENT FINDING NUMBER: QA/BMP-2

ASSESSMENT FINDING TITLE: Incomplete and/or Deficient EMS Procedures

PERFORMANCE OBJECTIVE:

DPSOL 292-602, Preparation and Control of Environmental & Health Protection (EHP) Procedures, establishes EHP guidelines for the following:

PREPARATION OF NEW EHP PROCEDURES

EHP procedures need to be written if:

(a) for activities with unusual or special safety requirements
(b) for activities which involve many steps and/or people
(c) for activities which must be performed in prescribed sequence, and/or
(d) for activities which are too important or complicated to rely on verbal instructions

PERIODIC REVIEW OF EHP PROCEDURES

All EHP procedures should be formally reviewed in their entirety at least every two years.

INTERIM PROCEDURES

Interim procedures need to be reviewed and published for controlled distribution. The EHP supervisor must initiate the formal procedure for publishing Interim Procedures by forwarding the appropriate approval information to the EHP Procedure Coordinator.

FINDINGS:

EMS does not have procedures to ensure the quality of all required operations. In addition some procedures are out of date, some procedures although current do not reflect current operations, and INTERIM procedures have not been processed for controlled distribution.

DISCUSSION:

Procedures are not available in the EMS to cover all of the required operations and to ensure their quality.

The EMS does not have a sample log in protocol for Environmental Water Quality Analysis and Environmental Counting Laboratory areas. The Environmental Radiochemistry Analysis and Environmental Counting Laboratory areas do not have documented procedures for sample reanalysis. The balance operation procedure in the Environmental Radiochemistry Analysis area although current was not for the balance currently being used.

EHP personnel are responsible for implementing the EHP procedure DPSOL 292-602 in the preparation and control of procedures that EHP generates.

Several DPSOLs available in the Environmental Radiochemistry Laboratory and Environmental Counting Laboratory areas were issued more than 2 years ago. Some were 1985 vintage, indicating that the 2-year review schedule is not being adhered to.

EHP personnel are responsible for ensuring that they are using the latest version of EHP procedures by checking the EHP Procedures Index and/or checking with the EHP Procedures Coordinator.

Several DPSOLs revised to conform to the WSRC format were presented to be Interim Procedures, but no records were available to indicate that the supervisor had forwarded the appropriate documentation to EHP Procedure Coordinator so the revised/new procedures could be formally reviewed, approved, and distributed in the SRS system.

PROBABLE CAUSAL FACTORS:

Inadequate supervision in the preparation and control of procedures.

3.5.8 Radiation

3.5.8.1 Overview

The purpose of the radiation portion of the environmental assessment was to evaluate production and support facilities and operations at the Savannah River Site (SRS) for routine and accidental release of radiative contaminants. Activities and programs were reviewed with respect to their associated impacts on the environment and their compliance with DOE Orders and other applicable regulations or standards, or conformance with reference guides and best management practices. Radiation issues were evaluated against the applicable guidelines and regulations listed in Table 3.5.8-1.

Programs and systems to control and monitor releases and to evaluate the environmental impact of radiological contamination have been developed and implemented. Of particular interest from an environmental radiological viewpoint are airborne radionuclide

emissions, liquid radionuclide discharges, and practices involving the release of property and equipment for use without radiological restriction.

(1) Airborne Radionuclide Emissions

Airborne emissions from the SRS have historically been the most significant contributors of radiation exposure to members of the general public. Tritium and tritium oxide from reactors and separations facilities are the predominant airborne radionuclide releases, accounting for greater than 50% of the offsite dose from airborne emissions; smaller levels of other radioactive gases, vapors, and particulates are also released. Potential emission sources have been identified, and control equipment and sampling/monitoring systems have been installed on many of the release points. The design of the control and sampling/monitoring systems vary, depending upon the character of the airstream and the contaminant. Results of the sampling and monitoring are used to evaluate total emissions and estimate radiation doses to offsite population. Specific issues investigated during the appraisal included:

- Design, placement, maintenance, and calibration of on-site and off-site ambient air monitors.

- Laboratory facilities for airborne environmental analyses.

- Quality assurance program and records for airborne radiological sampling and analyses.

- Airborne dose calculations, inputs, assumptions, and methodology.

Document reviews, interviews, and direct observations were used to identify potential major airborne emission sources and evaluate the design and performance of the sampling/monitoring programs. Data from on-site and off-site monitoring was reviewed and compared with applicable standards.

(2) Liquid Radionuclide Discharges

Numerous surface water bodies are located on or adjacent to the SRS. With few exceptions, these waters receive potentially contaminated effluents from SRS operations. Based on the potential for radionuclide contamination, liquid wastes from facilities and operations may be collected for handling as radioactive waste, temporarily held for analysis before release or treatment, routed through continuous monitors with provisions for diversion to retention basins, or discharged directly to surface waters. Samples of liquid releases are collected at discharge points and in onsite and offsite streams. Previous radionuclide releases have resulted in low-level contamination of some stream and lake sediments. Specific issues investigated included:

- Programs for control and monitoring of liquid effluents.

- Procedures for water sampling and analysis.

- Quality assurance program and records for liquid effluent monitoring program.

- Sediment sampling and analysis programs.

- Status of stream and lake bed contamination.

Document reviews, interviews, and direct observations were used to identify emissions sources and evaluate the performance of sampling/monitoring programs. Annual release data and associated dose estimates were compared with applicable standards.

(3) Waste Management Practices

Site radiological wastes include solid wastes (low-level, intermediate-level, and transuranic) and liquid wastes. The

greatest volume of solid waste is low-level contaminated waste, most of which is disposed by shallow land burial at the Radioactive Waste Burial Ground. Some intermediate-level wastes are buried and others are stored for eventual disposal at the Waste Isolation Pilot Plant (WIPP) in New Mexico.

With exception of some reactor-generated liquid wastes, disposal by discharge into seepage basins has been discontinued, and liquid radioactive wastes are collected for monitoring and treatment (as required). The Effluent Treatment Facility collects and treats low-level wastes; treated liquids are released into Upper Three Runs Creek. Higher-level liquid wastes are stored in underground storage tanks and a portion is treated by evaporation, to reduce the waste volume.

The radioactive solid and liquid waste programs were primarily investigated by Waste Management specialists with assistance from the radiation specialists, as required. Radiation specialists focused the assessment on programs for identifying, evaluating, and disposing of or releasing materials, facilities, and property without requirements for future radiological control. These included such activities as decommissioning, environmental restoration, disposal by sanitary landfill or other non-radiologically restricted burial, excess materials disposition, salvage, and off-site waste treatment or processing. Issues investigated included:

- Radioactive, mixed, and non-hazardous waste management practices.
- Guidelines for designating wastes as radioactive and measurement procedures.
- Identification of radiologically contaminated property and facilities.
- Decommissioning and decontamination programs.

Where appropriate, the radiological assessment was coordinated with other assessment disciplines such as air, surface water, waste management, inactive sites (CERCLA), and quality assurance.

3.5.8.2 Evaluation

There is an extensive program for control and monitoring of radiological contaminants in effluents and the environment at the

Savannah River Site. Various aspects of the program are described in numerous documents; however, there is no single document such as an environmental monitoring plan or effluent monitoring plan, combining all pertinent information. Supporting documentation for the design bases and rationale for sampling activities, including choice of locations, frequencies, and methodologies, has not been developed.

(1) Airborne Radionuclide Emissions

The assessment did not identify any potential sources of radionuclide emissions unknown to the SRS. Decisions regarding control and monitoring devices on emission sources were appropriate, as were the selections of primary radionuclides and physical/chemical forms for which monitoring was conducted on various discharges. Numerous deficiencies in design, placement, and maintenance of monitoring systems, relative to the guidelines of ANSI N13.1, ANSI N42.18, DOE Draft Order 5400.XY, Title 10 CFR 61, and best management practices were identified. Most of these deficiencies are known to the site and have been described in previous appraisals, audits, and surveys. Action plans for replacement or upgrading many of the major emission monitoring systems, such as those on reactors and separations facilities, have been initiated. Recently planned installations are designed to conform with the applicable guidance. The reactor effluent monitoring program was noted to be lacking Technical Specifications, which establish the control and monitoring requirements for all modes of operation. Deficiencies in practices related to record keeping and quality assurance, relative to airborne radionuclide emissions monitoring, were also noted; of particular note was the lack of supporting calculations and independent verification for emissions data for the Tritium Facility.

Estimated and measured environmental air concentrations are in compliance with DOE Orders, and calculated doses to off-site individuals are well within the DOE and NESHAPs limits (the maximum site boundary dose for 1988 was calculated to be 0.46 millirem). Tritium, Iodine-129, and Argon- 41 were responsible for 67%, 14%, and 12%, respectively of the total airborne dose. Although there are deficiencies in the emissions monitoring program, based on the low-levels measured through the environmental monitoring program it is considered unlikely that correction of these deficiencies would result in noncompliance with the regulatory dose or concentration limits.

(2) Liquid Radionuclide Discharges

The program for controlling and monitoring liquid radionuclide discharges is effective in meeting the annual concentration guides and dose limits, established by DOE. The maximum estimated dose to an individual in the general public from liquid releases during 1988 was 0.79 millirem; 89% of that value was calculated to be due to consumption of fish, and 11% was from ingestion of water. Principal radionuclides were Cs-137 and tritium, accounting for about 87% and 11%, respectively, of one total estimated dose. The SRS considers the potential for large tritium releases to be low and it is impractical to remove tritium from water at the levels being released from SRS; therefore, tritium concentrations are not measured prior to release. Samples are collected at discharge points and from site drainage streams to provide data on actual liquid radionuclide releases; however, this approach precludes identification of unusually high tritium levels and an opportunity to treat or release the waste in a controlled manner to be consistent with the ALARA principle. The reliability of current flow monitoring devices for reactor facility process sewers is questionable. Also, although provisions for liquid waste hold-up exist at some facilities, such as H-Area separations, comparable provisions are not available at F-Area separations segregated cooling water or for the K and L reactor process sewers. Preliminary studies have been performed for hold-up systems at these facilities, but funding has not yet been provided.

Many contaminated drainage pathways have been placed on the CERCLA list of operable units; however, several such areas have not been included on this list. Criteria for determining inclusion or exclusion of such areas is not defined. Identification and surveillance of these radioactively contaminated areas was investigated by the Inactive Waste Sites (CERCLA) specialists.

(3) Waste Management Practices

A review of the activities related to identifying, evaluating, and disposing of or releasing materials and property without restrictions for future radiological controls, revealed the absence of a comprehensive program and lack of radiological guidelines, consistent with DOE Order 5400.5 and best management practices. The decommissioning and environmental restoration programs at SRS are still in the developmental stages. Site-specific guidelines for residual soil and surface contamination have not been developed and submitted to DOE/EH for concurrence.

Salvage and excess materials programs are being conducted with contamination guidelines that, for some radionuclides, exceed the levels established by DOE. The choice of a radiological criteria of 2 nCi/g for designating a mixed waste relative to a hazardous waste is inconsistent with accepted health physics practices of radionuclide-specific and case-specific evaluation, and the 2 nCi/g level is significantly higher than levels typically used. Although the activity level criteria for disposal in the onsite sanitary landfill is very low, approval or concurrence by DOE is not evident and the quality assurance program is not adequate for evaluating compliance with provisions to exclude tritium and alpha contaminated waste.

The environmental radiological control and monitoring program was compared with the guidelines of INPO for conduct of operations and maintenance at nuclear power stations. QA programs, relative to emissions controls and monitoring, were also reviewed relative to INPO guidelines. There is general conformance to these guidelines in areas of organization, procedures, training, calibration and maintenance, record keeping, and data verification. However, as noted in the individual findings and evaluations of the Radiation specialty and the QA sections, deficiencies have been identified in each of these functional areas. The frequency or severity level of the conduct of operations and maintenance deficiencies do not significantly effect the conclusions as to the overall performance of the program and the current radiological status of the site environment. However, failure to correct or resolve deficiencies increases the potential for future environmental consequences.

TABLE 3.5.8-1

List of Applicable Radiation Regulations/Requirements/Guidelines

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE Order 5400.1	General Environmental Protection Program	DOE
DOE Order 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
DOE Order 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE Order 5400.XY (Draft)	Radiological Effluent Monitoring and Environmental Surveillance	DOE
DOE Order 5480.4	Environmental Protection, Safety, and Health Protection Standards	DOE
DOE Order 5482.1B	Environment, Safety, and Health Appraisal Program	DOE
DOE Order 5481.1	Environmental Protection, Safety, and Health Information Reporting Requirements	DOE
DOE Order 5700.6B	Quality Assurance	DOE
DOE Order 5820.2A	Radioactive Waste Management	DOE
DOE Order 6430.1A	General Design Criteria	DOE
10 CFR Part 50.36	Nuclear Regulatory Commission Technical Specifications for Reactor Facilities	NRC
40 CFR Part 61 (Subpart H)	National Emission Standards for Radionuclide Emissions from DOE Facilities	EPA

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
ANSI N13.1-1969	Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities	ANSI
ANSI N42.18-1980	Specifications and Performance of Onsite Instrumentation for Continuously Monitoring Radioactivity in Effluents	ANSI
ASME NQA-1	Quality Assurance Program Requirements for Nuclear Facilities	ASME
INPO 85-038	Guidelines for the Conduct of Maintenance at Nuclear Power Stations	INPO
INPO 85-017	Guidelines for the Conduct of Operations at Nuclear Power Stations	INPO

3.5.8.3 Findings

ASSESSMENT DISCIPLINE: Radiation

ASSESSMENT FINDING NUMBER: R/CF-1

ASSESSMENT FINDING TITLE: Lack of Technical Specifications Which Address Radiological Effluent Monitoring Requirements

PERFORMANCE OBJECTIVE:

DOE Order 5480.6 (R-184) requires that Department of Energy owned nuclear reactors are "sited, designed, constructed, modified, operated, maintained, and decommissioned in a manner that gives adequate protection for health and safety and will be in accordance with uniform standards, guides, and codes which are consistent with those applied to comparable licensed reactors." This is accomplished through the DOE Order requirement 5480.6 8d(1) that "Each DOE-owned reactor shall have a Technical Specification document meeting the code of Federal Regulations, Title 10, part 50.36 (R-175)."

FINDING:

The L, K, P-Area reactors do not have technical specifications which address requirements for radiological effluent monitoring under all facility operating modes, including shutdown and maintenance, per DOE Order 5480.6 8d(1).

DISCUSSION

DOE reactors perform effluent monitoring and report releases of radioactivity in accordance with both the Abnormal Condition Control (ACC) procedures and Emergency Action Levels (EAL's). However, DOE-owned reactors, L, P, K, have not established minimum operability requirements for radiological liquid effluent and radiological airborne emission monitoring in accordance with DOE Order 5480.6 8d(1) which states "Each DOE reactor shall have a technical specification document meeting the code of Federal Regulations, Title 10, part 50.36." It is the WSRC position (R-58) that detailed requirements for radiological effluent monitoring should not be incorporated into technical specifications but rather that the Administrative Control section of the technical specification should invoke a referenced program requirement. However, DOE-SR (ED) does not concur with the WSRC interpretation. DOE-SR (ED) memo (R-59) states that DOE-owned reactors are required to have technical specifications for meeting 10 CFR 50.36. Additionally, the DOE Recommendations and Findings Tracking System (RAFTS) comments on WSRC response to

Report 07-01-89-0004 Finding 2 (R-60) state that radioactive release limits associated with Emergency Action Levels do not provide timely indication of operational problems or equipment failures and notes that draft DOE Order 5400.XY specifies alarm levels "to signal the need for corrective actions that may be necessary to prevent public or environmental exposures from exceeding the limits given in DOE 5400.5...". It further notes that "The 5400.5 limits are far below the limits associated with Emergency Action Levels."

The need for addressing limiting conditions for conduct of operations and maintenance and minimum operability requirements for effluent control and monitoring systems was demonstrated by the K-reactor incident of February 7, 1990. This relatively minor liquid spill resulted in an airborne effluent release of tritium. Because there were not requirements, specifying the minimum effluent monitoring systems under this operational mode, the primary tritium monitor alarm for the airborne emission monitoring system was not functional. In this particular case the magnitude of the release was small, but the incident emphasized the potential for inadequately monitored releases and the need for documented detailed requirements.

PROBABLE CAUSAL FACTORS:

Inadequate management oversight and deficiencies in policy implementation.

ASSESSMENT DISCIPLINE: Radiation

ASSESSMENT FINDING NUMBER: R/CF-2

ASSESSMENT FINDING TITLE: Inadequate ALARA Process for Tritium Sources and Releases

PERFORMANCE OBJECTIVE:

Radiological effluent releases to uncontrolled areas shall be determined for each release point (draft DOE Order 5400.XY (R-169)) and, per DOE Order 5400.5 (R-168) average concentrations of radioactivity at the point of release shall be within the concentration guides and As Low As Reasonably Achievable (ALARA). In addition, per DOE Order 5400.5, "Although there is no known practicable method for removing tritium from liquid waste streams, facilities and operations are to be designed and operated so that tritium sources and releases are considered in the ALARA process."

FINDINGS:

Concentrations of tritium in liquid effluents are not being monitored prior to their release at the Savannah River Site. The potential exists for short term releases of tritium significantly above the concentration guides from both batch and continuous processes.

DISCUSSION:

DOE Order 5400.5, "Radiation Protection of the Public and the Environment", states that while there are no known practicable methods for removing tritium from liquid waste streams, facilities and operations are to be designed and operated so that tritium sources and releases are considered in the ALARA process. The lack of analysis of liquid effluents for tritium prior to discharge precludes identification of unusually high concentrations and handling in a controlled manner. An example of such controlled handling under ALARA principles would be the delayed release of liquids, containing higher than usually concentration levels, to avoid large, short-term variations in concentrations within the receiving body of water.

H-Area and the Effluent Treatment Facility are two facilities, where engineered diversion and hold-up systems exist, but monitoring for tritium is not conducted prior to discharge. Operations personnel at these facilities are of the opinion that the potential for a pure high activity tritium release is small and that, except for the Tritium Facility, tritium contamination

would most likely occur in conjunction with other radionuclides, which are being monitored prior to discharge.

There is currently no sampling for tritium in the ETF effluent prior to discharge. However, the ETF liquid effluent is sampled by a flow proportional sampler. The sample is analyzed weekly by Health Protection Monitoring Group and results are issued in the monthly "Release Guide Report."

The Building 281-5F segregated cooling water delaying basin operates on a continuous plug flow basis. There is limited retention basin capacity for storage of batch discharges of water after sampling and verification of water quality. A new F-Area retention basin, similar to the one in H-Area for segregated cooling water, has been proposed, but the project has not been funded.

DOE-SR has requested an ALARA feasibility study for the need for hold-up (catch tanks) on reactor process sewers, which have average flow rates of approximately 2500 gpm. Under the current reactor program, liquid effluent flow monitoring is not a current reactor operations or restart issue. Health Protection Operations personnel expressed a lack of confidence in process sewer flow rate data. It was noted that purchase order requests for flow meters are currently on hold pending design completion. While it has been estimated that two, 1.5 million gallon tanks would be required for adequate hold-up, a full cost benefit feasibility study has not been completed. Other reactor process streams which are viable candidates for ALARA cost benefit studies include the distillation steam condensates and the -40 foot level sumps; the latter which could divert all flows to Bldg. 106, then to a 0.5 million gallon tank, followed by transport to the 200-Area for treatment. To date, Reactor Engineering has not addressed meeting DOE Order requirements for ALARA, i.e., formally conducting an evaluation of the hazards (risk), volume of contaminants, or ALARA requirements for hold-up in retention basins or tanks of selected reactor radiological effluent streams.

PROBABLE CAUSAL FACTORS:

Inadequate policy implementation and management oversight.

ASSESSMENT DISCIPLINE: Radiation

ASSESSMENT FINDING NUMBER: R/CF-3

ASSESSMENT FINDING TITLE: Radiological Guidelines for Unrestricted Release Are Not Consistent With the DOE Requirements

PERFORMANCE OBJECTIVE:

DOE Order 5400.5 (R-16) establishes guidelines for residual radioactivity levels on or in property being released from DOE control for unrestricted use, i.e., for use in the public domain without requirements for radiological controls.

FINDING:

WSRC guidelines for surface contamination (DPSOL 193-507) and contaminated soil (DPSOL 193-488) (R-36) are not consistent with the DOE Order 5400.5 and are not stated in units which enable comparison with the guidelines in that DOE Order.

DISCUSSION:

WSRC guidelines (R-36) for surface contamination on property being released for unrestricted use (e.g., excess equipment, salvage, facilities, personal property, etc.) are:

TYPE CONTAMINATION	REMOVABLE	FIXED
Alpha Emitter	<10 dpm/100cm^2	None Detectable
Beta-Gamma	<80 dpm/100cm^2	None Detectable

Removable contamination is determined by standard smear techniques. Fixed activity measurements are performed using portable survey instruments having, per WSRC estimate, minimum detection sensitivities of 1000 alpha dpm/100 cm^2 and 14,000 beta-gamma dpm/100 cm^2 (R-49, R-185). Guidelines from DOE Order 5400.5 are presented by different radionuclide categories (see attached Table (CF3-1)). The levels for the most restrictive category (transuranics, etc.) have been reserved, awaiting resolution of comments from several sites; it is therefore required that sites which have contaminants in this category submit a proposed interim guideline level for DOE/EH concurrence. The authorized levels for this category of contaminant will almost certainly be less than 1000 dpm/100 cm^2-the average limit for the next most restrictive category of radionuclides. Although transuranics are potential contaminants at SRS, no authorized limit has been sought or obtained. In addition, according to WSRC's own evaluation, they would not be able to

measure levels of alpha below 1000 dpm/100 cm^2. Based on WSRC's estimated sensitivity level of 14,000 dpm/100 cm^2, the limits for beta-gamma contamination also could not be met for Sr-90 (1000 dpm/100 cm^2) or for the average beta-gamma levels (5000 dpm/100 cm^2) of other fission and activation products.

Fixed contamination levels measured at SRS are expressed in units of "cpm" (counts per minute) or "none detectable"; these limits do not permit comparison of surface activity measurements with the DOE guidelines, which are in units of dpm/100 cm^2. For soil contamination the WSRC criteria (DPSOL-488) is that samples must count less than 3 cpm alpha and less than 10 cpm beta-gamma (above background). As with the surface contamination criteria, the WSRC procedure does not differentiate between the relative hazards associated with different radio-nuclides and does not provide results in units which are consistent with DOE guidelines, i.e., pCi/g. Use of gross alpha or gross beta for environmental contamination monitoring is to be used only as a screening "tool". Measurements of radioactivity levels in effluents and the environment are to be reported by specific radionuclide. Because DOE has not established generic soil guidelines for other than radium and thorium, sites where soil contamination is present and decommissioning or restoration activities are being conducted must develop site-specific guidelines for each radionuclide of concern and obtain DOE/EH concurrence. No such soil guidelines have been developed by WSRC and authorized by DOE/EH. Therefore, decisions concerning cleanup of contaminated areas, inclusion or exclusion of areas from lists of CERCLA operable units, and disposal procedures for potentially contaminated soil and rubble may be inappropriate.

PROBABLE CAUSAL FACTORS:

Inadequate Procedures.

TABLE CF3-1

Figure IV-1

Surface Contamination Guidelines

Radionuclides[2/]	Allowable Total Residual Surface Contamination (dpm/100 cm^2)[1/] Average[3/,4/]	Maximum[4/,5/]	Removable[4/,6/]
Transuranics, I-125, I-129, Ra-226, Ac-227, Ra-228, Th-228, Th-230, Pa-231.	RESERVED	RESERVED	RESERVED
Th-Natural, Sr-90, I-126, I-131, I-133, Ra-223, Ra-224, U-232, Th-232.	1,000	3,000	200
U-Natural, U-235, U-238, and associated decay product, alpha emitters.	5,000	15,000	1,000
Beta-gamma emitters (radionuclides with decay modes other than alpha emission or spontaneous fission) except Sr-90 and others noted above.[7/]	5,000	15,000	1,000

[1/] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute measured by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[2/] Where surface contamination by both alpha-and beta-gamma-emitting radionuclides exists, the limits established for alpha- and beta-gamma-emitting radionuclides should apply independently.

[3/] Measurements of average contamination should not be averaged over an area of more than 1 m^2. For objects of less surface area, the average should be derived for each such object.

TABLE CF6-1 (Continued)

4/ The average and maximum dose rates associated with surface contamination resulting from beta-gamma emitters should not exceed 0.2 mrad/h and 1.0 mrad/h, respectively, at 1 cm.

5/ The maximum contamination level applies to an area of not more than 100 cm2.

6/ The amount of removable material per 100 cm2 of surface area should be determined by wiping an area of that size with dry filter or soft absorbent paper, applying moderate pressure, and measuring the amount of radioactive material on the wiping with an appropriate instrument of known efficiency. When removable contamination on objects of surface area less than 100 cm2 is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. It is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

7/ This category of radionuclides includes mixed fission products, including the Sr-90 which has been separated from the other fission products or mixtures where the Sr-90 has been enriched.

ASSESSMENT DISCIPLINE: Radiation

ASSESSMENT FINDING NUMBER: R/CF-4

ASSESSMENT FINDING TITLE: Inadequate Records for Tritium Facility Stack Release Determination

PERFORMANCE OBJECTIVE:

DOE Order 5400.1 Chapter IV Item 10 (R-166) requires a quality assurance program for environmental monitoring that includes laboratory quality control, record keeping, audits, and independent verification. The mandatory quality assurance standard, ASME NQA-1 (R-180), requires that records furnish documentary evidence of quality. They must be retrievable, auditable, and stamped, initialed, or signed and dated by an authorized individual. Site Health Protection procedure, DPSOL 292-610, "Records Management" (R-45), requires that records furnishing physical evidence of the quality of an item or activity be maintained and permit identification and traceability. In addition, records are only considered valid when authenticated (signed and dated) by the originator. Changes must be initialed and dated.

FINDING:

Worksheets, documenting calculations of tritium stack discharges, are not retained. The total discharge value is transferred to a weekly report form and the supporting calculations are discarded. The data entries on the weekly report form are not signed or initialed and dated by the individual that developed or verified the data. Changes on the weekly report form are not always notated by initial and date.

DISCUSSION:

Tritium stack emissions are continuously monitored by Kanne chambers and the results are recorded as Curies per minute on a strip-chart recorder. At the start of each shift, an integration of the previous shift's release is performed by hand calculation. The final result of the calculation is transferred to the appropriate blank on a weekly record form, following which the supporting calculations are discarded; therefore, the accuracy of the original calculations cannot be checked or verified. The strip charts are retained and could be reintegrated. Entries onto the weekly report form are not identified as to the individual responsible for the data calculations, although the health protection inspector does initial and date the routine survey checklist to indicate task completion. Several instances of changes to data on the weekly forms were noted; changes were

accomplished by lining out the original entry and writing in the new value, but the changes were not signed/initialed and dated.

Supervisory or quality assurance personnel do not periodically audit or verify the accuracy of calculations or review and approve stack release reports.

PROBABLE CAUSAL FACTORS:

Inadequate procedures and lack of oversight.

ASSESSMENT DISCIPLINE: Radiation

ASSESSMENT FINDING NUMBER: R/BMP-1

ASSESSMENT FINDING TITLE: Lack of Comprehensive Environmental and Effluent Monitoring Plans

PERFORMANCE OBJECTIVE:

DOE Order 5400.1 requires each site that uses, generates, or releases significant pollutants or hazardous materials (radioactive and/or non-radioactive) to prepare a written environmental monitoring plan describing the rationale and design criteria for the monitoring program, responsibilities, procedures, QA requirements, etc. The plan must address both effluent monitoring and environmental surveillance. Draft DOE Order 5400.XY requires a similar plan; also, 40 CFR 61 requires a quality assurance program of comparable content for facilities conducting airborne effluent monitoring under NESHAP.

FINDING:

WSRC has not developed a comprehensive environmental monitoring plan for its effluent monitoring and environmental surveillance programs.

DISCUSSION:

WSRC conducts an extensive program of environmental sampling monitoring and effluent monitoring. Portions of this program are described in the annual Environmental Reports (R-41), site procedure manuals (R-10, R-11, R-12, R-18), and numerous other documents prepared by WSRC and DOE. However, all pertinent information has not been combined into a single document. Also, the design bases and rationale for sampling locations, frequencies, and methodologies have not been developed. An external critique of the environmental radiological monitoring program at the Savannah River Site, performed in 1985 by the Radiological Assessments Corporation (R-7) described a need for evaluating the choice of sampling and analysis activities. The need for a comprehensive plan was identified by a previous DOE functional appraisal, "Environmental Radiological Sampling Functional Appraisal", September 1988 (R-4). Such information is currently required for air effluent monitoring, under 40 CFR 61 (NESHAP)(R-164). In addition, DOE Order 5400.1 (Chapter IV) (R-166) requires a monitoring plan be developed by 11/91 and draft DOE Order 5400.XY (R-169) specifies such a plan be developed within 12 months and implemented within 36 months of the effective date of issuance. Annual review of this plan and periodic updates will also be required.

PROBABLE CAUSAL FACTORS:

Inadequate management oversight.

ASSESSMENT DISCIPLINE: Radiation

ASSESSMENT FINDING NUMBER: R/BMP-2

ASSESSMENT FINDING TITLE: Unauthorized Radiological Criteria and Inadequate Quality Assurance Program for Disposal in Sanitary Landfill

PERFORMANCE OBJECTIVE:

DOE Order 5400.5 (R-168) requires that guidelines for residual radiological content of material and equipment being released from radiological controls or restrictions be developed and submitted to DOE/EH for authorization. WSRC procedures for sanitary landfill disposal of "clean" waste from radiologically regulated areas, define radiological criteria which the waste must satisfy and establish administrative controls and monitoring requirements for meeting the criteria.

FINDINGS:

WSRC criteria for release of segregated "clean" waste from radiologically regulated areas to a sanitary landfill have not been authorized by DOE/EH. The quality assurance program is not adequate to evaluate compliance with the requirements for such wastes, as stated in DPSOX 10068 (R-38) and DPSOL 221-F-8044 (R-39).

DISCUSSION:

WSRC criteria for segregated "clean" waste from radiologically regulated areas are that the waste contain no alpha or tritium contaminated material and that the total package content be less than 10 nCi of beta-gamma emitting radionuclides. Exclusion of alpha and tritium waste is by administrative control; process knowledge of waste generator operations is used to determine facilities from which segregated "clean" waste will be accepted. To evaluate compliance with 10 nCi limit, waste boxes are monitored at the generating facility and also by Waste Management Operations, using a sensitive commercial gamma measuring system. The criteria and monitoring procedure have not received authorization by DOE, as specified in DOE Order 5400.5, Chapter II, item 11.C.(6). A listing of generators or facilities which are approved to send such wastes to the Landfill Monitoring Facility has not been developed; a mechanism to check received packages against an approved originator list is therefore not available. Testing of individual packages of waste indicates that about one half of the packages received contain in excess of the allowable 10 nCi beta-gamma activity level. This indicates

that administrative control alone is not effective and raises a question regarding the possibility of alpha and tritium contamination in the packages. Because alpha and low-energy beta (from tritium) radiations cannot be detected by external measurement methods, a program of periodic package content inspection would be required to evaluate performance.

PROBABLE CAUSAL FACTORS:

Inadequate policy implementation and oversight.

ASSESSMENT DISCIPLINE: Radiation

ASSESSMENT FINDING NUMBER: R/BMP-3

ASSESSMENT FINDING TITLE: Deficiencies in Air Emissions Sampling/Monitoring Program

PERFORMANCE OBJECTIVE:

"Effluent monitoring shall comply with applicable regulations and shall be conducted to provide representative measurements of the quantities and concentrations of pollutants..." (DOE Order 5400.1, Chapter IV, 5.a.2) (R-166). Reference standard ANSI N13.1 (R-162) and draft DOE Order 5400.XY (Chapter III) (R-169) provide guidance for acceptable radionuclide air effluent measurement systems. This guidance addresses such aspects as sample extraction (isokinetic and multipoint sampling), sample transport to minimize line losses, collecting and monitoring devices, measurement of flow in effluent and monitoring systems, analytical procedures, and quality assurance programs to assure proper system performance. ANSI N42.18 (R-163), a mandatory standard for continuous monitoring of effluents, also requires representative sampling and specifies measurement sensitivities of systems for various radionuclides.

FINDING:

The design and operation of many of the WSRC stack effluent measurement systems are such that draft DOE Order 5400.XY, ANSI N13.1, and ANSI N42.18 are not being met; there is not supportive documentation to demonstrate that representative measurements are being performed.

DISCUSSION:

Guidance and requirements for various aspects of air effluent measurement systems are summarized below:

1. Sample Extraction - Probe location should be at points where flow patterns are not markedly distorted due to duct bends, transitions, and entries. Generally, sampling points should be a minimum of 5 duct diameters downstream of disturbances. Sampling from vertical runs is preferable to sampling from horizontal runs. Probe designs should avoid abrupt changes in flow direction; probes should be readily removable for replacement, cleaning, and inspection. When sampling particulates, sample extraction should be at the same velocity as the duct flow (isokinetic) to avoid size fractionation.

2. Sample Transport Lines - Sampling lines should be as short as possible and of a diameter that assures an adequate transport velocity is maintained to avoid loss by deposition. Elbows, sharp bends, constrictions, and other obstructions in lines should be avoided. Heat tracing should be provided, where necessary, to prevent loss of sample through condensation within the sample line. Particulate sampling lines should be electrically grounded to prevent deposition by electrostatic forces .

3. Sample Collection Devices - Collection devices should be selected on the basis of the radionuclides of interest and the stack emission characteristics. Collector housings should be designed to minimize sample loss. Collection efficiencies should be determined. Continuous monitoring systems should have sensitivities consistent with ANSI N42.18. Monitors must have NIST-traceable calibration.

4. Flow Measurement - Velocity distribution should be determined at the sampling location to assure that flow is developed and mixing is complete. Sampling flows should be continuously measured; measuring devices should be calibrated at least annually. Measurements of bulk effluent flows should be consistent with those of sampling flows.

5. Continuous Monitoring Systems - Sampling must be representative. The sensitivity of the monitoring system must satisfy the requirements of ANSI N42.18.

Reviews of data, reports, and correspondence; discussions with site personnel; and field observations of stack sampling and monitoring systems identified numerous deficiencies in the air effluent measurement program. Most of these deficiencies are already known to the site and have been identified in self assessments and described in previous documents, including the DOE Environmental Survey Report (R-181), an interoffice memo (R-9), and WSRC comments (R-35) on the anticipated impacts of draft DOE Order 5400.XY. Action plans to address deficiencies on some major systems have been developed. Specifications (R-17) for new installations have been developed, and recently completed or upgraded sampling systems are being designed in accordance with the guidelines.

The following table provides examples of some specific deficiencies, identified during this appraisal. It should be noted that this table is not intended as an extensive or all-inclusive listing of the deficiencies of WSRC air effluent monitoring systems, but rather to show problem areas that may be

indicative of general deficiencies in systems, including those not specifically assessed during this appraisal.

Estimated radiation doses to the public from WSRC air emissions are well within the EPA and DOE criteria. It is unlikely that correction of the deficiencies identified on the present systems would change this conclusion. However, the deficiencies do serve to challenge the credibility of reported emissions from current and past operations.

PROBABLE CAUSAL FACTORS:

Lack of policy implementation and inadequate funding support.

TABLE BMP-3

Examples of Emission Monitoring System Deficiencies Identified/Observed During Appraisal

Deficiency	Emission Source (Stack)								
	232H Line[3]	291F	221-1F A Line	241-H Annulus and Purge[b]	773 Sand-filter	420D	244H	321M	105L
Sample Extraction									
Probe Location	c		x	x	x			x	
Probe Design	x	x	x	x	x	x	x	x	x
Isokinetic Sampling	x	x	x	x	x	x	x	x	x
Multipoint Sampling			x	x	x	x	x	x	x
Sample Transport									
Line Diameter	x	x	x		x	x			
Line Length	x	x	x	x	x	x	x	x	x
Obstruction	x		x	x	x	x	x	x	
Heat Tracing	x		x	x	x	x	x	x	x
Flow Measurement									
Sample Flowmeter Calibration	x			x	x	x	x		
Stack Flow Data	x	x		x	x	x	x		x
Monitoring Device									
Sample Collectors									
Continuous Monitors	x						x		

(a) Table is not intended to be inclusive of all site emission sources.
(b) Applicable to some systems; systems are not identical.
(c) Blank indicates deficiency not observed -- deficiency may exist.

ASSESSMENT DISCIPLINE: Radiation

ASSESSMENT FINDING NUMBER: R/BMP-4

ASSESSMENT FINDING TITLE: Inappropriate Radiological Criteria for Hazardous Waste/Mixed Waste Classification

PERFORMANCE OBJECTIVE:

DOE Order 5400.3 (R-167) requires that a waste, containing both a radiological component and a non-radiological hazardous component, be classified as "mixed" waste. That order does not define the radioactivity level at which the waste is to be considered radioactive, but DOE Order 5400.5 (R-168) provides guidance on concentrations of radionuclides, which may be released to the public or environment without need for radiological controls.

FINDING:

WSRC's Waste Management Program is applying a radiological concentration of 2 nCi/g (for all radionuclides) as a level below which a waste is considered to be non-radioactive. If an otherwise hazardous waste is considered non-radioactive, i.e., below 2 nCi/g, it is not required to be managed as a "mixed" waste.

DISCUSSION:

DOE Order 5400.3 and EPA regulation, Title 40 CFR Part 261, (R-182) specify that a waste containing both a radioactive and nonradioactive hazardous component must be classified as "mixed" waste. These regulations do not provide definitive guidance on the radiological concentration at which a material is to be considered a mixed waste. The generator of these wastes is responsible for this decision - either on a general or a case-specific basis.

WSRC is using a radiologic concentration level of 2 nCi/g as a criteria for determining whether or not a waste is radioactive. This concentration level was adopted from transportation regulations (DOE Order 1540.2 (R-183) and DOT regulation Title 49 CFR Part 173 (R-165); for the purpose of those regulations the 2 nCi/g concentration is intended as a level below which a material is not considered radioactive from the standpoint of regulating its packaging, labeling, and shipping - it is not the intent that materials containing less than 2 nCi/g should be exempt from all radiological controls.

Hazardous waste at a radioactivity level of up to 2 nCi/g is shipped by WSRC for offsite processing by incineration or treatment at commercial facilities. The processing facilities have been advised that the content is considered non-radioactive by DOT regulations, and WSRC has received correspondence from waste processors, indicating that their firms are willing to accept such waste (R-47, R-48). It should be noted that these processing facilities do not possess radioactive material licenses, issued by the NRC or state regulatory agencies. Depending upon the level, total quantity, and specific radionuclides, there may be restrictions by such regulatory agencies on the receipt, use, processing, and disposal of wastes containing less than 2 nCi/g.

Because different radionuclides may have considerably different levels of dose associated with a given amount of activity and exposure scenario, it is common practice in the health physics profession to develop radionuclide-specific and case-specific guidelines for acceptable levels. For example, one of the major DOE sites uses a fraction of the derived concentration guides (DCG's) for ingested water (from DOE Order 5400.5) as a concentration criteria for what is considered radioactive for mixed waste classification purposes. These DCG's were established on the basis of specific radionuclides. The DCG for tritium - the predominant radionuclide containment in the WSRC hazardous waste - is 2 nCi/g; however, for other radionuclides the DCG may be orders of magnitude less than 2 nCi/g. For example, DCG's for some common radioactive materials at WSRC are: Cs-137, 1 nCi/g; Sr-90, 0.001 nCi/g; and Pu-239, 0.00003 nCi/g. Other DOE facilities have employed different methodologies to develop such criteria; an example is the use of concentrations that have been established for decommissioning sites for release to unrestricted public use.

This particular mixed waste criteria concern exists throughout the DOE complex; it is an example of the type of issue that could be addressed by DOE/HQ under the provisions of DOE Order 5400.2A (R-178).

PROBABLE CAUSAL FACTORS:

Lack of Policy Guidance.

3.5.9 Inactive Waste Sites and Releases

3.5.9.1 Overview

The inactive waste sites and releases assessment of the SRS evaluated the compliance status of the site with regard to the statutory provisions of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA), Resource Conservation and Recovery Act (RCRA) as amended by the Hazardous Solid Waste Amendments (HSWA), the proposed National Contingency Plan (NCP), RCRA regulations, State regulations, applicable DOE Orders, and a National Resources Defense Council (NRDC) Consent Decree. The specific regulatory requirements against which the SRS was assessed are presented in Table 3.5.9-1. The goals of the assessment were to determine whether the current activities performed under the Site's environmental restoration program fulfill the requirements of CERCLA and RCRA, determine the adequacy of the methods used to quantify spills and spill reporting procedures, determine whether federally-owned property associated with SRS has been transferred, and if so, the adequacy of the procedures used to ensure acceptability for release/ transfer. To accomplish the assessment, investigations were conducted at the site consisting of interviews with DOE-SR, WSRC and other contractor personnel; visits to selected inactive sites; and extensive review of documents, plans, sampling records, and internal policies and procedures.

The basic framework for assessing inactive waste sites and developing closure, post-closure, and remedial action plans at SRS is based on the requirements of RCRA, CERCLA, South Carolina Solid Waste Regulations (nonhazardous sites), South Carolina Hazardous Waste Management Regulation and the South Carolina Pollution Control Act. Waste site closure and remedial actions are also regulated by DOE.

Historically, RCRA has been the regulatory driver of the inactive waste site program at SRS. RCRA waste units are included in the RCRA Part A and Part B permit program for the Site. A large number of inactive waste sites are either scheduled for RCRA closures or are incorporated into the RCRA Facility Investigation (RFI) Program.

A June 1988 Consent Decree to resolve a lawsuit by the NRDC and South Carolina Department of Health and Environmental Control (SCDHEC) stated that the Metallurgical Basin, the F, H, P and K Acid/Caustic Basins and the Mixed Waste Management Facility require closure under RCRA, while the SRL Seepage Basins and the New TNX Basins would be closed in accordance with the Consent

Decree. The F, H, P and K Acid/Caustic Basins, the SRL Seepage Basins and the New TNX Basins are included in the RFI program.

The Environmental Protection Agency (EPA) proposed the SRS for inclusion on the National Priorities List (NPL) in Update Nine to the NPL published on July 14, 1989, and the SRS was finally listed on the NPL on December 21, 1989. In addition, DOE Order 5400.4 which became effective on October 6, 1989 requires DOE facilities to perform response actions in accordance with CERCLA regardless of whether the facility is included on the NPL.

In anticipation of the SRS being placed on the NPL, DOE-SR, EPA, and SCDHEC began negotiations in 1988 on a Federal Facilities Agreement (FFA) to satisfy the requirements of Section 120 of CERCLA. The scope of the resulting draft FFA directs the comprehensive environmental restoration of the Site. It contains requirements for investigation and remediation of releases and potential releases of hazardous substances, and interim status corrective action of releases of hazardous wastes or hazardous constituents. It expands on the investigation process begun at the SRS under the RCRA permit to address releases at or from units not included in the RCRA permit, and releases of hazardous or radioactive substances, or both, not regulated by the RCRA permit. Hazardous substances as defined by CERCLA are addressed in the RCRA corrective action program as a matter of comity to achieve CERCLA integration. The FFA also establishes requirements for the prevention and mitigation of releases or potential releases at or from high-level radioactive waste tank systems at the SRS.

In order to accomplish these goals, the FFA establishes a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions at the SRS in accordance with CERCLA, the NCP, RCRA, National Environmental Policy Act (NEPA), and applicable South Carolina State law. In effect, the FFA integrates the required response actions under CERCLA with the corrective measures now being conducted under the RCRA permit and State law.

Negotiations on the FFA are continuing as a tri-party agreement between EPA, DOE and the State. However, it is possible that EPA and the State may not resolve differences relative to the FFA. This could result in EPA seeking a two-party agreement with DOE. The technical and legal aspects of the agreements are still in negotiation.

3.5.9.2 Evaluation

A significant level of activity has occurred and continues to occur in an effort to address the environmental effects of past

waste disposal practices at the SRS. The SRS strategy for prioritizing waste site closures and remedial actions is to: 1) address sites that pose an imminent threat to human health and the environment, 2) meet regulatory requirements, 3) address sites close to the boundary of SRS, and 4) address the remaining sites according to the type of waste disposed at the site. Those sites that are handled in the SRS RCRA program are currently the priority sites for closure. Major facilities undergoing closure at the time of the assessment are the Mixed Waste Management Facility, the F- and H-Areas Seepage Basins, and the M-Area Settling Basin. The Metallurgical Lab Basin and Carolina Bay Closure Plans are currently undergoing review by EPA.

Currently, the SRS RCRA Part B permit identifies 79 sites for which RFIs are required. These detailed assessments are scheduled in the permit and will determine the nature, extent and potential pathways of contaminant releases to air, land, surface water and groundwater. Currently, the site is on schedule to provide deliverables to the regulators specified by the RFI Program. In addition, the site is actively integrating CERCLA requirements into the RFI program to bring these investigations into a remedial investigation equivalency as required in the draft FFA. Upon execution of the FFA and complete integration of CERCLA requirements into the SRS RCRA Corrective Action Program, only one equivalent Remedial Investigation/RCRA Facility Inspection (RI/RFI) and Feasibility Study/Corrective Measures Study (FS/CMS) will be required for each operable unit at the site.

Because of delays in negotiating the FFA and realizing the full scope of CERCLA's application to the site, the CERCLA inactive waste site program is largely in the planning stages. Over 130 operable units (grouped inactive waste sites or releases that may include the RFI sites) have been identified at the SRS that will be addressed under the FFA. Timely execution of the FFA is essential for the site to initiate the RI/FS process for those sites not included in the RFI Program.

Even in the absence of an executed FFA, SRS has initiated several activities related to integrating CERCLA requirements for future investigations. As part of the environmental restoration program, SRS has prepared a site-specific 5-year plan that provides a broad framework of the major activities that will be required to investigate and remediate inactive waste sites over the next five years. This plan specifies the tentative scope, schedule and budget for completing RI/FSs, initiating remedial actions where appropriate, and continued waste site closure. SRS recognizes that additional detailed technical plans and guidance will need to be developed over the next two years to direct specific CERCLA investigation activities.

The one compliance and four best management practice findings identified relate to three major areas of the Site's environmental restoration program: 1) the timely execution of the FFA and the consequences that may result from delays in negotiations, 2) identification of potential inactive sites that may require investigation and/or remediation, and 3) the initial planning and procedures required for a CERCLA compliant program.

Overall, SRS has taken positive steps toward implementing an environmental restoration program for their inactive waste sites, recognizing in most cases the extensive timeframe and scope of activities that will be required to meet the requirements of CERCLA. SRS is actively pursuing the integration of CERCLA requirements into the RCRA Corrective Action Program at the Site such as the establishment of an administrative record and risk assessment approach. In addition, significant research efforts are underway to provide improvements in the restoration efforts at the Site. These research efforts include ground water modeling applications, remediation of volatile organic contamination in vadose zones by application of horizontal well technology and numerous projects involving hazardous waste treatability studies.

TABLE 3.5.9-1

Applicable Inactive Waste Site Regulations/Requirements/Guidelines

Regulations/ Requirements/ Guidelines	Section/Title	Authority
CERCLA/SARA		
103	Notifications	EPA
104	Response Authority	
113(k)	Administrative Record	
117	Public Participations	
118	Drinking Water Supply Priority	
120	Federal Facilities	
120(h)	Federal Property Transfers	
121	Cleanup Standards	
40 CFR 264 Subpart F	Releases from Solid Waste Management Units	EPA
40 CFR 300	National Contingency Plan	EPA
40 CFR 302	Designation, Reportable Quantities, and Notification	EPA
40 CFR 373	Reporting Hazardous Substance Activity When Transferring Federal Real Property	EPA
DOE Order 5400.4	CERCLA Requirements	DOE
Executive Order 12580	Superfund Implementation	President
Federal Facility Agreement	Environmental Restoration Agreement for the Savannah River Site	DOE, EPA State of South Carolina
Civil Action No. 1:85-2583-6	NRDC Consent Decree	SCDHEC

3.5.9.3 Findings

ASSESSMENT DISCIPLINE: Inactive Waste Sites

ASSESSMENT FINDING NUMBER: IWS/CF-1

ASSESSMENT FINDING TITLE: Failure to Address Inactive Hazardous Substance Sites In A Prompt Manner

PERFORMANCE OBJECTIVE:

40 CFR 300.405(f) of the National Oil and Hazardous Substance Contingency Plan (NCP) requires that when a release of a hazardous substance, pollutant or contaminant is discovered, a removal site evaluation shall, as appropriate be promptly undertaken pursuant to 300.410. This evaluation shall determine if a removal action is necessary. If a removal action is not required, 40 CFR 300.420 requires a remedial site evaluation (i.e., preliminary assessment and/or site investigation) be conducted to determine if a remedial action is required.

FINDING:

Currently there are potential inactive hazardous substance sites which are not included in the RFI program or on the CERCLA Operable Units List and have not been addressed in a prompt manner.

DISCUSSION:

A small number of potential inactive hazardous substance sites at SRS have not been evaluated in a prompt manner to prevent, minimize, or mitigate damage to public health, welfare or the environment. According to WSRC, sites with the highest potential for environmental impact were evaluated first and the remainder prioritized for future investigation. Sites, which have not been addressed in a prompt manner, include but are not limited to, the creosote railroad tie storage area, the arsenic treated wood burning area, sandblast areas, the Fire Training Pit at 709-1F, and process and construction sewer lines located on SRS. If a timely removal site evaluation of an inactive hazardous substance site is not conducted, the potential exists for the migration of contamination from the site via the various environmental media, such as groundwater and surface water. An average of 6 months is currently required to conduct a site evaluation. However, for some sites a longer period of time has been required to conduct the evaluation and determine whether the site will be included on the CERCLA Operable Unit List or in the RFI program. Therefore, this lengthy screening process creates a potential delay in addressing sites which may pose an imminent threat to human

health or the environment, and require an emergency response be implemented.

PROBABLE CAUSAL FACTORS:

Inadequate procedure for implementing CERCLA requirements.

ASSESSMENT DISCIPLINE: Inactive Waste Sites

ASSESSMENT FINDING NUMBER: IWS/BMP-1

ASSESSMENT FINDING TITLE: Inadequate Reporting Procedures for Potential Hazardous Substance Sites

PERFORMANCE OBJECTIVE:

DOE Order 5400.4 states "Heads of Field Organizations, at the DOE facilities for which they are responsible shall (1) gather information with respect to releases and potentially imminent releases of hazardous substances and maintain a field organization-wide record of all actions taken under this Order, CERCLA, as amended, the NCP, and applicable DOE policies, requirements and procedures related to such releases, (2) take such actions as they deem necessary to assure that all field organization personnel responsible for conducting activities under this Order have maintained contact, as necessary, with appropriate EPA, State, and local officials with regard to the need for and execution of response actions; have obtained all appropriate EPA guidance documents applicable to the CERCLA related steps for which they are responsible; and have received training designed to ensure DOE compliance with applicable CERCLA requirements.

FINDING:

Procedures for reporting potential hazardous substance sites have not been developed for each contractor operating at SRS. These procedures have neither been prepared by WSRC or provided by DOE-SR to other DOE-SR contractors or government agencies performing work at SRS.

DISCUSSION:

A written procedure for reporting a potential inactive hazardous substance/waste site has not been provided by DOE-SR to other DOE-SR contractors and other government agencies located or performing work at SRS. A procedure which delineates the appropriate DOE-SR or WSRC contacts for reporting sites and identifying the time frame when notification should be made is needed. Currently, WSRC is responsible for determining whether the potential new sites which are identified at SRS are sites which (1) pose a potential imminent threat/hazard, (2) are RCRA SWMUs or (3) are CERCLA Operable Units. Interviews which were held with the various WSRC operating groups, DOE-SR contractors and government agencies determined the groups were reporting the discovery of potential new inactive hazardous substance sites at different time intervals to WSRC. Some groups report a site

immediately upon discovery and some groups report potential new sites to WSRC once a quarter. Reporting the location or description of a potential new site to WSRC is verbal and no written record is provided to WSRC or DOE-SR.

It should be noted that WSRC-EPS is currently revising the Waste Site Closure Manual and this document will contain a procedure for WSRC Operating Groups to use in reporting sites to WSRC-EPS. A similar document or procedure has not been developed by DOE-SR for use by the DOE-SR contractors and other government agencies conducting business at SRS.

PROBABLE CAUSAL FACTORS:

Inadequate policy implementation.

ASSESSMENT DISCIPLINE: Inactive Waste Sites

ASSESSMENT FINDING NUMBER: IWS/BMP-2

ASSESSMENT FINDING TITLE: Inadequate Criteria and Documentation for the CERCLA Operable Unit List

PERFORMANCE OBJECTIVE:

DOE Order 5400.4 states "It is the policy of DOE to respond to releases of hazardous substance.... DOE responses shall include both removal and/or remedial actions, as applicable, to reduce adverse impacts on public health and the environment from releases regardless of whether the facility is listed on the National Priorities List."

FINDING:

The criteria used to establish which sites are included as CERCLA Operable Units and the associated documentation are inadequate.

DISCUSSION:

The potential for a release to the environment exists from sites which are not currently included on the CERCLA Operable Unit List. In some cases, known releases of a hazardous substance have occurred at sites located at SRS and these sites are not included on the CERCLA Operable Unit List. Previous Du Pont and WSRC assessments and reports have identified sites which may have had potential releases of hazardous substances to the environment (C*-20H, -22H) and are not currently included on the CERCLA Operable Units List. A formal criteria has not been established to delineate the requirements WSRC is using to establish sites which are to be included in the CERCLA Operable Unit List. A record has not been prepared for each inactive hazardous substance site located at SRS which documents the evaluation for inclusion on the CERCLA Operable Unit List. Such a record would document the criteria which was used to assess a site and determine whether the site would be included on or excluded from the CERCLA Operable Unit List.

The existence of sites which have had releases to the environment but are not currently included in the CERCLA Operable Unit program may not meet the intent of the DOE Order 5400.4. These areas include sites where radionuclides have been released, abandoned underground storage tanks and other miscellaneous areas. Sites which have had releases of radionuclides to the environment include, but are not limited to, the C-, K-, P- and L-Reactor Disassembly Basins, the H-Area Tank 37, and the old

K-Area radioactive disposal site, and sites addressed in the Stephens and Ross report (C*-20H).

The SRS has several abandoned underground storage tanks which were associated with the former towns of Ellenton and Dunbarton. These towns were at one time located within the plant boundary at SRS. These tanks were abandoned prior to the date of January 1, 1974, which was established as the regulatory deadline for notification of existing tanks by the Federal regulations governing petroleum underground storage tanks. Initial soil and soil gas sampling have been performed to determine if a release has occurred (C*-23H). The initial investigation which was performed was limited in the depth soil samples were collected and the parameters for which samples were analyzed. Based on the limited scope of the initial investigation, these sites may present a potential source for groundwater and soil contamination from the release of hazardous substances, such as lead, benzene, toluene and xylene. These sites are not included on the CERCLA Operable Unit List.

Previous reports and assessments prepared by Du Pont and WSRC identify additional sites which may have had release of hazardous substances to the environment. These sites include, but are not limited to, the Sludge Drying Bed from the Old F-Area Sanitary Treatment Plant, various septic tanks located on SRS, the 709-1F Fire Training Pit, and the arsenic treated wood burning area. In accordance with DOE Order 5400.4 these sites need be evaluated against formal criteria and this evaluation process documented. These sites are not currently included on the CERCLA Operable Unit program.

PROBABLE CAUSAL FACTOR:

Inadequate policy implementation; inadequate documentation of the evaluation process for the CERCLA Operable Unit program.

ASSESSMENT DISCIPLINE: Inactive Waste Sites

ASSESSMENT FINDING NUMBER: IWS/BMP-3

ASSESSMENT FINDING TITLE: Lack of a Consolidated Database to Track Site Investigation and Remediation Activities.

PERFORMANCE OBJECTIVE:

Good management practice requires the establishment of a consolidated database to track site investigation and remediation activities.

FINDING:

A consolidated database has not been established to track discovery, investigation, remediation activities, and regulatory deadlines. This is especially important considering the number of RCRA SWMUs to be addressed in the RFI program, and the number of CERCLA Operable Units which will also be addressed as defined by the timetable established in the final version of the FFA.

DISCUSSION:

As the number of Operable Units and RFI sites which are in different stages of investigation and/or remediation increases with time, difficulties may be encountered in tracking the activities ongoing at each site and the regulatory timeframes. The establishment of a database to track RCRA SWMUs and CERCLA Operable Unit activities is especially important. The custodian for each area is responsible for preparation of the RFI or RI plan, and EPS and SR must review each plan prior to submittal to the regulatory agency to insure the plan meets the requirements outlined in the FFA, and is submitted by the date which it is due. It should be noted that EPS is in the process of preparing a database to track the RFI site activities.

PROBABLE CAUSAL FACTORS:

Increasing regulatory requirements.

ASSESSMENT DISCIPLINE: Inactive Waste Sites

ASSESSMENT FINDING NUMBER: IWS/BMP-4

ASSESSMENT FINDING TITLE: Significant Issues Relevant to Federal Facilities Agreement (FFA) Negotiations that Impact Future CERCLA Compliance Status

PERFORMANCE OBJECTIVE:

DOE Order 5400.4, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Requirements, states that it is the policy of DOE to respond to releases of hazardous substances in accordance with the provisions of CERCLA, as amended, as well as those of the National Contingency Plan (NCP) and Executive Order 12580. DOE responses shall include both removal and/or remedial actions, as appropriate, to reduce adverse impacts on public health and the environment regardless of whether the facility is listed on the National Priorities List (NPL). CERCLA Section 120 (a) requires that no later than 6 months after inclusion on the NPL, DOE shall commence a remedial investigation and feasibility study for the facility.

FINDING:

A CERCLA compliant environmental restoration program will not be fully implemented at SRS in accordance with the requirements of DOE Order 5400.4 until negotiations on the FFA are complete. Several important issues relative to FFA negotiations that directly impact the future CERCLA compliance status of the facility have been identified. These issues include:

- Timely execution of the FFA and the substantive differences between EPA Region IV and the State relative to the negotiations.

- Lack of attention to CERCLA/NEPA integration as required by DOE Order 5400.4.

- Potential impacts of the reserved conflict-of-interest provision in DOE Order 5400.4.

- Ability of EPA and the State to provide the staffing and resources necessary to perform review and oversight functions required by the Agreement.

- Negotiation of a separate funding agreement to provide cost recovery of State expenses incurred through the implementation of the FFA.

DISCUSSION:

DOE Order 5400.4 became effective on October 6, 1989, and requires DOE facilities to perform environmental response actions in accordance with CERCLA, as amended, regardless of whether the facility is on the NPL. The SRS was officially listed on the NPL in December, 1989. In anticipation of SRS being placed on the NPL; DOE, EPA Region IV, and SCDHEC began negotiations on a FFA to satisfy the interagency agreement requirements of CERCLA Section 120. The scope of the FFA directs the comprehensive environmental restoration of the SRS. It contains the requirements for site investigation and remediation of releases and potential releases of hazardous substances. It would also expand SRS's corrective action process begun at the SRS under the RCRA permit to address releases at or from units not included in the RCRA permit, and releases of hazardous or radioactive substances, or both, not regulated by the RCRA permit. FFA negotiations have been conducted for the last two years, during which time DOE has elected to continue the RCRA Facility Investigations (RFI) as scheduled in the RCRA permit. Hazardous substances as defined by CERCLA are being addressed under the RFI program as a matter of comity to achieve CERCLA integration into the investigations performed under the RFI program.

The RFI Program at SRS is currently addressing a total of 79 solid waste management units (SWMUs). The scope of the FFA groups these SWMUs and other known or potential waste sites or releases into over 130 operable units. Although investigation planning has been initiated for the RFI Program, integration of CERCLA provisions into a complete environmental restoration program at SRS will not take effect until FFA negotiations are complete. Several CERCLA required elements currently being developed by the Site for implementation under the FFA include: 1) establishment of a Community Relations Plan, 2) establishment of an Administrative Record, and 3) meeting the natural resource trustee notification responsibilities in past or current CERCLA-related negotiations. Several issues crucial to the successful negotiation and execution of the FFA have been identified during the audit and are described in this finding as follows.

1. Timely execution of the FFA and the substantive differences between EPA Region IV and SCDHEC relative to negotiations.

In September 1989, the State of South Carolina formally withdrew from the FFA negotiations over conflicts EPA Region IV relative to regulatory jurisdiction. In February 1990, the State submitted a letter to EPA outlining proposed amendments to the current FFA draft. Three areas of substantive differences were identified to include dispute resolution, the necessity for the Site to obtain State permits for remedial actions, and the

inclusion of the high level radioactive waste tank section in the Agreement. The ability of the State and EPA to resolve their differences in the negotiations is of primary importance to DOE. EPA has indicated that they will seek a two-party agreement with DOE should the State not be able to resolve their differences in the negotiations. DOE-SR Operations position on this matter is that a three- vs two-party agreement is preferred. EPA has further indicated that they will seek a consent order under CERCLA to force SRS into a CERCLA compliant track should a three- or two-party agreement fail to be negotiated with DOE in a timely manner.

Timely execution of the FFA is critical for SRS to remain on an environmental restoration track compliant with CERCLA. Since the Site is listed on the NPL, execution of the FFA, complete integration of CERCLA requirements in the RFI Program, initiation of the RI/FS process for identified operable units not included in the RFI Program, and establishment of a Community Relations Plan and Administrative Record are all essential CERCLA required elements that need to be in place as soon as possible for SRS to achieve full compliance in FY 90 and beyond.

2. Lack of attention to CERCLA/NEPA integration as required by DOE Order 5400.4.

DOE Order 5400.4 states that where DOE remedial actions under CERCLA trigger the procedures set forth in NEPA, it is the policy of DOE to integrate the procedural and documentation requirements of CERCLA and NEPA, wherever practical. The primary mechanism for this integration is the RI/FS process. The draft of the FFA reviewed at the time of the audit does not address these NEPA integration requirements or provide a mechanism to implement NEPA/CERCLA integration. It is essential that NEPA requirements for a given remedial action be identified as early in the RI/FS process as possible. Should it be determined that NEPA procedures are required for a given operable unit at a late stage in the RI/FS process, separate RI/FS and EIS document requirement tracks could develop. This could potentially lead to significant impacts on schedules and costs for remediation.

3. Potential impacts of the reserved conflict-of-interest provision in DOE order 5400.4.

DOE Order 5400.4 contains a proposed conflict-of-interest provision currently being considered in a reserved section of the Order. The provision essentially states that contractors selected to perform RI/FS work shall be required to execute a disclosure statement specifying that they have no financial or other interest in the outcome of the project. Assuming the FFA is executed in a timely manner and the conflict-of-interest

provision proposed by DOE remains intact, SRS would immediately be faced with a CERCLA non-compliant posture. The provision would force SRS to procure yet another contractor to perform RI/FS work, which could arguably include the RFI Program SWMUs once the FFA is negotiated.

The process of acclimating another contractor to the environmental restoration program at SRS would require a phased approach which would be costly and could result in substantial delays to the environmental restoration program schedule proposed in the FFA.

4. Ability of EPA and the State to provide the staffing and resources necessary to perform review and oversight functions required by the Agreement.

Interviews with EPA personnel have indicated that once environmental restoration programs gain momentum at SRS and other DOE facilities in Region IV, they will not have the personnel or the resources to keep up with document review and oversight duties required by interagency agreements. Current EPA Region IV staffing and budget projections for CERCLA programs related to Federal Facilities will not keep up with the projected demands associated with the SRS and Oak Ridge FFAs alone.

5. Negotiation of a separate funding agreement to provide cost recovery of State expenses incurred through the implementation of the FFA.

In parallel to the FFA negotiations, it is anticipated that DOE and SCDHEC will negotiate a separate funding agreement to allow for recovery of State expenses incurred through the implementation of the FFA. Once again, the timely execution of the FFA is contingent upon another variable that involves tough negotiations and funding considerations. Should this agreement not be in place at the time the FFA is finalized, delays in the State's participation may impact the environmental restoration program schedule at the Site.

PROBABLE CAUSAL FACTORS:

Competing regulatory jurisdiction relative to FFA negotiations. New DOE policy considerations.

3.5.10 National Environmental Policy Act

3.5.10.1 Overview

The purpose of the National Environmental Policy Act (NEPA) portion of the environmental assessment was to: 1) evaluate NEPA management structure and NEPA review processes at the Savannah River Site; 2) identify problems that may lead to inappropriate procedures or inadequate NEPA documentation; and 3) evaluate compliance with the NEPA, Council on Environmental Quality (CEQ) regulations, and DOE NEPA Guidelines, Orders, and Memoranda.

Responsibility for the NEPA program for the site is with the Savannah River Operations Office (DOE-SR). The authority for determining and documenting the level of NEPA review required has been delegated to the Operations Offices, although a recent DOE Notice (SEN-15-90) withdraws some of this authority.

NEPA documentation for the site consists of eight Environmental Impact Statements (EISs), seven final Environmental Assessments (EAs), and, since 1985, approximately 65 Memoranda-to-File (MTFs). Environmental Impact Statements are required in NEPA for "major federal actions significantly affecting the quality of the human environment" (Pub. L. 91-190, 42 U.S.C. 4321 et seq.). Several such major actions could be expected for operations of the size and complexity of those at SRS, and indeed the site has eight existing EISs and others in the planning stage. Environmental Assessments are required by NEPA for cases where the need for an EIS is not clear or to comply with NEPA when an EIS is not needed. Many such actions would be expected for operations of the size and complexity of those at SRS; the site has seven existing EAs and others in the planning stage. A Memorandum-to-File is a DOE mechanism for documenting that the environmental impacts of an action are "clearly insignificant" and, therefore, no further NEPA documentation is required. For operations of the size and complexity of those at SRS, a large number of activities would be expected to require no more than a MTF.

The NEPA portion of the environmental assessment resulted in three compliance findings: (1) implementing DOE NEPA procedures, (2) inappropriate use of MTFs, and (3) insufficient level of NEPA documentation. In addition, the assessment identified two best management findings dealing with tiering to site EISs and with WSRC NEPA procedures.

Compliance with the procedural provisions of NEPA was evaluated based on the CEQ regulations for implementing NEPA (40 CFR 1500-1508). Additional documents used in the assessment process are listed in Table 3.5.10-1.

TABLE 3.5.10-1

List of Applicable National Environmental Policy Act Regulations/Requirements/Guidelines

Citation	Title/Section	Authority
P. L. 91-90 (January 1, 1970)	National Environmental Policy Act (NEPA)	U.S.Congress
40 CFR 1500-1508 (November 28, 1978)	Regulations for Implementing the Procedural Requirements of NEPA	Council on Environmental Quality (CEQ)
10 CFR 1021 (July 30,1979)	Compliance with the National Environmental Policy Act	DOE
52 FR 47662-47670 (December 15, 1987)	DOE Compliance with the National Environmental Policy Act (NEPA); amendments to the DOE NEPA Guidelines	DOE
DOE Order 5440.1C (April 9, 1985)	NEPA	DOE
DOE Order 5400.1 (November 9, 1988)	General Environmental Protection Program	DOE
DOE Order 5400.4 (October 6, 1989)	Comprehensive Environmental Response, Compensation, and Liability Act Requirements (CERCLA RI/FS and NEPA	DOE
10 CFR 1022 (March 7, 1977)	Compliance with Floodplain/Wetlands Environmental Review Requirements	DOE
No Citation	DOE Environmental Compliance Guide (1981)	DOE
No Citation	DOE NEPA Compliance Guide (Draft) (1988)	DOE
No Citation	NEPA Guidance related to Memorandum-to-file and Categorical Exclusion (March 25, 1988)	DOE

3.5.10.2 Evaluation

Evaluation of compliance with the National Environmental Policy Act (NEPA) at the SRS was approached from a number of different standpoints, ranging from examination of the capabilities of the DOE-SR and WSRC staffs to implement NEPA, to review of the site's NEPA documents and files. The following sections describe general areas examined, approaches used to evaluate adequacy in each area, and general findings.

The general approach to the NEPA assessment included interviews, document reviews, and onsite verification. Interviews were conducted with WSRC and DOE-SR staff responsible for NEPA compliance, the legal staff, and others. Documents were reviewed for adequacy in relation to (1) compliance with environmental laws, regulations, and guidelines, (2) use for reference or tiering, and (3) best industry practices.

Organization and Procedures for Implementing NEPA

To ensure that proposed actions are given the proper level of NEPA consideration, both the DOE-SR and WSRC staff must have a clear understanding of the requirements of NEPA, CEQ, and relevant DOE Orders, Notices, and guidance. Further, the staff should have formal, written procedures for implementing NEPA that accurately reflect the above requirements. The Environment Subteam assessment of SRS capabilities in this area was accomplished by interviewing DOE-SR and WSRC staff that have specific NEPA responsibilities, and by comparing written procedures against CEQ and DOE requirements.

The overall impression of the administration of NEPA at the SRS is very favorable. The DOE-SR NEPA staff are experienced and have a good understanding of their role in the NEPA process. The DOE-SR staff attend bi-weekly meetings with WSRC staff to discuss NEPA issues and to facilitate DOE's NEPA determinations. This degree of communication between the operating contractor (which proposes the actions) and the DOE Operations Office (which makes the NEPA determinations) is excellent, and should be continued. Similarly, coordination with DOE-HQ on NEPA issues appears to be good. DOE-SR NEPA staff are encouraged to participate in training courses for both NEPA and related issues (e.g., wetlands assessment). The recognized need for continuing education has been formalized by the use of systematic profiles to match the staff's job description with available training. Finally, approximately annual audits of Du Pont's (the former contractor) and now WSRC's NEPA status by DOE-SR have been valuable for fostering correct procedures and documentation.

WSRC also has developed an excellent system for implementing NEPA reviews. The custodians (i.e., WSRC project proponents) are required to fill out an Environmental Evaluation Checklist for all proposed actions except purchase requisitions and direct repair type orders. The Checklist conveys information about potential environmental impacts to WSRC Environmental Protection Section (EPS) staff for their consideration. The Checklists are reviewed in bi-weekly meetings with DOE-SR, thereby enabling DOE staff to keep informed of WSRC activities and make the necessary NEPA determination. WSRC provides a NEPA orientation session for anyone who may be involved in preparing Checklists, EPS staff, and newly promoted frontline managers. WSRC maintains good project files, and has generally done a thorough job in keeping up with project modifications that could require subsequent NEPA consideration. Finally, the EPS is developing a computerized "commitment tracking" system which will assist them in adhering to monitoring and mitigation commitments made in NEPA documents.

On the negative side, both DOE-SR and WSRC written procedures for implementing NEPA are inadequate and have yet to be revised (Finding NEPA/CF-1 and NEPA/BMP-2). Although in practice NEPA reviews and determinations are now generally conducted appropriately, the written procedures have not reflected changes in either NEPA requirements or actual conduct of activities at SRS. The need to update and correct SRS written NEPA procedures is particularly important in light of major changes resulting from the recently issued SEN-15-90.

Environmental Impact Statements

During the SRS assessment, existing EISs were reviewed to ascertain the degree to which they complied with the CEQ implementing regulations for NEPA (40 CFR 1500-1508) and pursuant DOE Guidelines. In addition, various supporting documents and procedures were reviewed.

The existing EISs for the site are not ideally suitable for site-wide NEPA coverage and for tiering of future NEPA actions (NEPA/BMP-1). Moreover, they contain numerous minor inadequacies or omissions relative to the CEQ implementing regulations. Although required notifications for EISs generally have been made in a timely manner, apparently no Record of Decision (ROD) was prepared or issued for the original site EIS, ERDA-1537 (N-108). On the other hand, the most recent EISs are thorough and complete, and have been prepared in a timely, professional manner. The SRS has issued a commendably thorough preliminary draft guide for EIS preparation (N-130) which promises to be very useful in the areas of training and communication. The contractor maintains an effective and knowledgeable organization

for integrating environmental concerns under NEPA with planning and implementing of site projects and activities.

Environmental Assessments

During the SRS assessment, existing EAs were reviewed to ascertain the degree to which they complied with the CEQ implementing regulations for NEPA (40 CFR 1500-1508) and pursuant DOE Guidelines. In addition, various supporting documents and procedures were reviewed.

The existing EAs for the site do not list agencies and persons consulted, and some state that no outside consultation occurred. The CEQ regulations require that consultation be documented (40 CFR 1508.9(b)); moreover, seeking and documenting outside advice and concurrence leads to better judgments, often aids acceptance, and may increase perceived credibility.

Memoranda-to-File

During the SRS assessment, about 65 MTFs and other related documents (e.g., Environmental Checklists and Evaluations) were reviewed to ascertain the extent to which such activities had received NEPA consideration as provided in DOE Guidelines, and whether a significant number of actions had been inappropriately dismissed by an MTF when some higher level of NEPA documentation should have been undertaken.

Several MTFs were reviewed which appeared to require, but did not receive, additional NEPA coverage (NEPA/CF-2). Overall, however, the site uses MTFs appropriately to deal with the many actions of minor environmental consequence.

NEPA Coverage of Modifications

Environmental Checklists, Site Use Permits, Test Authorizations, and MTFs are used constructively by SRS to document and review changes to larger actions which were originally covered in an EA or EIS. It is commendable that SRS has a mechanism for tracking changes in proposed actions. In some cases, however, the modifications appeared to require more NEPA documentation than provided. For example, the DWPF underwent post-EIS modifications which were inadequately covered by MTFs (NEPA/CF-2). Similarly, the FMF was modified and is being decommissioned without appropriate coverage (NEPA/CF-3).

Lack of NEPA Coverage

In general, the appropriate NEPA documents have been prepared for actions at the SRS. However, a notable exception is the ETF,

which was inadequately covered, first by a brief discussion in an EIS and subsequently in an MTF (NEPA/CF-2).

An examination of selected documents from the WSRC NEPA files revealed several proposed actions for which MTFs have not been written. Failure to prepare an MTF is not an infraction of NEPA or CEQ regulations, but exemplifies an inconsistent approach to the preparation of NEPA-related documents. It is a best management practice to remain consistent in preparation of documentation, even though the documentation may not be required.

3.5.10.3 Findings

ASSESSMENT DISCIPLINE: NEPA

ASSESSMENT FINDING NUMBER: NEPA/CF-1

ASSESSMENT FINDING TITLE: Outdated DOE-SR NEPA Implementation Plan

PERFORMANCE OBJECTIVE:

Under DOE Order 5440.1C(6)(c)(10), Responsible Supervisory Officials or their designees are directed to establish identifiable procedures to ensure that environmental factors are adequately considered. By memorandum dated 03/04/81, authority for such matters at the SRS was delegated to the Savannah River Operations Office. Much of this authority has since been withdrawn by SEN-15-90.

FINDING:

The Savannah River Operations Office (DOE-SR) Implementation Plan for DOE Order 5440 ("Savannah River Operations Office Plan for Implementing Its Delegated Authorities Under DOE 5440.1B Implementing the National Environmental Policy Act") does not reflect current DOE NEPA policy as defined in DOE Order 5440.1C and associated memoranda and notices.

DISCUSSION:

The Site Implementation Plan for NEPA provided by DOE-SR was apparently never finalized and is clearly out of date. The document provides inadequate and incorrect information in delineating responsibilities and providing guidance for implementation of NEPA at the site. Specific deficiencies in the DOE-SR Implementation Plan include:

(1) incorrect references to DOE Order 5440.1B, which was replaced by DOE Order 5440.1C in 1985;

(2) failure to cite formal DOE NEPA guidance memoranda (e.g., analysis of worker impacts in NEPA documentation);

(3) delegation of MTF approval authority to DOE-SR line Assistant Managers, now rescinded by SEN-15-90 (N-127).

(4) failure to identify DOE Order 5400.4 (10-6-89), which calls for the integration of procedural and documentation requirements of CERCLA and NEPA, wherever practical.

Although DOE-SR staff are implementing NEPA correctly the formal procedures need to be updated, particularly in light of the recently issued SEN-15-90 and DOE Order 5400.4.

PROBABLE CAUSAL FACTORS:

Inadequate procedures.

ASSESSMENT DISCIPLINE: NEPA

ASSESSMENT FINDING NUMBER: NEPA/CF-2

ASSESSMENT FINDING TITLE: Deficiencies in Memoranda-to-File

PERFORMANCE OBJECTIVE:

Memoranda-to-File (MTFs) should be used only for proposed actions that have clearly insignificant environmental impacts, as per Memoranda from EH entitled "Initiation of NEPA Documentation", October 29, 1981, and "NEPA Guidance Related to Memorandums-to-File and Categorical Exclusions," March 25, 1988; and DOE Order 5440.1C.

FINDING:

About 65 MTFs issued since 1985, and other related documents (e.g., Environmental Checklists, Environmental Evaluations, and older MTFs) were reviewed. For the actions covered by MTFs, DOE-SR determined that no significant impacts would result and that no further analysis was required. For two projects discussed below, this conclusion was not supported by the information provided in the MTF and associated documents. For these, DOE Action Description Memoranda should have been prepared and forwarded to the Office of NEPA Project Assistance, EH-25, for the
determination of appropriate NEPA documentation. Minor procedural inconsistencies were noted for five additional MTFs.

DISCUSSION:

An MTF is to be prepared by the Responsible Supervisory Official (RSO) under specified criteria. The criteria were presented in a guidance memorandum of 10/29/81 from Asst. Sec. Vaughan, which stated "If a proposed action requires analysis of questions related to DOE control and jurisdiction, or environmental data gathering or analysis to reach a conclusion, then it fails the test of clearly insignificant and an ADM, Action Description Memorandum, as outlined in the DOE Environmental Compliance Guide, should be prepared and submitted" for the appropriate level (i.e., EA, EIS, or supplemental EIS) of NEPA determination.

The following actions were judged to have been inappropriately covered by MTFs:

- Defense Waste Processing Facility (DWPF) -- Several post-EIS modifications associated with the DWPF were undertaken before receiving NEPA review and have not received the appropriate level of review. These modifications were judged in MTFs

(N-052 and N-053) to have clearly insignificant environmental impacts. Modifications not analyzed in DOE/EIS-0082 include:

- environmental releases (atmospheric and/or aqueous) of several toxic and/or radioactive contaminants (e.g., benzene, NO_x, N_2O, Hg, C-14, and tritium).

- discharge of wastewaters to the only remaining relatively undisturbed stream (Upper Three Runs Creek) draining SRS.

- changes in the low level waste form and disposal method, requiring more than three times the land disposal area predicted in the FEIS.

- larger facilities for storage of more than twice as many high level waste canisters, each with 50% more radioactivity but 50% less exposure at one meter than predicted.

The Environmental Division of DOE-SR has since recognized the need for further NEPA review and has recently prepared an Environmental Analysis (pursuant to DOE NEPA Guidelines C.2(a)) to determine whether a supplemental EIS is in order. The modifications, however, are already underway or completed.

- Effluent Treatment Facility (ETF) -- Construction and operation of the ETF were covered in an MTF (N-034). The impacts of this facility, however, are not clearly insignificant. In particular, the scope of the project and the discharge of relatively large quantities of largely uncharacterized, but radioactively and chemically contaminated effluent into one of the least disturbed streams on the SRS call for at least the ADM level of analysis. In addition, no NEPA documentation consistent with CEQ and DOE requirements could be found for subsequent changes in the filtering procedure (continued reliance on activated charcoal) and associated increased waste disposal.

In addition, the following MTFs exhibited minor deficiencies as noted:

- Two MTFs (N-003 and N-022) should have provided more detail to document the basis for the determination that effects were clearly insignificant (i.e; for the former, neither construction impacts nor the eventual disposition of the GFD are discussed; for the latter, insufficient information was provided with regard to protection of wildlife).

- Two MTFs (N-010 and N-054) did not cite the relevant EIS clearly enough to allow independent evaluation of the determination.

- The Uranium Solidification Facility was correctly judged as "substantially the same as" an earlier action (N-067 and N-107). However, DOE NEPA procedures (DOE Order 5440.1C (6) (C) (2)) require that an MTF be written when using this categorical exclusion, and none was found in the project files.

PROBABLE CAUSAL FACTORS:

Inadequate procedure.

ASSESSMENT DISCIPLINE: NEPA

ASSESSMENT FINDING NUMBER: NEPA/CF-3

ASSESSMENT FINDING TITLE: Insufficient Level of NEPA Documentation for the Naval Fuels Material Facility (FMF)

PERFORMANCE OBJECTIVE:

According to the DOE NEPA Compliance Guide, memoranda-to-file (MTFs) are intended for use only in circumstances where it is immediately clear that a proposed action will have no significant impacts. MTFs should be used where the action is clearly insignificant, and not used to provide supplemental analyses to a NEPA document. If a proposed action requires environmental data gathering or analysis to reach a conclusion, then it fails the MTF test of clearly insignificant and an EA or EIS is necessary.

FINDING:

A comparison between the assessed Naval Fuel Materials Facility (FMF) processes/operations (N-101) and the modified as-built FMF processes/operations indicate that the as-assessed and as-built project impacts are not identical. An MTF (N-93) presents modifications to the EA (N-101) as clearly insignificant on the basis of a referenced environmental evaluation impact analysis, contrary to the DOE MTF guidance. This MTF (N-99) is incorporated by reference into a subsequent MTF (N-36) and also concludes the impacts from the design changes are clearly insignificant. The FMF is currently being placed into cold standby mode and undergoing decontamination operations (N-100). This status was not discussed in the original EA. An analysis, entitled Environmental Information (N-100), was prepared for the shutdown operation and is currently being reviewed by DOE for NEPA consideration. The lack of any cumulative assessment of these or the related impacts in original EA (N-101) would appear to be significant and warrant additional environmental analysis in the form of a revised NEPA document.

DISCUSSION:

Review of records (N-93 through N-101) and interviews indicate that numerous changes from the Naval Fuels Material Facility (FMF) not envisioned in the EA were covered by a series of MTFs and non-NEPA documents (listed in N-99) that cumulatively are beyond the scope described in the original EA. Although SRS staff have developed internal environmental impact analyses (referenced in N-93) to demonstrate that the project

modifications were insignificant, the DOE NEPA Compliance Guide states that memoranda-to-file (MTFs) are intended for use only in circumstances where it is immediately clear that a proposed action will have no significant impacts. If the proposed action requires environmental data gathering or analysis to reach a conclusion, then it fails the MTF test of clearly insignificant and an EA or EIS is necessary. This would appear to indicate that the assessment of project modifications through MTFs was inappropriate.

Examples of modifications from the EA (N-101) that were considered to be clearly insignificant in subsequent MTFs and other memos:

- Increase of estimated FMF radioactive waste from 140 cubic meters per year to 720 cubic meters per year (N-99).

- Increase of FMF low-level radioactive waste from 570 cubic meters per year (N-101) to 2,300 cubic meters per year (N-36).

- Establishment of uranium content standards for the disposed solid waste. The wastes are to be measured for uranium content (N-101), while a modification in an MTF states that up to 70 kilograms/year of uranium could be contained in these wastes (N-36).

- Increase of the annual estimated radioactive releases from the solid wastes from an initial level of 0.6 curies (N-101) to a new level of 7.5 curies (N-99).

- Changes in content of air emissions produced by FMF operation from 4 pollutants (N-101) to a new total of 17 (N-36).

- Increases in the number of air emission discharge sources from one 200-foot stack (N-101) to 13 additional vents that range from 42.5 feet to 108 feet (N-36). These air emission point sources were later altered to 108 feet for the main stack and vent heights from 12 feet to 50 feet (N-99).

The environmental consequences of decontamination and decommissioning assessed in Section 5.5 of the EA for Naval Reactor Fuel Materials (N-101) briefly stated that the FMF total containment design will facilitate decontamination and decommissioning (D & D) and is expected to result in minimal radiological impacts. However, the impacts of converting the facility to cold standby status and the impacts of the corresponding decontamination procedures and radiological wastes generated by these operations apparently are not considered D & D operations by SRS personnel. Additional NEPA documentation would

appear to be appropriate to cover these formerly unassessed impacts. SRS staff have recognized this departure from the EA-analyzed operations and have submitted an analysis (Environmental Information - N-100) for the cold standby conversion operation to be reviewed by DOE for NEPA consideration. The recommendation from this analysis (N-100) is that the standby operations are clearly insignificant and that the Environmental Information be tiered to the FMF EA.

An example of modifications from the EA (N-101) that were considered to be clearly insignificant in Environmental Information document (N-100):

- The associated decontamination processes conducted during these cold standby operations are projected to probably exceed the annual forecasted amount of 60 kilograms of discarded uranium (in the enlarged 2300 cubic meter volume established in N-36) and the 10 kilograms of discarded uranium (in the enlarged 720 cubic meter volume established in N-99) with additional modifications in waste disposal practices.

PROBABLE CAUSAL FACTORS:

Inadequate policy implementation.

ASSESSMENT DISCIPLINE: NEPA

ASSESSMENT FINDING NUMBER: NEPA/BMP-1

ASSESSMENT FINDING TITLE: Inadequacy of Site EISs for Tiering

PERFORMANCE OBJECTIVE:

The CEQ regulations of 40 CFR 1502.20 and 1508.28 encourage the use of tiering as a means to eliminate repetitive discussions so that subsequent environmental assessments or analyses can concentrate on issues specific to a proposed action. Guidance from the CEQ (46 FR 18026 - 18038) also supports the preparation of "area-wide or overview" EISs (for analysis of the affected environment and potential cumulative impacts) when reasonably foreseeable or proposed agency actions share common timing or geography. The CEQ regulations also recognize that EISs may cease to represent current conditions, and specify the circumstances for which preparation of a supplemental EIS is required.

FINDING:

There are eight EISs that cover various aspects of previous and current operations at the SRS. All are available for reference or for tiering of MTFs, EAs, and new EISs. Individual EISs have various deficiencies which make them inappropriate for at least some of these potential uses. As a result, the EISs for the site are not ideally suitable for reference or tiering.

DISCUSSION:

Many of the older EISs are not suitable for tiering because they no longer represent current conditions, are deficient in numerous areas, and/or they predate new guidelines and requirements (e.g., RCRA/CERCLA issues, impacts to workers). Although the more recent EISs, taken together, give reasonably good coverage for sitewide environmental issues for the purpose of tiering, no one of them is entirely suitable on its own. Use of the EISs for reference or tiering is confusing and must be undertaken with considerable care. Deficiencies encountered in the EISs are summarized in the accompanying table.

No single sitewide environmental document (whether an EIS or other publicly available analysis) provides a comprehensive assessment of the environment over the entire site. The details of endangered and threatened species, floodplains and wetlands, historical and archaeological sites, radiological characteristics, waste storage and disposal, air and water emissions, decontamination and decommissioning plans, and

cumulative impacts of operation have not been drawn together at a sitewide scale suitable for tiering or reference.

In particular, there has been an increasing emphasis on worker health and safety in recent years (memorandum of June 10, 1988 from Asst. Sec. Baynard); these issues are not adequately covered in the most recent EISs (N-113, N-114, and N-115), which predate the memorandum. Because recent studies reported in BEIR V (N-129) indicate that cancer risks from low-level radiological exposure are three to four times greater than previously believed, discussions of health effects to worker and offsite populations in the recent EISs may be obsolete.

Also of concern is the treatment of cumulative impacts in the latest three EISs. The subjects treated in the cumulative impact sections of these documents differ and are not directly or easily comparable. For example, the L-reactor EIS (N-113) tabulates total body radiation dose, whereas the Groundwater Protection EIS (N-115) discusses health effects. Thus, it is difficult to develop an understanding of all potential cumulative impacts for the entire site. Moreover, the focus in these EISs is less than sitewide, and some cumulative impacts may be overlooked, under-treated, or unnecessarily qualitative.

DOE-SR consideration of the need for and type of sitewide environmental document to address these concerns should take into account the forthcoming agency-wide policy for development and updating of sitewide EISs called for in DOE Notice SEN-15-90 (N-127).

PROBABLE CAUSAL FACTORS:

Inadequate policy.

SRS EIS DEFICIENCIES[1]

DEFICIENCY	EIS No.: 1537	0023	0046	0062	0082	0108	0120	0121
cover sheet	x	x						
purpose & need	x							
preparers	x	x	x					
agencies consulted	x	x						
index	x	x	x	x				
alternatives		x						
compare impacts	x							
direct/indirect				x				
cumulative		x		x				
significance	x		x		x	x	x	
E&TS	x	x	x	x	x			
Archeological	x		x	x				
F/W	x	x	x	x			x	
recreational	x	x		x				
FWCA	x	x	x	x			x	
Air		x	x	x			x	
Noise	x	x		x				
Pesticides							x	

1 Symbol indicates that EIS was in some way deficient with regard to topic. Table does not include topics that apparently do not apply to site (i.e., American Indian Religious Freedom Act; Food Security Act; Coastal Zone Management Act; Wild and Scenic Rivers or National Trails System).

SRS EIS DEFICIENCIES[1]

DEFICIENCY	EIS No.: 1537	0023	0046	0062	0082	0108	0120	0121
Workers/nonrad		x	x	x	x	x	x	
Workers/rad		x	x	x	x	x	x	
public/nonrad		x	x	x	x			
public/rad				x	x			
Environment/nonrad	x	x	x	x				
Environment/rad		x		x	x	(D&D) x		
Socioeconomics		x	x	x	x			

1 Symbol indicates that EIS was in some way deficient with regard to topic. Table does not include topics that apparently do not apply to site (i.e., American Indian Religious Freedom Act; Food Security Act; Coastal Zone Management Act; Wild and Scenic Rivers or National Trails System).

ASSESSMENT DISCIPLINE: NEPA

ASSESSMENT FINDING NUMBER: NEPA/BMP-2

ASSESSMENT FINDING TITLE: Inadequate WSRC NEPA Procedures

PERFORMANCE OBJECTIVE:

WSRC NEPA procedures for determining the level of NEPA review should be consistent with DOE Order 5440.1C and the delegation of NEPA authority. Authority to make NEPA determinations based on Section D of the DOE NEPA Guidelines has been delegated to DOE-SR.

FINDING:

Existing WSRC written procedures for NEPA evaluations (N-118, N-120) could allow NEPA determinations to be made by WSRC personnel, rather than the appropriate DOE personnel. This could occur for proposed actions which WSRC considers to have "no impact" (i.e., categorical exclusions and actions which are "clearly insignificant") or for Memoranda-to-File prepared by WSRC for Test Authorizations.

DISCUSSION:

The formal procedures used by WSRC to implement NEPA review (N-118, N-120) have been carried over from existing DuPont procedures (N-117, N-119). There are several aspects of these procedures which are not consistent with DOE Order 5440.1C, DOE NEPA Guidelines, and the delegation of authority for NEPA determinations by DP to DOE-SR. These aspects include:

(1) Environmental Evaluation Checklists that contain information needed to make a NEPA determination are not required for all projects, but rather only for projects costing $250,000 or more, all Test Authorizations, and any other activity judged (by WSRC) to have a "high potential" for significant impacts, regardless of cost. Because this procedure does not explicitly require the input of DOE, WSRC could determine that a project is categorically excluded from NEPA documentation or is "clearly insignificant", without having the authority to do so. Such determinations by WSRC are conveyed to the custodian in a letter which states that no additional NEPA documentation (NAD) is required. There is no indication in the procedure that DOE-SR is a part of, or is necessarily informed about, these decisions.

(2) The written WSRC NEPA procedures note that DuPont (and by extension, WSRC) issues final Memoranda-to-File (MTFs) for

test authorizations and transmits information copies to DOE-SR. Only DOE has the authority to issue final MTFs. WSRC has recognized these deficiencies, and has begun to correct them both in the manner in which NEPA reviews are presently conducted and by developing new, draft procedures (N-121, N-122). The new procedures call for the preparation of Environmental Evaluation Checklists for all proposed WSRC activities except purchase requisitions and direct repair type orders. The status of all activities under consideration are now reviewed in routine meetings with DOE-SR NEPA personnel, thereby keeping DOE informed of contractor activities in a timely manner. These new, draft procedures will need to be revised to reflect the recent DOE Order regarding NEPA (SEN-15-90; February 5, 1990, N-127) before formal implementation at the SRS.

PROBABLE CAUSAL FACTORS:

Inadequate procedures.

3.5.11 Special Issues and Noteworthy Practice

ASSESSMENT DISCIPLINE: SPECIAL ISSUE

ASSESSMENT FINDING NUMBER: SI/NWP-1

ASSESSMENT FINDING TITLE: Environmental Protection Program Guide

PERFORMANCE OBJECTIVE:

The performance objective is to have available a general information guide that outlines and describes succinctly and in sufficient detail the overall function and management of the Savannah River Site's Environmental Division.

FINDING:

The U.S. Department of Energy (DOE)-Savannah River Operations Office (SR) has produced a well organized and researched, exceptionally detailed, easy-to-understand, Environmental Protection Program Guide (Guide) that provides comprehensive information on the site-wide operation of the SR Environmental Division (ED). The development of these documents have resulted in the ED being fully knowledgeable of the SRS compliance status and proactive towards regulatory change.

DISCUSSION:

The Guide, in a three volume set, provides enough SRS background information and program detail to familiarize a wide audience, both on and off-site, with a clear and concise understanding of the responsibilities of the ED. In the first volume of the Guide, the historic background and mission of the SRS is presented; this is followed by a further breakdown as to the organizational structure of DOE-SR and its relationship with major SR contractors who have significant roles in the environmental protection program. The Guide goes on to identify the mission of the ED, its mandates and policies regarding environmental protection activities, its internal functional organization and management structure for coordinating the four environmental program branches it is ultimately responsible for, and the Division's environmental interface with several organizations regarding SRS environmental protection activities. The entire ED Environmental Protection Program is structured around addressing issues and concerns in principally the areas of environmental compliance, environmental research, and natural resource management.

In the final chapter of the first volume of the Guide, the reader is introduced to the three ED work categories of program documentation responsibility; i.e., personnel management and administrative functions; ED technical implementation of environmental protection activities (e.g., policy development, permit acquisition, report submittal, resource management); and ED technical evaluation of work overseen by or under the ED's jurisdiction (e.g., appraisals, audits, inspections, surveillances). The documents identified in each of the ED work categories are called out in the Environmental Protection Implementation Plan (EPIP) and provide more detail on the specific aspects of the ED Environmental Protection Program.

Essentially, there are three ED report types, Division Administration, Technical Implementation, and Technical Evaluation. Six reports have thus far been generated under the category of Division Administration. These reports include:

(a) two Environmental Division Operating Reference Manuals, one being a general description of the ED organization, staffing, and responsibilities; the other on the technical functions of the ED and what the staff does in the course of performing technical work;

(b) two reports that are for Environmental Compliance Tracking; the first being a weekly report on the status of activities of ED related to regulatory and programmatic requirements, and the other being a three volume set comprised of a compilation of reference documents relevant to the operations of ED (consent orders, settlement agreements, memoranda of understanding and agreement, etc.);

(c) a document on Letters of Guidance that summarizes and provides historical references for Letters of Guidance from the ED to contractors regarding environmental compliance and programmatic activities; and

(d) a document on Environmental Division Friday Flashes which compiles weekly notices of significant ED events.

Eleven reports have been produced under the category of Technical Implementation. These reports include:

(a) a document on the Three Year SRP Permitting Activities Schedule; a semi-annual schedule that summarizes all activities related to permit submittals, permit maintenance, and permit-related reporting for SRS;

(b) two Environmental Compliance Implementation Plans; one on project compliance--the procedures and information needed to determine the compliance requirements for a new project, timing for initiation of activities, and procedural guidelines on how to meet compliance requirements; and the second plan on operational compliance--the specific requirements and commitments associated with individual facilities and activities and procedures for assuring compliance with these requirements and commitments;

(c) an Environmental Division Unplanned Release Response Manual that delineates ED responsibilities and procedures for responding to unplanned operations releases that impact or have potential impact on the environment;

(d) two reports concerning SRS's geoscience program: the Geoscience Program Report which describes the program, organizations and processes which implement and control the program; and the second report on the Geoscience Implementation Plan which identifies plans and schedules for implementing the Geoscience Program;

(e) a Radiological Environmental Program Report which provides the objectives and requirements of the Environmental Radiological Monitoring Programs at SRS; the Effluent and Environmental Radiological Programs for each SRS area, and the Environmental Technology Development Programs conducted by the SRL, SREL and the SCWRC;

(f) a three volume report on the Air Program at SRS which provides information on the air quality regulations, permits, and sources on the SRS;

(g) a Programmatic Summary Report which provides an overview of the ED Environmental Programs Branch programmatic activities in Environmental Technology Development and Natural Resource Management during each fiscal year;

(h) a Procedures Guide for Preparation of an Environmental Impact Statement--a step-by-step procedures guide for DOE-SR staff and contractors on how to prepare an environmental impact statement; and

(i) a Waste Management Program Report (draft in preparation) which describes SRS's hazardous and nonhazardous

waste management program, including inactive waste sites.

In the final report category of Technical Evaluation, there have been three reports generated. These include:

(a) a report on the Comprehensive Environmental Protection Evaluation Program (formerly the Comprehensive Environmental Protection Appraisal Plan)--a description of the ED's program for evaluation of environmental programs at SRS in accordance with DOE and SR appraisals, audits, inspections, and surveillances, and a summary of corrective action tracking and follow-up;

(b) an Environmental Compliance Implementation Plan, Volume III: Compliance Implementation Evaluation Report for 1985, 1986, 1987, and 1988--an evaluation on how well SRS has complied with the requirements and commitments identified in CIP II for ongoing operations and projects at SRS. The CIP III also provides a description of future compliance items for the next year, 2 years, and 3 to 5 years. Over time, the CIP III will also provide the basis for a trend analysis of environmental compliance activities; and

(c) an Environmental Protection Program Annual Overview and Status Summary for 1985, 1986, and 1987.

ASSESSMENT DISCIPLINE: SPECIAL ISSUE

ASSESSMENT FINDING NUMBER: SI/BMP-1

ASSESSMENT FINDING TITLE: Inadequate Timely Responses by Department of Energy (DOE) - Headquarters (HQ) Organizations to Regulatory Schedules and Environmental Commitments

PERFORMANCE OBJECTIVE:

DOE Order 5400.1 requires that Headquarters organizations are responsible for timely review, resolution, and dissemination of significant environmental compliance issues. DOE Order 5400.2A requires that all DOE organizations shall respond to, provide, or advise each other as to the status of significant issues and related reviews, comments, and resolutions of those issues. Secretary of Energy Notice (SEN) 6, 6A, and 13 also realign the structure of various offices within the Department and set forth coordination and action requirements of each office.

FINDING:

DOE-HQ and SRS organizations have not provided timely responses to various significant environmental commitments and reports. This failure has impacted the SRS relationship with regulators, and potentially compromises the future compliance status of SRS.

DISCUSSION:

SEN 6, 6A, and 13 reorganized the several of the offices within the DOE complex in late 1989. Apparently, the reorganization is continuing to develop, and the alignment of personnel and responsibilities is not completely clear cut at this time. It has been noted that, on various occasions, DOE-HQ, DOE-SR, and WSRC have failed to provide a timely response to significant environmental issues. In several instances, DOE-SR has asked regulatory agencies (South Carolina Department of Health and Environmental Control (SCDHEC) and United States Environmental Protection Agency (USEPA - Region IV) for extensions on many compliance-related due dates. These delays are obviously occurring at WSRC, DOE-SR, or DOE-HQ.

DOE-SR has not consistently submitted timely reports to SCDHEC. SCDHEC generally allows industry 15 - 30 days to respond to review comments on issues or to submit compliance reports. In the case of DOE-SR and WSRC, SCDHEC has extended a courtesy and has allowed the site 90 days to respond. In some instances, the site has not been able to meet even this extended time frame.

For example, the F-and H-Area seepage basin groundwater monitoring wells quarterly report submitted for the third quarter of 1989 required an extra thirty days to submit. The report was submitted on February 1, 1990, resulting in a total of 120 days to submit a routine compliance report. This situation leads to the potential for reviewing monitoring well data that may be as old as seven months. Other instances that involve delays in submission to regulatory agencies are detailed below.

- F- and H-Areas borrow pits 4th quarter groundwater monitoring wells report was submitted 4 months late to SCDHEC (e.e., in July 1989). Because of the untimely submission, a Notice of Violation (NOV) was issued to DOE-SR;

- The TNX area Organic Removal Demonstration Project Closure Plan was submitted by the site to SCDHEC on January 4, 1990 (the due date was July 7, 1989). The 6 month late submission was due to delays at both DOE-SR and in the HQ coordination process. Further, the submission was made only after SCDHEC coaxed DOE-SR by stating that any further delay was unacceptable. Rather than pursue enforcement actions, as it could have, SCDHEC accepted the late submission;

- Extensions in time have been requested for preparation and/or response to comments involving issue such as minor thermal discharges, fish kills, the Metallurgical Lab seepage basin Groundwater assessment report, and for preparation and submittal of the acid - caustic basins quarterly groundwater monitoring wells report.

These increases in time required to respond to regulatory deadlines are not a function of delays in DOE-SR and WSRC alone, HQ also plays a role. Delays in HQ apparently set the whole review cycle off balance and increase delay time. In general, review of permits and submissions through HQ is slow. A few examples are detailed below.

- DOE-SR submitted the TNX area Organic Removal Demonstration Project Closure Plan to HQ for review in late September 1989. It was not returned to DOE-SR until late December 1989. The document was already two months overdue prior to HQ submittal. It was submitted to the regulators in January 1990.

- The Wetlands Policy issue was addressed to HQ in a memorandum dated July 1989. It took 4 months to reply to DOE-SR and to tell them to follow normal process with the US Army Corps of Engineers;

- The K-Reactor cooling tower budget issue (which affects the project plan) is still in HQ (via DP) for resolution. This issue is now approaching 3 months old;

The regulatory agencies have made mention of issues that are of concern to them also. These were brought up in separate meetings with USEPA and SCDHEC.

- According to SCDHEC, a letter sent through the review and approval cycle in HQ took six weeks to be submitted to them;

- SCDHEC is concerned about the timeliness of SRS permit submittals. In several instances, DOE-SR has submitted completed applications to SCDHEC several days before SRS required the approved permit for use. While SCDHEC states that they are willing to provide a timely turn-around for DOE-SR and WSRC, a time period of several days is unacceptable;

- USEPA indicated that there have been communications difficulties regarding disclosure on such items as described above. This is particularly evident, according to USEPA, when DOE-SR materials are being reviewed by the HQ entities. This issue is highlighted by the 25 issue papers that are in HQ (various entities) for review. EPA - Region IV has been notified of these issues but formal discussions will take place after development of DOE policy.

PROBABLE CAUSAL FACTOR:

Inadequate follow-up of issues due to incomplete alignment of personnel and resources, and inadequate policy implementation by HQ.

ASSESSMENT DISCIPLINE: SPECIAL ISSUE

ASSESSMENT FINDING NUMBER: SI/BMP-2

ASSESSMENT FINDING TITLE: Lack of a Comprehensive Trend Analysis and Corrective Action Program to Reduce System Failures and Environmental Impacts

PERFORMANCE OBJECTIVE:

Best management practice requires the development of a comprehensive trend analysis program that (1) produces measurable performance indicators from documented system failures; (2) provides a mechanism for transfer of information to management for tracking and follow-up of corrective actions; and (3) reduces the frequency of system failures and potential environmental impacts. The development of a site-wide trend analysis program necessitates the recognition and understanding of clearly defined performance measurement criteria, performance improvement objectives, and a realistic implementation plan.

FINDING:

There is no trend analysis program which translates system failures data into measurable performance indicators for the prevention of adverse environmental consequences.

DISCUSSION:

The criteria used in the overall environmental assessment included document reviews, interviews, and observations of facility operations. The SRS's conduct of operations and maintenance activities were evaluated as part of the assessment. Facility operations, processes, and activities were looked at from both a compliance and best management practices viewpoint. This finding is based on an evaluation which includes the site's performance record during the last 18 months.

In this evaluation, many different situations were examined (e.g., environmental assessment findings, reported system failures, UORs, NOVs, INPO Conduct of Operations and Maintenance Assessments, WSRC self-assessments, TSAs, ES&H Performance Appraisals, audits). As a result of these document reviews, interviews, and observations, common threads of repetitive, causative factors were identified. Even more apparent is the potential underreporting of incidents or events sitewide and the lack of a formal review process and trend analysis to assess causative factors associated with these occurrences.

Common system deficiencies were observed sitewide and throughout all levels of line management. These deficiencies include, but are not limited to: (1) March 1990 environmental assessment findings; (2) August 10, 1988, P-Reactor tritium release (#R-63); (3) January 22, 1989, Water Hammer in the Secondary Loop of K-Reactor (#R-64); (4) September 12, 1989, P-Reactor Tampering Incident (#R-62); (5) February 7, 1990, K-Reactor moderator release (#R-65); and (6) January 1990 WSRC Contamination Cases (#R-48). The deficiencies and program weaknesses identified from the environmental findings listed below (grouped by causal factors) are indicative of the continuing system failures prevalent throughout the SRS. These deficiencies and program weaknesses were identified by the authors of the referenced reports.

TIGER TEAM FINDINGS of March 1990

A. Procedures/Policy/Policy Implementation

1. Burma Road Rubble Pile/F-Tank Farm. Hydrogeology, BMP-4: Failure to adhere to established procedures in performing hydrogeologic investigations;

2. SRS Site-wide. Toxic and Chemical Materials, BMP-2: Lack of policy and procedures on management of unused toxic and chemical materials;

3. SRS Site-wide. Toxic and Chemical Materials, BMP-4: Inadequate labeling of chemical storage cabinets;

4. SRS Site-wide. Toxic and Chemical Materials, BMP-5: Lack of comprehensive site-wide asbestos management program;

5. SRS Site-wide. Toxic and Chemical Materials, BMP-6: Inaccessibility of material safety data sheets (MSDS);

6. SRS Site-wide. Quality Assurance, BMP-2: Incomplete and/or deficient EMS procedures;

7. SRS Site-wide. Radiation, BMP-2: Unauthorized radiological criteria and inadequate quality assurance program in sanitary landfill;

8. F- and H-Areas, Effluent Treatment Facility,Reactors. Radiation, CF-2: Inadequate ALARA process for Tritium sources and releases,

9. F/H Effluent Treatment Facility. Surface Water, BMP-4: Inadequate labeling and tagging;

10. Reactors, Radiation, CF-1: Lack of technical specifications which address radiological effluent monitoring requirements;

11. 700-Area (SRL) Tank Farm. Waste Management, CF-4: Technical violations of inventory procedures for Tank 722-4A;

12. F/H Canyons. Waste Management, CF-5: Lack of permit for storage of mixed waste;

13. SRS Site-Wide, Waste Management, BMP-8: Deficient underground storage tank management program;

14. SRS Site-Wide. Waste Management, BMP-11: Inadequate review of staging and satellite area locations and surfaces;

15. SRS Site-Wide. Waste Management, BMP-12: Inadequate policy and procedures for mercury management.

B. Training/Accountability/Oversight

1. SRS Site-wide. Hydrogeology, BMP-5: Lack of adherence to defined responsibility, coordination, and authority between the U.S. Corps of Engineers and the Savannah River Site;

2. SRS Site-wide. Toxic and Chemical Materials, BMP-7: Lack of adequate labeling of secondary containers of chemical substances;

3. SRS Site-wide. Toxic and Chemical Materials, BMP-3: Deficiencies in type, placement and lack of spill cleanup equipment;

4. SRS Site-wide. Quality Assurance, CF-4: Deficiencies in oversight of sampling, analysis, and technical data for SRS environmental protection programs;

5. SRS Site-wide. Surface Water, BMP-3: Inadequate maintenance management system;

6. SRS Site-wide. Surface Water, CF-2: Improper abandonment of drinking water wells;

7. SRS Site-Wide. Waste Management, CF-1: RCRA training program deficiencies;

8. SRS Site-Wide. Waste Management, CF-9: Deficiencies in management of waste drums; and

9. K-Reactor. Waste Management, CF-10: Unavailable contingency plan.

WSRCs CONTAMINATION CASES for the month of January 1990

Review of WSRC's Contamination Cases report for the month of January 1990 (#R-48) identified the occurrence of 14 contamination cases within the following areas; F- and H-Areas, Separations, K-Reactor and just outside the F-Area. The report presents a breakdown of each contamination case by root cause of contamination (e.g., improper removal or protective clothing; inadequate or breakdown in procedure; inadequate procedure in or undetected contamination in area), the level of contamination, the work group involved (i.e., Waste Management Works Operation, Waste Management Works Engineering, Construction, Fire Department, Separations, Reactor, Health Physics), and the exact location of the incident. These cases have causal factors that are comparable to the deficiencies identified in the aforementioned incidents and findings.

Further supporting evidence of continuing system failures were observed where work permits at both F/H Separations and K-Reactor Area were found to improperly specify or define the performance criteria against which these respective jobs were inspected. In both the instances observed, the jobs were approved although it was not clear for what they were being inspected against. In both instances, jobs did not have all essential safety systems to assure safe conduct of the job. In one instance, respirators were approved where smearable contamination was not detected (this job also had individuals in the same room working without respirators).

The causal factors or deficiencies identified in the aforementioned environmental findings and observations are indicative of redundant system failures that continue to occur unchecked site-wide by a comprehensive trend analysis and/or corrective action program. These deficiencies are notably in the following areas:

1. Procedures

    - absence of procedures;
    - inability to follow procedures;
    - use of out-of-date procedures;
    - use of unauthorized procedures;

2. Accountability/Oversight

    - inadequate line management oversight (Du Pont, DOE-SR, WSRC);
    - inadequate (less than professional or responsible) technical support;

- ineffective or inadequate management control programs;
- absence of responsible key or essential personnel in work place at time of operation or maintenance;

3. Training

   - inadequate, incomplete, and sometimes no on-the-job training for line operators (senior operator, shift operators, auxiliary operators);
   - inadequate or lack of training to perform job specific duties;

4. Planning

   - aborted operations or maintenance jobs due to poor or inadequate pre-planning or scheduling; and
   - unavailability of work permits or pre-job briefings in work area.

These aforementioned deficiencies, along with noted recurring environmental impacts, span virtually all major unit operations at the SRS site including Separations, Tritium, M-Area, and Reactors. These deficiencies reflect the need for greater application of trend analysis and corrective actions to reduce the frequency of environmental impacts and contamination incidents. Current WSRC practice does not reflect maximum utilization of "lessons learned" or include, for instance, any relevant applications of applicable technology transfer from similar DOE plutonium handling unit operations (e.g., Oak Ridge [Y-12], Los Alamos [Technical Area 55], Rocky Flats Plant [Bldgs. 371 and 771], and Lawrence Livermore [Special Isotope Separations]). All the noted deficiencies are symptomatic of procedural, planning, oversight/accountability, training problems that need strong corrective action to prevent the recurrence of similar events.

4.0 SAFETY AND HEALTH ASSESSMENT

4.1 PURPOSE

The purpose of the Safety and Health (S&H) Subteams appraisals was to assess the effectiveness of representative safety and health programs at the Savannah River Laboratory (SRL), Tritium Facilities, and selected Waste Management Facilities. Included were the following sitewide programs: Medical Services, Emergency Preparedness, Packaging and Transportation, and Aviation Safety.

4.2 SCOPE

These Technical Safety Appraisals were conducted in accordance with the Procedures for Conducting Technical Safety Appraisals, DOE-EH, January 1990 (TSA Procedures) and Protocol for the Conduct of Concurrent Tiger Team Assessments and Technical Safety Appraisals, January 16, 1990. The S&H Subteams evaluations were performed concurrently with assessments conducted by an Environmental Subteam, a Management Subteam, and an Occupational Safety and Health Administration (OSHA) type inspection team, all of which were part of the Tiger Team Assessment.

The SRL S&H Subteam also evaluated the following sitewide programs: Medical Services, Packaging and Transportation, Emergency Preparedness, and Aviation Safety. In addition, the OSHA-type inspection activities were the responsibility of this S&H Subteam.

The Tritium Facilities S&H Subteam evaluated the Tritium Program Management Team (PMT) activities and other supporting PMTs.

The Waste Management Facilities evaluated were: the F-Area Tank Farm, the H-Area Tank Farm, the waste burial grounds, and the Effluent Treatment Facility.

Within the S&H programs of the prime contractor, performance was appraised in the following TSA disciplines: Organization and Administration, Quality Verification, Operations, Maintenance, Training and Certification, Auxiliary Systems, Emergency Preparedness, Technical Support, Packaging and Transportation, Nuclear Criticality Safety, Security/Safety Interface, Experimental Activities, Site/Facility Safety Review, Radiological Protection, Personnel Protection, Fire Protection, Aviation Safety, and Medical Services.

4.3 APPROACH

Each evaluation was conducted by a team of experts assembled by the Office of the Deputy Assistant Secretary for Safety, Health, and Quality Assurance (SH&QA), Office of Safety Appraisals (OSA). The teams were composed of experts from DOE Headquarters staff, employees of DOE contractors, and outside consultants.

The Waste Management Facilities S&H Subteam was led by Mr. Braj K. Singh, SH&QA, OSA during the period, February 5 through March 2, 1990. Guidance and direction from DOE Headquarters was provided by Mr. James P. Knight, of the same office. A list of the team members and their areas of responsibility is provided in section 4.9.1; biographical sketches of team members are provided in Appendix A.

The Tritium Facilities S&H Subteam assessment was conducted at the site during February 5 to 9, and February 20 through March 6, 1990. The Tritium Facilities S&H Subteam was led by Dr. Owen O. Thompson, OSA; guidance and direction was provided by Mr. Robert W. Barber, Acting Deputy Assistant Secretary for SH&QA. A list of the team members and their areas of responsibility is provided in Section 4.9.2; biographical sketches of the team members are provided in Appendix A.

The S&H Subteam evaluation of the SRL, sitewide Medical Services, sitewide Packaging and Transportation, sitewide Emergency Preparedness, was conducted February 27 through March 14, 1990. The Aviation Safety appraisal was conducted February 5 through March 2, 1990. The SRL S&H Subteam was led by Mr. Blake P. Brown, SH&QA, OSA. Guidance and direction from DOE Headquarters was provided by Lewis G. Hulman of the Office of Quality Programs (OQP). A list of the team members and their areas of responsibility is provided in Section 4.9.3; biographical sketches of team members are provided in Appendix A.

The evaluation by each S&H Subteam focused on operations and the condition of equipment and facilities. A TSA is designed to be an appraisal of an operating facility. This approach is based on the assumption that the facility and its equipment have been appropriately designed and constructed and that safety reviews or Safety Analysis Reports (SARs) adequately evaluate the risks presented by the operation of the facility. This evaluation addresses whether current operations are being conducted within the operation safety procedures established for specific facilities and activities.

The activities of each S&H Subteam were guided by the performance objectives and supporting criteria contained in the "Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites," January 1990.

This section of the report contains the findings and concerns identified by each S&H Subteam using the established performance objectives for each of the technical areas evaluated, including the four technical areas evaluated sitewide as part of the SRL S&H Subteam assessment. Although all of the performance objectives were addressed, this report only covers those objectives for which a concern was identified. Therefore, the reader is cautioned about forming an opinion of the safety and operational performance within an area without first reading the

summary statement. When a performance objective is not listed, it implies that the team judged all applicable criteria to be met.

The findings identified by each S&H Subteam were obtained in three ways: (1) observing routine operations, emergency exercises, and the physical condition of the site and facilities; (2) interviewing management, staff, operators, and craft personnel; and (3) reviewing policy statements, records, procedures, and other relevant documents. A concern addresses a situation that in the judgment of the S&H Subteam: (1) reflected less than full compliance with a DOE safety and health requirement or mandatory safety standard; (2) threatened to compromise safe operation; or (3) if properly addressed would substantially enhance the excellence of that particular situation, even though that part of the operation was judged to have a currently acceptable margin of safety. Because of this last category for addressing the excellence of operation, more concerns are reported than would result from a strictly compliance-oriented appraisal.

The findings that support each concern immediately precede the concern. The category rating, potential hazard, and level of compliance for each concern were determined by using the criteria presented in Section 4.7. As a result of the Waste Management Facilities S&H Subteam findings, 96 concerns are identified in this section of the report. All of the Concerns were judged to be Category III, except Concerns TC.1-1, EP.4-1, EP.7-1, PP.5-5, and FP.6-1, which were judged to be Category II. As a result of the Tritium Facilities S&H Subteam findings, 79 Concerns are identified in this section of the report. All of the Concerns were judged to be Category III, except Concerns SS.4-1, PP.3-2, FP.2-1, and FP.2-2, which were judged to be Category II requiring expedited attention by the contractor. As a result of the SRL S&H Subteam findings, 113 Concerns are identified in this section of the report. All of the Concerns were judged to be Category III, except for RP.10-1 and sitewide EP.5-2, which were judged to be Category II.

Drawing upon the extensive experience of its members, each S&H Subteam has made an effort to identify some of the responsible factors in each statement of concern. However, it is recognized that this effort is at best imperfect due to team members' relative unfamiliarity with the details of the contractor's overall operations. Therefore, each S&H Subteam believes the contractor should consider the findings, and even the statements of concern, as possibly symptomatic of some set of deeper root causes. Therefore, each S&H Subteam recommends that the prime contractor search out and correct those root causes to reasonably assure that improvements in the safety of the operation will be sustained.

4.4 SAFETY AND HEALTH SUMMARY

The Safety and Health Program at the SRS is in the early stage of a sweeping transition. Policies and practices characteristic of industrial safety and health programs developed several decades in the past are being supplemented, and in many cases, replaced with the more comprehensive, technically rigorous safety and health program required by DOE Orders and recent Secretarial Directives.

Significant findings were identified in every area sampled during this appraisal. Although deficiencies are not unexpected from a comprehensive assessment at this early stage of the transition, the extent of these results underscore the need for constant vigilance and monitoring of safety performance while long-term improvements are put in place. For example, extensive deficiencies in site-wide training, worker safety, quality assurance, radiation protection and emergency preparedness programs were cited; an improving but still markedly inadequate fire protection program was noted; lack of adequate safety and hazards analyses (site-wide) and the resulting lack of technical bases for design, operation, and maintenance of safety systems were identified.

Eleven Category II concerns were also developed during the three TSAs conducted for this assessment. Each of these concerns requires expedited resolution due to the significance of the risks involved. The Category II concerns relate to several aspects of emergency planning, lack of technical training for process control room operators, removal of fire hazards and provision of emergency egress, protective equipment for fire fighters and security personnel, control of the respirator program, and the potential for radiological release from some process hoods. A number of corrective actions were initiated during the course of the appraisal.

There were positive attributes noted during these appraisals. Noteworthy practices were observed in certain aspects of Maintenance, Auxiliary Systems, Nuclear Criticality Safety, and Medical Service programs. In addition, boding well for the future, the interviews and interactions during these appraisals indicated a capable staff, including over 400 new exempt personnel, generally anxious to understand the changing requirements and expectations and ready to accept direction and guidance to implement the necessary changes. This same capability and desire to comply with understood requirements are sustaining an adequate margin of safety in day-to-day operations in this interim period.

In managing the change to a currently acceptable safety culture, WSRC is establishing a number of top level plans and programs. At its present state of development this top level guidance appears to have the characteristics and substance necessary to meet DOE long-range expectations. However at this point, the

requirements and expectations have not been communicated to the line managers or work force in sufficient detail to allow effective implementation. Systems are also not in place to effectively measure expected performance. These gaps in the evolution of the top down programs, combined with the apparent lack of a comprehensive interim strategy for ferreting out priority safety concerns needing short-term correction or compensatory action, have left a sometimes tenuous status quo. Day-to-day operations proceed on the strength of capable staff using approved segments of past procedures, but a good understanding at the worker level of necessary safety and health upgrades and the means to implement such upgrades is lacking. Similarly, a number of good but limited industrial safety practices are being carried on, but numerous violations of DOE Orders, OSHA regulations, and recognized good industrial practices continue.

The full course of change is clearly years away. Recent self-assessments by WSRC are objective and astute, indicating a good understanding of the breadth and depth of the fundamental changes in safety culture that must be brought about. The tenor of those changes appears well established and consistent with DOE goals, but a comprehensive strategy to manage the process of change has yet to mature.

4.5 SAFETY AND HEALTH FINDINGS AND CONCERNS

4.5.1 WASTE MANAGEMENT FACILITIES

4.5.1.1 Organization and Administration

4.5.1.1.1 Overview

The WSRC overall organizational structure represents a logical functional arrangement of resources that continues the strong safety emphasis of the previous contractor and enhances the independent safety review function through the Environment, Safety, Health, and Quality Assurance Division. The structure is not yet well defined through formal mechanisms such as job and position descriptions, resulting in multiple findings and concerns for Waste Management and interfacing organizational segments.

There are 11 organizational levels from the WSRC President to an operator in the H-Area Tank Farm. This structure most likely contributes to communication problems, and it raises the question of whether process-related safety decisions are being made at the appropriate level.

Most management control systems are just being established and documented. Two company manuals, WSRC Management Requirements and Procedures and Service Manual (Personnel Practices), were issued. A dozen additional manuals are scheduled to be issued between January 31 and April 1, 1990, including the Environmental Compliance and Procedures, Industrial Hygiene, ALARA Program, Safety, and the Quality Assurance Manual.

Staffing demands still exceed the ability to find and recruit qualified personnel, with more than 100 positions in Waste Management still unfilled. Every operating manager questioned on this issue acknowledged that the situation was affecting the organization's ability to fulfill its mission. Temporary overcrowding of facilities due to recent staff additions is also becoming a problem. Continuous high overtime, particularly for operations personnel, can pose a long-term problem that must be continually monitored.

Managers were cognizant of the difficulties in maintaining adequate controls in the rapidly changing environment of new policies, new procedures, and new staff that presently exists at the facilities.

Management objectives are defined at various levels and tracked through a variety of systems. A centralized tracking and reporting system is under development in the Management Integration Department to provide an integrated system for management reporting and trending. Communication of WSRC's ability to meet defined goals and objectives, as noted in the Award Fee Program, and progress reporting to the DOE have not

been effective. Actions have been taken for improvement. The Site Item Reportability and Issue Management (SIRIM) process was developed to define what was to be reported to whom, and to provide a consistent approach to the resolution of issues. Management hopes this process will enhance the working relationship between WSRC and DOE and extend through all levels of both organizations. An important area of contention is the rate at which previously established policies, procedures, and other work control mechanisms can be restructured and implemented by WSRC.

Corporate support from Westinghouse has been visible, as evidenced by the transfer of about 450 exempt persons to WSRC. Safety is stressed and adherence to policies and procedures in the work place is emphasized.

The Safety Analysis Reports for all facilities across the site are in the process of being rewritten in the U.S. Nuclear Regulatory Commission format. Completion is expected to take years of extensive work by the Savannah River Laboratory, with the assistance of contractors to augment the present staff. Some document control issues were discovered in the Waste Management Projects (WMP) organization and its interaction with the Engineering and Projects Division. During the transition from the old to the new, control systems, policies, program documents, procedures, and other formal documents have not all been suitably defined.

An internal audit program is just being put into place. The fitness-for-duty program is accepted by the staff, but not all supervisors have had appropriate training and there is no program for retraining. Fitness for duty is being addressed in more detail in the TSA of the Savannah River Laboratory.

4.5.1.1.2 Findings and Concerns

OA.1 FACILITY ORGANIZATION

PERFORMANCE OBJECTIVE:

Management should organize and manage the facility's work, programs, and resources so that safety and health are an integral part of the personnel duties and requirements are consistently implemented.

FINDINGS:

- The Waste Management Projects (WMP) organization acts as a liaison between Waste Management Operations (WMO) and the Engineering and Projects Division (E&PD). WMP has no old Du Pont position descriptions except for generics, which are not adequate, and new WSRC position descriptions are not yet approved.
- WMP is responsible for ensuring that local details are considered by E&PD, and Waste Management schedules and requirements for new facilities are met. There is conflict between WMP and E&PD as to roles, responsibilities, and functions.

CONCERN: (OA.1-1) (H3/C2)

The functional organization, accountabilities, and interactions between Waste Management Projects and the Engineering and Projects Division are not well defined, causing internal work coordination problems that are disruptive to an orderly and supportive work process.

FINDINGS:

- Personnel Protection authorities and responsibilities were divided between construction, safety, line management, and industrial hygiene organizational segments.
- No clear central authority for the construction safety and industrial safety disciplines was defined.

CONCERN: (OA.1-2) (H3/C2)

There is no central point of authority for coordination of personnel protection policies and procedures on a sitewide basis.

FINDINGS:

- The morale of the WSRC staff has been adversely affected due to the recent DOE assessment and determination of the WSRC award fee, which was unexpectedly low and did not suitably recognize the accomplishments of the new organization, as judged by WSRC top management.

- Line managers in Waste Management consistently categorized relations with DOE negatively. The major areas of contention are the rate at which the transition to the new policies, procedures, and work control and reporting mechanisms can be made, and the lack of recognition by DOE for any progress.

CONCERN: (OA.1-3) (H3/C2)

Relationships between WSRC and DOE are strained and not conducive to a positive, responsive, and supportive work atmosphere, which is an important component of a safe, productive, and professional environment.

OA.6 PERSONNEL PLANNING AND QUALIFICATION

PERFORMANCE OBJECTIVE:

Personnel programs should ensure that appropriate job qualification requirements or position descriptions are established for all positions that affect safe and reliable operation.

FINDINGS:

- There are more than 100 unfilled positions in the Waste Management organization. Managers unanimously acknowledged that these staffing shortages were negatively affecting their programmatic performance.

- Overtime for operators has continuously been at 20 percent. Similar figures have been determined for other groups in Waste Management. Managers quote work weeks that average more than 60 hours.

- Increases in staffing levels have contributed to the crowding of shops and work areas for maintenance activities and office facilities for professional staff. Building 703H is reportedly within 12 persons of its occupancy limit. Skid shacks and trailers are being sought as temporary facilities to relieve the overcrowded conditions, but some are not expected before August 1990.

CONCERN: (OA.6-1) (H2/C2) Inadequate facilities and the overstressing and fatiguing of staff contribute to reduced safety margins for activities that require human interaction and decision making.

OA.7 DOCUMENT CONTROL

PERFORMANCE OBJECTIVE:

Document control systems should provide correct, readily accessible information to support facility operations.

FINDINGS:

- Numerous documents that define the present status of the Waste Management facilities were found to be out-of-date.
- Examples that electrical blueprints are not updated in a timely manner were found to exist as far back as the 1982-1985 time period.

CONCERN: (OA.7-1) (H2/C2)

There is no effective configuration control system for Waste Management facilities.

(Findings in Sections TS.2, TS.3, AX.1, AX.8, and OP.3 also support this Concern.)

FINDINGS:

- Records are kept in 1.5-hour rated safes in various Waste Management facilities, including both permanent and nonpermanent structures. Duplicate records are not being kept in the majority of these cases. Records include special process inspector certifications, maintenance and test equipment (M&TE) calibrations, and quality surveillances. This practice is not in compliance with 32 CFR 1220.
- Interoffice Memorandum ESH-DOA-890068 (August 3, 1989) provides instructions with respect to the interim storage of records, but does not mention classification as identified in DOE 5480.4 and NFPA-232, Standard for Protection of Records.

CONCERN: (OA.7-2) (H2/C1)

Records storage practices are in violation of DOE 5480.4, its referenced NFPA-232, Standard for Protection of Records, and 32 CFR 1220.

FINDINGS:

- The Waste Management Projects (WMP) organization is using the previous, out-of-date, document control system. WMP made a decision to continue work and pursue staffing needs prior to addressing procedural enhancements.
- The written interface agreement between WMP and the Engineering and Projects Division does not clearly state or define authority and responsibility for all phases of project activity to the satisfaction of both

organizations. This impedes the updating of WMP's document control procedures.

CONCERN: (OA.7-3) (H3/C1) The document control system in use by Waste Management Projects does not meet the requirements of NQA-1 Basic Requirement 6 and Supplement 6S-1.

4.5.1.2 Quality Verification

4.5.1.2.1 Overview

The quality programs being developed by the WSRC Waste Management Program Management Team (WM-PMT) are intended to address the requirements of DOE 5700.6B, DOE SR 5700.6C, and ANSI/ASME NQA-1-1986, "Quality Assurance Program Requirements for Nuclear Facilities" (NQA-1). Each department is required to develop and implement procedures that address the requirements of the site QA Manual. This process has been under way for about 7 years; most of the implementing procedures are written and approved. However, implementation has not been keeping pace with earlier expectations.

WSRC reemphasizes the importance of quality as a way of doing business in the WSRC Policy Manual WSRC-1-01 (April 1, 1989), Sections 1.1 and 4.2. The WSRC QA Plan, WSRC-1-05 (April 1, 1989), has been approved by DOE-SR. A new WSRC QA Manual was approved by the site QA manager in February 1990, with distribution scheduled on or about February 28, 1990. Following issuance of the manual, WM-PMT will necessarily reexamine their implementing procedures and make the needed revisions.

SRS has historically not been successful at meeting quality improvement goals for program implementation. The WSRC commitment to and emphasis of quality appears to now be having some impact on employee attitudes regarding quality. Quality is no longer taking a back seat to other items or issues. Quality oversight is increasing in WM-PMT through early review of procedures, procurement documents, and work orders. Waste Management Programs Quality (WMPQ) has a very active and formal surveillance program in place. The site QA/QC inspector training program is showing results in the areas of enhanced receiving inspection and surveillances. Management and the site QA department are kept informed of the status of quality program implementation, nonconformance reports, and corrective actions through regular formal reports. DOE-SR is on distribution for or has access to all quality program information.

Tracking and trend analyses are improving throughout WM-PMT. The effective use of computer databases for development of information that contributes to the management decision making process is widespread. The staff may need assistance in optimizing their software and database management practices.

The current implementation status of the quality program is such that the requirements of DOE 5700.6B, DOE-SR 5700.6C, and NQA-1 are not fully addressed. WSRC and DOE-SR are aware of the program deficiencies, and it appears that corrective actions will continue to receive an appropriate degree of management attention. There are also concerns regarding inadequate storage capabilities in WM-PMT operating areas, inconsistencies in

application of calibration program requirements, and the lack of incorporation of inspection activities into the various work control processes.

4.5.1.2.2 Findings and Concerns

QV.1 QUALITY PROGRAMS

PERFORMANCE OBJECTIVE:

Administrative programs and controls are in place to assure policies concerning quality are administered for each facility throughout the site.

FINDINGS:

- Implementation status reports to WSRC management (Memoranda OPS-WMF-890055, OPS-WME-890464, OPS-WMT-890355, OPS-WMP-89-2633) indicate incomplete implementation in the areas of Quality Program; Design Control; Procurement Document Control; Instructions, Procedures and Drawings; Measuring and Test Equipment; Document Control; and Records Management.

- The units within the Waste Management Program Management Team (WM-PMT) (i.e., Operations, Works Engineering, Technical, Projects, and Quality) are at different stages of implementation as driven by historical workload, resources, and management attention.

CONCERN: (QV.1-1) (H2/C1)

A quality assurance program as required by ANSI/ASME NQA-1 and DOE-SR 5700.6C has not been fully developed and implemented for Waste Management.

QV.2 PROCUREMENT AND SUPPLIER CONTROL

PERFORMANCE OBJECTIVE:

Provisions are established for the control of purchased material, equipment, and services; for selection and control of suppliers; and for assessing the adequacy of procurement activities.

FINDINGS:

- There is not a sitewide procurement guidelines document that specifies how the procurement process will be administered.
- The process for establishing maximum/minimum quantities for spare parts does not utilize application of accepted reliability methods.
- Following receipt inspection, items are delivered to the H-Area procurement location, where personnel contact the end user for pickup. However, there are no interim storage facilities in the procurement location.

CONCERN: See Concern QV.5-1.

QV.3 RECEIVING AND PRE-INSTALLATION INSPECTIONS

PERFORMANCE OBJECTIVE:

Provisions are established for the inspection of purchased material, equipment, and services in accordance with documented procedures by trained personnel.

FINDINGS:

- Inspection of materials and equipment prior to use or installation is not a formal requirement. However, delivery of materials and equipment to Waste Management Program Management Team (WM-PMT) areas is not always followed by a verification of acceptable condition.

- WM-PMT procurement does not presently have adequate storage facilities in which to hold items in transit from Central Receiving to the end user.

CONCERN: See Concern QV.5-1.

QV.4 CALIBRATION PROGRAM

PERFORMANCE OBJECTIVE:

Provisions are made to assure that tools, gauges, instruments, and other measuring and testing devices are properly identified, controlled, calibrated, and adjusted at specified intervals.

FINDINGS:

- The calibration of equipment at WSRC relies on consistent application of the definitions prescribed in the site QA Manual for categories 1 and 2 measuring and test equipment. Inconsistent application of these definitions to equipment used or controlled by operations, maintenance, and health protection was observed.

- The custodian of an equipment item is solely responsible for assigning the level of calibration required. Environment, safety, health, and quality organizations are not required to concur, nor do they have a means of overriding the custodian's decision.

- Waste Management's calibration practices have been a frequent subject of Waste Management Programs Quality (WMPQ) surveillances. Many implementation deficiencies have been identified, some repeatedly, over the last 2 years. Satisfactory closure of surveillance items has not always been achieved, despite WMPQ tracking and reports to management.

- WMPQ surveillance reports (e.g., numbers 88-S-05-0094, 88-S-05-0096, 88-S-05-0111, 89-S-05-0083, 89-S-05-0095, 90-S-05-0030) and WMPQ Program or System Assessment Report Number 39 (November 1989) provide additional documentation of the widespread nature of the deficiency.

CONCERN: (QV.4-1) (H2/C1)

The calibration program as implemented does not assure that measuring and test equipment used in process control, environment, health, and safety applications is functionally accurate.

(Findings in Sections MA.3, MA.5, AX.2, AX.6, and RP.8 also support this Concern.)

QV.5 IDENTIFICATION AND CONTROL OF HARDWARE/MATERIALS

PERFORMANCE OBJECTIVE:

Provisions are established to identify and control the use or disposition of hardware, materials, parts, and components as well as to assure that incorrect/defective items are not used.

FINDINGS:

- Items delivered to the procurement location in H-Area cannot be stored on an interim basis due to a total lack of facilities. They are placed on the paved surface to await pickup by the end user.
- A replacement motor was found stored outside for 6 days in violation of the specified storage requirements.

CONCERN: (QV.5-1) (H2/C1)

The control of items between central receiving and the end user does not meet the requirements of NQA-1 Supplement 13S-1.

(Findings in Sections QV.2, QV.3, and MA.3 also support this Concern.)

QV.6 INSPECTIONS

PERFORMANCE OBJECTIVE:

Prerequisites are provided in written inspection procedures with provisions for documenting and evaluating inspection results.

FINDINGS:

- The incorporation of inspection holdpoints in the work control processes has been the sole responsibility of the cognizant engineer, allowing some inspection requirements to be overlooked.

- Indirect work orders were recently revised to include a quality verification and inspection plan that is reviewed by Waste Management Programs Quality (WMPQ) prior to work authorization. This system is not fully implemented.

- Special process inspections are requested through informal means, without adequate lead time or information for inspection planning.

- An improperly located switch label was identified during inspection of work completed under work request number HN406. Drawing changes did not reflect existing discrepancies between file drawings and as-found conditions. No final inspection requirement was specified.

CONCERN: (QV.6-1) (H2/C1)

Not all inspection requirements and oversight activities are recognized, planned for, or conducted in a way that complies with Basic Requirement 10 and Supplement 10S-1 of NQA-1.

(Findings in Sections QV.7, AX.5, and MA.2 also support this Concern.)

QV.7 CONTROL OF SPECIAL PROCESSES

PERFORMANCE OBJECTIVE:

Provisions are established to assure the acceptability of special processes such as welding, heat treating, nondestructive testing, and chemical cleaning, and that special processes are performed by qualified personnel using qualified procedures and equipment.

FINDINGS:

- Site Engineering and Services Quality-QC, the provider of special process inspections to Waste Management Program Management Team (WM-PMT), has received QA audit and surveillance attention that identified noncompliance with multiple NQA-1 requirements. Corrective actions are being implemented, but the deficiencies are not yet completely resolved. Tracking is being performed by the Environment, Safety, Health, and Quality Assurance Division.

- Special process inspections are obtained through informal request processes. This does not always provide for adequate inspection planning.

CONCERN: See Concern QV.6-1.

4.5.1.3 Operations

4.5.1.3.1 Overview

Waste Management Operations (WMO) is responding with enthusiasm to the challenges associated with a fuller response to DOE requirements and the policies of the WSRC management. As a result of self-appraisal activities, areas for improvement have been identified and many improvements are being pursued simultaneously. Although some dividends from this process are evident, improvements in the effectiveness of the training program are expected to take a couple of years of intensive effort.

Organizational interfaces and authorities are clearly understood, although line staff responsibilities and authorities are not documented as required.

Administrative procedures for directing safe and reliable plant operation are in place. Operating procedures, including temporary procedures or changes, incorporate all of the recognized good practices. Control room activities are properly supervised. Operational Safety Requirements are assured by the more restrictive limits stated in Technical Standards and further restrictive limits placed in the operating procedures (log sheets). Corrective action to maintain process within these limits is taken by operators and difficulties are reported promptly. The reliability of the process control equipment in service is reasonably good.

As-built drawings are not available, but a considerable effort is under way to improve this situation.

Facility status controls are monitored through data recording log sheets and, more importantly, by means of a new shift turnover procedure that incorporates facility log keeping. When the pilot run of this procedure is completed, it is expected that the procedure will become the model for use by other departments.

The checking of equipment and its initial alignment is included in evaporator startup procedures as well as other procedures. A lock, tag, and try procedure is documented and in use. The stated purpose is personnel safety. However, the procedure's importance to plant status control is not mentioned, and there is no provision for an independent check of equipment alignment prior to and after maintenance and testing. Other desirable improvements to these procedures were noted.

Work conditions are under sufficient control to be reasonably good. Maintenance activities and, to a lesser degree, operations are subject to postponement due to weather conditions. The special equipment required for operation and maintenance was in good condition. The public address system, radios, and personal pagers worked well during routine operations, although there were

too few separate channels available for satisfactory radio communications. Cleanliness and order were evident even though maintenance and construction activities were numerous.

Operators demonstrated an ability to operate precisely according to the appropriate procedure (DPSOL). However, their monitoring of equipment condition was not up to industry practice. Operator knowledge of the process was related to the number of years on the job, indicating a strong need for improved initial process training.

WSRC's internal review of human factors associated with the in-tank precipitation process may have overlooked the disadvantages of having provided two different types of digital control systems in the same control room.

4.5.1.3.2 Findings and Concerns

OP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Operations organization and administration should ensure effective implementation and control of operations activities.

FINDING:

- Responsibilities and authorities of each management, supervisory, and professional position within Waste Management Operations (WMO) have not been compiled into a single document.

CONCERN: (OP.1-1) (H3/C2)

Responsibilities and authority of each management, supervisory, and professional position are not documented for ready access.

OP.2 CONDUCT OF OPERATIONS

PERFORMANCE OBJECTIVE:

Operational activities should be conducted in a manner that achieves safe and reliable operation.

FINDINGS:

- There is no written guidance to direct or limit the work assignments of operator trainees.
- Shift supervisors guide and observe the on-the-job training process, and then make work assignments based on their personal judgment of the trainee's progress.

CONCERN: (OP.2-1) (H3/C2)

Written policies are not available to direct the work assignments of trainees to assure that qualified persons are used.

(Findings in Section TC.3 also support this Concern.)

OP.3 OPERATING PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE:

Approved written procedures, procedure policies, and data sheets should provide effective guidance for normal and abnormal operation of each facility on site.

FINDINGS:

- As-built facility drawings are not generally available to the operators.
- Operator aids, such as sketches and single line drawings, are readily available as approved DPSOLs. However, the aids contain far less safety-related information than as-built drawings.

CONCERN: See Concern OA.7-1.

OP.4 FACILITY STATUS AND CONTROLS

PERFORMANCE OBJECTIVE:

Operations personnel should know the status of systems and equipment under their control, should know the effect of non-operational systems and equipment on continued operations. They should ensure that systems and equipment are controlled in a manner that supports safe and reliable operation.

FINDINGS:

- The document describing the procedure for lock, tag, and try (WSRC-8Q) identifies the procedure as being for personnel safety only and does not mention its importance to plant configuration and status control.

- Neither the lock, tag, and try procedure nor Waste Management Operations (WMO) procedures provide for or require independent confirmation of equipment alignment prior to and following removal from normal service.

- During the appraisal, control room operators received a radio message from the maintenance forces in the field stating that an emergency generator was to be tested, and received another message at the end of the test. However, operations personnel did not confirm or inspect the alignment of the generator after the test.

- Lock and tag logbooks in the control rooms indicate the location and dates of the locked and tagged equipment, but do not indicate the date on which the tagging was last verified as to need and accuracy.

- Present procedures allow a tag and lock to be in place for 30 days without validation. This period, according to interviewees, will be extended to 90 days in the next revision to the procedure. Both periods are longer than good industry practice.

- Caution tags are used in the control room to cover annunciator windows that are in the alarm state because of maintenance or an out-of-normal process condition. Although this is a good practice, the tags are not numbered or labeled to relate to a particular window. The tags have become detached and the place to reattach was not readily determined.

- "Do Not Operate" tags do not specifically identify the equipment on which the tag is hung.

- A danger tag attached to a lockout device on a manhole cover located approximately 20 ft. north of the Emergency Diesel 254-3H was not signed or dated, nor was the reason for the installation of the tag indicated, as required by the SRS Safety Manual (WSRC-8Q, item 21, Revision 2: "Danger, Caution, and Warning Tags"; and item 22, Revision 1: "Locking, Tagging, and Trying").

- Locks used for lockout are not always controlled. Several locks were found unattached and unlocked in the field.

CONCERN: (OP.4-1) (H2/C2)

The lock, tag, and try procedure (WSRC-8Q) does not recognize the importance of process status control, and lacks elements of industry good practice with regard to independent alignment verification, validation frequency, and tag information. Implementation is not in accordance with the SRS Safety Manual (WSRC-8Q), DOE 5482.1A, and 29 CFR 1910.150.

OP.6 OPERATOR KNOWLEDGE AND PERFORMANCE

PERFORMANCE OBJECTIVE:

Operator knowledge and performance should support safe and reliable operation of equipment and systems for which they are responsible.

FINDINGS:

- The operators observed strictly followed "data taking" procedures, which direct them to notify the supervisor of any out-of-normal situation. However, during the conduct of these procedures, the operators did not pay attention to the condition of running equipment in accordance with good industry practice. For example, no bearings or motors were felt or closely observed for excessive temperature, vibration, or other indications of possible deterioration, and no attention was paid to a rotating fan/motor unit that was making an unusually loud noise.

- In discussions, staff members stated the opinion that operators did not observe rotating equipment more closely because the former contractor felt it was not safe to get close to rotating equipment.

CONCERN: (OP.6-1) (H2/C2) Less experienced operators do not adequately monitor the condition of the equipment involved in their work.

FINDING:

- The ability of operators to answer questions concerning details of the process, equipment, and faults involved in their jobs ranged from unsatisfactory to good, depending on the years of experience on the job. This indicates a deficiency in the training of the newer operators.

CONCERN: See Concern TC.1-1.

OP.8 HUMAN FACTORS

PERFORMANCE OBJECTIVE:

Human factors considerations should be incorporated in the design, layout, and operation of all facilities on the site in order to facilitate operator control, information processing, and recognition and proper response to alarms, instruments, and other equipment.

FINDINGS:

- For communication purposes, a receiving unit must be on at all times in the control room. Cross-talk from other organizational units using the same channel was constant and somewhat informal at times, creating distractions for the console operators. This condition is more pronounced in the H-Area.
- Radio cross-talk was a source of distraction during the emergency drill conducted for the TSA Team.

CONCERN: See Concern EP.5-1.

FINDINGS:

- There are two different digital control systems in the in-tank precipitation process control room. These must be operated at times by all of the qualified operators at this facility. (One unit was manufactured by the Texas Instruments Co. and the other by Classic Systems.)
- The two digital control systems do not have common spare parts, maintenance procedures, or operating procedures, which may complicate training, operations, and maintenance.

CONCERN: (OP.8-1) (H2/C3) Providing two different digital control systems in the in-tank precipitation control room is not a good human factors practice.

4.5.1.4 Maintenance

4.5.1.4.1 Overview

Maintenance activities for the Waste Management facilities at the F- and H-Areas and burial grounds are provided by the Waste Management Works Engineering (WMWE) department. WMWE also provides engineering and other support services to the Waste Management organization. WSRC organizational charts dated November 1, 1989, and showing traceability of WMWE to the divisional and WSRC corporate levels were used for this appraisal. WMWE organizational charts and job descriptions for the positions within the WMWE department were also used.

WMWE provides the Waste Management production/operations department with services and maintenance repairs that are necessary for the day-to-day operation of the Waste Management facilities. WMWE is essentially an engineering support services organization whose duties include maintenance.

WMWE maintenance activities are primarily oriented toward providing maintenance for the F- and H-Area Tank Farms, the burial grounds, and associated support facilities, such as the pump maintenance and rebuild activities in Bldg. 299-H and the solid waste compactor that provides support to the burial grounds operation.

Most of the WMWE maintenance activities are reactive rather than proactive, i.e., much of the maintenance is done in response to work requests received from the Waste Management Operations (WMO) department. These activities are generally in response to repair, rebuild, or construction/facility modification work requests prepared by WMO using the Work Management System (WMS), which has been undergoing implementation sitewide for about 6 years and within WMWE for about 3 years.

Because implementation of the WMS is incomplete, and because of the engineering services nature of the work provided by WMWE, some aspects of conventional maintenance activities have not been given the attention dictated by DOE Orders and the Institute for Nuclear Power Operations (INPO) good practices, which are being adopted by WSRC. These areas of concern deal with the incomplete use of preventive, predictive, and corrective maintenance. Formality and documentation for these maintenance activities is not adequate. In addition, independent oversight is lacking to assure that some safety-oriented items, such as functional tests, calibrations, and assuring recall of instruments and controllers, is performed appropriately; that evidence of load tests on hoists, cranes, and lifting hooks is appropriately displayed; and that maximum capacity for hoisting and lifting equipment, such as forklifts and cranes, is appropriately displayed on the equipment.

WMWE is performing the essential elements of good repair and rebuild maintenance of facilities and equipment. However, programs oriented toward equipment recall and maintenance services, such as predictive and preventive maintenance, have not been fully implemented. Morale is high within the WMWE organization and personnel are enthusiastic about improving maintenance services. This enthusiasm is evident in the WMWE 1- and 5-year plans, the adoption of INPO maintenance guidelines, the implementation of a Performance Improvement Plan, and increased recognition of the need for improved maintenance actions. With increased attention to uniformity in sitewide maintenance practices and improved formality in documentation, conformance with DOE Orders and INPO standards can be achieved.

4.5.1.4.2 Findings and Concerns

MA.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Maintenance organization and administration should ensure effective implementation and control of maintenance activities.

FINDINGS:

- Implementation of the Work Management System (WMS) has been ongoing at SRS since late 1984, but is not complete for Waste Management activities, including those at Waste Management Works Engineering (WMWE). Only 15 to 20 percent of the approximately 40,000 WMWE maintenance items have been included in the WMS.

- The WMS work request is initiated by the Waste Management Operations (WMO) maintenance coordinator and is the primary means of requesting and authorizing maintenance work.

- The WMO maintenance coordinator independently decides if a Work Clearance Permit, Nuclear Safety Review, or other permits and reviews are required. The need for safety, health, and radiation protection monitoring is stated on the Work Clearance Permit.

CONCERN: See Concern TS.3-2.

FINDINGS:

- Expansion of WMWE maintenance duties and documentation requirements has necessitated a rapid growth of the WMWE staff, resulting in the potential for inefficiencies and loss of work control.

- The WSRC organizational charts indicate that maintenance functions sitewide are performed by many independent works engineering organizations, such as WMWE and Central Services Works Engineering (CSWE).

- The works engineering organizations are essentially independent of one another and are not required to provide uniform sitewide maintenance activities, as is desirable for predictive and preventive maintenance.

CONCERN: (MA.1-1) (H3/C2) Lack of a unified sitewide maintenance organizational structure inhibits implementation of effective and efficient maintenance activities.

MA.2 CONDUCT OF MAINTENANCE

PERFORMANCE OBJECTIVE:

Maintenance should be conducted in a safe and effective manner to support each facility condition and operation on the site.

FINDINGS:

- Oversight of Waste Management Works Engineering (WMWE) routine maintenance activities is provided by the Waste Management Programs Quality (WMPQ) and Waste Management Technology (WMT) departments, both of which are part of the Waste Management organization. WMPQ is responsible to the Waste Management manager, and WMT is responsible to the Waste Management Operations (WMO) manager.

- Independent oversight of WMWE activities by the WSRC Environment, Safety, Health, and Quality Assurance Division is provided only during periodic audits, not on a routine basis.

CONCERN: See Concern QV.6-1.

FINDINGS:

- Neoprene fuel lines were recently installed on a number of diesel generator engines. After installation, one line was found resting on the engine exhaust manifold of emergency diesel 254-3H, creating a fire hazard.

- A wire splice on a diesel generator was improperly made using bare wire (no terminal ends), a bolt, a nut, and electrical tape.

- The air exhaust from diversion box 2 in the H-Area old hill Tank Farm does not have any air sampling instrumentation and the exhaust filter was not labeled.

CONCERN: (MA.2-1) (H2/C2) Inadequate attention to good maintenance practices can result in unsafe conditions and/or release of radioactive materials.

MA.3 MAINTENANCE FACILITIES, EQUIPMENT, AND MATERIAL

PERFORMANCE OBJECTIVE:

Facilities, equipment, and material should effectively support the performance of maintenance activities.

FINDINGS:

- The maintenance shops in the H-Area are small, and adequate clearance around machine tools is not provided for safe work.
- Insufficient space is available in the H-Area shops to accommodate work on long-term items in the prototype development stage, which must remain in the shop for extended periods.

CONCERN: (MA.3-1) (H2/C2)
The small size of the H-Area maintenance shops contributes to crowded working conditions, which inhibit safe performance of maintenance activities.

FINDINGS:

- Stationary and mobile hoists, cranes, and lifting hooks observed in the F- and H-Areas do not have any physical evidence, such as tags or stickers, indicating that they have been periodically load tested. Current practice is to load test only after repair.
- Most forklifts and cranes are not clearly marked relative to load capacity.
- The Waste Management Works Engineering (WMWE) manual on rigging and heavy equipment procedures (DPSOP 253.3) requires compliance with DOE 5480.4, and is written to comply with ANSI B-30 crane safety series, which specifies less stringent capacity and load test requirements than commonly required at other DOE sites.
- WMWE is preparing a new manual on rigging and heavy equipment procedures, which will adopt more stringent requirements.

CONCERN: (MA.3-2) (H2/C2)
Due to the lack of periodic load tests, hoists, cranes, forklifts, and/or rigging slings may be used outside of their load range or may fail in use.

FINDING:

- Most of the instruments and controls in the H-Area old hill Tank Farm control room have "M&TE [calibration recall] Category 2" stickers, which indicate calibration recall "as needed." This does not provide notification of periodic calibration and test requirements.

CONCERN: See Concern QV.4-1.

FINDINGS:

- No areas are provided for controlled, segregated storage in the parts and materials storage areas of the WMWE maintenance shops.

- Stainless steel, carbon steel, copper, and other metals and plastics were stored in the same rack in the piping/tubing/materials storage area at Bldg. 241-58H.

CONCERN: See Concerns QV.5-1 and RP.8-1.

MA.4 PLANNING, SCHEDULING, AND WORK CONTROL

PERFORMANCE OBJECTIVE:

The planning, scheduling, and control of work should ensure that identified maintenance actions are properly completed in a safe, timely, and effective manner.

FINDINGS:

- The Work Management System (WMS) provides Waste Management Works Engineering (WMWE) with information required for planning, scheduling, and controlling repair-type maintenance work. However, only about one sixth of the WMWE maintenance items have been included in the WMS.
- The "Tickler" system and maintenance and test equipment (M&TE) procedure do not provide adequate means for control and scheduling of some maintenance activities, such as preventive maintenance.
- The WMS and "Tickler" system are the only systems being used for control of maintenance work.

CONCERN: (MA.4-1) (H2/C2) The WMS and "Tickler" system are not providing identification of all needed maintenance actions and requirements.

FINDINGS:

- Equipment, instrumentation, and controls for diversion box 2 in the H-Area old hill Tank Farm are in a transitional state because of extensive instrumentation upgrades. Some equipment classified as temporary (e.g., air samplers) has been installed for a long period of time. The electrical power to these air samplers is provided with extension cords that are not weather-rated and are in violation of OSHA requirements. (See Concern PP.6-1.)
- Temporary equipment installations are being used where permanent installations are required.

CONCERN: (MA.4-2) (H2/C2) Temporary installations do not receive adequate technical review and follow-up.

MA.5 CORRECTIVE MAINTENANCE

PERFORMANCE OBJECTIVE:

The material condition of components and equipment should be maintained to support safe and effective operation of all facilities on the site.

FINDINGS:

- Most of the instruments and controls used for controlling the decontamination and pump assembly and disassembly in Bldg. 299-H did not have status/calibration or maintenance and test equipment (M&TE) tags on them.
- At ETF, only the radiation survey meters had M&TE tags requiring periodic recalibration; the rest of the instruments and controls had M&TE tags requiring calibration "as needed."
- The new instrumentation at diversion box 2 in the H-Area old hill Tank Farm had M&TE tags with calibration "as needed" and older M&TE tags on which the writing was no longer legible due to weathering.
- The metal M&TE tags being installed on some instruments and controls are too large to be attached to the specific part, and do not provide information as to calibration status.

CONCERN: See Concern QV.4-1.

FINDINGS:

- Waste Management Works Engineering (WMWE) maintenance work control documentation does not provide an overview of all equipment failures to assure effective maintenance activities.
- The lubrication procedure DPSOL-WMWE-15003 does not provide sufficient information regarding the type of lubricant to be used, intervals between lubrications, etc.
- Analyses of instruments, equipment, and controls performance and failures to evaluate maintenance effectiveness are not formally documented.

CONCERN: (MA.5-1) (H2/C2) Documentation of corrective maintenance of equipment is incomplete.

MA.6 PREVENTIVE MAINTENANCE

PERFORMANCE OBJECTIVE:

Preventive maintenance should contribute to optimum performance and reliability of systems and equipment important to operations.

FINDINGS:

- The Work Management System (WMS) has the capability to provide adequate information for a good preventive maintenance program. However, after about 3 years of implementation, only one sixth of the 40,000 Waste Management Works Engineering (WMWE) maintenance items have been included in the WMS.
- Vibration and oil sample analyses are not used to assess equipment performance.
- The documented preventive maintenance program currently being used by WMWE is incomplete. Most WMWE maintenance is of a repair-type nature.

CONCERN: (MA.6-1) (H2/C2)

Optimum reliability, safety, and performance of equipment is not being achieved because of the lack of a complete formal preventive maintenance program.

MA.7 PREDICTIVE MAINTENANCE

PERFORMANCE OBJECTIVE:

Maintenance history evaluation and systematic root cause analyses should be used to support maintenance activities and optimize equipment performance.

FINDINGS:

- Maintenance history records for most equipment are incomplete or not available. Because of the severely toxic and highly contaminated environment, much of the equipment is used until failure and then replaced.
- Age-related degradation of equipment is not documented in the Waste Management Works Engineering (WMWE) maintenance activities.
- WMWE maintenance personnel have not been given a documented, specific assignment to collect and analyze equipment history data.

CONCERN: (MA.7-1) (H2/C2) Optimal equipment performance is not being achieved because of an incomplete predictive maintenance program.

4.5.1.5 Training and Certification

4.5.1.5.1 Overview

The F-Area and H-Area Tank Farms are among the facilities that must attain training program accreditation in accordance with DOE 5480.18, "Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities." Criteria of this order were therefore included in the requirements against which findings were assessed. DOE 5480.18 incorporates the Institute of Nuclear Plant Operations (INPO) performance-based training methodology.

Until the middle of calendar year 1989, Waste Management personnel focused minimal attention and resources on development of an operations training program that would meet the requirements of DOE 5480.5. Since that time, some progress has been made in establishing a training program. Several technically competent persons have been assigned training responsibilities. Although these individuals are extremely dedicated and conscientious, there is a severe lack of experience among them with regard to knowledge of and familiarity with DOE Orders and requirements, performance-based training concepts and programs, and current industry training standards. The operations training program at the Waste Management facilities is significantly out of compliance with DOE 5480.5, Paragraph 10, "Personnel Selection and Training."

The relatively new Waste Management operations training structure is not well understood by all persons involved in the training process. Responsibilities and authorities are not clearly defined.

Most of the training elements required by DOE 5480.5 do not exist at the Waste Management facilities.

General employee training is administered to newly hired employees by the WSRC Human Resources Division. The training includes all required elements of DOE 5480.11 for general employee training, and also includes general employee safety and personnel protection training. However, training for radiation workers and for Health Protection Inspectors at WSRC is not in compliance with DOE 5480.11. In spite of the lack of a sitewide radiation worker training program, the Waste Management organization has implemented a program to ensure that all of their personnel (including construction personnel) will be trained in the topics identified in DOE 5480.11.

In the area of personnel protection training, there is a concern that annual retraining on OSHA requirements is not being performed. Having recognized that this is a problem, Nuclear Materials Process Training is developing a program to formally document and track the completion of annual training

requirements, based on supervisors' input and specific job requirements.

Personnel who perform mechanical, electrical, and instrumentation maintenance receive excellent classroom and practical training, administered by Central Services Works Engineering, prior to being permanently assigned to the Waste Management facilities. Continuing training ensures retention and improvement of job-related knowledge and skills for the maintenance personnel.

There is no formal program in place to provide any technical, job-related training to first-line supervisors of the various operating areas. Additionally, no facility exercises (drills) are conducted to refresh, reinforce, and further develop the skills, knowledge, and ability of operators and supervisors to respond to abnormal or emergency situations that may occur within the operating areas.

The training facilities inspected at various training locations throughout WSRC are adequate. However, there are no physical training facilities for Fire Department personnel. (See Section FP.6.)

The training programs for QC inspectors and nondestructive examination technicians are administered in accordance with the requirements of NQA-1.

4.5.1.5.2 Findings and Concerns

TC.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

The training organization and administration should ensure effective implementation and control of training activities.

FINDINGS:

- There are no job descriptions for some of the positions involved in operator training, and descriptions that do exist are not all signed by appropriate management.

- Some job descriptions offer only a broad-based description, without details pertaining to specific responsibilities. For example, the job description for the Procedures, QA, and Training Manager is entitled "WMO Department Area Superintendents." There are at least six WMO Department Area Superintendents in Waste Management Operations (WMO). There is no further documentation describing authorities and responsibilities for this position with regard to the details of training responsibilities.

- The creation of Nuclear Materials Process Training in April 1989 enhanced the potential effectiveness of the existing WMO trainers by providing additional competent and experienced training personnel. Since then, nine more training positions have been created and filled, with appointments to the newly created training positions based on good performance and a high level of technical knowledge. However, none of the new trainers has experience as a training professional.

- The longest any of the four full-time classroom trainers has served is 9 months.

- There are no job descriptions for the in-field trainers.

- Personnel responsible for Waste Management operator training were not knowledgeable regarding individual job responsibilities and the relationships among the various training functionaries, both within the Waste Management organization and throughout WSRC.

- Newly assigned classroom and in-field trainers demonstrated lack of knowledge concerning DOE Orders pertaining to training.

- Training records of operating personnel were auditable, but inconsistent and incomplete, and therefore not in accordance with DOE 5480.5. It could not be ascertained from the records whether all operators had completed appropriate training to qualify them for the jobs to which they were assigned. Individual records for workers in similar positions did not contain similar information, and there were many instances of unexplained signature omissions.

- There is no verification of training performed by cognizant management or supervisory personnel, as described in and required by DOE 5480.5, Paragraph 10.a(6) and (8).

- There is no formally issued and approved training policy or procedure that describes the current training organization within WMO.

CONCERN: (TC.1-1) (H2/C1) (CAT II)

Operators and supervisors at the Waste Management facilities have not been trained to operate the facilities as required by DOE 5480.5, Safety of Nuclear Facilities (September 23, 1986).

(Findings in Sections OP.6 and TC.3 also support this Concern.)

TC.3 NUCLEAR FACILITY OPERATIONS OTHER THAN REACTORS

PERFORMANCE OBJECTIVE:
(Nuclear Facilities Only)

The nuclear facility operator and supervisor training and certification programs should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDING:

- Operator trainees are not given a comprehensive written or oral exam to assess their knowledge and/or skill level prior to being assigned operating duties.

CONCERN: (TC.3-1) (H2/C2)

Comprehensive job knowledge is not measured prior to assigning personnel to operating tasks.

FINDINGS:

- There is no annual retraining or reexamination of operators or supervisors in abnormal and emergency operating procedures, as required by DOE 5480.5, Paragraph 10.a(7).

- There is no biannual retraining or reexamination of operators or supervisors, as required by DOE 5480.5, Paragraph 10.a(7).

- On-the-job training is not structured and managed in accordance with the requirements of DOE 5480.5, Paragraph 10.a(5).

CONCERN: See Concern TC.1-1.

TC.4 GENERAL EMPLOYEE/PERSONNEL PROTECTION TRAINING

PERFORMANCE OBJECTIVE:

General employee and personnel protection training programs should ensure that facility personnel, subcontractors, and visitors have an understanding of their responsibilities and expected safe work practices, and have the knowledge and practical abilities necessary to effectively implement personnel protection practices associated with their work.

FINDINGS:

- There is no requirement for line supervisors to be directly involved in their employees' annual retraining process in OSHA-related topics, other than the acknowledgement signature on WSRC Form OSR 4-388.

- Line supervisors have the option of adding to or deleting from annual OSHA retraining requirements for individual employees, depending on specific job requirements and conditions. However, there is no way for a line supervisor to formally document that specific individual requirements are not applicable and not required.

- The training topics listed on OSR 4-388 forms were often not signed off by either employees, managers, or both. In some cases, the OSR 4-388 form could not be produced at all.

CONCERN: (TC.4-1) (H2/C1)

Not all Waste Management employees receive required annual retraining on OSHA-related topics, as required by 29 CFR 1910.120.

FINDINGS:

- Radiation worker training is not currently in full compliance with the requirements of DOE 5480.11. (Waste Management has recognized this problem, and is in the process of providing training while awaiting implementation of the sitewide program.)

- In September 1989, DOE-SR issued an Implementation Plan for attaining compliance with DOE 5480.11. DOE-SR and WSRC committed to be in compliance with certain training-related elements of the Order by December 31, 1989. However, in February 1990, DOE-SR issued a Status Evaluation of the DOE 5480.11 Implementation Plan, which identified several training-related items that were not in compliance with the Order, even though the commitment date of December 31, 1989, had passed.

- WSRC Interoffice Memorandum 735-15A (February 20, 1990) also identified several training-related items that were not in compliance with the Order, even though the commitment date of December 31, 1989, had passed.

- A sitewide policy to ensure all radiation workers are trained as required by DOE 5480.11 has not been issued.

CONCERN: (TC.4-2) (H2/C1)

Not all personnel have been appropriately trained in accordance with DOE 5480.11.

(Findings in Sections AX.5 and TC.9 also support this Concern.)

TC.9 RADIOLOGICAL PROTECTION PERSONNEL

PERFORMANCE OBJECTIVE:

The radiological protection personnel training and qualification program should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDINGS:

- Health Protection (HP) Inspector training is not currently in full compliance with the requirements of DOE 5480.11.

- In September 1989, DOE-SR issued an Implementation Plan for attaining compliance with DOE 5480.11. DOE-SR and WSRC committed to be in compliance with certain training-related elements of the Order by December 31, 1989. However, in February 1990, DOE-SR issued a Status Evaluation of the DOE 5480.11 Implementation Plan, which identified several training-related items that were not in compliance with the Order, even though the commitment date of December 31, 1989, had passed.

- WSRC Interoffice Memorandum 735-15A (February 20, 1990) also identified several training-related items that were not in compliance with the Order, even though the commitment date of December 31, 1989, had passed.

CONCERN: See Concern TC.4-2.

TC.10 TRAINING FOR SUPERVISORS, MANAGERS AND TECHNICAL STAFF

PERFORMANCE OBJECTIVE:

Training programs for supervisors, managers, and the technical staff should broaden overall knowledge of processes and equipment and develop supervisory and management skills.

FINDINGS:

- First-line supervisors have been trained as facility operators, but no program is in place to provide managers and technical staff with any technical training.
- First-line supervisors receive no specific technical training to prepare them for their supervisory role, as required by DOE 5480.5.
- First-line supervisors for the operating areas are appointed to their positions by management, based on knowledge, experience, and performance in their specific area. However, there are no documented requirements defining minimum qualifications for supervisor candidates.
- Supervisors can be assigned to Waste Management operating areas in which they have no direct experience or training.

CONCERN: (TC.10-1) (H2/C1)

There is no assurance that first-line supervisors have proper and adequate knowledge and experience to direct normal and emergency activities of the operators whom they supervise, as required by DOE 5480.5.

TC.11 SIMULATOR TRAINING/FACILITY EXERCISES

PERFORMANCE OBJECTIVE:
(Reactors and Nuclear Facilities Only)

Simulator training and/or facility exercises should be conducted utilizing methods and techniques that are effective in developing and maintaining team and individual knowledge and skills in responding to abnormal and emergency events, and in integrated operations.

FINDINGS:

- Waste Management operating personnel receive no training in emergency and abnormal operating procedures beyond classroom presentations.
- There is no program in place to conduct periodic training exercises for developing and maintaining team and individual knowledge and skills.

CONCERN: (TC.11-1) (H2/C2)

No facility exercise (drill) program is in place to assure that operators and supervisors have the skills, knowledge, and ability to respond to abnormal and emergency operating situations.

4.5.1.6 Auxiliary Systems

4.5.1.6.1 Overview

Eight of the nine auxiliary system performance objectives were evaluated during this TSA. The coolant cleanup systems performance objective was not considered applicable to Waste Management.

The Waste Management auxiliary systems for water, electricity, and heat removal have adequate capacity to meet current needs and expected growth due to facility expansion. A process ventilation program recently implemented by the Power Engineering Department has many desirable attributes. It provides a focal point for process ventilation, establishes responsibility for the system, provides system design standards and configuration controls, and establishes an air balance and preventive maintenance program.

The functional requirements of each auxiliary system have not been developed and documented. Most auxiliary systems have not been identified as important to facility safety. In cases where auxiliary systems have been designated as important to safety, the Safety Analysis Reports (SARs), Operational Safety Requirements (OSRs), and Technical Standards do not adequately define the system operating envelope.

The 115-KVA and 13.8-KVA electrical distribution systems for which Power Operations is responsible are maintained under a preventive maintenance program. However, the normal and emergency power systems for which Waste Management Operations (WMO) has cognizance are not tested and maintained in accordance with generally accepted industrial practices.

Waste containing fissile material is controlled, stored, and transferred within the facility in a safe manner and in accordance with approved procedures.

A program (Project S-3603) has been implemented to bring the design of continuous air monitors and airborne effluent monitoring systems into compliance with current industrial practices and DOE requirements. However, there are a number of liquid and airborne effluent monitoring systems for which a documented program to effect compliance has not been developed.

Waste minimization and volume reduction activities have been established at some Waste Management facilities and have resulted in significant reductions in waste generation and cost.

A low-level waste minimization program has been established in accordance with DOE requirements, but waste minimization programs that establish goals based upon past performance and anticipated operations have not been established for hazardous waste and

high-level radioactive waste. WSRC has recognized this deficiency and has established a plan and schedule to provide the requisite programs.

4.5.1.6.2 Findings and Concerns

AX.1 SYSTEMS REQUIREMENTS

PERFORMANCE OBJECTIVE:

Auxiliary systems shall be considered under the same functional criteria for design, engineering, operations, maintenance, and modifications as the structural, confinement, and primary process system of the facility.

FINDINGS:

- The operational requirements for auxiliary systems as defined in Safety Analysis Reports, Operational Safety Requirements, and Technical Standards are not adequate to ensure the systems are maintained within the appropriate operating envelope.
- A document delineating the functional criteria of each auxiliary system does not exist.

CONCERN: (AX.1-1) (H2/C2) The functional requirements for each auxiliary system have not been developed and documented.

FINDINGS:

- The evaporator cell exhaust ventilation fan and motor are not labeled.
- The handles for the annulus air inlet dampers of tank 38 are not labeled.
- Valves in the ETF process stock monitor are labeled with paper tags, many of which have been blurred by rain and are illegible.
- The 50-gallon drum housing a ^{252}Cf neutron source was labeled with a felt-tip pen. The barrel and its contents are used as a check source for the assay machine.
- Valve position indicating lights and the push button that control the diversion of the segregated cooling water were not labeled. Color coding of the lights was not consistent. The control panel was located adjacent to the 281-6H Water Monitor House.

CONCERN: (AX.1-2) (H2/C2) Waste Management has not fully implemented a program addressing human factors conventions and standards as applicable to auxiliary systems.

AX.2 EFFLUENT HOLDUP AND TREATMENT

PERFORMANCE OBJECTIVE:

Effluent holdup and treatment should ensure that the amount of hazardous substance released to the environment as escaping emissions and/or as effluent gaseous or liquid releases are less than DOE and EPA standards and are ALARA.

FINDINGS:

- With respect to ANSI N13.1-1969, "Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities," and ANSI N42.18-1980, "Specifications and Performance of Onsite Instrumentation for Continuously Monitoring Radioactivity in Effluents," the exhaust monitors measuring radioactive airborne effluent from the high-level radioactive waste tanks are deficient as noted below.

  - The monitors do not have isokinetic sample pickup heads.
  - The monitors do not initiate shutdown or diversion of the process system upon receipt of a high-level alarm, with the exception of the concentrate Transfer System.
  - The monitors do not contain calibrated flow meters.

- Many airborne sample points are not located greater than five times the major duct diameter from flow disturbances, as required by ANSI N13.1-1969.

- The storm water monitors have not received a primary calibration.

- The condensate outlets from each of the steam-heating coils of the evaporators and the concentrate Transfer System Pump Tank contain effluent radioactivity monitors. These monitors have not been calibrated nor are they under a preventive maintenance program.

- Health Protection does not receive written notification of repair or electronic calibration of effluent monitoring equipment. Health Protection performs all calibration requiring the use of radioactive sources. Therefore, effluent monitoring equipment may be in use that has not been calibrated with a radioactive source.

- A program to bring all effluent monitoring systems into compliance with ANSI N13.1-1969 and ANSI N42.8-1980 has not been established.

CONCERN: (AX.2-1) (H2/C1) The design and testing of effluent monitoring systems is not in accordance with ANSI N13.1-1969 and ANSI N42.18-1980.

FINDINGS:

- The performance and sensitivity of radioactive effluent monitors within existing background levels have not been analyzed and documented. Background radiation levels up to 4,000 counts per minute were noted for radioactive effluent monitors.

- Procurement Specification No. 13I-1682G (Project S-3603), used to purchase airborne effluent monitoring equipment, does not provide for an instrument having the capability to monitor the design basis accident conditions, as required by DOE 6430.1A.

- The instrument range necessary to permit monitoring of the design basis accident has not been established for the instruments monitoring effluents from the pump pits and diversion boxes.

CONCERN: (AX.2-2) (H2/C1) Analyses have not been performed to demonstrate that the effluent monitors can provide relevant and timely indication and notification of radioactive releases to the operators given existing background radiation levels, as required by DOE 6430.1A.

FINDINGS:

- H-Area high-level waste tanks 9 through 16 and 21 through 24 do not have continuous monitoring systems for airborne effluent. Tank 21 had a skid-mounted ventilation system attached that included an airborne effluent monitor.

- F-Area high-level waste tanks 1 through 8 and 17 through 20 do not have continuous monitoring systems for airborne effluent. Tank 18 had a skid-mounted ventilation system attached that included an airborne effluent monitor.

CONCERN: (AX.2-3) (H2/C1) High-level radioactive waste is not monitored in accordance with the requirements of DOE 5820.2A and DOE 5480.4.

AX.3 SOLID WASTES

PERFORMANCE OBJECTIVE:

Solid hazardous wastes (including radioactive wastes) should be controlled to minimize the volume generated, and handled in a manner that provides safe storage and transportation.

FINDINGS:

- Goals to reduce the generation of high-level radioactive waste and hazardous waste based upon past performance have not been established.
- Goals to reduce the generation of solid hazardous wastes based upon past results and anticipated operations have not been established for the ETF.
- A periodic review of hazardous waste generation records to determine trends has not been performed.

CONCERN: (AX.3-1) (H3/C1)

WSRC has not implemented a documented program to reduce the hazardous waste generated at all facilities, as required by DOE 5400.3 and DOE 5820.2A.

AX.5 VENTILATION SYSTEMS

PERFORMANCE OBJECTIVE:

Ventilation systems should reliably direct all airborne effluent from contaminated zones or potentially contaminated zones through cleanup systems to ensure that the effluent reaching the environment is below the maximum permissible concentration and is ALARA.

FINDINGS:

- Visual inspection of housings, filters, and filter clamping devices as required by ANSI N510-1980, "Testing of Nuclear Air-cleaning System," are not provided for in DPSOL 241-FH-210 Revision 7, "Replacing Exhaust HEPA Filters," DPSOL 241-FH-211 Revision 3, "Replacing Purge Inlet HEPA Filters," and DPSOL 193-7-104 Revision 0, "DOP Efficiency Test of HEPA Filters General Procedure."

- The door on the annulus air inlet filter housing of Tank 28 was bent such that air bypassed the prefilters. The plenum contained weeds and a substantial amount of dirt. These conditions are indicative of an ineffective inspection program.

- DPSOL 193-7-104 Revision 0 does not require the dust level to be checked upstream and downstream of the HEPA filter, as required by ANSI N510-1980.

- ANSI N510-1980 requires stable conditions to be established and defines stable conditions as subsequent data sets having values within ± 5 percent; DPSOL 193-7-104 Revision 0 has no requirements regarding stability.

CONCERN: (AX.5-1) (H2/C1)

Testing of HEPA filters does not meet the requirements of DOE 5480.4 and ANSI N510-1980.

FINDINGS:

- A documented qualification program for health protection personnel performing HEPA filter testing does not exist as required by DOE 5480.11 and ANSI N45.2.6, "Qualification of Inspection, Examination and Testing Personnel for Nuclear Power Plants," as invoked by ANSI N510-1980. (ANSI N45.2.6 was superceded by ANSI NQA-1 and ANSI NQA-2 in September 1986.)

- On-the-job and classroom training in the performance of HEPA filter testing is provided to health protection personnel, but there is no documented training program that prescribes the training, content, and scope.

CONCERN: See Concern TC.4-2.

AX.6 VITAL SUPPLY SYSTEMS

PERFORMANCE OBJECTIVE:

The electric, water, and emergency power systems should reliably provide vital services as required by all facilities on the site.

FINDING:

- Bounding conditions, surveillances, and tests for the normal and emergency power systems are not specified in the following documents: "Safety Analysis - 200-Area Savannah River Plant Separations Area Operations Liquid Radioactive Waste Handling Facilities" (DPSTSA-200-10); "Operational Safety Requirements For Waste Management" (DPW-86-106 Revision 1); and "Technical Standard Waste Tank Farms" (DPSTS-241).

CONCERN: (AX.6-1) (H2/C2)

The operating envelope and testing and surveillance requirements for the normal and emergency power systems important to the safe operation of the facility are not specified in the applicable Safety Analysis, Operational Safety Requirements, or Technical Standard.

FINDINGS:

- DPSOL 241-H-765 Revision 2, "Diesel Test, Building 254-3H," does not test the diesel at the design electrical load as required by IEEE 308-1980, "IEEE Standard Criteria for Class 1E Power System for Nuclear Power Generating Stations," as referenced by DOE 5480.4.

- There is no documented preventive maintenance and testing program for electrical breakers and transformers under the cognizance of Waste Management Operations (WMO).

- Interoffice Memorandum, "Breaker Calibration and Frequency" (December 29, 1989), indicated that 28 breakers in the F-Area were past due for calibration, and an additional 22 breakers had no calibration stickers affixed or had never been calibrated.

- Interoffice Memorandum OPS-WME-89-0393, "Circuit Breaker Calibration" (October 23, 1989), stated, "Currently, Waste Management has eighteen (18) circuit breakers out-of-calibration in H-Area's Tank Farm and Maintenance Facility. Based upon the stated frequency of calibration, seven of these breakers have been out-of-calibration for more than 7 years."

- Interoffice Memorandum OPS-SEJ-90036, "Circuit Breaker Quarterly Status Update (U)" (February 16, 1990), stated, "...a number of breakers have come due for calibration since December, and there are still some exceedingly out of tolerance."

- Power pole inspections conducted in 1985 and 1987 identified 22 poles as needing immediate repair or attention. The poles have not been repaired or replaced because Power Operations has been unable to obtain the consent of area custodians to de-energize the electrical systems necessary to permit the repairs to be made.

CONCERN: (AX.6-2) (H2/C1)

Normal and emergency power systems are not tested and maintained in accordance with IEE 308-1980, as referenced by DOE 5480.4, and with generally accepted industrial practices for facilities and systems of similar complexity.

AX.8 ENGINEERED SAFETY SYSTEMS

PERFORMANCE OBJECTIVE:

Engineered Safety Systems should be reliable and available to provide protection to the facility when required.

FINDINGS:

- The minimum Engineered Safety Systems components and monitoring devices necessary to permit operation of the facilities are not specified in the following documents: "Safety Analysis - 200-Area Savannah River Plant Separations Area Operations Liquid Radioactive Waste Handling Facilities" (DPSTA-200-10); "Technical Standard Waste Tank Farms" (DPSTS-241); and "Operational Safety Requirements For Waste Management" (DPW-86-103 Revision 1).

- The actions to be taken if the minimum Engineered Safety Systems configuration cannot be maintained are not specified in the applicable Safety Analysis Report (SAR), Operational Safety Requirements (OSRs), or Technical Standard for all systems.

- The existing SARs do not meet the requirements of DOE 5480.1B. However, WSRC has made the commitment to DOE that all SARs and OSRs will comply with the requirements of DOE 5480.1B, SR-OM-5480.5-1, and DOE 5480.ZZ (draft).

- Formal risk analyses have been performed based upon the original facility design and standards, past practices, and operating experience. The analyses have been used as a basis for SARs, OSRs, and Technical Standards. However, the analyses required by DOE 6430.1A have not been performed.

- The operating envelope that defines the minimum equipment required for operation of the facilities has not been identified and has not been linked to the appropriate SAR, OSRs, and Technical Standards.

CONCERN: (AX.8-1) (H2/C1)

Waste Management limiting conditions for operations have not been completely and adequately identified, and Engineered Safety Systems, as defined in DOE 6430.1A, have not been identified.

4.5.1.7 Emergency Preparedness

4.5.1.7.1 Overview

Emergency preparedness in the SRS Waste Management facilities is affected by the evolving state of the site emergency preparedness program. The program for SRS was in a transitional state because the site emergency plan and procedures are under revision. The area and facility emergency plans are planned for revision when the new site emergency plan is implemented. SRS initiated the revisions in response to identified deficiencies in the emergency preparedness program.

A DOE emergency preparedness compliance audit conducted during January 1990 reconfirmed the need for major revisions in the SRS emergency preparedness program. The DOE audit team identified weaknesses in required annual reviews, emergency classification levels, emergency action level initiating conditions, approval of emergency planning zones, responsibilities of personnel, evacuation routes, recovery/reentry procedures, and training. The audit report indicated that a majority of the weaknesses should be corrected by implementation of the new plan. The new site emergency plan is expected to be approved in March 1990. Implementation of the revised plan will drive major revisions to emergency plans and procedures for the Waste Management facilities.

Waste Management TSA personnel conducted follow-up inspection activities on a recent K-reactor liquid spill that further demonstrated the need for revision and refinement of the emergency preparedness program. Review of the event indicated concerns in initiating conditions and classification, procedural adequacy, emergency response organization training, personnel recall, and facility activation. Some of the identified areas of concern for the site were applicable on a generic basis to Waste Management.

Emergency plans for the 200-F and H-Areas and the Waste Management facilities have not been updated. The emergency procedures contained in the "200-Areas Emergency and Disaster Plans" (F- and H-Areas), "200-H Area Emergency and Disaster Plans" (H-Area only), and the "Waste Management Emergency Procedures and Plans" are not the latest revision. The 200-F and H-Area disaster plan is still effective and applicable to H-Area and duplicates guidance in a newer 200-H Area emergency plan. The result is that H-Area has two effective emergency plans that are slightly different.

The Waste Management emergency action level scheme is not consistent with DOE 5500.2A, "Emergency Notification, Reporting, and Response Levels" (April 13, 1988), in that emergency classification levels do not correspond with emergency response levels described in the DOE Order.

Emergency preparedness training in the Waste Management facilities does not meet the requirements of DOE 5500.3. There is no program established for emergency preparedness initial classroom training, exercises, and drills, or periodic retraining. Routine or periodic exercises and drills are not conducted. An exercise evaluated by the TSA team indicated a significant concern in the area of exercise performance.

During the exercise, the Facility Emergency Coordinator and the operators evacuated from the 241-18F control room to the 241-1F control room without the knowledge of the Area Emergency Coordinator. For a period of time, the Area Emergency Coordinator could not contact the Facility Emergency Coordinator.

Communication capability during the exercise was degraded due to occasional telephone problems in both the F-Area Tank Farm control rooms. Radio communication was degraded due to excessive traffic on the channel, the inability to clear the channel, and the inability to receive clearly inside the 241-1F control room.

Emergency facilities and supplies were not adequate to support the small emergency exercise evaluated by the TSA team. Protective clothing and radiation monitoring equipment were not available in the control room for evacuation of shift personnel or response to the emergency. Large-scale facility layouts, status boards, and damage control equipment were not available. These deficiencies would hinder the protection of emergency workers and their ability to respond to and mitigate the consequences of emergencies.

The Waste Management Operations Department performed an excellent critique following the exercise that identified a majority of the deficiencies noted by TSA team evaluators.

Specific evacuation routes for the Tank Farms are not specified in the emergency plan or procedures, and the routes are not marked in the area. Personnel accountability methods or procedures are not specified in the emergency plan and detailed implementing procedures for personnel accountability have not been developed.

Facility line management, though responsible for emergency preparedness training for the facilities, has not implemented a training or exercise program. The facility has no assigned emergency preparedness staff and no personnel trained to perform that function. Oversight by WSRC was recently established; however, oversight has not been implemented. Oversight procedures should be implemented in conjunction with the new SRS emergency plan.

4.5.1.7.2 Findings and Concerns

EP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Emergency preparedness organization and administration should ensure effective planning for, and implementation and control of, facility emergency response.

FINDINGS:

- Trained emergency planning personnel were not assigned to the staff of the Waste Management facilities. Organizational responsibility was not assigned to an individual or individuals for coordination of emergency planning within the facility, as required by DOE 5500.3.

- There was no single integrated list of emergency response personnel within the Waste Management facilities. Specific personnel were not assigned to provide maintenance, technical, and operations support during emergencies, as required by DOE 5500.3.

- Program requirements did not provide for annual reviews of the facility emergency preparedness program. Annual reviews were not documented or conducted, as required by DOE 5500.3.

- Although various audits had identified facility deficiencies in emergency preparedness, the deficiencies were not formally or informally tracked by the facility.

CONCERN: (EP.1-1) (H1/C1)

Significant elements of the emergency preparedness program (e.g., training, exercises, and drills; program reviews; correction of deficiencies; and assignment of personnel) have not been developed and implemented as required by DOE 5500.3.

(Findings in Section EP.2 also support this Concern.)

EP.2 EMERGENCY PLAN AND IMPLEMENTING PROCEDURES

PERFORMANCE OBJECTIVE:

The emergency plan, the emergency plan implementing procedures, and their supporting documentation should provide for effective response to operational emergencies.

FINDINGS:

- DOE 5500.3 requires that emergency plans be kept up-to-date. DPSOL emergency procedures contained within DPSOP 313 Revision 0, "Waste Management Emergency Procedures and Plans," and DPSOP 115-FH Revision 49, "200-Areas Emergency and Disaster Plans," are not the latest revisions and do not match controlled copies of the same procedures maintained in the Waste Management control rooms.

- H-Area has two effective emergency plans in force instead of a single plan. DPSOP 115-FH Revision 49, "200-Areas Emergency and Disaster Plans," and DPSOP 115-H Revision 2, "200-H Area Emergency and Disaster Plans," are both effective for H-Area. The plans are similar but contain minor differences in procedure revision dates and information.

- The emergency plan and emergency procedures are not verified on an annual basis as required by DOE 5500.3.

- The emergency plans and procedures do not contain major elements required by DOE 5500.3. Missing elements include descriptions and functional requirements for the organization, training, exercise and drills, facilities and equipment, and maintenance of emergency preparedness. (See Concern EP.1-1.)

CONCERN: (EP.2-1) (H2/C1)

The Emergency Plans and Procedures are missing program elements, are inconsistent, are not effectively coordinated between areas and facilities, and have not been kept up-to-date, as required by DOE 5500.3.

EP.3 EMERGENCY RESPONSE TRAINING

PERFORMANCE OBJECTIVE:

Emergency response training should develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

FINDING:

- The Waste Management facilities have not established or implemented a program for initial and continuing emergency preparedness training. WSRC management policy WSRC-1-01 MP 4.12 Revision 0, "Emergency Preparedness," requires facility line management to be responsible for implementing emergency preparedness training for Waste Management.

CONCERN: (EP.3-1) (H2/C1)

The absence of any trained planning staff and missing or deficient program elements required by DOE 5500.3 could result in inadequate response to emergencies. (See Concern EP.4-1.)

EP.4 EMERGENCY PREPAREDNESS DRILLS AND EXERCISES

PERFORMANCE OBJECTIVE:

Emergency preparedness programs should include provisions for simulated emergency drills and exercises to develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

NOTE: The drills and exercises referred to in this section are related to tests of and training on the emergency preparedness program. In many cases, these drills and exercises are best initiated using an operational situation. If accomplished that way, an additional benefit is gained by exercising the operations personnel and the interface between operations and emergency preparedness. Therefore, for maximum benefit, an operational drill or exercise can be used to lead into the emergency preparedness event, providing a drill or exercise to each program.

FINDINGS:

- Waste Management has not conducted integrated routine or periodic emergency preparedness exercises involving the elements of detection, mitigation, classification, notification, augmentation, personnel accountability, and protective action recommendations.

- Communication problems were noted during the emergency exercise. (See Concern EP.5-1.)

- The performance of Waste Management personnel during the evaluated exercise indicated significant deficiencies in Waste Management's ability to plan and adequately control an emergency exercise.

- The drill controllers staged the exercise in the wrong control room (241-18F), which did not contain the remote indication for the affected tank.

- During the exercise, the Facility Emergency Coordinator (FEC) evacuated the control room shift operating staff (241-18F) without informing the Area Emergency Coordinator (AEC). The AEC was unable to contact the FEC for a period of time.

- The control rooms or the immediate area did not contain equipment for initial response to the emergency as required by DOE 5500.3. (See Concern EP.5-1.)

- Emergency equipment shutdown procedures were not referenced until prompted by the unit manager, who relieved the FEC several minutes into the emergency.

CONCERN: (EP.4-1) (H1/C1) (CAT II)

There is no assurance that the Waste Management facilities can adequately and consistently respond to a range of emergencies.

EP.5 EMERGENCY FACILITIES, EQUIPMENT, AND RESOURCES

PERFORMANCE OBJECTIVE:

Emergency facilities, equipment, and resources should adequately support facility emergency operations.

FINDINGS:

- During the emergency exercise, occasional problems were observed with one telephone in each control room and the portable radios. On two occasions, the Facility Emergency Coordinator had to step outside the control room to establish radio communications. Several attempts were made to clear the channel without success.

- There is no dedicated phone or radio channel for emergency communications. Proper classification, notification, and protective actions are dependent on reliable communications.

CONCERN: (EP.5-1) (H1/C1)
During an emergency, communication may not be adequate to keep the Area Emergency Coordinator and the Technical Support Center informed of status.

FINDINGS:

- The 241-1F and 241-18F control rooms are not equipped with emergency lockers containing radiation equipment, dosimetry equipment, anti-contamination clothing, barrier tape survey maps, flashlights, and other material that operations personnel may need to respond to an emergency or an evacuation of the control room.

- During the emergency exercise, health physics inspectors could not readily locate 115-vac electrical outlets that were needed to run air samplers.

- A staging point remote to the facilities and potential emergency sites for emergency personnel, tools, and equipment has not been established as required by DOE 5500.3.

CONCERN: (EP.5-2) (H1/C1)
The emergency facilities and equipment have deficiencies that, during an emergency, could result in hazards to emergency workers and degraded response to the emergencies.

EP.6 EMERGENCY ASSESSMENT AND NOTIFICATION

PERFORMANCE OBJECTIVE:

Emergency assessment and notification procedures should enable the emergency response organization to correctly classify emergencies, assess the consequences, notify emergency response personnel, and recommend appropriate actions.

FINDINGS:

- The facility classification wording of "Emergency Alert" is similar to the site "Alert" and the facility "Area Emergency" is similar to the site "Site Area Emergency." Neither of the similar sounding terms are the same classification level.

- The initiating conditions for emergency classification are not precise and provide opportunity for error. A single event can be classified under multiple categories. The classification system does not meet the intent of DOE 5500.2A.

- Procedures and personnel in the Waste Management facilities misuse and interchange the terms "classification" and "emergency action level." Therefore, emergency action levels (EALs) have come to mean classification rather than a specific value or parameter for an accident that requires event classification.

- The classification matrix of DPSOL 241-FGH-8511 Revision 1, "Events, Conditions, Concerns, Notification," was complex and lengthy, and did not have an index. The matrix contained 22 pages with some events listed under as many as four separate categories. Reportable events and issues are combined with emergencies. The notification matrix is combined with the classification matrix.

CONCERN: (EP.6-1) (H2/C1) The Waste Management facilities' emergency action level (EAL) scheme is not in compliance with DOE 5500.2A.

FINDINGS:

- The administrative burden of making as many as 12 notifications at the onset of an emergency is placed on the Facility Emergency Coordinator. Although a procedural note specifies that emergency action should take precedence, notification time requirements for serious emergencies is "immediate."

- Standard notification forms were not available. Therefore, the information passed was not consistent or recorded, and a record of the time and information was not kept.

- Record- and log-keeping during the emergency exercise was inadequate due to lack of staffing, communication problems, and notification requirements.

CONCERN: (EP.6-2) (H2/C1) The notification program and its implementation do not provide for timely, consistent, and documented notifications and communications.

EP.7 PERSONNEL PROTECTION

PERFORMANCE OBJECTIVE:

Personnel protection procedures should control and minimize personnel exposure to any hazardous materials during abnormalities, ensure that exposures are accurately determined and recorded, and ensure proper medical support.

FINDING:

- Evacuation routes for the F- and H-Areas are not well specified. The evacuation routes consisted of an arrow on the area maps at the main and alternate gates. Routes within the area were not specified on the maps or marked in the areas. In fact, during a release from the canyon buildings, evacuation of the F- or H-Area Tank Farm by either primary or alternate gates would result in an evacuation toward the canyon buildings and in the general direction of the release.

CONCERN: (EP.7-1) (H1/C1) (CAT II)

Evacuation procedures to protect F- and H-Area Tank Farm personnel during releases from the canyon buildings are not adequate.

FINDING:

- Personnel accountability methods for the Waste Management facilities are not specified in the emergency plan. Specific procedures for personnel accountability were not developed. The accountability system was dependent on supervisors remembering who was in the area.

CONCERN: (EP.7-2) (H1/C1)

Accountability procedures to protect personnel during emergencies are not developed and implemented for the Waste Management facilities.

4.5.1.8 Technical Support

4.5.1.8.1 Overview

Technical support to operations comes primarily from three technical organizations under the Waste Management manager. Waste Management Works Engineering (WMWE) supports non-project facility modifications; Waste Management Projects (WMP) is responsible for design and construction liaison with the Engineering and Projects Division (E&PD); and Waste Management Technology (WMT) engineers and technicians maintain surveillance to help improve process and equipment performance, resolve operational and safety-related issues, and ensure compliance with Technical Standards and Operational Safety Requirements (OSRs).

Waste Management has many competent and enthusiastic engineers. They are knowledgeable concerning facility systems and operations and contribute effectively to safe operations. Self-assessments have identified many of the deficiencies in technical support, and corrective actions are being aggressively pursued. However, adequate safety review of small modification projects, coordinated by WMT engineers, has generally not been fully documented, and this has been expressed as a concern.

Sound engineering practices are used for construction and facility modification projects. The engineering design review process has been modified to conform with DOE 4700.1. The previous Du Pont system of basic design data has been replaced by functional design criteria and functional performance requirements. Procedures are still being written for the new engineering design review process; nevertheless, this new process does not ensure that all safety-related disciplines have provided input into the design review. Also, it is not clear what the role of the Environment, Safety, Health, and Quality Assurance (ESH&QA) Division will be in design review. The Facility Safety Evaluation Section intends to play a significant role in safety assessments, regulatory compliance, and surveillances. Approximately 1 year ago, WMP began operational readiness reviews, as required by DOE 5480.5, prior to final closeout of modification projects. The procedures manual is still being drafted and additional training on conducting readiness reviews is required.

Staffing and resources for technical support are judged to be inadequate in a number of areas. Difficulty has been experienced in hiring qualified and experienced specialists in some safety disciplines. Additionally, a number of positions are still vacant in the Engineering and Projects Division following the transition from Du Pont to Westinghouse.

A comprehensive design and configuration control system for modification projects is not in place. Appropriate identification and approval of direct versus indirect work may require additional procedural review and approval. Configuration

control associated with revised procedures, operator training, and as-built drawings in the completion of modification projects needs to be strengthened. Safety-related limits and cautions are generally not referenced and highlighted in procedures. The large backlog of safety-related as-built drawings is a concern.

Safety Analysis Reports (SARs) prepared for Waste Management facilities have not followed the format of DOE 5480.5, which requires a complete section on OSRs. Updating the SARs to DOE requirements will probably take more than 6 years. In the meantime, an assurance of the appropriate safety envelope for each Waste Management facility, including the identification of all safety systems with their surveillance requirements, will continue to require special attention.

The Savannah River Laboratory (SRL) provides support to Waste Management programs in research and development of new processes, equipment design, review, and approval of test authorizations, and technical assistance to operations. However, long-range planning has generally given low priority to the analytical laboratory needs of Waste Management facilities. As a result, the analytical services in F- and H-Areas are inadequate to effectively support Tank Farm operations. Closer attention may also need to be given to the requirements for analytical laboratory support for new Waste Management facilities.

Only nonradioactive hazardous waste is shipped offsite. RHYTHM representatives and package compliance inspectors provide oversight for offsite shipments. Hazardous, radioactive, and mixed waste is transported onsite. The organization and management of hazardous material transportation falls within the ESH&QA Division. Safety analysis documentation for some onsite waste packages that have been used for many years is either unavailable or out-of-date. This concern is discussed in greater detail in the Packaging and Transportation section (4.5.3.9) of the Tiger Team report.

Waste Management does not have a defined and documented criticality safety program. Nevertheless, support from SRL and Separations Technology has in general assured that Waste Management criticality issues have been addressed. A WMT engineer has been designated to develop criticality safety expertise and coordinate a Waste Management program. Although the risk of a criticality accident in Waste Management facilities may be small, sufficient fissile material is regularly processed and handled to require a specialist to focus attention on criticality safety issues and good practices.

4.5.1.8.2 Findings and Concerns

TS.2 PROCEDURES AND DOCUMENTS

PERFORMANCE OBJECTIVE:

Technical support procedures and documents should provide appropriate direction, allow for adequate record generation and maintenance for important activities, and should be properly and effectively used to support safe operation of all facilities on the site.

FINDINGS:

- Former Du Pont practice was to use Technical Standards rather than Operational Safety Requirements (OSRs). Although the Technical Standards reviewed appropriately identified potential hazards and accidents, safety envelopes, and operating limits, none followed the DOE and NRC format for engineered safety systems with specified surveillance requirements.

- New Safety Analysis Reports (SARs) for Waste Management facilities are to follow the required DOE format. The SAR for the new Defense Waste Processing Facility, still in draft form, follows SROM 5480.5-1, which requires a complete section on OSRs. However, according to the WSRC Safety Analysis Report Schedules Plan (November 1989), it will take more than 6 years to prepare SARs for new Waste Management facilities and to update those for old facilities.

CONCERN: (TS.2-1) (H2/C1) A current and complete Safety Analysis Report is not available for each Waste Management facility, as required by DOE 5480.5.

FINDINGS:

- Those Waste Management facilities that do not have a current SAR are operating out of compliance with DOE Orders, specifically with regard to identified safety systems with specified surveillance requirements.

- Operational Safety Requirements for Waste Management Operations (DPW-86-103 Revision 1) specifies surveillance and testing requirements of engineered safety systems, but not all safety systems are identified.

CONCERN: See Concern AX.8-1.

TS.3 FACILITY MODIFICATIONS

PERFORMANCE OBJECTIVE:

Technical support services required by each facility on the site to execute modifications should be carried out in accordance with sound engineering principles that should assure proper design, review, control, implementation, and documentation in a timely manner.

FINDINGS:

- Evaluation of design packages for large engineering projects verified review and approval by safety specialists. However, formal procedures do not require review and approval by all safety-related disciplines.
- Environment, Safety, Health, and Quality Assurance (ESH&QA) participates only informally in design review and approval.

CONCERN: (TS.3-1) (H2/C2)

Procedures for engineering project design do not require formal review and approval by all safety-related disciplines.

(Findings in Section FP.1 also support this Concern.)

FINDINGS:

- Small process or facility modification projects, referred to as non-project related indirect work by WSRC, do not undergo adequate safety-related review during design and conduct of work.
- Waste Management Technology (WMT) has principal responsibility to ensure that all safety-related questions have been addressed. WMT procedures do not require review by specific safety disciplines.
- Procedures do not require Industrial Safety involvement in project review.
- Procedures do not require fire protection concurrence in work clearance permits except for direct work on fire suppression systems.
- The facility custodian alone determines whether work clearance permits require Health Protection approval.

CONCERN: (TS.3-2) (H2/C2) Work requests and procedures for small process or facility modification projects and maintenance do not require formal review and approval by all safety-related disciplines.

(Findings in Sections MA.1, SS.1, RP.1, PP.1, FP.1, and FP.7 also support this Concern.)

FINDINGS:

- Work completion of small process or facility modification projects requires only that revisions to procedures, as-built drawings, and operations training have been initiated or requested.
- Modified facilities can be operated for a considerable length of time without appropriate configuration control.

CONCERN: (TS.3-3) (H2/C2) Completion of as-built drawings, revised procedures, and operations training following facility modifications is not required prior to restart of operations.

FINDINGS:

- Thousands of as-built drawings for Waste Management facilities, including safety-related drawings, are not current.
- Waste Management Works Engineering is now authorized to prepare as-built drawings with central document control approval. However, they can keep up only with current modifications.
- A 3-year schedule for updating as-built drawings is in place, but the schedule primarily addresses only current needs.
- No prioritized list of safety-related drawings that require updating has been prepared. Although Piping and Instrument Diagrams (P&IDs) are said to be given highest priority, the highest priority on the 3-year schedule is for the 1-H evaporator.

CONCERN: See Concern OA.7-1.

TS.4 EQUIPMENT PERFORMANCE TESTING AND MONITORING

PERFORMANCE OBJECTIVE:

Effective equipment performance testing and monitoring should be performed by technical support groups to assure that equipment and system performance is within established safety parameters and limits.

FINDINGS:

- There is no analytical laboratory support in H-Area. Analyses of samples for chemistry control from both F- and H-Area Tank Farms are carried out in the 772-F Separations Laboratory.
- Savannah River Laboratory provides some analytical services to Waste Management, but does not place a high priority on routine process operations support.
- Because of increased programmatic activity in the Separations programs, Waste Management samples have been given low priority and may require months for turnaround.

CONCERN: (TS.4-1) (H2/C2) Analytical laboratory services for the F- and H-Area Tank Farms are inadequate to effectively support operations.

TS.8 CRITICALITY SAFETY

PERFORMANCE OBJECTIVE:

Specialized support for criticality safety issues should be fully integrated into the operation of the nuclear facility, and the handling and storage of fissile material by facility personnel.

FINDINGS:

- Waste Management was formerly a part of the Separations organization and was covered by its criticality safety program. Since splitting off into a separate operations organization, Waste Management has had no formal criticality safety program.
- Criticality concerns such as high fissile material content in transuranic waste drums, abnormal waste in tanks and evaporators, accumulation of fissile material at the Effluent Treatment Facility, sludge processing, and in-tank precipitation have previously been addressed by the specialists in Separations and the Savannah River Laboratory. This support may not continue to be available because of increased programmatic activities in those organizations.
- Future criticality safety technical support is required because Waste Management facilities will continue to deal with significant quantities of fissile material in its processes, particularly in sludge handling.
- A criticality safety specialist is not available to focus attention on criticality safety issues and good practices for Waste Management.
- A DPSOL Waste Management Criticality Safety Manual has been drafted, but has not yet been approved and implemented.

CONCERN: (TS.8-1) (H2/C1) Waste Management does not have a fully implemented nuclear criticality safety program.

4.5.1.9 Security/Safety Interface

4.5.1.9.1 Overview

Wackenhut Services, Inc. (WSI) provides security for SRS. WSI provides law enforcement, traffic control, access control, protective response, and site security support. The support is provided under an interface protocol document, "Security and Support Services Agreements at Savannah River Site," dated January 1990.

Under the protocol document, WSRC retains site responsibility for direction of all emergency response operations, emergency planning, entry authorization, and the review, design, and installation of safeguards equipment.

Procedures for protective response, training, and emergencies are detailed and provide adequate guidance for access, egress, and protective response under emergency conditions. Facility-specific knowledge is ensured by assignment of facility security officers who have line management responsibilities for all security-related matters at a facility.

The analysis required by DOE 5480.16 has not been completed for the Waste Management facilities. The purpose of the analysis is to examine the potential consequences of using weapons, vehicles, and other protective force equipment in the vicinity of safeguarded systems or components and hazardous materials and processes. The results of the analysis are required to be integrated into the security force training program and procedures.

The design for new facilities, improvements, and modifications are reviewed to determine the effect of the changes on safeguards and security. Major modifications and new facilities receive reviews as part of the project scoping document and design. If the changes affect safeguards and security, a specific safety review is conducted. There is a concern that the safety review process is not formalized for minor modifications and enhancements. Building custodians review minor changes to determine the impact on systems and components; however, specific review screening checklists are not used.

4.5.1.9.2 Findings and Concerns

SS.1 SAFETY OF IMPROVEMENTS

PERFORMANCE OBJECTIVE:

Security/safeguards improvements and modifications should not create or increase hazards that would impede the safe, reliable operation or shutdown of any facility on the site in normal, abnormal, or emergency situations.

FINDING:

- Security/Safeguards modifications that are accomplished using assigned maintenance orders and indirect work orders do not have a formalized program that results in a specific documented safety review.

CONCERN: See Concern TS.3-2.

SS.3 FACILITY PLANNING FOR SECURITY/SAFEGUARDS EMERGENCIES

PERFORMANCE OBJECTIVE:

Safety authorities and responsibilities for all types of security/safeguards emergencies should be well defined and understood by all involved parties.

FINDING:

- Waste Management has not performed an analysis to determine the potential consequences associated with using weapons, vehicles, and other protective force equipment in the vicinity of safeguarded systems or components and hazardous materials and processes, as required by DOE 5480.16.

CONCERN: (SS.3-1) (H2/C1)

The risk of using weapons, vehicles, and protective force equipment in the vicinity of facility systems, components, and processes has not been determined, as required by DOE 5480.16.

SS.4 SAFETY OF SECURITY ACTIVITIES

PERFORMANCE OBJECTIVE:

Safety aspects of security activities involving use of weapons and other protective force equipment in the vicinity of safety systems and/or hazardous processes and materials should be identified and understood by all involved parties.

FINDING:

- Security personnel have not been trained in the effects of using weapons and other protective force equipment in the vicinity of safeguarded systems and hazardous material and processes in the Waste Management facilities, as required by DOE 5480.16.

CONCERN: (SS.4-1) (H3/C1)

The training required by DOE 5480.16 on use of weapons and other equipment has not been conducted.

4.5.1.10 Facility Safety Review

4.5.1.10.1 Overview

WSRC has established new policies and procedures that enhance the ability to provide independent safety review for the Waste Management program areas. The creation of a new Environment, Safety, Health, and Quality Assurance Division and the establishment of the Safety Department and the Facility Safety Evaluation Section to oversee the nonreactor programs have provided a safety function independent from the line organizations.

The previously established Site Central Safety Committee, with its numerous subcommittees, and the network of Area Safety Committees have been maintained. This long-established structure provides for coordination and communication of relevant safety information and the establishment and review of policies across the WSRC organization. These committees still maintain their basic role of coordinating, communicating, and advising in industrial and operational safety activities in a nuclear/chemical environment. The new safety functions concentrate on the technical, engineering, and process control reviews, functions that had previously been assigned in varying degrees to the Savannah River Laboratory.

The newly established review functions do not bring the independent safety review process into full compliance with DOE Orders. The document Triennial Review of the Contractor Independent Safety Review Systems of the SRS Non-Reactor Facilities (ESH-FSE-890068) clearly represents a landmark effort in defining the parameters of the independent safety review system at WSRC, as compared to 94 DOE TSA Performance Objectives. It defines six areas for improvement encompassing 256 new recommendations. The next Triennial Review will be performed by the Internal Oversight Department under the Executive Vice President. Annual facility reviews have not been completed for more than 30 facilities sitewide, including the Waste Management facilities, as required by DOE 5480.5.

Safety review activities are performed at multiple levels, each having some degree of independence from the primary working organizational segment whose activity is being reviewed. This results in the advantage of having a variety of perspectives, but also results in the disadvantages of multiple tracking systems, the possibility of losing timeliness, and difficulty in verifying issue closure.

There is no definitive program to review operating experience. While the Site and Area Review Committees provide some distribution of safety incident reports across the site, the program to review lessons learned is limited to SRS activities and information. Communications with DOE, the NRC, the Institute

of Nuclear Power Operations (INPO), vendors, and other agencies that have information about operating experience are not part of the safety program.

4.5.1.10.2 Findings and Concerns

FR.4 ANNUAL FACILITY SAFETY REVIEW

PERFORMANCE OBJECTIVE:

An annual operating review of the facility should be performed by a committee appointed by top contractor management.

FINDINGS:

- An annual facility safety review of the waste management facilities meeting the requirements of DOE 5480.5 has not been performed for more than a year, although there have been periodic reviews by the F- and H-Area Safety Committees in accordance with their charters.

- The recently formed Site Safety Review Committee (SSRC) has the function of providing independent reviews of environmental and safety activities. However, the SSRC Charter does not specify responsibility for an annual facility safety review.

- Independent safety review functional responsibilities are also assigned to the Facility Safety Evaluation Section (FSES) of the Safety Department, Environment, Safety, Health, and Quality Assurance Division. However, these responsibilities do not include an annual review that meets the requirements of DOE 5480.5.

- The FSES document Triennial Review of the Contractor Independent Safety Review System of the SRS Non-Reactor Facilities (ESH-FSE-890068, November 1989) acknowledges that annual facility safety appraisals must be improved to meet the intent of DOE 5480.5.

CONCERN: (FR.4-1) (H2/C1) WSRC has not provided for an annual facility safety review that meets the requirements of DOE 5480.5.

FR.5 TRIENNIAL APPRAISAL OF FACILITY SAFETY REVIEW SYSTEM

PERFORMANCE OBJECTIVE:

A triennial appraisal of the safety review system should be performed by contractor management.

FINDING:

- The document Triennial Review of the Contractor Independent Safety Review System of the SRS Non-Reactor Facilities (ESH-FSE-890068, November 1989) presents an extensive review by the Facility Safety Evaluation section of the independent safety review system that included activities of Waste Management. The defined major objective was to develop a detailed, comprehensive description of the Savannah River Independent Safety Review System. ESH-FSE-890068 does not provide an independent assessment of the effectiveness of the safety review system, as required by DOE 5480.5.

CONCERN: (FR.5-1) (H2/C1)

The Triennial Review represented by ESH-FSE-890068 does not meet the requirements of DOE 5480.5.

FR.6 OPERATING EXPERIENCE REVIEW

PERFORMANCE OBJECTIVE:

Operating experiences should be evaluated, and appropriate actions should be undertaken to improve safety and reliability.

FINDINGS:

- Investigation and analysis of in-house events within Waste Management are performed, but there is no specified program to incorporate other external sources of significant operating experience information for application to Waste Management.

- Waste Management does not consider external sources of information such as DOE and NRC letters, bulletins, and information notices; vendor reports; facility event reports; and Institute of Nuclear Power Operations circulated operating experience information.

CONCERN: (FR.6-1) (H3/C2)
Waste Management does not have a program in place to incorporate external sources of information about operating experiences.

FINDING:

- Substantial review and assessment of records from maintenance (preventive and corrective maintenance history), operations (system and component performance testing), and technical support (design basis requirements) are not performed in a systematic and integrated manner.

CONCERN:
See Concern MA.6-1.

4.5.1.11 Radiological Protection

4.5.1.11.1 Overview

All radiological protection performance objectives were reviewed with the exception of performance objectives or parts of performance objectives that are sitewide, as discussed below. Overall, the radiological protection program protects the workers from receiving radiation exposures in excess of WSRC and DOE limits, but does not adequately minimize collective radiation exposure or limit the extent of contaminated areas.

Line management is designated as being responsible for radiological protection, as required by DOE 5480.5. However, the implementation of the radiological protection program is such that the responsibility for radiological protection actually lies with the Health Protection Department rather than line management. When problems are encountered or audits are performed, the Health Protection Department has the responsibility for taking corrective action, even when the root cause is with Waste Management. Waste Management personnel are not consistently or formally apprised of trends in radiological protection.

Radiation procedures are adequate for control of radioactive material, but the lack of organization makes them difficult to follow. The field implementation of these procedures requires extensive supervision. WSRC has plans to restructure the procedures and to use radiation work permits that would simplify the implementation of radiological protection. A sitewide discussion on procedures is included in the TSA of the Savannah River Laboratory (SRL).

Areas toured were adequately posted and monitored. The control of radioactive check sources was acceptable in two of the three areas audited. WSRC is implementing a centralized inventory for radioactive sources.

The external radiation protection and ALARA programs effectively maintain individual radiation exposures per job to a minimum, but they do not minimize the collective exposure received in the Waste Management facilities.

The external dosimetry program is addressed in the TSA of SRL, and the internal dosimetry program is addressed in the TSA of the Tritium Facility.

Internal radiation exposures at the Waste Management facilities are very well controlled. However, personnel are frequently directed to wear respirators or protective clothing when the likelihood of contamination or an intake of radioactive material is very small. These practices may actually increase external exposure by slowing up the work or result in other negative health effects, such as heat exhaustion.

The adequacy of the maintenance and calibration of radiation instruments is addressed in the TSA of the SRL. All instruments audited in the Waste Management facilities had check sources available to verify their operation. Many of the instruments had current calibrations, but there were exceptions.

The nature and extent of contaminated areas throughout the Tank Farms vastly complicates efforts to prevent the migration of contamination from one area to another, especially during windy or rainy conditions. Waste Management personnel have controlled the contamination so that it does not spread outside their controlled areas; however, more attention is required to minimize the extent of the contamination inside the radiologically controlled areas.

Records are kept on the appropriate field instruments. The occupational exposure records are kept sitewide and are addressed in the TSA of the SRL.

4.5.1.11.2 Findings and Concerns

RP.1 RADIOLOGICAL PROTECTION

PERFORMANCE OBJECTIVE:

Facility organization and administration should ensure effective implementation and control of radiological protection activities on the facility.

FINDINGS:

- The Waste Management line organization is designated as being responsible for worker safety in their facilities; however, implementation of the radiological protection program is actually the responsibility of the Health Protection Department.

- Waste Management line managers and supervisors are generally not aware of the performance indicators (i.e., extent of contaminated areas, extent of areas requiring respirators) published by the Environmental and Health Protection Department. This information is useful for anticipating potential radiological problems.

- Waste Management Works Engineering is not obtaining safety reviews from the Health Protection Department on procedures that involve work in radiologically controlled areas.

CONCERN: (RP.1-1) (H2/C2) The organization and administration of the radiological protection program does not ensure the effective implementation of radiological protection programs.

FINDING:

- The recently initiated appraisal program performed by the Program Optimization Section of the Environmental and Health Protection Department is primarily directed toward the performance of the Health Protection Department, not the performance of Waste Management in the area of radiological protection. Deficiencies noted in the appraisal reports become the responsibility of the Health Protection Department, even though the solution to the root cause may reside with the operating organization, over which the Health Protection Department has no control.

CONCERN: (RP.1-2) (H2/C1) The Health Protection Department's appraisal program is not in compliance with DOE 5480.5.

RP.3 RADIOLOGICAL PROTECTION PROCEDURES AND POSTING

PERFORMANCE OBJECTIVE:

Radiation protection procedures for the control and use of radioactive materials and radiation generating devices should provide for safe operations and for clearly identified areas of potential consequences.

FINDING:

- The practice of "doubling the beta dose" (actually doubling the sum of the beta and gamma doses) when posting radiation areas or recording readings on surveys implies that a beta radiation field is present in cases when it is not. This practice is conservative, but may cause confusion among the less knowledgeable workers.

CONCERN: (RP.3-1) (H2/C3)
The criteria for posting radiation areas and recording survey results for beta doses are not based on technical criteria.

FINDINGS:

- Sources in the F-Area Tank Farm were not controlled under lock and key where required.

- A 0.25 mCi Cs-137 source was signed out from the Health Protection office of the F-Area Tank Farm for 8 days. Sources are supposed to be returned at the end of the shift. The source was not missed until the discrepancy was pointed out. The source was subsequently located with a person other than the person who originally signed out the source.

- F-Area integrity and inventory checks were not recorded on Form OSR 4-386, as required by DPSOP 40. The checks were not readily auditable because results of the checks were located in the inspector log sheets.

- A centralized source inventory was not implemented. However, the Health Protection Department was in the process of setting one up.

CONCERN: (RP.3-2) (H3/C2)
Source control programs are not adequate to ensure control of radioactive sources.

RP.4 EXTERNAL RADIATION EXPOSURE CONTROL PROGRAM

PERFORMANCE OBJECTIVE:

External radiation exposure controls should minimize personnel radiation exposure.

FINDINGS:

- Procedures in place for work in radiologically controlled areas are typically not specific enough to minimize radiation exposures. Examples of directives include, "Follow all safety rules," and "Comply with provisions of DPSOP 40." However, work in radiological areas is well monitored by Health Protection Inspectors.
- A radiation work permit system was not in place.
- The ALARA goals limit exposure to individuals, but there are no effective ALARA goals that limit the collective exposure for a job. This results in spreading the radiation exposure among a large number of personnel.

CONCERN: See Concern RP.11-1.

RP.5 EXTERNAL RADIATION DOSIMETRY

PERFORMANCE OBJECTIVE:

The routine and accident personnel radiation dosimetry programs should ensure that personnel radiation exposures are accurately determined and recorded.

FINDING:

- Personnel driving waste trucks wear the radiation dosimeters on their chest, even though the radiation source is behind them.

CONCERN: (RP.5-1) (H2/C1)

The dose to personnel driving waste trucks is not properly determined as required by DOE 5480.11.

RP.8 FIXED AND PORTABLE INSTRUMENTATION

PERFORMANCE OBJECTIVE:

Personnel dosimetry and radiological protection instrumentation used to obtain measurements of radioactivity should be calibrated, used, and maintained so that results are accurately determined.

FINDINGS:

- The Nuclear Measurements air monitors in Bldg. 299-H were all approximately 3 months past due for calibration.
- Several frisker stations in the F-Area Tank Farm had count rate meters without source calibration stickers, and the electronic calibration stickers stated, "Calibrate as needed."
- The constant air monitors in the F-Area Tank Farm were approximately 4 months past due for calibration.
- The hand and shoe counter at the 643G monitoring station in the burial grounds was past due for calibration.
- The alpha constant air monitor at Bldg. 724-8G in the burial grounds did not have a calibration sticker. The Ludlum count rate meter at the same location was also past due for calibration.
- Instrumentation had check sources available for field verification of operability.

CONCERN: (RP.8-1) (H2/C2) Fixed field radiological protection instruments are not all currently calibrated so that accurate measurements can be made.

RP.9 AIR MONITORING

PERFORMANCE OBJECTIVE:

Air monitoring systems through selection, location, calibration, and maintenance should ensure reliable estimates of air activity for radiological control purposes.

FINDINGS:

- Air monitoring at the Tank Farm is usually performed with permanently mounted fixed monitors, which could be several hundred feet from the work site. Personnel in the work site are required to wear respirators.
- The air monitoring station at Bldg. 299-H has many bends and long stretches of 2-inch diameter pipe between the sampling point and the collection point, potentially resulting in unreliable measurement of the air activity.

CONCERN: (RP.9-1) (H3/C1) The air monitoring program does not ensure reliable estimates of air activity, as required by DOE 5480.11.

RP.10 RADIATION MONITORING/CONTAMINATION CONTROL

PERFORMANCE OBJECTIVE:

The radiation monitoring and contamination control program should ensure worker protection from radiation exposures.

FINDINGS:

- Approximately 20 percent of the Tank Farm area is contaminated. These outdoor areas are subject to wind and rain.
- Containment methods are not fully utilized to prevent the spread of low to moderate levels of contamination.
- The radiologically controlled areas are large and do not minimize the use of protective clothing or health protection personnel. Following a rain storm during the TSA, a road inside the Tank Farm area was closed because of contamination. A person inside the radiologically controlled area but not inside a contaminated area became contaminated. This type of occurrence is not unusual.
- Decontamination facilities in the Tank Farms are located on the clean side of the radiologically controlled areas, resulting in the potential for unnecessary spreading of contamination outside of a radiologically controlled area.

CONCERN: (RP.10-1) (H3/C2) The contamination control program does not minimize the spread of contamination.

RP.11 ALARA PROGRAM

PERFORMANCE OBJECTIVE:

A formally structured, auditable program should be in place with established milestones to ensure that exposures are maintained as low as reasonably achievable (ALARA).

FINDINGS:

- There are two types of ALARA goals: (1) pro-rated yearly departmental total person-rem, and (2) monthly and yearly limits on individuals.
- Specific jobs do not have effective total person-rem goals. For example, the refurbishment of the 241-H evaporator resulted in a total of approximately 12 person-rem, but the ALARA program focuses on limiting individual exposure, not total job exposure.
- Construction personnel typically receive the bulk of the radiation exposure while working on Waste Management jobs in the Tank Farms, but the exposures received are not part of Waste Management's ALARA goals.

CONCERN: (RP.11-1) (H3/C1) The ALARA program does not ensure that collective exposures are kept as low as reasonably achievable, as required by DOE 5480.11.

4.5.1.12 Personnel Protection

4.5.1.12.1 Overview

The personnel protection disciplines evaluated at SRS included industrial safety, construction safety, and industrial hygiene. The construction safety program was applicable only to Bechtel and subcontractor personnel as a separate program. The WSRC industrial safety program is applicable to all WSRC personnel within the Waste Management areas. Bechtel does not have a formal industrial hygiene program or radiation safety program and therefore operates in accordance with the site radiation protection and industrial hygiene programs as defined by WSRC. Because of the division of responsibility between Bechtel and WSRC, there was no central point of authority governing health and safety programs at SRS. This is not a compliance issue, but there is confusion when different groups working in the same area use different safety rules.

Staffing levels in both the industrial safety and industrial hygiene disciplines were inadequate to address all DOE-mandated requirements. Most of the deficiencies identified in this appraisal had been previously identified within WSRC, but had not been corrected. Professional staff members were competent and 50 percent of all professional staff members had 5 or more years of experience. Because first-line operating and health protection personnel did not recognize common OSHA violations in the Tank Farm areas, training in industrial safety requirements for these employees is considered inadequate.

Many SRS health and safety program documents were written without reference to applicable DOE and general industry consensus standards. While all necessary areas are addressed, industrial safety and industrial hygiene policies were formulated at a time when DOE policy allowed deviation from industry consensus practices if the resulting program provided equal or better protection of employees. Staff industrial safety and health protection personnel are aware of this situation and are addressing it in forthcoming revisions to health and safety policy documents. Scheduled revisions to industrial safety and health protection documents have been deferred in consideration of the pending changes. Consequently, site program and policy documents are not current.

In all situations, relevant industrial safety and industrial hygiene concerns are addressed in current program and policy documents, even though not all of these documents fully incorporate DOE and OSHA requirements. Even where requirements are identified in the SRS program documentation, resources are not always allocated to meet the requirements identified. In some cases, deviations from required standards and DOE orders are only procedural, e.g., the division of responsibility for the respiratory protection program between two or more organizations. In another case where periodic monitoring and documentation of

contaminant levels is identified and scheduled but not performed, the deficiencies are considered substantive.

Regular professional industrial hygiene staff walk-throughs of Waste Management areas have not been performed within the past 2 to 3 years. Walk-throughs by professional industrial safety personnel are being performed regularly, although notable deficiencies are apparently being overlooked. In this respect, the program appears to have deteriorated from where it was 2 to 3 years ago.

The only Category II concern in Personnel Protection was the noncompliance of the respiratory protection program with the DOE-mandated respiratory protection standard, ANSI Z88.2-1980. The lack of required personnel monitoring and documentation of monitoring, coupled with the absence of adequate administrative controls to assure that respirators were appropriately issued, elevated this concern to Category II status.

4.5.1.12.2 Findings and Concerns

PP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Facility organization and administration should ensure effective implementation of the personnel protection program.

FINDINGS:

- Current internal audits performed by Program Optimization do not address all elements of the personnel protection programs. For example, field verification of respirator usage and personnel monitoring practices are not defined in the Program Optimization internal audit program.
- A periodic chemical monitoring program has been developed, but not implemented as required by DOE 5480.10 9.b.(4).
- Periodic walk-throughs of Waste Management areas have not been performed in accordance with the SRS procedure for implementation of DOE 5480.10 requirements, as documented in DPSOP 193-5-104.
- There is no program to ensure that employees identified as being at high-risk for hearing loss receive annual audiograms, in accordance with 29 CFR 1910.
- Allocation of resources is insufficient to assure that personnel protection disciplines meet the requirements of DOE 5483.1A, DOE 5480.4, DOE 5480.9, DOE 5480.10, 29 CFR 1910, and 29 CFR 1926.

CONCERN: (PP.1-1) (H2/C1) Current personnel protection programs do not meet the requirements of DOE 5483.1A, DOE 5480.4, DOE 5480.9, DOE 5480.10, 29 CFR 1910, and 29 CFR 1926.

FINDINGS:

- Safety review of small construction projects, minor facility modifications, and equipment purchases is not accomplished until the line organization requests a readiness review.
- Safety issues for other than major facility modifications, equipment purchases, and construction projects may not be identified until the final readiness review.

CONCERN: See Concern TS.3-2.

FINDING:

- Responsibility for administering the site safety program is divided between two autonomous units, one for WSRC and one for Bechtel. These programs have been administered differently for separate activities in the same physical area within the Waste Management facilities.

CONCERN: (PP.1-2) (H3/C3)

Site construction and industrial safety policies are administered differently because a central point of authority has not been established and a consolidated safety program has not been defined.

PP.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE:

Procedures and documentation should provide appropriate direction, record generation, and support for the personnel protection program.

FINDINGS:

- Health and safety procedures and documentation were in a state of revision and were not current.
- The written safety and industrial hygiene program addressed topics required by DOE 5480.10, DOE 5480.9, and DOE 5483.1A, but the procedures were not in conformity with all identified and applicable requirements.

CONCERN: (PP.2-1) (H3/C2)

The written safety and health programs are not in compliance with DOE 5483.1A, DOE 5480.10, and applicable DOE mandatory consensus standards.

PP.3 MANAGEMENT OF HEALTH AND SAFETY CONCERNS

PERFORMANCE OBJECTIVE:

Chemical, physical, and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

FINDINGS:

- Periodic walk-throughs of Waste Management areas have not been performed in accordance with the SRS procedure for implementation of DOE 5480.10 requirements, as documented in DPSOP 193-5-104.

- Review periods for industrial hygiene procedures have been identified in written procedures, but reviews have not been performed as required by DOE 5480.10.

CONCERN: (PP.3-1) (H2/C1)
Periodic reviews of designated standards and walk-through surveys by professional industrial hygiene personnel are being performed only sporadically, and therefore are not in compliance with DOE 5480.10.

FINDING:

- Reviews of purchase orders by WSRC industrial safety personnel were not routinely performed.

CONCERN: (PP.3-2) (H2/C1)
Safety reviews of purchase orders for safety concerns are not being performed in accordance with good management practices.

FINDING:

- Safety audits of Waste Management facilities, which involve senior staff members, were being performed on the basis of requirements for staff involvement and not as periodic facility evaluations or audits. Consequently, safety staff walk-throughs of the Waste Management areas occurred infrequently.

CONCERN: (PP.3-3) (H2/C2)
Safety staff walk-throughs of Waste Management facilities are not performed in accordance with good management practices.

PP.4 SURVEILLANCE OF HEALTH AND SAFETY CONCERNS

PERFORMANCE OBJECTIVE:

Appropriate surveillance of activities should be conducted to measure safety and health performance and ensure the continued effectiveness of controls.

FINDINGS:

- There was no formal surveillance program identified for evaluation of construction activities.
- There is a documented program for periodic monitoring of chemical, physical, and biological stresses, but the required monitoring has not been performed at the frequency required by DOE 5480.10.
- The level of respiratory hazard in the work place and/or time-weighted average concentration was not being documented in accordance with ANSI Z88.2-1980.

CONCERN: (PP.4-1) (H2/C1)

The current program for periodic chemical monitoring of both construction and operations personnel does not meet the requirements of DOE 5480.10 and ANSI Z88.2-1980.

PP.5 COMPLIANCE WITH OCCUPATIONAL HEALTH STANDARDS

PERFORMANCE OBJECTIVE:

Facility operations should comply with DOE-prescribed standards for the evaluation and control of occupational health hazards.

FINDINGS:

- There was no site inventory of asbestos-containing materials in the Waste Management areas, as required by 29 CFR 1926 and DOE 5480.10.
- Some insulation and gasket materials in the Tank Farm areas were not marked as to asbestos content.

CONCERN: (PP.5-1) (H2/C1) The SRS asbestos program does not meet the requirements of 29 CFR 1926 and DOE 5480.10.

FINDINGS:

- The hearing-conservation program adequately identified employees at risk, in accordance with DOE Orders and OSHA guidelines, but no mechanism was available to verify that all at-risk employees received an annual audiogram.
- A hearing-conservation program for construction personnel was not defined in accordance with DOE 5480.10 and 29 CFR 1926.
- DOE-SR granted a permanent exemption from OSHA hearing-protection requirements, although current requirements in DOE 5480.4 require permanent exemptions to be granted by the program Secretarial Office.

CONCERN: (PP.5-2) (H2/C1) The SRS hearing-conservation program does not meet the requirements of 29 CFR 1926.

FINDING:

- The SRS carcinogen control program does not control American Conference of Governmental Industrial Hygienists (ACGIH) suspect carcinogens.

CONCERN: (PP.5-3) (H2/C1) The SRS carcinogen control program does not comply with the requirements of DOE 5480.10.

FINDINGS:

- The Tank Farm area did not have an emergency communications capability as required by 40 CFR 264.

- Personnel assigned to the Tank Farm area were not adequately trained on emergency procedures in accordance with 29 CFR 1910.20.

CONCERN: (PP.5-4) (H2/C1) Emergency notification capabilities in the Tank Farm areas are not in compliance with 29 CFR 1910.20 or 40 CFR 264.

FINDINGS:

- The level of respiratory hazard in the work place and/or time-weighted average concentration was not being documented to the extent required in ANSI Z88.2-1980.

- There were no controls to assure that respiratory protection equipment is issued and used appropriately.

- The Health Protection staff acknowledges situations in which organic vapor respirators have been used for radiological protection purposes and vice versa.

CONCERN: (PP.5-5) (H1/C1) (CAT II) The SRS respiratory protection program is not in compliance with the ANSI Z88.2-1980 requirements regarding monitoring and administrative controls for respirator usage, as mandated by DOE 5480.4.

PP.6 COMPLIANCE WITH OCCUPATIONAL SAFETY STANDARDS

PERFORMANCE OBJECTIVE:

Work places should be free of uncontrolled physical hazards and be in compliance with DOE-prescribed occupational safety standards.

FINDINGS:

- Several compressed gas cylinders had expired hydrostatic pressure test stamps.
- There were electrical extension cords being used for applications in excess of 90 days.
- Exposed gasket material observed near tank 38 was unmarked and later confirmed as containing asbestos.
- A welding area at the H-Area Tank Farm had no exhaust ventilation, even though stainless steel and galvanized metals were welded.
- A telephone line in H-Area was grounded to an electrical circuit ground.
- The Health Protection supervisor in the H-Area Tank Farm was unaware of OSHA requirements for emergency communications.
- A breaker in 241-64H was locked out with a hasp and tag but no lock. The tag had been in place for over 1 year.

CONCERN: (PP.6-1) (H2/C1) OSHA noncompliance items within the Waste Management areas have not been identified and corrected.

PP.7 PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE:

Facility personnel should be adequately informed of chemical, physical, and biological stresses that may be encountered in their work environment.

FINDINGS:

- Information on employee occupational safety rights and obligations were not visibly posted at the Waste Management facilities, as required by DOE 5483.1A.
- The chemical labeling program makes use of manufacturers' warnings on original containers and the NFPA diamond system for labeling other containers.
- Personnel interviewed were knowledgeable of health and safety risks associated with chemicals carrying the NFPA labeling system, but were not knowledgeable of risks associated with chemicals carrying only the manufacturers' labels.

CONCERN: (PP.7-1) (H2/C1)

The hazards communication program is not adequately addressing the health and safety risk associated with chemicals that do not carry the NFPA label, as required by 29 CFR 1910.1200.

4.5.1.13 Fire Protection

4.5.1.13.1 Overview

The major guidelines used in the evaluation of fire protection at SRS Waste Management facilities were DOE 5480.1B, "Environmental, Safety, and Health Program for Department of Energy Operations" (September 23, 1986), DOE 5480.4, "Environmental Protection, Safety, and Health Protection Standards" (May 15, 1984), and DOE 5480.7, "Fire Protection" (republished November 16, 1987). Other guidelines used were the National Fire Protection Association's mandated National Fire Codes and the philosophy and standards of the Highly Protected Risk Insurance Industry, as exemplified by the Factory Mutual System, Industrial Risk Insurers, and Kemper.

The Waste Management organization has been given the responsibility for basic fire safety, as described in WSRC Policy 4.7. This responsibility is a designated function of the building custodian (and/or fire warden), who is provided with semiannual training. However, the training program is of limited scope and does not fully address necessary fire protection program elements such as the Life Safety Code, National Electrical Code, or the Flammable Liquids Code.

The bulk of DOE's mandated fire protection program is the responsibility of the sitewide Fire Department and the various Fire Protection Engineering organization being developed. However, the necessary elements of the DOE fire protection program are not fully implemented.

The sitewide WSRC Fire Protection Engineering program was established in April 1989, but it is not yet completely functional or fully staffed. WSRC Fire Protection Engineering is still undergoing organizational change, and the necessary fire protection program elements such as structure, policy, procedures, and standards have not been fully developed. Therefore, the implementation and effectiveness of the program mandated by DOE 5480.7 have been substantially limited.

The sitewide WSRC Fire Department has been operating within its present format since 1987. The basic program elements for Fire Department operations are in place, and firefighters are State certified and annually recertified, and have a minimum of 3 years of municipal experience. However, a completed self-assessment has shown that additional resources are needed to provide administrative support and gain compliance with NFPA 1500, "Standard on Fire Department Occupational Safety and Health Program."

The facilities observed during this appraisal are such that a credible (readily conceivable) fire is likely to be similar to a typical unprotected industrial property fire. Large quantities of unusual hazardous materials probably would not be released, although no risk analysis has been performed to assure this.

Therefore, any additional threat to the public beyond that due to common industrial fire releases is considered unlikely.

However, the facilities appraised would not qualify for improved risk fire insurance coverage as required by DOE 5480.7, due to the lack of water supplies and automatic fire sprinkler protection, and inadequate fire alarm provisions. Because of these deficiencies, there is increased potential risk to plant personnel.

The team judged that, based upon conditions in effect at the time of this appraisal, a credible fire (e.g., a control room fire) is not likely to result in a shutdown of an important facility for an unacceptable period of time (6 months), as defined in DOE 5480.7. Extra efforts by Waste Management and the use of other available control rooms, processes, and equipment at each Tank Farm would allow resumption of operations on an interim basis until final repairs could be completed.

Although shutdown of the important Waste Management facilities would probably not exceed the allowable shutdown period, this has not been assured by a formal risk analysis. Additionally, there has been no risk or loss potential analysis conducted to assure that property damage to the Waste Management facilities reviewed will not exceed the $1 million maximum allowable loss from a credible fire.

WSRC general management and the management of the Waste Management facilities are aware of the deficiencies, and are both actively working toward resolution and correction. For example, the design of fire protection water supplies and distribution systems for H-Area has been approved as an FY 1991 line item.

4.5.1.13.2 Findings and Concerns

FP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Fire Protection organization and administration should ensure the effective implementation and control of fire protection equipment and activities.

FINDINGS:

- The fire protection organizational structure, including authorities and responsibilities, has not been defined for the Fire Protection Engineering staff. The need for Fire Protection Engineering expertise and Fire Protection Engineering relationships within the WSRC organization are still being assessed and the organization developed.

- Adequate resources have not been established or allocated to accomplish the necessary elements of the DOE-mandated fire protection program. Examples include the following.

  - Engineering program elements have not been completed.
  - Facilities and equipment for record keeping, surveillance, and associated program elements have not been provided.
  - Fire Department operations program elements have not been completed.

- Fire Protection personnel do not clearly understand their authorities, responsibilities, accountabilities, and interactions with supporting groups or within the Fire Protection program.

- Facility and site fire protection standards have not been established for incorporation into plans and specifications for all new construction or modifications of existing facilities. The first draft of these standards is expected to be completed in March 1990.

CONCERN: (FP.1-1) (H2/C1)

The Fire Protection organization and administration necessary for the effective implementation and control of the fire protection program are not in place, as required by DOE 5480.7.

(The findings in Sections FP.2, FP.5, FP.6, and FP.7 also support this Concern.)

FP.2 LIFE PROTECTION

PERFORMANCE OBJECTIVE:

All facilities onsite should provide adequate life safety provisions against the effects of fire.

FINDINGS:

- Exit signs were improperly located and/or illuminated within the Tank Farm control room buildings.
- The emergency notification system/public address system could not be clearly heard within all areas of the Waste Management facilities. The burial grounds do not have an emergency notification system.
- Automatic fire sprinkler protection has not been provided in any of the Waste Management buildings or structures.
- Automatic fire detection has not been provided for the electrical equipment and cable areas of the control rooms, where heavy smoke can be anticipated.

CONCERN: (FP.2-1) (H2/C1) Compliance to NFPA 101, Life Safety Code, has not been achieved, and alternate measures have not been provided.

FINDINGS:

- Building custodians and fire wardens have not received Life Safety Code training to perform the field inspections, as mandated by WSRC Policy Statement 4.7.
- Fire Protection engineers have not performed self-assessments or field verification inspections to ensure Life Safety Code compliance.
- Waste Management projects personnel have not been provided Life Safety Code training to effectively perform their project liaison responsibilities.
- Fire Protection standards and procedures have not been developed to ensure compliance with the Life Safety Code.

CONCERN: (FP.2-2) (H2/C1)

There is no program in place to ensure that facilities meet the requirements of WSRC Policy Statement 4.7, or NFPA 101, Life Safety Code, or that conformance is verified by periodic field inspections.

(The findings in Section FP.7 also support this Concern.)

FP.5 PROPERTY PROTECTION

PERFORMANCE OBJECTIVE:

A maximum credible fire, as defined in DOE 5480.7, Section 6.f, should not result in an unacceptable property loss.

FINDINGS:

- Automatic fire sprinkler protection has not been provided in any of the Waste Management buildings or structures.
- Automatic fire detection and alarm systems have not been provided in the electrical equipment and cable areas of the control rooms.
- Water supplies and fire hydrant protection have not been provided.
- Cable tray physical separation and fire protection have not been provided.
- Halon 1301 protection systems for the control rooms are located within the control rooms and are subject to fire exposure within the area they are to protect. This is not in compliance with NFPA 12A, "Standard on Halon 1301 Fire Extinguishing Systems."
- Self-assessments, fire risk analyses, and fire hazard analyses to determine credible and maximum potential fire loss have not been completed.
- A maximum foreseeable dollar loss valuation program to develop dollar loss potential estimates has not been completed.

CONCERN: (FP.5-1) (H2/C1)

There is no assurance that the maximum property loss, due to credible fire scenarios, will not exceed the $1 million limits established by DOE 5480.7.

(The findings in Sections FP.1 and FP.7 also support this Concern.)

FP.6 FIRE DEPARTMENT OPERATIONS

PERFORMANCE OBJECTIVE:

The Fire Department should have the capacity to promptly terminate and mitigate the effects of a fire in a safe and effective manner.

FINDINGS:

- Fire engines 1, 3, 4, and 5 are not adequately equipped with spare self-contained breathing apparatus cylinders, folding ladders, and 6-foot pike poles for fire suppression response.
- Testing is not provided for the hard-suction hose on the fire engines, and there are no maintenance or testing procedures for the hard-suction hose.
- Training programs are not in place to provide appropriate levels of training for driver-operators, fire officers, or safety officers.
- The program for Fire Department personnel to advance beyond the State certification and Firefighter I level of competency has not been completed.
- Personal Alert Safety System (PASS) devices for the safety and rescue of Fire Department personnel have not been provided.
- The Fire Stations at A- and F-Areas, serving the Waste Management facilities, are not equipped with proper ventilation systems to protect firefighters from vehicle exhaust.
- Annual medical examinations are not being provided for Fire Department personnel.
- There is no detailed, structured physical fitness program for firefighters, nor is there a physical fitness facility to implement such a program.
- There is no rehabilitation program for Fire Department personnel who are unable to meet the standard fitness program.

CONCERN: (FP.6-1) (H1/C1) (CAT II)

The Fire Department is not in compliance with the requirements of NFPA 1500, "Standard on Fire Department Occupational Safety and Health Program," as mandated by DOE 5480.4, for such

items as annual medical examinations, specific training, physical fitness, and Personal Alert Safety System devices.

FP.7 PROGRAM IMPLEMENTATION

PERFORMANCE OBJECTIVE:

A fire protection engineering program should be in place to effectively provide and maintain an "improved risk" level of fire protection.

FINDINGS:

- Fire Protection Engineering surveys as defined in DOE 5480.7 have not been conducted in Waste Management areas.
- Exemptions for deficiencies do not exist.
- Water supplies, distribution systems, fire hydrants, and associated equipment have not been provided.
- Automatic fire sprinkler suppression systems have not been provided.
- Surveys, audits, and appraisals to assure proper implementation of fire protection standards have not been completed.
- Fire hazard and fire risk analyses for assessing the potential impact of credible fires have not been completed.
- There are no documented programs, procedures, standards, and policies for Fire Protection Engineering.

CONCERN: (FP.7-1) (H2/C1)

The requirements for improved risk, as mandated by DOE 5480.7, are not met by the Fire Protection Engineering program.

(The findings in Sections FP.1, FP.2, and FP.5 also support this Concern.)

4.5.1.14 Nuclear Criticality Safety

The Nuclear Criticality Safety Performance Objectives are addressed under Performance Objective TS.8 in the Technical Support section of this report.

4.5 SAFETY AND HEALTH FINDINGS AND CONCERNS

4.5.2 TRITIUM FACILITIES

4.5.2.1 Organization and Administration

4.5.2.1.1 Overview

This appraisal of organization and administration covered all TSA performance objectives and included review of appropriate documents and interviews with all levels of the organization from the President, WSRC, to operators at the Tritium Facilities. The interrelations of the Tritium Project Management Team (PMT) with supporting organizations such as ESH&QA, Human Resources, Management Integration, Planning, the various standing safety committees, and Nuclear Materials Processing Division management were also reviewed.

The primary change in operations resulting from Westinghouse's assumption of the SRS contract is best characterized by increased application of DOE and national consensus standards, mandatory compliance with these standards, and a more rigorous documentation and formality of activities. The breadth and magnitude of the changes required of WSRC and the expectations of DOE in their timely accomplishment have presented a major challenge to WSRC's ability to "manage change" effectively.

Significant organizational changes have been made requiring the integration of existing elements and the creation of new elements, particularly to provide independent ES&H oversight. Although not fully defined and still evolving, they have been accomplished in a logical and understood manner. Line management understands its "ownership" of safety responsibilities, but there are areas where this has not been fully realized. The effective industrial safety culture instilled under du Pont is being broadened to cover all areas of safety. Because there are 9 to 11 layers of management, additional communications activities are being provided to mitigate potential problems resulting from this long communication chain. This increased communication will also enhance ownership of the numerous goals established. A hierarchial series of policy and procedure manuals is being developed, and a detailed Performance Improvement Program (PIP), to bring SRS into compliance, has been developed and is being implemented. The absence of some of these management control documents coupled with the absence of formally issued job descriptions, and the extensive chain of command, makes management involvement in safety decision making suspect.

Staffing shortages are already adversely affecting the ability to accomplish existing ES&H tasks. The ambitious goals of the PIP will require an almost doubling of the Tritium facilities staff and similar increases in ES&H supporting organizations over the next several years if they are to meet their goals. When considering security, recruitment, housing, and training

requirements, it is doubtful that these goals can be met in the required time frame.

Westinghouse corporate support of WSRC has been vigorous and manifested in many ways. Most visible has been the transfer of approximately 450 managers from other Westinghouse activities to WSRC (although none of these transfers occurred at the Tritium Facilities). This is to be contrasted to the 15 to 25 new managers brought in when similar contract transfers have occurred at other DOE sites. Additionally, Westinghouse has provided corporate level policies, procedures, and directives that are supportive of DOE objectives, particularly in the ES&H and quality assurance areas, and has provided oversight activities in the environmental and nuclear safety area.

WSRC has developed the Site Item Reportability and Issue Management System, and Commitment Management System, which when fully implemented should provide management with the ability to monitor and assess current performance, and determine the effect of new initiatives such as PIP. Included in PIP are plans to generate new Safety Analysis Reports and Operational Safety Requirements consistent with current industry standards. However, document control and storage practices are not in compliance with DOE Orders and NQA-1 requirements.

WSRC has an effective Substance Abuse program with strong employee support, but it does not assure initial training for all supervisors or provide for periodic refresher training.

WSRC is vigorously developing a management team and the policies and procedures to bring SRS into compliance with DOE and other applicable standards. The ability to obtain the necessary resources to implement the plans being developed in the time frame desired by DOE remains in doubt.

4.5.2.1.2 Findings and Concerns

OA.1 SITE/FACILITY ORGANIZATION

PERFORMANCE OBJECTIVE:

Management should organize and manage the site/facility's work, programs, and resources so that safety and health are an integral part of the personnel duties, and requirements are consistently implemented.

FINDINGS:

- While a new, integrated organizational structure was developed by WSRC subsequent to its assumption of the SRS contract on April 1, 1989, additional changes have already occurred that make these organization charts obsolete. However, this has not been found to be an impediment to employee understanding of the WSRC organization.

- There is no single document or collection of documents that define organizational mission, responsibilities, accountabilities, or interfaces. WSRC management is aware of this deficiency and has included corrective actions in the Performance Improvement Program. Line operating managers understand their "ownership" responsibilities for their facilities but the reality of their ownership is not always evident. (See Sections MA.1 and RP.3.)

- While most exempt employees have participated in the development of new WSRC job descriptions, these have not been formally approved or issued. A review of these unapproved job descriptions indicates that they include only cursory treatment of safety responsibilities and limited treatment of employee responsibilities, authorities, and interactions.

- Without approved job descriptions or defined organizational roles, employees do not have an understanding of the need to interface with supporting organizations, the limits of their authority, or the need to inform and/or seek higher management approval, particularly with regard to ES&H activities. (See Sections MA.1, EP.3, and FP.1 for additional supporting material.)

- There are between 9 and 11 levels of management. While this is an unusually large span of control, WSRC management is aware of it

and plans to correct this consistent with Westinghouse standards and good practices. WSRC has taken a number of effective mitigating actions to reduce the communications problem that would normally result from such a long management chain.

CONCERN: (OA.1-1) (H2/C2)

Organizational documents that define the mission, responsibility, and interfaces of the various organizational elements coupled with approved job descriptions that define the individual's role, responsibility, and accountability in accomplishing the mission are lacking.

OA.2 ADMINISTRATION

PERFORMANCE OBJECTIVE:

Administrative programs and controls are in place to assure policies concerning health and safety are administered throughout the facility.

FINDINGS:

- Most WSRC management control systems are in the early stages of formation. An extensive Performance Improvement Program (PIP) includes the development of hierarchial management control systems including budget, reporting, and safety oversight systems.

- The new safety oversight system has resulted in the establishment of new organizational units such as ESH&QA Division, new standing safety review committees at the plant and Project Management Team level, and the development of new policies and procedures.

- New reporting systems such as the Site Item Reportability and Issue Management System and sitewide tracking systems such as the Commitment Management System are in early stages of implementation.

- WSRC plans for these various control systems appears reasonable, but it is too early to assess whether they will be effectively implemented.

- Staffing to carry out this ambitious PIP has been projected to approximately double at the Tritium Facilities with similar increases required in the support organizations over the next couple of years.

- These resource requirements appear realistic and are being phased in over this time period. Senior WSRC management believes staffing levels can be achieved in this time frame to effectively meet PIP initiatives, despite the delays that will be encountered in obtaining clearances, recruiting qualified personnel, training, and quartering them.

- The ability to meet staffing projections in the time frame required is a view not shared by most of the operating line managers interviewed at the Tritium Facilities, the supporting organizations, or this appraisal team.

- Current staffing shortages are already adversely affecting safety-related activities in preventive maintenance, as-built drawings, procedure review and development, and supporting independent oversight functions in ESH&QA. (Also see Sections OP.1, OP.4, TC.1, and PP.1 for additional supporting material.)

CONCERN: (OA.2-1) (H2/C2)

WSRC management may not have a realistic view of current staffing needs and the ability to obtain sufficient, qualified staff for timely implementation of Performance Improvement Program initiatives.

OA.7 DOCUMENT CONTROL

PERFORMANCE OBJECTIVE:

Document control systems should provide correct, readily accessible information to support site/facility operations.

FINDINGS:

- A sitewide document control system consistent with the requirements of NQA-1 exists. However, there is evidence that this system is not capturing all required documents or assuring that revisions to documents are properly updated. (Also see Sections QV.1, TS.2 and RP.3 for additional supporting material.)

- The storage of documents required by NQA-1 does not meet fire protection (NFPA-232) or other NQA-1 storage requirements. (See Section TC.1 for additional supporting material.)

CONCERN: (OA.7-1) (H3/C1) DOE 5700.6B requirements to control and store safety and quality assurance documents are not being met.

OA.8 FITNESS FOR DUTY

PERFORMANCE OBJECTIVE:

A Fitness-for-Duty Program should be capable of identifying persons who are unfit for their assigned duties as a result of drug or alcohol use, or other physical or psychological conditions, and should provide procedures to remove them from such duty and from access to vital areas of the site or facility pending rehabilitation or remedial actions.

(Note: The medical aspects of fitness-for-duty are addressed in Section MS.6 of the Savannah River Laboratory S&H Subteam report.)

FINDINGS:

- When interviewed, some supervisors could not recall when or whether they had received training in substance abuse recognition or procedures.
- The current WSRC substance abuse program does not specify the need for periodic refresher training.

CONCERN: (OA.8-1) (H2/C2) New supervisors are not always provided substance abuse training, and periodic refresher training for all supervisors is lacking.

4.5.2.2 Quality Verification

4.5.2.2.1 Overview

In performing this part of the appraisal, relevant Quality Verification activities within the Tritium Facilities were reviewed, as well as those at the Site Quality Office, the Total Quality Office, General Stores, and the Savannah River Standards Laboratory. The objectives and criteria for this appraisal area are derived from the requirements of ANSI/ASME NQA-1. That standard was imposed on the site in 1981, and several attempts to implement a formal quality assurance (QA) program have been made. Although those earlier attempts have helped with getting all of the NQA-1 related implementing procedures in place at the Tritium Facilities, full compliance with NQA-1 will not be achieved this calendar year as projected on the Tritium Program QA Manual Implementation Schedule. New requirements in the WSRC QA Manual 1Q, which take effect April 1, 1990, have not yet been factored into the Tritium Facilities QA Program compliance schedule.

Tritium Facilities personnel are participating in the development of the sitewide quality program, the planned procurement procedure changes, and the proposed warehousing improvements. The Tritium Facilities method for handling procurement requisitions is serving as a model for other site divisions.

The foundation exists for establishing an excellent QA program at the Tritium Facilities. Good discipline already exists with regard to product line activities. Work is done in accordance with operating procedures, special processes are identified and controlled, inspections are performed, portable measurement instruments are calibrated, and surveillances and verifications are conducted. These practices, however, are not yet evident in the non-product activities.

Weaknesses in the existing Tritium Facilities QA Program were noted in several important areas. Implementation and compliance is moving slowly in the critical QA elements of design control, procedures, inspection, calibration, and storage of parts and materials. Temporary measures being used to control item receiving, inspection, and storage areas do not meet the requirements of NQA-1. The calibration program is just starting for fixed or installed instruments in the process lines, stacks, and safety-related support systems. Reviews of operating procedures, shop fabrications, and most maintenance activities are not receiving independent verifications.

Management priorities and support for the Tritium Project Management Team Quality Program are not clearly stated in the Nuclear Material Processing Division Performance Improvement Plan. The QA program is treated as one of several management systems requiring development and implementation and is in the early stages of the improvement effort. Plans for self-assessments are not yet available, QA performance indicators are

not specifically identified, the QA work breakdown structure is unclear, and QA program training requirements are not addressed.

4.5.2.2.2 Findings and Concerns

QV.1 QUALITY PROGRAMS

PERFORMANCE OBJECTIVE:

Administrative programs and controls are in place to assure policies concerning quality are administered for each facility throughout the site.

FINDINGS:

- A documented and approved WSRC Quality Assurance (QA) Plan (WSRC 1-05), issued in April 1989, established the requirements for executing the management policy, requirements, and procedures (WSRC-1-01, MP 4.2, WSRC-1-03, MRP 4.06) for the WSRC QA Program. Until the consolidated WSRC QA Manual (WSRC-1Q) takes effect on April 1, 1990, the existing QA manuals are being used. The applicable quality documents for the Tritium Facilities are the SRP QA Manual (DPW-83-111-3, revised February 1, 1989) and the Tritium Program Quality Instructions (DPSPM-200-6, revised May 2, 1989).

- Commitments and schedules for the implementation and compliance achievements of the Tritium Quality Program were first made in December 1987. Progress on these commitments has been tracked since then and measured against the Tritium Program QA Manual Implementation Schedule. Recent status reports pertaining to the Tritium Quality Program (Memoranda OPS-TQA-890214 and OPS-TQA-900011) showed that administrative systems and controls are in place for all NQA-1 related elements.

- Compliance is achieved when fully trained people are executing their jobs in accordance with the established QA systems and controls. At the Tritium Facilities, full implementation and compliance is still lacking in several essential elements: design control (see Sections OP.4, AX.1, TS.3, PP.1, and FP.1); instructions, procedures, and drawings (see Sections OP.4, RP.3, and PP.6); special processes; inspection (see Sections PP.3, PP.4, and QV.6); control of measuring and test equipment (see Section QV.4); handling, shipping, and storage (see Sections QV.5 and MA.3); quality improvement; and document control (see Sections OA.7, OP.3, TC.1, TS.2, RP.3, RP.12, and PP.2).

- The status reports on the Tritium Quality Program show that full compliance is scheduled for December 1990. These projections, however, are based on meeting the existing SRS quality requirements which will change on April 1, 1990, when the new sitewide QA Manual 1Q becomes effective. The impact of these new requirements on the existing Tritium Quality Program has not been factored into the compliance schedule.

- Management priorities and intentions for the Tritium Quality Program are not readily identified in the Nuclear Material Processing Division Performance Improvement Program (PIP) dated December 19, 1989. The QA program, which is treated as one of several management systems requiring development and implementation, is in the early stages of the improvement effort. Plans for self-assessments (PIP, paragraph 2.5.13) are not yet available; QA performance indicators are not identifiable (PIP, paragraph 4.4.3.2); the QA work breakdown structure is unclear; and QA program training requirements are not addressed.

CONCERN: (QV.1-1) (H2/C1) A quality assurance program, as required by NQA-1 and DOE 5700.6B, has not been fully developed and implemented for the Tritium Project Management Team.

QV.3 RECEIVING AND PRE-INSTALLATION INSPECTION

PERFORMANCE OBJECTIVE:

Provisions are established for the inspection of purchased material, equipment, and services in accordance with documented procedures by trained personnel.

FINDINGS:

- Procedures have been established to identify the inspection status of purchased items. A "QA HOLD" tag is used to identify an item which is nonconforming or its quality is indeterminate. The tag precludes release of an item before required assessment and disposition are performed. Except for the "QA HOLD" tag there are no special provisions or tags to clearly identify or segregate rejected items.

- Warehouse or storage areas either at General Stores or within the Tritium Facilities are not available for exclusive use by inspection activities. Temporary measures, such as roped-off zones, and use of existing shelving, are used as compensating actions, but are not adequate to meet controlled storage requirements of NQA-1.

CONCERN: See Concern QV.5-1.

QV.4 CALIBRATION PROGRAM

PERFORMANCE OBJECTIVE:

Provisions are made to assure that tools, gages, instruments, and other measuring and testing devices are properly identified, controlled, calibrated, and adjusted at specified intervals.

FINDINGS:

- There are several designations for measuring and test equipment (M&TE) within the Tritium Facilities. The three main types of M&TE are: Works Engineering Portable, Production Portable, and Production Fixed or Installed. The portable types have been identified, and procedures for their calibration and maintenance are available. The instruments designated as "installed" have not all been identified for calibration. Those directly associated with product quality are in the existing calibration program. The remaining installed instruments are not scheduled to be identified before the end of June 1990.

- Procedures for the calibration, maintenance, and control of the installed M&TE (DPSOL TF-H-5055) are not complete and are to be revised.

- Instruments (outside the three types above) used for stack monitoring (see Section TS.5), radiation protection, fire protection, and other similar health and safety functions are not part of the Tritium Facilities calibration program. (Also see Section QV.1.)

CONCERN: (QV.4-1) (H2/C2)

The calibration program for the Tritium Facilities does not assure the accuracy of measuring and test equipment used in process control and in health and safety applications.

QV.5 IDENTIFICATION AND CONTROL OF HARDWARE/MATERIALS

PERFORMANCE OBJECTIVE:

Provisions are established to identify and control the use or disposition of hardware, materials, parts, and components as well as to assure that incorrect/defective items are not used.

FINDINGS:

- There are three receiving points and ten designated storage areas for hardware and materials scattered throughout the Tritium Facilities.
- Inventory lists are incomplete except for product-related and high-pressure system items.
- Construction groups share some of the same storage areas for their materials storage and welding inspections.
- Temporary waiver from the site quality requirements has been requested of the Site Quality Department by the Tritium Project Management Team to allow storage of Level B items in Level C space (Memorandum OPS-TWE-890245). A formal response has not been received. Compensatory actions are required to upgrade and reclassify available areas.
- A surveillance of storage and handling (Report 89-S-04-T086) conducted by the Tritium Quality Department identified six deficiencies which still require corrective or compensatory actions.
- Segregation of nonconforming materials and scrapped or excessed items is not always practiced in storage areas.
- Except for high-pressure process items, safety-related parts and components are not being adequately segregated in the storerooms. (Also see Sections QV.3 and MA.3.)

CONCERN: (QV.5-1) (H2/C1)

The present storerooms and procedures used at the Tritium Facilities for the storage and control of safety-related or quality-designated hardware and materials do not meet the requirements of NQA-1.

QV.6 INSPECTION

PERFORMANCE OBJECTIVE:

Prerequisites are provided in written inspection procedures with provisions for documenting and evaluating inspection results.

FINDINGS:

- For non-product activities or items, formal and independent inspection requirements and guidelines are not developed. Specification of inspections, hold points, and independent verifications of activities such as machine shop fabrications and maintenance repairs are not routine and are determined by the fabricating organization. (Also see Section TS.3.)
- Operators and mechanics performing inspections are from the same organization which perform the work activity.
- Reviews of operating procedures are not always independently verified or documented. (Also see Section OP.3.)

CONCERN: (QV.6-1) (H2/C1) Inspections and verifications are not performed by persons independent of the organization doing the work as required by NQA-1.

4.5.2.3 Operations

4.5.2.3.1. Overview

This assessment of the Tritium Facilities at the SRS examined the operations in Bldgs. 232, 234, 236, 237, and 238 in H-Area. The functional areas included processing, enrichment, recovery, and capture of tritium; unloading, reclamation, and loading (both active and inert) of reservoirs; storage, packaging and shipment of tritium; and by-product recovery. Tritium extraction is not currently being conducted, and this area was not reviewed. A cursory look was given to the Materials Testing Facility. This facility is run by the Savannah River Laboratory (SRL) and is being reviewed concurrently by the SRL Safety and Health Subteam.

Production operations historically were conducted in a manner which maximized the amount of acceptable product that could be shipped on schedule. Matters such as effluent control, waste minimization, contamination control, etc., were given less attention. Recently the DOE has defined additional important criteria, and the production organization has responded. Programs such as the Performance Improvement Program and the Project Management Team are examples. Management recognizes that the staff must be increased and must be trained in order to accomplish the ambitious goals that have been established.

The concept of custodianship is being given new emphasis in the tritium area. This is a good concept and will pay abundant dividends as it integrates the many supporting operations. However, at present it has led to some confusion as to roles and relationships.

Operations are conducted in a safe and professional manner and are adequately monitored and reviewed by management. However, the required degree of formalism is not present in these reviews. Operating procedures provide specific, detailed guidance for safe operation of the facilities, but not all revised procedures are formally verified and validated prior to use.

The status of the process is clear to the operators, and they effectively monitor the equipment. When problems arise, the lack of accurate system drawings hampers timely resolution. Locks and tags are effectively employed to protect equipment, people, and the environment. The electrical lock-out method should be evaluated to determine if safety could be enhanced.

Working conditions are reasonably good, considering that the buildings have been expanded many times without any overall plan. The ventilation system has not kept pace with the demands placed upon it.

The operators have the required knowledge and skills to follow the detailed, written procedures, but formal documentation of operator qualifications is lacking in many cases. Shift

personnel do not have sufficient in-depth knowledge to deal adequately with abnormal situations, as shown by the frequency of contacts with management during off-hours. The generally young professional staff in the Tritium Facilities should broaden their contacts with other DOE tritium-handling sites.

The process facilities are old and have been expanded many times to accommodate additional equipment. Human factors were not properly considered in these expansions. As an awareness of human factors has grown, they have not been incorporated in the facility resulting in a facility that is not user friendly.

4.5.2.3.2 Findings and Concerns

OP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Operations organization and administration should ensure effective implementation and control of operations activities.

FINDINGS:

- The specific responsibilities and interfaces between production and the supporting organizations are not clearly understood by everyone in the Tritium Facilities. This is because the concept of custodianship is being given a new emphasis by WSRC and is not clearly defined, and has not been incorporated into practice. As a result, the interfaces with the support groups are uncertain.
- Specific interface documents do not exist for most of the support groups.
- Operating personnel do not have clear, written descriptions of their duties. These duties are usually described in the annual performance reviews.
- Nearly 40 percent of the performance reviews are not held on time.

CONCERN: See Concern OA.1-1.

FINDINGS:

- Staffing of the Replacement Tritium Facility with experienced and/or well trained people, while continuing to operate existing facilities, will be difficult.
- The number of operations personnel is too small to permit their adequate involvement in the design of modified equipment.

CONCERN: See Concern OA.2-1.

OP.2 CONDUCT OF OPERATIONS

PERFORMANCE OBJECTIVE:

Operational activities should be conducted in a manner that achieves safe and reliable operation.

FINDING:

- A signoff is not specifically required on procedure changes that assures the Operational Safety Requirements will not be violated.

CONCERN: See Concern TS.2-2.

FINDING:

- Operators are assigned to decontaminate floors, walls, and other surfaces in the controlled areas.

CONCERN: See Concern RP.10-1.

FINDING:

- Information about process upsets is not always collected and reviewed to find common factors.

CONCERN: See Concern TS.4-1.

FINDINGS:

- Cut reservoirs are allowed to sit in hoods and off-gas to the stack.
- All lines and tanks containing tritium are not double-walled.
- Tritium contaminated equipment has been abandoned in place without being decontaminated or sealed.
- A few heat exchangers contain only a single metal wall between the cooling water and the tritium.
- All mass spectrometer sample lines are not contained within conduits or cable trays. The capillary that runs from Bldg. 236 to Bldg. 234 is unprotected.
- The process enclosures are ventilated to the stack.

CONCERN: (OP.2-1) (H2/C2) Lack of double containment leads to effluents that are not at a level that is As Low As Reasonably Achievable (ALARA) and may result in major releases of tritium to the environment with attendant potential personnel risks and potential programmatic impacts.

OP.3 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE:

Approved written procedures, procedure policies, and data sheets should provide effective guidance for normal and abnormal operation of each facility on a site.

FINDING:

- A program does not exist for collecting and analyzing unusual occurrences and/or age-related degradation as a basis for replacing equipment.

CONCERN: See Concern TS.4-1.

FINDINGS:

- Operators are instructed to follow procedures exactly and to stop any job that cannot be performed safely.
- While walk-throughs of procedures are frequently performed, there is no auditable verification and/or validation of procedures prior to use. (Also see Section QV.1.)

CONCERN: (OP.3-1) (H2/C2) Procedures are not verified and validated prior to use.

OP.4 FACILITY STATUS CONTROLS

PERFORMANCE OBJECTIVE:

Operations personnel should know the status of the systems and equipment under their control, and the effect of nonoperational systems and equipment on continued operations. They should ensure that systems and equipment are controlled in a manner that supports safe and reliable operation.

FINDINGS:

- Accurate, detailed drawings describing the process and all auxiliary and supporting systems do not exist.
- Drawings are not always revised before modified equipment is placed in service.
- Also see Section QV.1.

CONCERN: (OP.4-1) (H2/C2)

Up-to-date or as-built drawings of the process do not exist.

OP.6 OPERATOR KNOWLEDGE AND PERFORMANCE

PERFORMANCE OBJECTIVE:

Operator knowledge and performance should support safe and reliable operation of the equipment and systems for which they are responsible.

FINDINGS:

- Shift supervisors consider the knowledge and skills of their operators when making assignments. However, there is no formal program to qualify each operator before he/she is assigned to a particular task.
- Written statements of the knowledge and skills required for many jobs do not exist.
- An effectively functioning program to provide the necessary training does not exist.

CONCERN: See Concern TC.3-1.

FINDINGS:

- In the past at SRS, only minimal emphasis was placed on "lessons learned." (Also see Concern FR.6-1.)
- Operations and technical support personnel are not encouraged to be cognizant of information from the tritium community on advances in the state-of-the-art in tritium handling.

CONCERN: (OP.6-1) (H2/C2) Operations and technical support personnel are not knowledgeable of the applicable state-of-the-art of tritium process technology.

OP.7 SHIFT TURNOVER

PERFORMANCE OBJECTIVE:

Turnovers conducted for each shift station should ensure the effective and accurate transfer of information between shift personnel.

FINDINGS:

- Shift turnover effectively and adequately transfers the pertinent information.
- Shift turnover is not guided by a written check sheet. An improved procedure is scheduled to be implemented by April 1, 1990.
- All of the shift logs in Bldg. 234 are not signed by the operators.

CONCERN: (OP.7-1) (H2/C2) Shift turnover procedures do not meet the guidelines of the Institute of Nuclear Power Operations.

OP.8 HUMAN FACTORS

PERFORMANCE OBJECTIVE:

Human factors considerations should be incorporated in the design, layout, and operation of all facilities on the site in order to facilitate operator control, information processing, and the recognition and proper response to alarms, instruments, and other equipment.

FINDINGS:

- As additions have been made to the process, the panel in the control room has not been revised to permit close and orderly grouping of related displays.
- The control panels are not labeled with descriptive terms to help a person understand the process.
- Instruments are not marked to show the normal or safe range of operation. The digital instruments in use in the control panels do not lend themselves to showing ranges of operation.

CONCERN: (OP.8-1) (H2/C1) Human factors considerations have not been adequately addressed in the control room.

FINDINGS:

- Color coding of lines is virtually nonexistent.
- Equipment labels do not include any functional representations/descriptions, and therefore, it is difficult for inexperienced people to identify and locate a particular piece of equipment.
- Piping is not labeled with words so that it can be readily identified.

CONCERN: (OP.8-2) (H2/C1) Piping and equipment are not adequately labeled or color coded.

4.5.2.4 Maintenance

4.5.2.4.1 Overview

Maintenance activities addressed during this appraisal centered on the H-Area Tritium Facilities real property (DOE 4330.4); production oriented equipment; facilities and activities that support maintenance (shops, procurement, supply storage); and the records and management systems that are used for documenting, tracking, and planning maintenance. The vehicle fleet maintenance area, central stores and parts storage areas, central shop area, and standards laboratory were inspected.

Information was obtained through interviews with personnel involved at various levels, observation of areas and equipment, review of documents, and observation of activities.

Maintenance at the Tritium Facilities is done by different groups which are responsible for different equipment. Equipment that has a Tritium Production Department person as its custodian, has maintenance done by Tritium Engineering personnel. This is mainly equipment that is considered to be production or process equipment although some maintenance will be done through the Tritium Engineering Procurement Group by outside vendor services such as roof repair.

Equipment owned by Power Operations is maintained by Separations Engineering personnel; this is mainly heating, ventilating, and air conditioning equipment and generators.

Buildings and grounds are in good condition and generally are clean and neat. The shop areas are clean and neat with tool storage and a small area for storage of spare parts. However, storage space for spare parts and maintenance supplies is limited; and with the lead time for procurement of equipment getting longer because of requirements for drawings and specifications, this could effect the quality of maintenance. Measuring and test equipment are stored and calibrated according to their safety and quality category, and control of use is good.

Maintenance activities are effectively conducted using proper procedures and with good coverage by Health Protection, production, and maintenance supervision. Tag out of a maintenance activity was observed and it was complete and thoroughly checked. Planning and scheduling of jobs uses the Work Management System (WMS) to track status of work orders that are in the system. Each piece of equipment is identified by a number to permit tracking in the WMS. Included are those that have a predetermined maintenance interval, such as preventive maintenance, as well as those entered into the system when needed. The corrective maintenance on some equipment is done at failure of the equipment and is done in a manner that has kept production running. The backlog of repair/maintenance and work orders is acceptable.

A policy statement that defines the functional interface between the groups involved in maintenance in the Tritium Facilities (i.e., Power Engineering, Separations Engineering, Tritium Process, and Tritium Engineering) does not exist.

The WMS is used for record keeping and data gathering on maintenance of equipment, but there is not enough information entered to allow analysis of the condition of equipment or to do predictive maintenance type analysis.

Maintenance for some equipment in the facility is done by Separations Engineering for Power Engineering. The facility management may not get information on the status of equipment whose custodian is Power Engineering.

Equipment that is important to safety or reliable operation is not categorized separately in the WMS, therefore, its conditions or schedule of maintenance cannot be easily tracked.

Rust, steam leaks, and deteriorating insulation in some areas indicates that preventive maintenance is not being performed on some non-process equipment.

Procedures are used extensively in maintenance, but because of lack of historical data, the WMS cannot be used to update procedures.

4.5.2.4.2 Findings and Concerns

MA.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Maintenance organization and administration should ensure effective implementation and control of maintenance activities.

FINDINGS:

- Maintenance of equipment necessary for safe and reliable operation of the facility is done by two different organizations.
- The functional relationship between the different groups responsible for maintenance and operations is not written in a policy statement or organizational document.

CONCERN: See Concern OA.1-1.

FINDINGS:

- Facility management does not have custodianship (responsibility for operation or maintenance) of ventilation fans or most emergency generators that service their facility. (Also see Section OA.1.)
- Separations Engineering personnel do maintenance on the fans and generators on their own schedule (except for veto by the facility management for operational reasons).
- Facility management does not automatically receive information on the condition of this equipment.

CONCERN: (MA.1-1) (H2/C2) There is no formal process to assure that facility management receives timely information on the status of support equipment that might affect safe and reliable operation of the facility.

MA.3 MAINTENANCE FACILITIES, EQUIPMENT, AND MATERIAL

PERFORMANCE OBJECTIVE:

Facilities, equipment, and material should effectively support the performance of maintenance activities.

FINDINGS:

- Storage space for maintenance supplies and spare parts is limited.
- For effective maintenance, more supplies and spare parts should be available at the Tritium Facilities.
- Increased requirements for drawings, specifications, and reviews of procurement documents will increase the time needed to obtain some parts.
- Increased procurement time will require the storage of additional equipment for effective maintenance.
- Related findings are provided in Sections QV.1 and QV.5.

CONCERN: (MA.3-1) (H3/C2) Storage space for supplies and spare parts is not adequate to support an effective maintenance program.

MA.6 PREVENTIVE MAINTENANCE

PERFORMANCE OBJECTIVE:

Preventive maintenance should contribute to optimum performance and reliability of systems and equipment important to operations.

FINDINGS:

- Corrosion and rust are evident on some non-process pipes and fittings.
- There are steam leaks around couplings and fittings located outside buildings.
- Insulation on some pipes is deteriorating and not well secured.
- The preventive maintenance program does not have provisions for identifying and flagging equipment that may need replacement because of age.

CONCERN: (MA.6-1) (H3/C2)

Preventive maintenance is not adequately addressing degradation of equipment because of age or weather exposure.

MA.7 PREDICTIVE MAINTENANCE

PERFORMANCE OBJECTIVE:

Maintenance history evaluation and systematic root cause analysis should be used to support maintenance activities and optimize equipment performance.

FINDINGS:

- Most maintenance records reviewed do not contain information about equipment conditions or reason for failure.
- Data concerning failure modes and equipment conditions are not entered into the Work Management System (WMS).
- Vibrational analysis and other techniques are not used to track equipment condition.
- Equipment related to safe and reliable operation is not uniquely identified in the WMS to allow better predictive maintenance on them.
- Also see Section TS.4.

CONCERN: (MA.7-1) (H3/C1) Maintenance activities are not being supported by trend analyses or failure analysis.

4.5.2.5 Training And Certification

4.5.2.5.1 Overview

All TSA performance objectives of the training and certification area were evaluated. In addition, other areas of this appraisal covered specific training for radiological protection, personnel protection, etc.

To accomplish the appraisal task, many other WSRC divisions were reviewed in addition to Tritium Production Training. The groups reviewed, who support Tritium Facilities, included Human Resources, Central Services Works Engineering, Health Protection Training, Quality Assurance, Site Engineering and Services, and Quality Nuclear Material Processing Training, which directly supports Tritium Production Training.

The Tritium Facilities are among those facilities that must achieve accreditation in accordance with DOE 5480.18, "Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities." Therefore, this criterion was included in the requirements against which findings were measured.

The Tritium Production Department's increased emphasis on training did not occur until September 1989 when the manager of Tritium Production Training was able to devote time to the training effort, further increasing his effort to approximately 30 percent by January 1990. The Tritium Production Department did have a training organization established prior to this time, but was unable to effectively carry out its responsibilities. Obstacles to carrying out these responsibilities were the need for an adequate and trained staff along with a clear management mandate to ensure excellence in training, beginning with an understanding of the training requirements of DOE 5480.5 and current industry standards.

All operating personnel in the Tritium Production Department, except professional staff, are classified as Grade 7 operators even though the complexity of the job tasks varies greatly. Some operators do relatively non-complex tasks, such as welding or inspections, while others operate complex process systems requiring integrated systems knowledge and understanding. Management has not assured that all personnel who operate equipment at the facility are qualified according to pre-established qualification training outlines. Presently, no comprehensive examinations to test skills and knowledge are administered to operators and supervisors prior to initial certification or recertification. Additionally, management has not verified the qualification of the facility operators as required by DOE Order. The annual training at this facility, while accomplishing some requirements of DOE Orders, falls short in ensuring that operators and supervisors are knowledgeable, particularly in the areas of emergency and abnormal procedure

actions and requirements. Training records are stored throughout the Tritium Facilities and the SRS making auditing and determination of training status extremely difficult and not in accordance with accreditation criteria and DOE Orders.

General employee training for newly hired personnel is administered by WSRC Human Resources. The training is adequate for initial employee orientation, covers the required elements of DOE 5480.11, and includes general employee safety and personnel protection training. Radiation worker and Health Protection Inspector training does not meet the requirements of DOE 5480.11. Delayed issuance of the DOE 5480.11 Implementation Plan by DOE-SR (September 1989), and lack of management attention to implementation of this Order have played a part in the noncompliance. Radiation worker training at the Tritium Facilities has not changed (improved) since the implementation plan was issued.

The Central Services Works Engineering maintenance training program for mechanical, electrical, and instrumentation personnel is comprehensive and well documented. It appears to provide a continuous source of trained maintenance personnel.

Supervisory training to ensure first-line supervisors have the tools and skills needed to interact with their personnel and to take responsibility for the facilities during an emergency is not adequate. Clearly defined qualification standards, covering the required skills and knowledge, do not exist and supervisors may be placed in charge of process equipment and operating crews prior to completing qualification requirements. Many have the responsibility of acting as the Facility Emergency Coordinator without training for the position. The method of training a supervisor after selection to the position is the "watch me and see how I do it" type.

This facility does not have a program for conduct of evaluated drills of emergency and abnormal conditions. Without such a program, management cannot have assurance that the staff can handle emergencies when they occur.

4.5.2.5.2 Findings and Concerns

TC.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

The training organization and administration should ensure effective implementation and training activities.

FINDINGS:

- Audit of six selected operator records and three supervisor records, randomly selected, was conducted. The audit revealed that no records contained management verification of training as required by DOE 5480.5.10(6) and (8), prior to assigning an operator or supervisor to an operating position.

- No single record retention area has all the training records for an individual. This practice does not allow for record auditability as required by DOE 5480.5 and DOE 5480.18. (Also see Concern OA.7-1.)

CONCERN: (TC.1-1) (H3/C1)

Training records management is not in accordance with applicable DOE Orders.

FINDINGS:

- The Tritium Production Training Manager is in a position one to two levels lower in the management chain than comparable training managers in the Tritium Project Management Team. This reduces access to higher level management concerning training needs.

- There are approximately 170 personnel who require some form of training at the Tritium Facilities.

- There are only three instructors assigned to the Tritium Production training staff.

- No one in Tritium Production Training has a background in training or professional training experience.

- The experience of the three instructors ranges from 0 to 18 months.

- The manager of the Tritium Process, immediate supervisor of the Tritium Production Training Manager, stated that training assistance is available from the Nuclear Materials Processing Training staff, however, lack of staff in

Tritium Production Training limits the ability of Tritium Production Training to use the NMPT resources.

CONCERN: See Concern OA.2-1.

TC.3 NUCLEAR FACILITY OPERATIONS OTHER THAN REACTORS

PERFORMANCE OBJECTIVE:

The nuclear facility operator and supervisor training and certification programs should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDINGS:

- Personnel in the Tritium Process Division, except professional staff, are classified as Grade 7 operators even though the complexity of job tasks varies greatly.

- A training program is in place at the facilities, but the program is rudimentary on-the-job training on which a formal job task analysis has not been completed.

- Training on one job task, 8H04 - milling and machining, has not been accomplished by any operator, but operators continue to operate the equipment.

- The Nuclear Material Processing Training group requested, by letter to Tritium Facilities Management in late 1988, a disposition regarding this job task since no operators had qualified on the milling and machining operation. As of this appraisal, the Nuclear Materials Processing Training group has not received a reply regarding disposition of this task.

- There is no evidence that operators and supervisors obtain annual training and certification on abnormal and emergency procedures as required by DOE 5480.5(7).

- The on-the-job training required of supervisors and operators at this facility does not address configuration control or procedure changes and alteration in operations as required by DOE 5480.5.10(5).

- Supervisors and operators are not certified in control room operations.

- A comprehensive examination is not administered prior to assignment of control room operator.

- The Supervisor Selection and Training Program does not require that a supervisor's knowledge level be higher or more in-depth than an operator's knowledge.

- Facility records do not document the status of medical evaluation according to the job task.

- Also see Sections OP.6 and TS.3.

CONCERN: (TC.3-1) (H2/C1) Operators and supervisors have not completed and maintained an adequate level of training as required by DOE 5480.5.

TC.4 GENERAL EMPLOYEE/PERSONNEL PROTECTION TRAINING

PERFORMANCE OBJECTIVE:

General employee and personnel protection training programs should ensure that site/facility personnel, subcontractors, and visitors have an understanding of their responsibilities and expected safe work practices, and have the knowledge and practical abilities necessary to effectively implement personnel protection practices associated with their work.

FINDINGS:

- WSRC Form OSR 4-388, documenting OSHA compliance training, requires an approval signature by the employee's line supervisor. None of the records reviewed for 1989 had the required signature.
- In addition, for the records reviewed, all personnel were missing one or more of the required OSHA training sessions.

CONCERN: (TC.4-1) (H1/C1) All employees are not receiving the required OSHA training commensurate with their job duties.

FINDINGS:

- WSRC made commitments to be in compliance with DOE 5480.11 by December 31, 1989, for radiation worker training, except certain elements which could not be achieved due to insufficient resources. These commitments are still open.
- The DOE-SR Status Evaluation (February 1990) concluded that one of the major factors impacting the effectiveness of DOE 5480.11 implementation at the SRS is a lack of adequate commitment from WSRC upper management.
- Radiation worker training is only in a pilot program status at the present time.

CONCERN: (TC.4-2) (H1/C1) Radiation worker training does not meet the requirements of DOE 5480.11.

TC.9 RADIOLOGICAL PROTECTION PERSONNEL

PERFORMANCE OBJECTIVE:

The radiological protection personnel training and qualification program should be developed and improve the knowledge and skills to perform assigned job functions.

FINDINGS:

- No formal continuing or recurrent training is conducted for health protection (HP) personnel.
- HP Inspector training is not currently in compliance with the requirements of DOE 5480.11.
- A new HP Inspector Training Class started training on February 20, 1990. The training material was not officially approved as of the date of this appraisal.
- WSRC made commitments to be in compliance with DOE 5480.11 by December 31, 1989, for health protection, except certain elements which could not be achieved due to insufficient resources. These commitments are still open.
- The DOE-SR Status Evaluation concluded that one of the major factors impacting the effectiveness of DOE 5480.11 implementation at the SRS is a lack of adequate commitment from WSRC upper management.

CONCERN: See Concern TC.4-2.

TC.10 TRAINING FOR SUPERVISORS, MANAGERS, AND TECHNICAL STAFF

PERFORMANCE OBJECTIVE:

Training programs for supervisors, managers, and the technical staff should broaden overall knowledge of processes and equipment and develop supervisory and management skills.

NOTE: This performance objective applies to those managers and supervisors to whom operations, maintenance, engineering, or technician personnel report. Technical personnel are those individuals whose job responsibilities affect the safe and reliable operation of each facility on the site, but who are not operators, maintenance, or quality control inspectors and nondestructive examination technical personnel. Examples of such positions are: engineers, engineering technicians, test/surveillance personnel, and chemists/chemistry technicians.

FINDINGS:

- There is no formal program established to provide continuing training to supervisors or managers.
- Twenty-five percent of the personnel responsible for Facility Emergency Coordinator duties have not completed a Facility Emergency Coordinator training session.
- First-line supervisors are appointed by management based on knowledge, experience, and performance. Management has not documented minimum qualification requirements for the different supervisory positions at the Tritium Facilities.
- Not all supervisory personnel are formally qualified on the production areas for which they are responsible.

CONCERN: (TC.10-1) (H2/C1) Personnel are assigned to supervisory positions prior to obtaining the training necessary to act in a supervisory capacity.

TC.11 SIMULATOR TRAINING/FACILITY EXERCISES

PERFORMANCE OBJECTIVE:

Simulator training and/or facility exercises should be conducted utilizing methods and techniques that are effective in developing and maintaining team and individual knowledge and skills in responding to abnormal and emergency events, and in integrated operations.

NOTE: The exercises referred to in this performance objective are not events that necessitate implementation of the site or facility emergency plan, but rather are abnormal or emergency situations to which the operations shift is expected to respond.

FINDING:

- The facility does not have an exercise program established to provide initial and continuing training for abnormal and emergency events as required by DOE 5480.10.(5).

CONCERN: (TC.11-1) (H2/C1)

Operators and supervisors do not have the training necessary for adequate response to emergency and abnormal conditions.

4.5.2.6 Auxiliary Systems

4.5.2.6.1 Overview

All performance objectives in the auxiliary systems area were addressed except for storage and handling of fissile material which was determined not to be applicable. The appraisal covered the equipment listed in the Safety Analysis Report (SAR) as auxiliary systems and engineered safety systems (ESS). In addition, the following equipment was reviewed because of its association with criteria of the performance objectives: the effluent processing systems known as "stripper systems," the stack effluent tritium monitoring system, the high efficiency particulate air filters associated with the Line III operations, and the particulate monitoring system associated with Line III.

There is no management policy which requires auxiliary systems and ESS equipment requirements to be documented or which requires such equipment to be maintained to meet the performance requirements of the SAR. Two compliance related concerns were developed; one deals with the management review of these systems and the second is associated with incorporating the auxiliary systems equipment into the facility status control program.

Effluents that reach the environment from the facility include: tritiated gaseous effluents released through the four emitting stacks; effluent in the form of radioactive particulate in the Line III ventilation system; and liquid effluents from the cooling of process equipment. These effluents are monitored and the adequacy of these monitoring systems is discussed in the Technical Support Section of the appraisal. The primary holdup and treatment systems associated with the Tritium Facilities are three gaseous effluent processing systems known as "Strippers," and the Dump and Divert System. The stripper systems remove gram quantities of tritium from the gaseous effluents generated in the facility and are essential to the continued safe operation of the facilities. One concern in the holdup and treatment area addresses the lack of redundancy in stripper catalytic reactors and a second concern is associated with the leak rate of the Divert Hold Volume.

The ventilation systems are once-through, and are capable of supplying a minimum of ten building-air-changes per hour. Each ventilation system is provided with a backup supply fan, a backup exhaust fan, and redundancy in the plant compressed air system which is used to operate damper controls in the ventilation system.

The common practice of removing doors in the building when it is more convenient for traffic flow and the practice of propping doors open between radiologically controlled areas and clean areas disrupts air flow in the buildings.

The ventilation systems for the Tritium Facilities have not been balanced in recent history. There is no established policy regarding minimum volume flow rates for the different operating areas. The primary requirement placed on the ventilation systems is air flow direction and a hood face velocity of 200 feet per minute. Ventilation engineers started defining the ventilation system for Bldg. 234-H approximately a year ago, but the staff is too small to recover from the years of backlog which exist in this area. As a result they have not been able to complete the task.

Two concerns were developed regarding the ventilation system; one regarding the balancing of the systems and one regarding establishment of minimum volume flow rates for the operational areas.

There are five emergency power diesel generators associated with the Tritium site. These systems are in good repair, are started under no load on a weekly basis, and are load tested using the supplied load on a monthly basis. One generator failed to provide adequate service on one occasion during the last few years. The circumstances of the failure have been investigated and the discrepancies corrected.

Steam is supplied for heat and for the powering of emergency fire pumps and cooling water pumps. The three boilers located in H-Area are used as emergency backup to the steam plant located in D-Area. The primary function of these boilers is for freeze protection in the event of a significant steam outage in the winter time.

Considering the number of local electrical storms, the electrical power systems are reliable. An effort to mitigate the effect of local electrical storms on the operation of the facility was made by the installation of a discharge line placed along the main feeder lines. The design of this system was not well thought out, and a retrofit is in process to correct the initial design problems. There are two feeders for H-area, and the combination of multiple feeders combined with the emergency generators provides reliable electrical power for the area. The tritium handling apparatus is designed to fail-safe in the event of a power outage, and as a result, power outages do not constitute a significant safety threat.

The cooling water, fire water, and domestic water systems are showing their age and the effects of the number of retrofits and modifications that have occurred over the years of operation.

The heat removal systems for the area consists of a cooling tower which recirculates cooling water to the facilities. A portion of the recirculating cooling water, locally known as the process cooling water, is diverted to cool the facility operating equipment. This water is discharged to the H-12 outfall.

The ESS listed in the SAR do not accurately describe the equipment which is considered by the facility operating staff as engineered safety systems. The ESS equipment is not specifically identified in the maintenance procedures and most personnel working with the equipment are not aware of any significant difference between the ESS equipment and any other apparatus onsite. This failure to properly identify and define the safety systems, currently a common problem throughout the DOE complex, is scheduled to be addressed in the next revision of the SAR.

The auxiliary systems are showing the effects of age but are providing adequate service to the facilities. The lack of as-built drawings hampers effort by the staff of the facilities in updating and monitoring the systems and determining the operating condition of the equipment.

4.5.2.6.2 Findings and Concerns

AX.1 SYSTEMS REQUIREMENTS

PERFORMANCE OBJECTIVE:

Auxiliary systems shall be considered under the same functional criteria for design, engineering, operations, maintenance, and modifications as the structural, confinement, and primary process system of the facility.

FINDINGS:

- Specifications for the auxiliary systems and components existed at one time but are no longer current and are not reviewed to determine adequacy of current equipment to meet the needs of the Tritium Facilities.
- The Safety Analysis Report (SAR) does not accurately describe all of the auxiliary systems associated with the operation.
- There is no policy which requires a review of the Auxiliary Systems such that equipment no longer required can be decommissioned, and equipment no longer performing properly can be replaced or refurbished.
- Also see Section QV.1.

CONCERN: (AX.1-1) (H3/C2) There is no management plan which addresses the identification, review, upgrade, refurbishment, etc., of the auxiliary systems equipment.

FINDINGS:

- The condition and status of Tritium Facilities equipment is reported on a daily basis to the various facility managers. The status of equipment which the managers consider significant to operations is reported in the facility status control program.
- The auxiliary systems, as listed in the SAR, are not specifically considered in the facility status control program. This is probably due to the fact that the list of auxiliary and engineered safety systems equipment as described in the SAR is no longer an accurate list of equipment important to daily operation.

CONCERN: (AX.1-2) (H3/C1) The auxiliary systems are not specifically considered in the facility status control program.

AX.2 EFFLUENT HOLDUP AND TREATMENT

PERFORMANCE OBJECTIVE:

Effluent holdup and treatment should ensure that the amount of hazardous substances released to the environment, as escaping emissions and/or as effluent gaseous or liquid releases, are less than DOE and EPA standards and are ALARA.

FINDINGS:

- The auxiliary equipment includes three stripper systems designed to remove tritium from gaseous effluent streams. These strippers are used to remove gram quantities of tritium from the waste gas streams before the waste gases are released to the environment.
- The largest stripper system is identified as the 15 scfm stripper system. This stripper is used to remove tritium gas, tritiated methane, and tritiated water from the gas streams and the Divert Hold Volume System.
- The 15 scfm stripper system is equipped with only one catalytic reactor bed.
- The catalytic reactor bed can be poisoned by common solvents such as Freon.

CONCERN: (AX.2-1) (H2/C3)

A second catalytic reactor bed is not installed and ready for service in the event of a catalyst bed failure.

FINDINGS:

- The Dump and Divert System is used to capture tritium in hold volumes in the event of a release of tritium into one of the loading related hoods. A tritium release is detected by the hood tritium monitor which signals a control system to actuate valves that dump the manifold pressure into volumes located inside the building and, in addition, actuates valves in the ventilation system which divert the tritium contaminated exhaust gases from the hood into a large holding volume located outside the building.
- The Divert Hold Volume is located at ground level. The leak rate of the Divert Hold Volume is not periodically checked and is unknown.
- Construction materials are stored against the outside of the building which encloses this storage volume. Construction workers, vehicles, and other facility personnel are free

to approach the outside of the building without significant restriction.

- Examination of the gaskets on the divert volume indicate that cracking of the gaskets is taking place.

- Under the worst-case conditions multi-gram quantities of tritium could be diverted into the Divert Hold Volume.

CONCERN: (AX.2-2) (H2/C2)

The leak rate of the Divert Hold Volume is not periodically determined.

AX.3 SOLID WASTES

PERFORMANCE OBJECTIVE:

Solid hazardous wastes (including radioactive wastes) should be controlled to minimize the volume generated, and handled in a manner that provides safe storage and transportation.

FINDINGS:

- Low level wastes such as lab coats, shoe covers, gloves, etc., are placed in containers, designated as B-25s, for disposal. The tritium operations generate 600 of these boxes of waste per year. Efforts to minimize the volume of low level waste by compaction were started in 1988 but, to date, no progress has been made. A compactor is available at Bldg. 253-H but the compactor is not used for Tritium Facilities waste compaction.

- Current management plans include the development of a waste minimization plan sometime in the future.

CONCERN: (AX.3-1) (H3/C1)
There is no waste minimization program or policy for the Tritium Facilities.

FINDINGS:

- At the Tritium Facilities there is a Savannah River Laboratory Material Test Facility (SRL-MTF).

- Tritium contaminated debris accumulate in a tray in the bottom of the SRL-MTF laboratory hood where samples are machined from test parts for the scanning electron microscope. The debris have not been removed and disposed of in recent history.

- The sampling and polishing hood in the SRL-MTF laboratory accumulates water used in the polishing operations in a settling tank under the hood. The fines in the settling tank are tritium contaminated and have been accumulating for several years without being cleaned out for disposal.

CONCERN: (AX.3-2) (H2/C2)
Tritium contaminated solid waste accumulating in a fines settling tank and machining tray in hoods is not periodically removed for disposal.

AX.5 VENTILATION SYSTEMS

PERFORMANCE OBJECTIVE:

Ventilation systems should reliably direct all airborne effluents from contaminated zones or potentially contaminated zones through cleanup systems to ensure that the effluent reaching the environment is below the maximum permissible concentration and is ALARA.

FINDINGS:

- The SRS health protection (HP) organization requires a minimum face velocity of 200 feet per minute (fpm) through all openings and doors in hoods used for tritium operations. Inspection of the hoods indicates that hood velocities run up to 400 fpm. Industry practices and standards show that these high flow rates may, in some cases, result in back streaming of contaminants into the room.

- The Operational Safety Requirements require a face velocity of 100 fpm.

- The DOE 6430.1A requires a face velocity of 125 $\pm$ 25 fpm.

CONCERN: (AX.5-1) (H2/C2) The face velocities of high-velocity air hoods are not in conformance with industry or DOE standards.

FINDINGS:

- The ventilation systems are tested to assure that air flow is in the correct direction from clean areas to tritium contaminated areas and then to the exhaust stack. All of the tritium handling buildings at the site are equipped with one backup supply fan and one backup exhaust fan.

- Numerous doors have been removed in the clean areas of Bldg. 234-H, apparently to enhance traffic flow but with a detriment to air flow control.

- The contaminated areas are isolated from the clean areas by doors marked with signs that say "Keep Door Closed."

- Several of the doors between the contaminated area and the clean area were observed to be propped open. The idea of "keep door closed" does not work; doors were observed to be propped open day after day.

- There are open louvered areas in the walls between the contaminated and the clean area. Some louvered areas have a plastic sheet taped over the louvers.

- The minimum volume flow rate for the clean areas, contaminated areas, airborne radioactivity areas, and hoods is not established, and is not known.

- All of the openings in the SRL-MTF laboratory machining hood have been taped closed. As a result, almost no air flows through the hood to flush contaminates out of the hood. When questioned, personnel in the area indicated that the openings have been taped closed for several months and were taped closed at the request of the health protection organization. The health protection personnel stated that they did not know that the hoods had been taped closed and that the tape should be removed.

CONCERN: (AX.5-2) (H2/C2) Minimum volume flow rate requirements have not been established for each area of all buildings, and the ventilation systems have not been balanced to meet these requirements.

4.5.2.7 Emergency Preparedness

4.5.2.7.1 Overview

The Emergency Preparedness (EP) appraisal used the seven TSA performance objectives which were derived from DOE 5500.3A (draft). Interviews with WSRC staff, operators, engineers, and managers were made on all three shifts. Existing WSRC documentation on or pertaining to emergency preparedness was reviewed. The focus was on H-Area and the Tritium Facilities. Discussions were held with the other EP Tiger Team members during the appraisal to discuss findings.

Some EP program development progress has been made by the WSRC management staff. The EP Coordinator has initiated a program for training shift managers on their emergency duties and has initiated drills for employee training. The WSRC self-appraisal was reviewed. It demonstrated a sincere effort to classify the EP program problems in terms of compliance and was well done. The five EP concerns found in this appraisal focus on the absence of resources needed to meet DOE requirements. Unfortunately, the draft DOE 5500.3A was not made available to the Tritium EP Coordinator until 2 months ago.

A DOE audit of the EP program in January 1990 confirmed the need for major changes in the SRS program. Weaknesses in annual review, emergency action classification levels, protective actions, planning zones, evacuation routes, recovery procedures, and training were all identified. These problems still exist since the earlier appraisal was conducted only 1 month ago.

In addition to the above EP program problems, emergency alarms, equipment, and systems require some improvement.

During the EP exercise, significant items were found to be out of compliance with DOE 5500.3A (draft). For example, no appraisal team evaluator knew who was the on-scene Emergency Director. Many of the support staffs did not know how to "play" as an exercise participant. Two bright spots during the emergency exercise were the excellent job done by the EP Coordinator and the control room operation staff.

In conclusion, this appraisal indicates that increased resources and extensive training will be needed to develop a good EP program.

4.5.2.7.2 Findings and Concerns

EP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Emergency preparedness organization and administration should ensure effective planning for, and implementation and control of, site/facility emergency response.

FINDINGS:

- Resources available for development of an emergency preparedness (EP) program have not been sufficient to revise and update the outdated EP plan in accordance with the guidance provided in DOE 5500.3A (draft).
- The current EP Coordinator for the Tritium Facilities will soon be transferring to their training operation.
- Many months are required to obtain Q clearances for new staff.

CONCERN: See Concern OA.2-1.

EP.2 EMERGENCY PLAN AND IMPLEMENTING PROCEDURES

PERFORMANCE OBJECTIVE:

The emergency plan, the emergency plan implementing procedures, and their supporting documentation should provide for effective response to operational emergencies.

FINDINGS:

- Plans, procedures, and supporting documentation for all classes of emergencies (e.g., ground releases, inversions) are not fully in place to protect all personnel, including security staff.
- The Safety Analysis Report does not cover all credible tritium emergencies such as ground releases. Interactions with nearby nuclear facilities have not been considered.
- There are no emergency plan implementing procedures for the Tritium Facilities.
- The Tritium Facilities Emergency Plan does not describe the emergency planning zone, contain emergency action levels, include appropriate protective actions, address recovery planning, or identify the methods to shift from one emergency class to another.
- The old Tritium Facilities abnormal operating procedures require curtailment of operations if wind speeds exceed 32 miles per hour. The Technical Support Center does not normally notify the operators until wind speeds exceed 40 miles per hour.

CONCERN: (EP.2-1) (H2/C1)

The absence of both critical emergency plan elements and emergency plan implementing procedures could result in failure to implement emergency responses in a timely manner.

EP.3 EMERGENCY RESPONSE TRAINING

PERFORMANCE OBJECTIVE:

Emergency response training should develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

FINDINGS:

- No documented emergency preparedness (EP) program management plan covers training methods, evaluation standards, and implementation responsibilities. (Also see Section 0A.1.)
- EP drills have been initiated for use by WSRC as a training tool.
- All managers do not receive initial training before participation in drills.
- Skills requirements are not documented for the various EP positions.
- EP program training is minimal in the Tritium Facilities.
- Industry experience is not used in the Tritium Facilities. (See Concern FR.6-1.)
- EP training records are not maintained for each individual as required by DOE 1324.2A.
- The effectiveness of the emergency training program has not been periodically evaluated.

CONCERN: (EP.3-1) (H2/C1) The lack of appropriate personnel training on emergency preparedness could result in failure to implement emergency responses.

EP.4 EMERGENCY PREPAREDNESS DRILLS AND EXERCISES

PERFORMANCE OBJECTIVE:

Emergency preparedness programs should include provisions for simulated emergency drills and exercises to develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

FINDINGS:

- The Tritium Facilities first sitewide field exercise demonstrated that there is no up-to-date emergency plan and emergency plan implementing procedure, and drills conducted to date are not adequate.
- The emergency preparedness (EP) operations staff performed their duties in a satisfactory manner.
- The sitewide drill demonstrated that support players and some coordinators need more training before drills/exercises.

CONCERN: See Concern EP.2-1.

EP.5 EMERGENCY FACILITIES, EQUIPMENT, AND RESOURCES

PERFORMANCE OBJECTIVE:

Emergency facilities, equipment, and resources should adequately support site/facility emergency operations.

FINDINGS:

- During an H-Area drill, alarms were not heard in all locations, and the wrong notice was read by the person announcing the drill.
- During a subsequent H-Area test of various alarm signals, the signals were not heard in some locations, and the voice descriptions were not heard in others.
- The WSRC self-appraisal of the emergency preparedness (EP) program indicated partial compliance with respect to alarm adequacy.

CONCERN: (EP.5-1) (H2/C1) The H-Area emergency alarms and public address announcements are not adequate to provide warning to all personnel during an emergency.

EP.7 PERSONNEL PROTECTION

PERFORMANCE OBJECTIVE:

Personnel protection procedures should control and minimize personnel exposure to any hazardous materials during abnormalities, ensure that exposures are accurately determined and recorded, and ensure proper medical support.

FINDINGS:

- The number of portable health protection instruments and Scott Air Packs for use during an emergency is insufficient.
- During the Tritium Facilities exercise, first aid supplies were neither called for nor obtained.
- Two of the three stretchers used during the exercise were determined not to comply with personnel safety standards.
- One ambulance used during the exercise did not get out of the Tritium Facilities because the battery failed.

CONCERN: (EP.7-1) (H2/C1) Adequate emergency equipment and supplies are not readily available.

4.5.2.8 Technical Support

4.5.2.8.1 Overview

This appraisal of technical support at the Tritium Facilities covered all applicable performance objectives except for hazardous materials transportation from the Tritium Facilities and interactions with outside organizations such as service or projects groups, which are beyond the scope of this assessment. Technical support is provided by a number of groups, the principal ones being the Tritium Technology and Tritium Engineering Departments. Additional support is provided by the Tritium Quality Department, by the Power Department for the building power and heating and ventilation systems, and by ESH&QA Division in the area of environmental release concerns.

Procedures and documents are, in general, clear, current, and controlled (or tracked) for needed approvals, changes, and periodic reviews. ESH&QA is not always in the approval chain, which could have safety implications. Deficiencies in the status of the Safety Analysis Report (SAR) and Operational Safety Requirements (OSR) documents and in technical drawings were noted. Programs are already underway to remove these concerns. Full compliance with DOE Orders, not required in the past, is being implemented.

Modifications are carried out with sound engineering principles and are the responsibility of in-house engineers or are tracked by a liaison group in the case of major projects performed by an outside group. Formal training of personnel who operate modified equipment or system(s) is sometimes lacking, although most modifications are such that informal training is sufficient. Related procedures are always completed prior to final acceptance and return to service. Corresponding as-built drawings are often delinquent, but this problem is being addressed with the hiring of two additional draftsmen. Temporary modifications are not reflected in new drawings but are noted and regularly and adequately tracked until made permanent or configuration is returned to the original design.

Equipment that is the responsibility of the Power Department is regularly monitored for operation within specifications and deviations are noted for prompt investigation and correction. Problems discovered during preventive maintenance are relayed to their operating group for diagnosis and repair. A program for regularly testing standby power equipment, such as emergency power generators, is in place and satisfactory. Records of equipment monitoring are kept, but generally no trending is being done. A pilot program involving vibration analysis is underway and may provide such data. Personnel are competent and professional.

Performance of equipment that is the responsibility of the Tritium Engineering Department is observed during the course of

operations by in-house inspectors, operators, and others from the Tritium Technology and Tritium Quality Departments. When identified, equipment problems are noted and investigated. Often, failed equipment is not worth repairing and is simply replaced. For some components or equipment, this is common practice and acceptable. A Works Management System, which is in the early stages of being implemented, has potential for improving preventive maintenance and obtaining trending data for equipment and systems.

Environmental releases are monitored by the ESH&QA Division. Liquid effluent releases are monitored specifically by the Environmental Monitoring Department. Releases of tritium to the environment through the facility stack are measured by a combination of flow-through ionization chamber monitors and passive desiccant samplers. Calibration of these monitors is incomplete. A particulate sampler in one of the stacks is primitive and also inadequate. The activity of low level tritiated waste transported to the burial ground is estimated and believed to be low. The activity of high level, activated solid waste, transported to the burial site in shielded casks, is more easily estimated.

Stack monitoring data are checked daily for any unusual or unexpected releases. Unusual releases are immediately investigated, and corrective or preventive measures are taken. Other efforts to minimize releases besides procedural or equipment changes include a method of directing accidental releases to a holdup volume, which can later be routed to a tritium removal system. New state-of-the-art facilities, under construction and design to replace the old Tritium Facilities, are also major steps in the right direction.

Packaging and transportation of hazardous materials consists mostly of routine packaging and shipping of tritium gas or weapons components containing tritium in approved shipping containers. Procedures, shipping container certificates, and container test results are in place. Procedures and documentation for other offsite shipments are also in order. Onsite shipments to the burial ground and to other areas are documented adequately. Occasionally, traffic over the routes used has to be controlled to allow high activity shipments to travel without undue risk. Formal training is weak for hands-on packaging personnel and records are not readily retrievable.

The administration of the technical support groups is well organized, and personnel are competent and knowledgeable. Their technical strength is manifested in the overall quality of the support provided to operations. Many active programs are underway or planned to further enhance the safety and quality of the technical support functions.

4.5.2.8.2 Findings and Concerns

TS.2 PROCEDURES AND DOCUMENTS

PERFORMANCE OBJECTIVE:

Technical support procedures and documents should provide appropriate direction, allow for adequate record generation and maintenance for important activities, and should be properly and effectively used to support safe operation of all facilities on the site.

FINDINGS:

- The Tritium Facilities Safety Analysis Report (SAR) does not comply with DOE Order 5480.5. Examples include the following.
  - It does not follow the required format.
  - It does not include changes incorporated into the facility since the SAR was last revised in 1987. (Also see Concerns OA-7 and QV-1.)
  - It does not address all credible emergencies. (See Section EP.2.)
  - The safety-related auxiliary systems listed are not up-to-date. (See Section AX.1.)
- An SAR Implementation Program to correct this deficiency by 1992 is in place. There is no assurance that this will be accomplished because the review, revision, and approval process for SARs is excessively long.

CONCERN: (TS.2-1) (H3/C1)
The facility Safety Analysis Report is incomplete and not in compliance with DOE Orders.

FINDINGS:

- The Operational Safety Requirements (OSR) document does not comply with draft DOE Order 5480.ZZ and DOE-EH-89-02.
  - It does not comply with the specified format.
  - It does not specify (in all cases) the actions to be taken in the event that OSR limits are exceeded.
- Many changes in facility operations have occurred which are not reflected in the last revision of the OSR document in 1985. However, a program was initiated to revise the OSR by 1991. This schedule is realistic. (Also see Concern OA.7-1.)
- Also see Section OP.2.

CONCERN: (TS.2-2) (H3/C1) The current Operational Safety Requirements document is incomplete and not in compliance with DOE requirements.

TS.3 FACILITY MODIFICATIONS

PERFORMANCE OBJECTIVE:

Technical support services required by each facility on the site to execute modifications should be carried out in accordance with sound engineering principles that should assure proper design, review, control, implementation, and documentation in a timely manner.

FINDING:

- In the past, the Savannah River Plant was not required to follow DOE Orders. Du Pont and other industry standards were used to design and build facility systems. However, the ESH&QA Division, along with the Management Integration Department, is currently developing procedural guidance and instructions for full compliance with applicable DOE Orders.

CONCERN: (TS.3-1) (H3/C1)

Not all codes and standards mandated by DOE Orders have been addressed in designing facility modifications.

FINDINGS:

- The ESH&QA Division is not always involved in the approval process for facility modifications.
- There is no review of design changes to address ALARA for radiological and other hazards.
- Also see Section QV.1.

CONCERN: (TS.3-2) (H3/C2)

The design review process does not include a requirement for an independent environment, safety, and health review to address potential safety and As Low As Reasonably Achievable (ALARA) concerns.

FINDINGS:

- Formal operator training is not normally required prior to operation of systems following modifications.
- A program does not exist that identifies system modifications that may require training for users.

CONCERN:

See Concern TC.3-1.

TS.4 EQUIPMENT PERFORMANCE TESTING AND MONITORING

PERFORMANCE OBJECTIVE:

Effective equipment performance testing and monitoring should be performed by technical support groups to assure that equipment and system performance is within established safety parameters and limits.

FINDINGS:

- Information about process upsets is collected but not reviewed to find common factors.
- Information collected in Unusual Occurrence Reports (UORs) is not being analyzed for age-related degradation as a basis for replacing equipment.
- Conducting reviews of process and equipment performance is part of the responsibility of the Tritium Technology Department. However, the data collected are not being extensively used.
- Also see Sections OP.2, OP.3 and MA.7.

CONCERN: (TS.4-1) (H3/C2) Data are not reviewed to enable operations personnel to anticipate critical wear and equipment or process failure before they occur.

TS.5 ENVIRONMENTAL IMPACT

PERFORMANCE OBJECTIVE:

Effective equipment performance testing and monitoring should be performed by technical support groups to ensure that equipment and system performance is within established safety parameters and limits.

FINDINGS:

- A particulate monitor in the Line III stack of Bldg. 232-H samples the air downstream of a stack high-efficiency particulate air (HEPA) filter. The monitor has a number of deficiencies including: non-isokinetic sampling, a long sampling line with many bends that could trap particulates, and non-quantitative collection of particles.

- A moisture trap in the sampling line may trap particulates before they reach the particulate collection chamber or tritium monitor.

CONCERN: (TS.5-1) (H3/C2)
The amount of radioactive particulates downstream of the high-efficiency particulate air filter in the Line III stack of Bldg. 232-H is not accurately determined.

FINDINGS:

- The Tritium Facilities Operational Safety Requirements (OSR) document specifies that the tritium stack monitors be capable of measuring tritium concentrations up to certain given values depending on the stack exhaust rate.

- The tritium released from the stacks of Bldgs. 232-H, 234-H, and 238-H is monitored by flow-through ion chamber monitors; they have not been properly calibrated to meet the OSR requirements.

CONCERN: (TS.5-2) (H3/C2)
Laboratory calibrations of an 18-L Kanne chamber tritium monitor and a high range 320-ML chamber tritium monitor over their defined or intended use ranges have never been adequately performed.

4.5.2.9 Security/Safety Interface

4.5.2.9.1 Overview

This Safety/Security (SS) Interface appraisal used the TSA performance objectives that are based upon DOE 5500.2A, and DOE 5500.3A. Both Wackenhut Services, Inc. (WSI) staff who provide security services for the Tritium Facilities, and the WSRC tritium staffs were included in this review. Those performance criteria pertaining to WSI were found to satisfy DOE requirements.

Contacts were made with other Tiger Team members to exchange information about findings. An earlier appraisal found that WSI had a specific problem which was resolved. A safety analysis covering armed guards and the consequences of weapons use was documented. Also the security procedures and performance during the emergency exercise demonstrated an adequate level of emergency preparedness.

The security inspectors at entry control facilities have no means to verify whether or not unacceptable levels of radionuclides exist in breathing air or as dose rates. This concern is a Category II concern and requires near term corrective action for potential tritium releases and additional correction prior to startup of reactors or separation facilities. The WSI staff needs the means to be alerted to an accidental release of radionuclides, and provided training on what those means are and how they work, so that proper decisions can be made about avoidance actions.

4.5.2.9.2 **Findings and Concerns**

SS.4 SAFETY OF SECURITY ACTIVITIES

PERFORMANCE OBJECTIVE:

Safety aspects of security activities involving use of weapons and other protective force equipment in the vicinity of safety systems and/or hazardous processes and materials should be identified and understood by all involved parties.

FINDINGS:

- Entry control facilities (ECF) 701-1H and 703-3H cannot shield security inspectors from radiation during an accident.
- There are no alarming monitors in the ECFs or the Control Access Station (CAS) to alert Security Inspectors to airborne radionuclides or dose rates from radionuclides.
- Emergency events in H-Area can arise from accidents at the reactors, separations, or tritium facilities.
- Some radiation-oriented emergencies could affect only the ECFs.
- The production reactors and separations plant are not operating at this time.
- Security Inspectors remain in the ECFs and CAS for all facility accidents except evacuation.
- DOE 5500.3A (draft) requires appropriate radiation monitoring for onsite staffs.

CONCERN: (SS.4-1) (H2/C1) (CAT II) The Security Inspectors in the entry control facilities and Control Access Station in H-Area have no means to verify whether or not radionuclides released from an event can cause unacceptable dose rates or breathing air concentrations. NOTE: Separations plant and reactors are not a factor until operations resume at these facilities.

4.5.2.10 Site/Facility Safety Review

4.5.2.10.1 Overview

The appraisal of facility safety review covered all TSA performance objectives and included review of appropriate documents, attending safety committee meetings, and interviews with members of the WSRC organizations involved in the WSRC independent review process. Those interviewed included the President and Executive Vice President, WSRC, regarding the independent review process, self-appraisals and the triennial review process; the chairmen of standing safety review committees; ESH&QA personnel involved in various aspects of their independent oversight and operating experience programs (Lessons Learned); and Management Integration regarding tracking and commitment control programs.

The changes initiated by WSRC in the area of independent safety review are among the most far reaching initiatives to date. They include the establishment of an ESH&QA Division to provide independent oversight of activities, a new Site Safety Review Committee (SSRC), provisions for independent annual facility inspections, triennial review of the performance of the independent review system, Site Item Reportability and Issues Management System to assure reporting and closure of off-normal events, and a Commitment Management System (CMS) to assure tracking and closure of all outstanding commitments.

The previously existing Site and Area Central Safety Committees continue to provide policy and perform communication and coordination roles, primarily with regard to industrial and operational safety matters. The new organizations will provide the technical, process, and multidisciplined safety oversight and support previously performed by various organizations, primarily the Savannah River Laboratory.

The above initiatives are in the early stages of development and there are still areas of noncompliance with applicable DOE Orders either in form or substance. For example, the SSRC has not been formally established, is not fully functional, and the proposed charter is not consistent with the requirements of DOE 5480.5. No annual facility safety appraisals have been performed. The responsibility for providing this oversight in the future has been assigned to the Facility Safety Evaluation Section (FSES) of ESH&QA. The process for these safety reviews has not been defined.

An extensive baseline assessment of the degree of independent safety oversight of operational activities was performed by the FSES and issued as a Triennial Report. However, it does not meet DOE 5480.5 requirements for independent assessment of the safety review system. In the future this will be performed by the Internal Oversight Department which reports directly to the Executive Vice President, WSRC.

Currently there is no system to communicate operational experiences from within or outside of WSRC to the various non-reactor facilities. Such a system is being developed by FSES, building on the experience of the Reactor Safety Evaluation Section. The many existing tracking systems involved in various aspects of the ES&H program do not assure verified closure of outstanding commitments, or provide management with trending or status of outstanding items. Currently, the centralized CMS is only handling external commitments (primarily with DOE). Future plans envision the CMS as the vehicle for handling all tracking and reporting needs with a hierarchy of reports, query capability, and other desirable features.

With few exceptions, the resources required to correct all of the independent safety review system deficiencies are minimal. They involve practices and procedures that are well established throughout the industry and result in a positive impact on the safety culture. Therefore, WSRC is encouraged to implement these corrective actions with great dispatch.

4.5.2.10.2 Findings and Concerns

FR.2 SAFETY AND ORGANIZATION

PERFORMANCE OBJECTIVE:

Items that require review by the Safety Review Committee should be well defined and understood by facility management.

FINDINGS:

- The Plant Central and Area Central Safety Committees are independent of the operating organization; however, they are largely coordination and communications committees with emphasis in the industrial safety area. They review industrial safety incidents and perform housekeeping audits.

- The recently established Tritium Safety Review Committee, whose membership is largely independent of Operations, is not considered by Tritium Facilities management or this appraisal team to be part of the independent safety review system.

- WSRC is in the process of establishing an independent Site Safety Review Committee (SSRC), chaired by the Safety Division Manager. While the SSRC has begun to function, most of its activities to date have been organizational in nature.

- The charter for the SSRC has not been formally issued and is already being revised. Even the revised charter does not meet DOE 5480.5 requirements in the following areas.

  - Membership does not assure that all safety disciplines will be covered.
  - Quorum requirements are poorly defined.
  - Age-related degradation of facilities and equipment is not treated.
  - The SSRC only reviews modifications, proposed experiments, or incidents in which an unreviewed safety question arises.

CONCERN: (FR.2-1) (H2/C1) There is no formally chartered and functioning independent safety review committee consistent with the requirements of DOE 5480.5.

FR.4 ANNUAL FACILITY SAFETY REVIEW

PERFORMANCE OBJECTIVE:

An annual operating review of the facility should be performed by a committee appointed by top contractor management, as specified in DOE 5480.5 and DOE 5480.6.

FINDINGS:

- Annual facility safety appraisals required by DOE 5480.5 have not been performed. Responsibility for performing these inspections in the future has been assigned to the Facility Safety Evaluation Section (FSES) of the Safety Department.

- The proposed revised charter for the Site Safety Review Committee incorporates some audit activities which are to be performed "under the cognizance of the committee" and overlap FSES activities.

CONCERN: (FR.4-1) (H2/C1) Annual facility safety appraisals, consistent with the requirements of DOE 5480.5, have not been performed.

FR.5 TRIENNIAL APPRAISAL OF SITE/FACILITY SAFETY REVIEW SYSTEM

PERFORMANCE OBJECTIVE:

A triennial appraisal of the safety review system should be performed by contractor management.

FINDINGS:

- While the Triennial Review of the Contractor Independent Safety Review System of the SRS Non-Reactor Facilities, provides a baseline for future triennial reviews, it does not meet the requirements of DOE 5480.5. It analyzed review activities, but did not do any actual reviews. The basic input was prepared by the operating departments and reviewed by the Facility Safety Evaluation Section. Therefore, it was not an independent assessment of the safety review system.

- Future triennial reviews are to be performed by the Internal Oversight Department which reports to the WSRC Executive Vice President. When performed, it will provide an independent assessment of the safety review system at SRS.

CONCERN: (FR.5-1) (H2/C1)

A triennial safety review consistent with the requirements of DOE 5480.5, has not been performed.

FR.6 OPERATING EXPERIENCE REVIEW

PERFORMANCE OBJECTIVE:

Operating experiences should be evaluated, and appropriate actions should be undertaken to improve safety and reliability.

FINDING:

- At present, with the exception of industrial safety incident reports that are transmitted through the Site and Area Central Safety Committees, there is no plant-wide system to communicate operating experiences ("lessons learned") from events that occur within SRS or from external sources such as DOE, Nuclear Regulatory Commission, or the Institute of Nuclear Power Operations. The Facility Safety Evaluation Section is in the process of establishing such a system, similar to the one developed by the Reactor Restart Safety Evaluation. (See Section OP.6 for additional supporting information.)

CONCERN: (FR.6-1) (H3/C2)

There is no system to communicate operating experiences from within and outside of WSRC.

FINDINGS:

- There are multiple tracking systems within Project Management Teams and ESH&QA. A new plant-wide Commitment Management System is currently tracking WSRC external commitments (primarily DOE). This latter system is expected to ultimately track all internal, as well as external, commitments.

- The above tracking systems vary in capability, do not always assure verified closure of open items, are not uniformly accessible for management querying, do not uniformly permit trending of the databases, and do not provide management with timely status reports. (See Sections RP.2 and FP.7 for additional supporting material.)

CONCERN: (FR.6-2) (H3/C2)

A centralized tracking system incorporating verified closure, query capability, and status of all outstanding commitments is lacking.

4.5.2.11 Radiological Protection

4.5.2.11.1 Overview

All of the performance objectives for radiological protection were reviewed with the exception of those that have sitewide aspects. The four Safety and Health (S&H) Subteam members assigned to radiological protection agreed to divide up the performance objectives in order to avoid duplication of effort as discussed below.

In general, WSRC operates a radiation protection program that protects the health and safety of employees. However, there is substantial room for improvement and some deficiencies must be corrected to comply with DOE 5480.11.

The Environmental and Health Protection (E&HP) Department is organized and managed by well qualified professionals. However, the Health Protection (HP) Inspectors and their supervisors generally lack any formal education beyond high school, and their training at SRS has not been adequate to provide them the fundamentals of radiation protection. Consequently, when HP Inspectors are faced with any task beyond their routine duties, they generally lack the understanding necessary to respond. The new enhanced training program should correct this problem.

The new internal audit program for radiation protection meets the requirements of DOE 5480.11. However, there is a concern that some corrective actions needed to respond to audit findings were being closed out before the actions were actually completed. The program for accident and incident investigations is addressed in the Savannah River Laboratory S&H Subteam report.

There are 31 policy and procedure manuals that provide the basis for work done in the E&HP Department. Some of these manuals have evolved over 35 years and have been revised numerous times without being reorganized. It is extremely difficult to understand and use these documents. Major reorganizations and revisions are needed soon.

Posting of radiation and contamination areas was generally good, except as noted in Section RP.3. A posting program is being implemented to comply with DOE 5480.11. The control of radioactive sources was acceptable in the facilities reviewed. WSRC is implementing a centralized inventory of radioactive sources. The program for radiation-generating devices (x-ray and radiography sources) is operated by Ebasco and their program was acceptable.

The external exposure control program at the Tritium Facilities is acceptable. The external dosimetry program is addressed in the Savannah River Laboratory S&H Subteam report.

Internal dosimetry for the entire SRS was reviewed in this report. The internal dosimetry program does not comply with the requirements of DOE 5480.11. Radiological areas have not been sufficiently characterized to provide a technical basis for the assignment of bioassay sample types and frequencies. The mechanism for follow-up and collection of delinquent bioassay samples is not working. There is a lengthy turn-around time for analysis of bioassay samples and there is a large backlog of persons awaiting whole body counts. Not all positive bioassay results are investigated and many investigations are incomplete because of the problem with delinquent bioassay samples.

The program for calibrating portable and fixed radiation detection instruments is addressed in the Savannah River Laboratory S&H Subteam report.

Deficiencies in air sampling and monitoring are addressed in the Auxiliary Systems and Technical Support sections of this report.

Although contamination has not led to significant assimilation of tritium in recent years, the contamination control program does not meet the requirements of DOE 5480.11. A well-disciplined contamination control program has not yet been implemented at the Tritium Facilities.

The ALARA program, as it applies to the Tritium Facilities, was acceptable. Other aspects of the ALARA program are addressed in the Savannah River Laboratory S&H Subteam report.

Comprehensive records related to occupational radiation exposure are not retained consistent with ANSI N13.6. There are many personnel files where radiation dose data are missing for many years.

4.5.2.11.2 Findings and Concerns

RP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Organization and administration should ensure effective implementation and control of radiological protection activities at the facility.

FINDINGS:

- Experience of Health Protection (HP) Inspectors interviewed ranged from less than 1 year to more than 10 years. Experience at the Tritium Facilities ranged from 6 months to over 10 years. However, 5 of the 11 inspectors interviewed had been at the Tritium Facilities less than 1 year. Most individuals indicated they had worked at a number of facilities, usually for less than a year at each facility.

- Quarterly training (about 1 hour per session) is provided to HP Inspectors. The Inspectors were reasonably knowledgeable about topics for which specific training had been provided; but when asked fundamental questions about the properties of tritium and counting instruments, their understanding seemed to be quite shallow. (See Concern TC.9-1 regarding deficiencies in radiation protection training.)

- HP Inspector job responsibilities are not clearly defined for each position. Job descriptions for each individual have not been prepared. Jobs tend to be defined by the routine survey requirements.

- An HP Inspector was observed performing a beta-gamma survey for low level contamination that had been detected by a Personnel Contamination Monitor (PCM-1B). The Inspector moved the pancake probe at too fast a scan speed to be able to detect low level contamination. When questioned about scan speed, he did not understand the relationship between scan speed and instrument sensitivity.

- On-the-job training is given to HP Inspectors, but there is no certification or other method to document completion of on-the-job training.

CONCERN: (RP.1-1) (H2/C1) Training provided to Health Protection Inspectors has not been adequate, and some Inspectors are not fully qualified.

RP.2 INTERNAL AUDITS AND INVESTIGATIONS

PERFORMANCE OBJECTIVE:

The internal audit program for both routine operations and unusual radiological occurrences should provide adequate performance assessments.

FINDINGS:

- Internal audits of the radiation protection program, as required by DOE 5480.11, are performed in accordance with WSRC Manual 292, Section 404. This document clearly defines responsibilities and procedures. (Audits required by DOE 5480.5 and DOE 5482.1B are not addressed here.)

- Audit reports have not been sent to Operation Managers, even though they may be partially responsible for some findings. (Also see Section FR.6.)

- Health Protection Internal Appraisal Numbers 89-017, 89-030, and 90-001 pertained to external exposure control, contamination control and radiation surveys, and external dosimetry and internal dose assessment at the Tritium Facilities, respectively. Responses to six findings were reviewed and evaluated by the Internal Audit Coordinator. Corrective actions for three of the six findings were closed out even though the actions were not complete.

CONCERN: (RP.2-1) (H3/C2)

Health Protection internal audit findings were closed out before the corrective actions were completed.

RP.3 RADIATION PROTECTION PROCEDURES AND POSTING

PERFORMANCE OBJECTIVE:

Radiation protection procedures for the control and use of radioactive materials and radiation-generating devices should provide for safe operations and for clearly identifying potential consequences.

FINDINGS:

- There are 31 policy and procedure manuals that provide the basis for work done in the Environmental and Health Protection (E&HP) Department. Review and revision of these manuals is required every 2 years. Not all of the reviews have been completed, and some of the manuals that were reviewed were not revised as necessary. There is no clear ownership (author) of specific manuals. (Also see Concern OA.1-1.)

- Approved revisions to manuals are printed and distributed by Information Services staff, who maintain manuals as controlled documents. Revisions are sent to assigned individuals with instructions and a signature sheet. After inserting revised pages, individuals are supposed to sign and return the signature sheet. However, there is no follow-up on individuals who do not return the signature sheet. Consequently, there is no assurance that controlled documents are maintained current. (Also see Concern OA.7-1.)

- The primary radiation protection policy and procedure manual is DPSOP 40, SRS Radiation and Contamination Control. This document has evolved over 35 years, has been revised 82 times without ever being reorganized, and is extremely difficult to understand and use.

- A subcontractor has been assigned to reorganize and rewrite DPSOP 40 and DPSOP 40-5, SRS Industrial Hygiene, with publication scheduled for August 1, 1990.

- Radiation Work Permits (RWP) were abandoned during the 1960s and replaced with DPSOP 40-1. A new RWP system is now being implemented, with expected completion in the Tritium Facilities by January 1, 1991.

CONCERN: (RP.3-1) (H3/C2) There is no firm schedule to revise and reorganize 29 of the 31 policy and procedure manuals used by the Environmental and Health Protection staff.

FINDINGS:

- Bldgs. 232-H, 234-H, and 238-H are divided into three or four different areas serviced by the same ventilation system. The "clean area" provides office space, lunchrooms, etc., for the building operating staff. The Radiologically Controlled Area (RCA) is a control zone which surrounds the "Contaminated Areas" and the "Airborne Radioactive Materials Areas." The "Contaminated Areas," in general, contain the process hoods where operations are conducted. The "Airborne Radioactive Materials Areas," in general, are hoods where higher levels of radioactive materials are found.

- The process hoods are posted with obsolete signs that say "radiation zone."

- A new posting and labeling policy has been established which conforms to the requirements of DOE 5480.11 but implementation of the policy is not complete.

CONCERN: (RP.3-2) (H3/C1) Radiological posting and labeling in the Tritium Facilities does not fully comply with DOE 5480.11.

RP.7 INTERNAL RADIATION DOSIMETRY

PERFORMANCE OBJECTIVE:

The internal radiation dosimetry program should ensure that personnel radiation exposures are accurately determined and recorded.

NOTE: This section of the report addresses internal dosimetry for the entire SRS.

FINDINGS:

- The technical basis for determining bioassay type and frequency has not been established for the nuclides encountered at SRS. The Naval Fuel Facility was characterized (report dated February 16, 1989) to provide a basis for assigning the proper bioassay type and frequency to workers in that facility. However, no other nuclear facilities have been characterized in a similar manner. Consequently, bioassay assignments are made without the benefit of a sound technical basis. Health Protection (HP) Operations Managers decide the type and frequency of routine bioassays, based on DPSOP 193-211, Table A.

- Particle size and solubility are not well known or used to help decide bioassay type and frequency.

- Routine bioassay samples are collected and delivered to the laboratories in Bldg. 735A. Special or "red label" bioassay samples are not transported to the bioassay lab by the same collection and delivery service. HP field personnel are expected to deliver special bioassay samples to the lab. Some employees fail to provide and/or deliver special bioassay samples to HP field offices on schedule.

- Employees who fail to leave a scheduled bioassay sample for over 1 month are added to a delinquent list. The list also tabulates those who are 2, 3, and 4 months delinquent. A person who is 5 months delinquent is listed again as being 1 month delinquent. There is a policy to remove people from radiation work if they are 3 months delinquent on a bioassay sample. However, there is no enforcement of this policy and some employees ignore requests for bioassay samples.

- When scheduled bioassay samples are not provided, it is impossible to do an accurate

dose assessment. In these cases, doses have to be based on the most recent bioassay result which gives higher calculated doses.

- The time required to analyze tritium bioassay samples is only 1 day. However, the time taken to analyze and report on other bioassay samples varies from 2 to 6 weeks, depending on the type of sample and the counting room backlog. This lengthy turnaround time sometimes prevents bioassay data from being used effectively to monitor and control exposures.

- Procedures require all bioassay results exceeding resample levels to be investigated. At the present time, this is only being done rigorously for plutonium results greater than 0.02 dpm/L. Enriched uranium results above about 30 dpm/1.5 L are investigated, but those that are about 5 to 10 dpm/1.5 L are not. There is no regular follow-up on positive fast scan results.

- When significant positive bioassay results are detected, restrictions on the worker's access to radiologically controlled areas are recommended to HP Operations management by Internal Dosimetry.

- There is a large backlog (9 months) of people awaiting routine whole body counts (shielded room). The number of people for whom whole body counts are required is being reduced.

- Visitors are given a fast scan and a yellow log card, but there is no mechanism to ensure that all visitors who require fast scans receive them.

- DPSOL 193-220 defines bioassay requirements for visitors, but operations managers may not follow this procedure. There is no mechanism to assure correct or consistent bioassay requirements for visitors.

CONCERN: (RP.7-1) (H2/C1) The sitewide internal dosimetry program does not comply with the requirements of DOE 5480.11.

RP.10 RADIATION MONITORING/CONTAMINATION CONTROL

PERFORMANCE OBJECTIVE:

The radiation monitoring and contamination control program should ensure worker protection from radiation exposures.

FINDINGS:

- A routine contamination survey program is conducted with goals of maintaining contamination levels below 50 dpm/100 cm^2 in clean areas and in radiologically controlled areas, and below 150,000 dpm/100 cm^2 in contaminated areas. The contamination limit in clean areas and in radiologically controlled areas is 450 dpm/100cm^2. The limit in contaminated areas is 150,000 dpm/100 cm^2. However, numerous deficiencies in this program were noted.

- Operators wearing plastic suits were working inside the R2 Hood in Room 68 in Bldg. 234-H. After they secured the hood door, they removed the contaminated tops of their plastic suits and dumped them on the floor. The tops were later placed in a radioactive waste box.

- The outer door of Bldg. 232-H truck lock was open for an extended period of time with a truck partly inside and partly outside of the lock. This open door provided direct access to a contaminated, radiation area. Winds blowing through the door could adversely affect contamination control and ventilation balance in this radiological area.

- Zn-65 contamination is a potential problem in the Bldg. 232-H Line III cell. Housekeeping, floor mopping, and cleaning are done infrequently and there is a potential for airborne contamination.

- Several glove boxes have sliding doors on the front panel that permit quick access to the box. An operator was observed opening and closing a sliding door and then using the glovebox gloves without first putting on a lab coat and gloves as required by standard procedures.

- Radiological areas (process rooms) are properly posted and the maximum contamination level in the room is recorded on the sign, based on a monthly survey. Contaminated hoods inside the rooms are also posted, but the contamination

level is not recorded since surveys are not done inside hoods. A survey frequency shorter than monthly would be prudent for radiological areas.

- Used or potentially contaminated protective clothing was found lying on the floor at step-off pads where there were no hampers for used clothing.

- Due to the location of change rooms in Bldgs. 232-H and 234-H, personnel in clean protective clothing frequently pass through radiologically controlled areas on their way to radiological areas. Outer protective clothing is to be removed at the exit from radiological areas, but people in potentially contaminated inner protective clothing routinely pass through radiologically controlled areas on their way to the change rooms.

- There is no general effort to reduce the size of the radiologically controlled areas in the Tritium Facilities.

- The frequency of routine mopping of floors in the radiological areas is not adequate to minimize contamination. (Also see Section OP.2.)

- There are no supplies or equipment in the Tritium Facilities for decontamination of personnel. During a contamination incident in the Bldg. 232-H Line III cell on August 3, 1989, a worker had to be taken to Bldg. 221-H for decontamination.

- Contamination control supplies and equipment (and some other radiation protection supplies) are frequently in short supply. There have been problems in maintaining standing orders and a reasonable stockpile of supplies. There have been instances when plastic suits, protective gloves, cloth booties, scintillation fluid, filter papers, and bioassay bottles were in critically short supply.

CONCERN: (RP.10-1) (H3/C1) The contamination control program at the Tritium Facilities does not comply with the requirements of DOE 5480.11.

RP.12 RECORDS

PERFORMANCE OBJECTIVE:

Records related to occupational radiation exposure should accurately document exposures received and be readily retrievable.

FINDINGS:

- Radiation exposure history records are maintained in the dosimetry files in Bldg. 735A. All other records are boxed, inventoried, and sent to the Federal Repository in Atlanta, after an interim storage period of up to 2 years onsite.

- The dosimetry files are now maintained in accordance with DPSOL 292-610, which includes Attachment 4, Records Retention and Disposition. Attachment 4 specifies retention requirements for all the records needed to meet the requirement of DOE 5480.11.

- Prior to 1989, not all of the required records were compiled and retained in a readily retrievable system. Consequently, there are many personnel files where radiation exposure data are not easily assembled.

- Historical copies of manuals, policies, and procedures that describe the technical and administrative basis for the radiation protection program are retained by Publications Control.

- Radiation records related to status of work areas, e.g., radiation survey reports, air sample results, etc., are not retained onsite beyond the interim storage period. The records sent to the Federal Repository are readily retrievable, but complete records are not easily compiled.

CONCERN: (RP.12-1) (H3/C1)

Comprehensive sitewide records related to occupational radiation exposure are not retained consistent with ANSI N13.6.

4.5.2.12 Personnel Protection

4.5.2.12.1 Overview

The appraisal of the personnel protection program of the Tritium Facilities at SRS included the review of WSRC policies and procedures, discussions with personnel from the Tritium Facilities and sitewide organizations, and walk-throughs of the Tritium Facilities buildings. The results of these efforts were judged against DOE performance objectives, criteria, Orders, and industry accepted standards. Findings and concerns identified during the appraisal are summarized in the following paragraphs.

A variety of activities involving safety and health risks to the workers are conducted in the Tritium Facilities. DOE-SR and WSRC have safety and health organizations to assist in the minimization of risks, and no situations involving imminent danger were observed in the Tritium Facilities. A Category II concern was identified regarding the potential release of reservoir contents into a process room which could result in unnecessary radiological exposure to personnel and contamination of the room. The other safety and health concerns that were identified at the Tritium Facilities result from noncompliance with DOE Orders and mandated OSHA Standards. These include potential exposure to physical, mechanical, health and electrical hazards.

The WSRC organization is complex and includes many layers of management, resulting in less than complete understanding of responsibilities, less than full assurance of comprehensive health and safety coverage, and deficiencies in the application of DOE Orders and industry standards. Line supervision has the responsibility for safety, but does not have appropriate training or support to ensure that the sitewide commitment to safety of workers can be met. Further, DOE-SR is unable to provide adequate oversight of safety and health programs at SRS due to assignments to other DOE sites.

There are academically qualified personnel in the areas of occupational safety and industrial hygiene in WSRC, but many of these personnel are relatively inexperienced and in some cases lack the proper DOE clearance to perform support or audit functions in their disciplines. In addition, several of these people do not have specific position descriptions or delineation of responsibilities and authority.

Many of the existing health and safety documents are out-of-date and not in compliance with DOE Orders and industry standards. This is partly due to the transition of the SRS contractor as well as staffing shortages and the large amount of work underway at SRS which requires safety and health oversight. WSRC is addressing the issue of program documents and procedures, but at a rate which is not consistent with DOE expectations.

Walk-throughs of the Tritium Facilities revealed many OSHA noncompliance items which need attention. These items include housekeeping, occupational safety, and electrical hazards. Many of these items are of the repeat variety identified in previous walk-throughs made by senior staff, other site safety committees, and personnel. These noncompliance items are the usual safety violations normally found throughout industry, such as certification and inspection of tools and equipment, hoists, and improper use of storage containers.

The respiratory protection program at the Tritium Facilities is fundamentally sound, with some weaknesses noted. An asbestos evaluation and tracking program is in place, but has not received adequate attention. Monitoring of operations involving asbestos is performed, but documented results of air samples taken during these operations are not received in a timely fashion.

Although the safety hazards communications program is in place, many personnel are not fully cognizant of their responsibilities and the location of workplace health and safety information. In addition, except for sitewide safety suggestion programs, the formal mechanism to review and resolve specific workplace health and safety concerns is cumbersome and inadequate.

4.5.2.12.2 Findings and Concerns

PP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Site and facility organization and administration should ensure effective implementation of the personnel protection program.

FINDINGS:

- There are seven industrial hygienists at SRS, one of whom is assigned to the H-Area which includes the Tritium Facilities. Industry guidance indicates that there should be approximately one industrial hygienist per 1000 workers, depending on the hazards present.
- The H-Area hygienist is not DOE Q cleared and thus cannot enter the Tritium Facilities.

CONCERN: See Concern OA.2-1.

FINDINGS:

- Except for larger construction or modification projects, active participation and design review of new projects by occupational safety and industrial hygiene personnel is either performed too late in the design or construction process, or is not accomplished until line supervision requests a final readiness review. (Also see Section QV.1.)
- The H-Area Safety Representative, although experienced in operations, is not certified by the American Society of Safety Engineers.

CONCERN: (PP.1-1) (H2/C2) Industrial and health safety reviews of Tritium Facilities modifications and projects are not being addressed sufficiently early to ensure that the health and safety of the workers and the public is protected.

FINDINGS:

- DOE-SR oversight of health and safety issues at SRS, including the Tritium Facilities, is the responsibility of a single staff individual.
- This person has been routinely assigned to other DOE sites to assist in health and safety matters.
- DOE-SR health and safety staff have not made regular visits to the Tritium Facilities.

CONCERN: (PP.1-2) (H2/C2)

The DOE Savannah River Operations Office does not have the capability to provide health and safety oversight of the Tritium Facilities personnel protection program.

PP.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE:

Procedures and documentation should provide appropriate direction, record generation, and support for the personnel protection program.

FINDINGS:

- SRS Industrial Hygiene (IH) Department is not in compliance with worker exposure reporting procedures as evidenced by reports that documentation of IH sample results has not been provided to Tritium Facilities personnel in a timely manner.
- Records of worker exposure to industrial and safety hazards are not current as required by OSHA and DOE requirements.

CONCERN: (PP.2-1) (H2/C1) Worker industrial hazard exposure records are not in compliance with DOE Orders and other industry standards.

FINDINGS:

- Although WSRC has an overall health and safety program to protect the workers and the public, the health and safety procedures and other related documents are not current and do not comply with the requirements of WSRC policy manual or DOE 5483.1A and DOE 5480.10.
- All procedures and policies contained in the Industrial Hygiene Policy Manual are not being followed.
- Reviews of industrial hygiene procedures and documents have not been conducted in accordance with program requirements.

CONCERN: (PP.2-2) (H2/C1) Health and safety policy and procedures documents are not current as required by WSRC policy and DOE Orders.

PP.3 MANAGEMENT OF HEALTH AND SAFETY CONCERNS

PERFORMANCE OBJECTIVE:

Chemical, physical, and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

FINDINGS:

- Chemical material inventories for the various Tritium Facilities are not current.
- Asbestos containing materials within the Tritium Facilities have not been identified and quantified as required by 29 CFR 1926 and DOE 5480.10.

CONCERN: (PP.3-1) (H2/C1) Chemical, physical, and/or other environmental stresses arising in the workplace are not being adequately identified, evaluated, and controlled.

FINDINGS:

- During quality checks of some reservoir assemblies in process hoods, the discharge point of these assemblies is oriented toward the open access door of the hood.
- This access door is required to be open during the quality checks to allow for the connection of the test equipment to the reservoir assemblies.
- Unrestricted release of reservoir contents would present a radiological hazard.
- Unobstructed personnel egress routes from the process area are not always available.

CONCERN: (PP.3-2) (H1/C2) (CAT II) The potential for release of reservoir contents through an open process hood access door could result in the unnecessary radiological exposure to personnel and contamination of the room.

PP.4 SURVEILLANCE OF HEALTH AND SAFETY CONCERNS

PERFORMANCE OBJECTIVE:

Appropriate surveillance of activities should be conducted to measure safety and health performance and ensure the continued effectiveness of controls.

FINDING:

- The respiratory protection program does not document the level of respiratory hazard contained in the Tritium Facilities and has not characterized these hazards as required by DOE 5480.10.

CONCERN: (PP.4-1) (H2/C1)

The respiratory protection program is not in compliance with DOE 5480.10 with regard to surveillance and standards.

FINDINGS:

- Routine walk-throughs of the Tritium Facilities by professional industrial hygienists and safety personnel are not being performed as required by WSRC policy requirements.

- Comprehensive safety and personnel protection walk-throughs of the Tritium Facilities are not being performed as required.

CONCERN: (PP.4-2) (H2/C1)

The Tritium Facilities are not receiving adequate industrial hygiene and safety inspections to ensure that the workplace is free of hazards as required by DOE Orders.

PP.5 COMPLIANCE WITH OCCUPATIONAL HEALTH STANDARDS

PERFORMANCE OBJECTIVE:

Site/facility operations should comply with DOE-prescribed standards for evaluation and control of occupational health standards.

FINDINGS:

- Although an active variance was obtained by the contractor from DOE several years ago, the hearing conservation program is inconsistent with the guidance provided by the American Conference of Governmental Industrial Hygienists for threshold limit valves.
- Long-term worker exposure to noise is not documented as required by DOE and OSHA.
- There is a significant backlog of annual audiograms for high risk workers. Annual audiograms are part of the hearing conservation program.

CONCERN: (PP.5-1) (H2/C1)
The hearing conservation program does not ensure that the hearing of high risk workers is protected as required by DOE 5480.10 or OSHA 1910.95.

FINDINGS:

- Although in compliance with OSHA standards, worker exposure to carcinogens is not reviewed on an annual basis as required by DOE. Further, the contractor sought exemption from DOE several years ago, but DOE has not acted upon this request.
- Preplanning meetings to review specific tasks to determine that the use of carcinogens in the work place is ALARA are not performed as required by DOE.

CONCERN: (PP.5-2) (H2/C1)
The carcinogen control program does not ensure protection of an employee's health and is not in compliance with DOE 5480.10.

FINDINGS:

- The SRS Laser Safety Program does not incorporate the safe and proper use guidance contained in ANSI Z136.1-1986.
- The laser system in the Tritium Facilities is not properly labeled.

CONCERN: (PP.5-3) (H2/C2)
The Laser Safety Program at the Savannah River Site does not ensure that personnel are protected as required by ANSI Z136.1-1986.

FINDINGS:

- ANSI Z88.2 requires annual training for respirator users and training for supervisors of respirator users. WSRC assigns the responsibility for this training to the first-line supervisors, however, supervisors are not provided training to prepare them for the responsibility.

- There is neither a specific individual at the Tritium Facilities who has been assigned the responsibility for the respiratory program nor adequate assurances that a worker using respiratory protection devices at the Tritium Facilities has current medical clearance.

CONCERN: (PP.5-4) (H2/C1)

The respiratory protection program does not comply with ANSI Z88.2.

PP.6 COMPLIANCE WITH OCCUPATIONAL SAFETY STANDARDS

PERFORMANCE OBJECTIVE:

Work places should be free of uncontrolled physical hazards and be in compliance with DOE-prescribed occupational safety standards.

FINDINGS:

- Electrical extension cords and temporary wiring in the Tritium Facilities are being used for periods longer than 90 days.
- There were numerous tripping and falling hazards in several areas of the Tritium Facilities.
- Several compressed gas cylinders were unlabeled.
- Hoists were found with expired inspection dates and damaged or inoperable hook safety latches.
- The OSHA noncompliances identified during this appraisal are listed below.
  - Singularly contained hydrogen gas line runs from the cylinder shed through the corridor of Bldg. 234 to the point of use.
  - Electrical panels blocked by hand truck.
  - Cloth was stuffed into an emergency public announcement speaker.
  - Evacuation alarms cannot be heard in all areas.
  - Exposed fiber-type insulation was found in the Bldg. 234 Chiller House.
  - Process hoods are inconsistently labeled in the Tritium Facilities.
  - The high-efficiency particulate air filter vacuum system in the shipping and receiving area of Bldg. 234 was found to have an expired inspection label.
  - The hoist in Bldg. 236 was found to have an expired inspection label.

- Hoist on north side of Bldg. 234 was found to have a damaged safety catch and the hoist was not secured to prevent uncontrolled swinging.

- The Kyle Facility construction area on the roof of Bldg. 234 had numerous OSHA hazards.

- A safety belt in Bldg. 232 was found to have an expired inspection date.

- Several ladders in the Tritium Facilities were past due for inspection.

- Two of the three stretchers used during the emergency exercise were past due for inspection.

- Loose wiring was hanging from an electrical pole on the east side of Bldg. 232.

- Loose refractory ceramic fibers were found in the ceiling and ceiling fixtures of the shipping and receiving area of Bldg. 234.

- Personnel access and egress in the reservoir assembly room of Bldg. 234 is limited and hazardous.

- Chemicals in many of the flammable storage cabinets were not properly labeled.

- The incident area of the emergency exercise was cluttered and contained tripping hazards.

- Some of the electrical circuits in the Bldg. 232 control room are not labeled.

- Unlabeled tritium piping running from Bldg. 232 to Bldg. 234 could be inadvertently damaged.

- Bldg. 232 has temporary wiring penetrating the east side of the building.

- A pipe was found to be hanging from a fire sprinkler line at the incident scene of the emergency exercise in Bldg. 232.

- Numerous pressure gauges were found to be out of calibration throughout the Tritium Facilities.

- In Bldg. 238, ultrasonic cleaners containing ethanol were not qualified for use with flammables.

- Uninspected electrical cords were found on the roof of Bldg. 232.

- Loose grounding wire was found on the north east roof area of Bldg. 232.

- Exposed asbestos was found on valving and piping on the north side roof area of Bldg. 232.

- Nonsparking tooling was missing from the cylinder shed on the north side of Bldg. 234.

- The lunch rooms in all buildings require thorough cleaning (i.e., can openers, under and behind refrigerators, etc.).

- Many pieces of equipment have been retired in place and have deteriorated to the point that they present a hazard.

CONCERN: (PP.6-1) (H2/C1) The Tritium Facilities are not free of occupational hazards as required by OSHA standards and DOE Orders.

FINDINGS:

- Legible electric circuit identification is a basic requirement; however, missing labels and blocked circuit panels make circuit identification difficult.

- Electrical equipment is locked out by placing a lock on the access door to the power panel. This action hinders access to other switches in the panel.

CONCERN: (PP.6-2) (H2/C1) Electrical circuit identification and lockout procedures are not in compliance with all applicable electrical codes.

PP.7 PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE:

Site/facility personnel should be adequately informed of chemical, physical, and biological stresses that may be encountered in their work environment.

FINDINGS:

- Personnel were not knowledgeable of the locations of Material Safety Data Sheets (MSDS), the name of the Tritium Facilities chemical coordinator, and the safety risks of chemicals carrying only the manufacturer's label.
- Employee occupational safety rights are not posted in a sufficient number of places.

CONCERN: (PP.7-1) (H2/C1)

Personnel are not being provided adequate information on their exposures to hazardous materials or conditions, nor are they being provided other hazards information as required by DOE 5483.1A.

4.5.2.13 Fire Protection

4.5.2.13.1 Overview

The appraisal of fire protection covered all performance objectives. The appraisal was confined to the Tritium Facilities, however, some site support operations were also included. Interviews were held with managers/staff of Security and Safety, Fire Protection Services, Fire Protection Oversight, Facilities Projects Fire Protection, Power House and the Tritium Facilities.

Tours were made of the Tritium Facilities as well as some facilities at the power house and fire stations.

The major guidelines used in the evaluation of fire protection at the SRS Tritium Facilities were DOE 5480.1B, DOE 5480.4, and DOE 5480.7. In addition, the National Fire Protection Association's (NFPA) fire codes and the "improved risk" philosophy, as defined in DOE 5480.7, were used in evaluating the facility.

The organization policy being developed by the WSRC includes three distinct divisions: Fire Protection Services, Facilities Projects Fire Protection, and the Fire Protection Oversight, all reporting to the ESH&QA Division. Fire Protection Services will be responsible for fire fighting and inspection/testing; Facilities Projects Fire Protection will be responsible for developing all construction activities for upgrading existing fire protection; and Fire Protection Oversight will be responsible for providing the necessary design criteria and ensuring all work started and completed is in compliance with applicable Orders, codes, etc.

Fire Protection Services and Facilities Projects Fire Protection have been in place for some time; however, with the establishment of Fire Protection Oversight, various responsibilities will have to be transferred from the Fire Protection Services and Facilities Projects Fire Protection. The overall fire protection program is in the early stages of development and there is concern that some responsibilities/ operations may be slighted. However, the organizational structure appears solid and, when implemented, should provide the total fire protection needs of this site.

Tritium Facilities management has never had in-house fire protection expertise necessary for managing their own fire protection program. Fire Protection Services was depended upon for guidance. The new organizational structure will infuse much needed fire protection expertise into the Tritium organization as well as for other areas of the SRS.

Building fire responsibility is part of the duties handled by the Building Custodian, his fire warden, and facility support

team. These people are trained in basic fire protection/ prevention by Fire Protection Services on a semiannual basis.

The sitewide WSRC Fire Protection Program was established in early 1989 but is not completely functional or fully staffed. Fire Protection Oversight is still undergoing organizational changes; and the necessary fire protection program elements such as structure, policy, procedures, and standards are not fully developed.

The Fire Protection Services has been operating under its current organizational structure since 1987. The basic program elements are in place. All firefighters are State certified; in fact, recent hires have been both State Certified and have a minimum of 3 years experience as firefighters. Additional resources are needed to provide administrative support. The requirements to attain compliance with NFPA 1500, "Standard on Fire Department Occupational and Health Programs," are being pursued.

The Tritium Facilities do not meet Life Safety Code requirements with respect to emergency lighting and exit directional signs that provide emergency egress. This is a Category II concern requiring expedited attention.

A severe potential life safety hazard exists in the area of assembly during shelter events. The presence of an unenclosed emergency generator in the basement presents an unnecessary potential fire exposure hazard. This also is a Category II concern.

Additional concerns were identified; namely, automatic fire suppression systems do not provide complete building(s) coverage, property losses resulting from a credible fire will be unacceptable, and the Fire Department is not in compliance with national standards.

WSRC general management and the Tritium Facilities management are aware of these and other deficiencies through the in-depth fire protection evaluations of the Tritium Facilities conducted by Factory Mutual Engineering Company (a nationally recognized fire engineering company) and Professional Loss Control (an independent fire consultant). Corrective actions and resolution of the recommendations developed by these organizations are being pursued within the constraints of resources. Management's continued emphasis on, and attention to the overall program needs, will be required to reach an "Improved Risk" level of fire protection/prevention.

4.5.2.13.2 Findings and Concerns

FP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Fire Protection organization and administration should ensure effective implementation and control of fire protection equipment and activities.

FINDING:

- The fire protection organizational structure consists of: Fire Protection Services, Fire Protection Oversight, and Facility Projects Fire Protection. The authorities and responsibilities of these organizations and their interrelationships have not been established.

CONCERN: See Concern OA.1-1.

FINDINGS:

- Guidance for application of required fire protection standards to plans and specifications for new construction or modifications to existing facilities has not been developed. (Also see Section QV.1.)

- The first draft of such a guidance document is expected to be completed in March 1990.

CONCERN: (FP.1-1) (H2/C1) National fire codes are not being properly applied to site and facility projects as required by DOE Orders.

FINDING:

- Resources have not been established or allocated to accomplish the necessary elements of an adequate fire protection program. Examples include:

  - inadequate number of fire protection engineers,
  - lack of administrative assistance for fire department operations,
  - the need to modernize facilities and equipment for filing and records.

CONCERN: See Concern OA.2-1.

FP.2 LIFE PROTECTION

PERFORMANCE OBJECTIVE:

All facilities onsite should provide adequate life safety provisions against the effects of fire.

FINDINGS:

- Egress routes of proper size, directness to exits, and that are always unobstructed are not available in all buildings.
- Exit signs are poorly located and difficult to see.
- Adequate emergency lighting has not been provided in some buildings.
- Panic release bars are not installed on all exit doors.
- Manual-pull fire alarm boxes to initiate local and central station alarms are not installed at exits from the buildings.

CONCERN: (FP.2-1) (H1/C1) (CAT II)

National Fire Protection Association requirements for emergency egress are not met in some Tritium Facilities buildings.

FINDINGS:

- The Tritium Facilities management is using the basement area of Bldg. 232-H as an assembly area during shelter events.
- Adequate exits are not available in this area.
- The emergency diesel generator presents an unnecessary risk to personnel using the shelter area.

CONCERN: (FP.2-2) (H1/C1) (CAT II)

The Bldg. 232-H basement is not safe for assembling personnel during shelter events.

FP.4 IMPAIRMENT OF OPERATIONS

PERFORMANCE OBJECTIVE:

The site should not be vulnerable to being shutdown for an unacceptable period as the result of a credible fire.

FINDINGS:

- A fire hazards analysis has not been performed for the Tritium Facilities. Such an analysis is essential to realistic design of an adequate fire suppression or detection system. (See also Section FP.5.)

- Partial sprinkler systems have been installed in some buildings. These systems are not adequate to ensure that unacceptable shutdown periods do not occur.

CONCERN: (FP.4-1) (H2/C1) Automatic fire suppression systems are not provided throughout the Tritium Facilities.

FP.5 PROPERTY PROTECTION

PERFORMANCE OBJECTIVE:

A maximum credible fire, as defined in DOE 5480.7, Section 6.f, should not result in an unacceptable property loss.

FINDINGS:

- A fire hazards analysis for the Tritium Facilities has not been performed. However, WSRC management is aware of many of the site's fire protection deficiencies as a result of evaluations performed by Factory Mutual Engineering Company (FMEC) and Professional Loss Control (PLC) in 1987. Recommendations from the FMEC and PLC reports remain valid and WSRC has developed an action plan for correcting the deficiencies identified. Progress on actions not requiring significant resources is progressing satisfactorily. Actions requiring significant resources are to be incorporated into the WSRC action plan after the results from the Tiger Team Assessment are available.

- In addition to previously identified deficiencies, the following were observed.

  - Process cabinets in Bldgs. 232-H and 234-H have no fire suppression. Combustible materials are used to enclose the process cabinets.
  - Automatic fire suppression or detection systems have not been provided for numerous temporary trailers on the Tritium Facilities site.
  - In the event of a catastrophic fire, site crowding of the structures results in risk to buildings not involved in the event.

CONCERN: (FP.5-1) (H2/C1)

Property losses resulting from credible fire scenarios, as defined in DOE 5400.7, will be unacceptable.

FINDINGS:

- The emergency generator, located in the basement of Bldg. 232-H, is not enclosed by fire walls.

- Personnel use the Bldg. 232-H basement as an evacuation assembly point.

- Electrical switchgear in the basement is vulnerable to heat or fire exposure due to its proximity to the generator.

- Under emergency conditions, basement ventilation may not be adequate.

CONCERN: See Concern FP.5-1.

FP.6 FIRE DEPARTMENT OPERATIONS

PERFORMANCE OBJECTIVE:

The Fire Department should have the capacity to promptly terminate and mitigate the effects of a fire in a safe and effective manner.

FINDINGS:

- Fire engines 1, 3, 4, and 5 are not adequately equipped with spare self-contained breathing apparatus cylinders, folding ladders, and 6-foot pike poles for fire suppression response.
- Procedures have not been developed for the testing of hard suction hose on the fire engines.
- Training programs are not in place to provide appropriate levels of training for driver-operators, fire officers, or safety officers.
- Personal Alert Safety System devices for Fire Department personnel safety and rescue have not been provided.
- The Fire Stations at A- and F-Areas are not equipped with proper ventilation systems to protect firefighters from vehicle exhaust.
- Annual medical examinations are not being provided for Fire Department personnel.
- There is no structured physical fitness program for firefighters, nor a physical fitness facility to implement such a program.
- There is no rehabilitation program for personnel who are unable to meet fitness standards.

CONCERN: (FP.6-1) (H1/C1) The Fire Department is not in compliance with the requirements of National Fire Protection Association Code 1500 as required by DOE 5480.4.

FP.7 PROGRAM IMPLEMENTATION

PERFORMANCE OBJECTIVE:

A fire protection engineering program should be in place to effectively provide and maintain an "improved risk" level of fire protection.

FINDINGS:

- A policy has not been completed detailing the responsibilities of the Fire Protection Services, Facilities Projects Fire Protection, and Fire Protection Oversight.
- The audits and appraisals required to be performed by WSRC are not being accomplished in accordance with DOE 5480.1B. (Also see Section FR.6.)
- The Fire Protection Services Impairment Program is not being followed.
- There is no program in place to follow up on reported fire protection deficiencies.

CONCERN: (FP.7-1) (H2/C1) The requirements for "Improved Risk," as mandated by DOE 5480.7, are not being met.

4.5 SAFETY AND HEALTH FINDINGS AND CONCERNS

4.5.3 SAVANNAH RIVER LABORATORY AND AVIATION SAFETY, MEDICAL SERVICES, PACKAGING AND TRANSPORTATION, AND EMERGENCY PREPAREDNESS

4.5.3.1 Organization and Administration

4.5.3.1.1 Overview

All eight of the Organization and Administration performance objectives were appraised. The appraisal was based on interviews with various levels of SRL management from the Vice-President and SRL Laboratory Director down through several levels of management. Interviews were also conducted with management and staff within the WSRC including the Environmental, Safety, Health, and Quality Assurance Division as well as with safety engineers and line management staff at DOE-SR. Discussions with the Organization and Administration counterparts on the Waste Management and Tritium Facilities TSA Teams were also made periodically during the course of this appraisal. Review of applicable DOE Orders and references and WSRC policies, procedures, manuals and reports served as a basis of understanding and comparison to practice. Tours and interviews were conducted in different areas of the SRL and its associated facilities.

Because of the independent nature of the direct reporting relationship of SRL to offsite corporate management under the previous contractor, SRL and SRS have the unique challenge of assuring the effective integration of SRL into the mainstream of SRS systems while still preserving its technological function. Further, WSRC management is at a critical point, attempting to implement many new systems and initiating a compliance culture. WSRC management must manage the change by establishing realistic priorities and integrating them across the site to be in the position of accurately assessing their ability to meet commitments. The Management Integration Department has a lead role in this and is following a logical pattern of establishing management systems such as the Commitment Management Improvement Initiative and the Management Information and Control System to accomplish this over the next 3 to 4 years.

The SRL organizational structure, in general, is logically arranged and clearly understood. The present management team continues to emphasize personal responsibility for safety which had been effectively institutionalized by the previous contractor. There is in some cases, a tendency to take a narrower view of safety with less emphasis on compliance; e.g., wearing dosimeters in Radiologically Controlled Areas.

Annual safety programs and goals are given high visibility through the SRL division and department level safety program documents. Annual performance appraisals of SRL personnel

include a discussion of safety performance. The SRL is presently using the Individual Career Management-Plus appraisal system, however, there are at least three other performance appraisal systems currently in use across the SRS. This makes it unclear how future appraisals will consider safety performance after implementation of a site appraisal system, presently scheduled for 1991. Specific or generic job descriptions have been established for SRL professional employees as part of an ongoing job evaluation process. Many staff do not have copies, however, these are available from SRL Human Resources. The influx of many new employees to SRS and SRL, the current job evaluation process underway, and the significant number of new site initiatives all combine to make the definition of roles and responsibilities of personnel uncertain.

There is concern for the potential loss of professional staff across the site. Although this has not manifested itself as a significantly increased rate of resignations, management is aware of this situation which they attribute, among several factors, to the change to a more compliance oriented philosophy of the operation and the salary competition from outside employers for specialized professionals.

The DRAFT-Safety Analysis Savannah River Laboratory Technical Area (DPSTSA-700-38) was submitted to DOE-SR approximately 1 year ago for their review and approval. The review of this SAR has not been completed by DOE-SR. Presently, DOE-SR has committed to provide comments on this document by June 1, 1990. The prolonged delays in reviewing these comments from DOE-SR has impacted the availability of an approved SAR for the SRL Technical Area. Furthermore, the present DRAFT-DPSTSA-700-38 neither reflects the current status of the SRL Technical Area nor are any formal mechanisms in place to update SARs whenever additional analyses become available.

Similarly there appears to be confusion over the format for OSRs. Written guidance to WSRC directs the contractor to follow the DRAFT DOE Notice 5480.ZZ and to submit to DOE-SR for approval a list of proposed criteria for items to be included in OSRs. This was completed via the letter E.W. Pottmeyer, Jr. to J.B. Whitsett, February 26, 1990. The use of draft guidance such as the DRAFT DOE Notice 5480.ZZ by the contractor appears to have added confusion to the process of establishing OSRs. In general, the use of draft DOE guidance, because of its tentative nature portrays uncertainty to the contractor and adds further delays to implementation of important safety requirements.

The transition of procedures from the previous contractor into the WSRC format is being managed through the Integrated Procedures Management System (IPMS) which should provide a fully integrated sitewide set of management and operating documents. While this system is being implemented there remains a concern for the overall control and use of procedures and systems. Repeated examples of outdated procedures in use, performance of

important operations without procedures, and the proliferation of separate procedure systems were observed.

The IPMS and the SRS Document Management System have been instituted to bring the document control and records management systems into configuration management compliance by the third quarter of 1991. None of the present vital records storage vaults for SRS meet DOE 5700.6B requirements. Plans for having vaults meeting these requirements indicate a second quarter 1991 availability.

A Substance Abuse Policy is in effect and reflects a positive approach directed at the rehabilitation of the employee. Orientation sessions on substance abuse are being given to all new employees, but substance abuse recognition training is not being given to all management and supervisory personnel and no refresher training is being provided.

4.5.3.1.2 Findings and Concerns

OA.1 SITE/FACILITY ORGANIZATION

PERFORMANCE OBJECTIVE:

Management should organize and manage the site/facility's work, programs, and resources so that safety and health are an integral part of the personnel duties and requirements are consistently implemented.

FINDINGS:

- The Westinghouse Savannah River Company Maintenance Centralization Study (May 12, 1989) concluded there was no central site direction in a preliminary study of the 11 Works Engineering organizations at SRS.
- The establishment of the WSRC Site Safety Review Committee and the Site Item Reportability and Issue Management System are examples of initiatives that have not been effectively communicated to all levels of site management.
- WSRC management has initiated several key site-wide activities concurrently without defining priorities and assuring their integration. The Management Integration Department, established to meet this need, has not provided a fully prioritized and integrated system for management, although it is following a logical pattern of establishing the necessary tools, through the Commitment Management Improvement Initiative and the Management Information and Control System, over the next 3 to 4 years.

CONCERN: (OA.1-1) (H3/C2)

A Westinghouse Savannah River Company management system to prioritize and integrate the implementation of key initiatives is not in place.

OA.7 DOCUMENT CONTROL

PERFORMANCE OBJECTIVE:

Document control systems should provide correct, readily accessible information to support site/facility operations.

FINDINGS:

- Although the WSRC Integrated Procedures Management System is directed at converting manuals and procedures into a fully integrated system, the completion of this effort will take considerable time.

- The WSRC Records Management Section is unable to provide support to the various WSRC divisions and departments. A finding in the Westinghouse Savannah River Company Maintenance Centralization Study (May 12, 1989) cited the heavy demand for new and revised procedures resulting in an estimated need of approximately 80 person-years to handle the backlog.

- In the absence of centralized support for the development of procedures there has been a proliferation of isolated procedure systems in various areas which exacerbates the already complex task of converting procedures and manuals.

- The use of outdated procedures, the performance of important operations without procedures, and the use of informal procedures were observed by various TSA team members, thereby, indicating the need for management attention to the overall area of procedures development and implementation of the Integrated Procedures Management System.

CONCERN: (OA.7-1) (H2/C2)

The lack of management attention to the overall procedures development and implementation process has led to a proliferation of independent systems and the improper use of procedures. (Also see Concerns CS.5-2, OP.3-2, OP.4-3, RP.3-4, RP.5-2.)

FINDING:

- The Savannah River Laboratory Quality Assurance Manual, DPSTM-87-700-1, Section 17., Attachment 2 specifies document vault storage facilities that meet the requirements of NQA-1. Discussions with SRS Records Management personnel revealed that none of the SRS vital records storage facilities meet these requirements (e.g.,floor drainage, fire rating).

CONCERN: (OA.7-2) (H2/C1) Storage facilities used to control vital records and documents do not meet the requirements of NQA-1 and DOE 5700.6B. (Also see Concern FP.7-1.)

FINDINGS:

- The DRAFT-Safety Analysis Report for Savannah River Laboratory Technical Area (DPSTSA-700-38) was formally submitted to DOE-SR on March 31, 1989. Inquiry into its approval status with DOE-SR revealed that although a quality review of the document had been completed, the safety review was only partially complete, and the environmental review not started.

- DPSTSY-200-5, "Transportation of Radioactive Materials by Truck and Rail at the Savannah River Plant" (November 1977) is a SAR for these operations. A revision was submitted to DOE-SR in September 1987 and subsequent comments have been addressed. The latest version was submitted to DOE-SR on September 30, 1989; DOE-SR has not completed its review of the SAR.

CONCERN: (OA.7-3) (H2/C2) The Savannah River Operations Office has not provided timely responses to Safety Analysis Reports.

FINDING:

- The DRAFT-Safety Analysis Report for Savannah River Laboratory Technical Area has not been approved.

CONCERN: (OA.7-4) (H2/C1) The Savannah River Laboratory Technical Area does not have an approved Safety Analysis Report as required by DOE 5480.5.

FINDINGS:

- Validation of OSRs for the SRL via the SAR review has not been accomplished, and thus, none have been prepared for the SRL Technical Area.

- WSRC management was requested by the DOE-SR to follow DRAFT DOE Notice 5480.ZZ in regard to format for OSRs. The request (letter J.B. Whitsett to E.W. Pottmeyer, Jr., January 3, 1990) further directed WSRC management to develop and submit to DOE-SR for approval a list of proposed criteria that define items to be included in OSRs.

- Draft criteria defining items for inclusion in OSRs have been prepared by WSRC, and submitted to DOE-SR (letter E.W. Pottmeyer, Jr. to J.B. Whitsett, February 26, 1990).

- The use of draft orders has caused confusion and led to delays. For example, the DRAFT DOE Notice 5480.ZZ has been difficult to interpret and apply, thus contributing to delays in OSR development for the SRL Technical Area.

CONCERN: (OA.7-5) (H2/C1) There are no Operational Safety Requirements for the Savannah River Laboratory Technical Area.

OA.8 FITNESS FOR DUTY

PERFORMANCE OBJECTIVE:

A Fitness for Duty Program should be capable of identifying persons who are unfit for their assigned duties as a result of drug or alcohol use, or other physical or psychological conditions, and should provide procedures to remove them from such duty and from access to vital areas of the site or facility pending rehabilitation or remedial actions.

FINDINGS:

- Orientation on the WSRC Substance Abuse Policy and Program is given to all new employees.
- Not all of the WSRC supervisory and management personnel have received substance abuse training.
- Refresher training on substance abuse to include substance abuse detection, is not being administered to WSRC supervisory and management personnel.

CONCERN: (OA.8-1) (H2/C2)

Substance abuse training is only being partially administered to Westinghouse Savannah River Company supervisory and management personnel. Refresher training in substance abuse detection is not being provided.

4.5.3.2 Quality Verification

4.5.3.2.1 Overview

This appraisal included all performance objectives as applicable within SRL. (Quality verification activities performed by the SRS quality organizations were reviewed by the Tank Farm and Tritium Facilities TSAs.)

The SRL Quality Assurance (QA) Program was reviewed as well as quality verification at specific areas within the SRL Technical Area and the TNX Facility. This review included interviews with SRL the QA Section and other SRL and SRS personnel; tours of facilities; and review of manuals, implementation procedures, reports and other documents.

The SRL QA Program is in a state of transition. The program requirements are presently defined by the SRL QA Manual; however, on April 1, 1990, a sitewide SRS QA Manual will replace the current manual. The new SRS QA Manual will provide some improvements to the SRL program; however, the overall impact is expected to be minimal since the manuals are similar. The current SRL QA Program requirements, as well as those expected to be defined by the new SRS QA Manual, are in agreement with NQA-1.

In addition to the current changeover to the sitewide QA Manual, the SRL QA Program has been impacted by recent organizational changes associated with the Du Pont/WSRC transition.

The SRL QA Program is not fully implemented and there fore is not in compliance with DOE 5700.6B. Implementation procedures are just now being prepared by some of the line organizations. Also, there is a noticeable lack of consistency in how the program is being implemented among the various line organizations.

The organizational placement of the SRL QA Section Manager does not provide an equal degree of independence from the various SRL line organizations or direct access to top level SRL management.

The SRL QA organization is staffed by qualified professionals and appears to have an aggressive surveillance program throughout activities under SRL management; however, formal SRL quality verification of SRL safety and health protection functions within SRL (which are provided by organizations under SRS management) is lacking.

A graded level procurement system provides for SRL QA review of the more critical procurements. Oversight of procurements by safety-related disciplines is not routine. The procurement originator and line organization approver are responsible for determining if safety or health protection review is required. (Health protection organization review is required by procedure for procurements of certain items.)

Supplier control and receiving inspections are primarily the responsibility of SRS quality organizations and were addressed in the Tritium Facilities TSA. Items purchased by SRL are received and inspected at the SRS central area.

The SRL measuring and test equipment (M&TE) calibration activities are not fully established and many differences are seen throughout SRL in how instrument calibration control is achieved. Efforts are underway within SRL and the SRS to fully implement M&TE calibration programs and achieve sitewide standardization. The Savannah River Standards Laboratory at SRL provides calibration traceability to the National Institute of Standards & Technology.

A nonconformance report system is used to control the use and disposition of defective materials and hardware at SRL. SRL uses the SRS central warehouses for spare part management. This function was reviewed in the Tritium Facilities TSA.

SRL QA is not taking a proactive role in assuring that inspection requirements are included in procedures.

Welding activities reviewed at SRL were found to be appropriately controlled. The Welder Certification Program is the responsibility of the SRS quality organizations and was reviewed in the Tank Farm TSA.

Four new concerns were identified in the Quality Verification area. In addition, a generic concern from the Organization and Administration area was referenced.

4.5.3.2.2 Findings and Concerns

QV.1 QUALITY PROGRAMS

PERFORMANCE OBJECTIVE:

Administrative programs and controls are in place to assure policies concerning quality are administered for each facility throughout the site.

FINDINGS:

- The SRL Quality Assurance (QA) Program, defined by the SRL QA Manual DPSTM-87-700-1, is generally consistent with DOE 5700.6B and NQA-1. The SRL QA Manual was issued in November 1987; however, implementation is incomplete.

- QA program implementation is considered the responsibility of each line organization. Significant variances in the degree of implementation as well as the methodology for implementation were observed among the various line organizations reviewed.

CONCERN: (QV.1-1) (H3/C1)

A Savannah River Laboratory Quality Assurance Program has not been fully and consistently implemented in accordance with DOE 5700.6B and NQA-1.

FINDING:

- The anticipation of the issuance of a new sitewide QA Manual (scheduled for April 1, 1990) has resulted in some apparent uncertainties among the different SRL organizations as to what the appropriate next steps are in achieving full implementation of the current QA program.

CONCERN:

See Concern OA.1-1

FINDING:

- The SRL QA Manager is placed under one of the SRL second level managers and accordingly does not have the same degree of independence from all line organizations and does not have a direct reporting line to top SRL management.

CONCERN: (QV.1-2) (H3/C2)

The Savannah River Laboratory Quality Assurance organization placement does not provide appropriate levels of independence and top level management access.

FINDING:

- The SRL QA organization is presently not providing formal quality oversight (i.e., scheduled surveillances) of safety and personnel protection-related functions at SRL.

(Surveillances of other SRL functions may overlap into these activities.) Organizations responsible for these functions at SRL are dotted line (functional but not administrative) to SRL management and receive quality verification oversight on a sitewide basis from SRS quality organizations with limited focus on SRL. The SRL QA organization is presently placing emphasis on the implementation of the SRL QA Program within SRL managed organizations and is not conducting scheduled quality surveillances of safety and health protection functions within SRL. The scope of responsibility for the SRL QA organization includes all activities within the laboratory.

CONCERN: (QV.1-3) (H2/C2) Savannah River Laboratory verification activities are not fully addressing safety and health protection activities within the Laboratory.

QV.2 PROCUREMENT AND SUPPLIER CONTROL

PERFORMANCE OBJECTIVE:

Provisions are established for the control of purchased material, equipment, and services; for selection and control of suppliers; and for assessing the adequacy of procurement activities.

FINDING:

- The procurement process does not routinely require review by safety-related disciplines to verify that safety and health protection has been properly addressed. These disciplines are included based on judgment of the procurement originator (for safety and quality) and validated by a designated procurement approver (typically a supervisor or manager) within the line organization and also by procedure for certain types of items.

CONCERN: See Concern QV.1-3.

QV.4 CALIBRATION PROGRAM

PERFORMANCE OBJECTIVE:

Provisions are made to assure that tools, gages, instruments, and other measuring and testing devices are properly identified, controlled, calibrated, and adjusted at specified intervals.

FINDINGS:

- Efforts are under way throughout the Laboratory to develop and implement measuring and test equipment (M&TE) calibration programs in accordance with the requirements of the SRL QA Manual. In addition, the Laboratory and SRS as a whole, are reviewing options for standardizing and integrating calibration programs and practices throughout the site. At present, implementing programs are largely undeveloped and existing calibration practices are inconsistent among implementing organizations within SRL.

- SRL facility "custodians" are individually responsible for calibration of instruments at their respective locations. The custodians observed were found to be performing and managing instrument calibrations using approaches very different from each other.

- Several different instrument calibration recall systems are being used throughout SRL. The feasibility of using the Works Management System (WMS) as a single sitewide calibration recall system is being evaluated.

- Instrument custodians, at their discretion, may elect to use any of several site organizations or outside vendors to perform instrument calibrations.

- Several different types of calibration tags are presently being used within SRL. Steps are being taken to implement sitewide standardization of calibration tags.

- SRL and SRS QA manuals identify two categories of instruments. Category 1 instruments require scheduled periodic calibration; Category 2 instruments require calibration only when the device is first put into service. The custodians determine the category for each of their instruments. Many instruments used for operation of systems and instruments used for personnel protection (e.g., SRL health

protection (HP) instruments) have been designated as Category 2.

- Many examples of safety-related monitoring instruments were observed that are "source checked" periodically with chemical or radioactive sources but are not calibrated on a periodic basis.

- M&TE calibration discrepancies observed at the TNX Precipitate Hydrolysis Experimental Facility include incorrect calibration tag data (possibly an isolated case) and the apparent absence of calibration tag on all of the many pressure gages in the system. The TNX Facility is in the process of establishing a calibration program.

- Instruments throughout Bldg. 773-A related to the ventilation system and breathing air systems, and SRL health protection (HP) instruments and monitors have not been included in a formalized calibration program. Steps are being taken to develop and implement calibration programs in these areas at this time.

CONCERN: (QV.4-1) (H3/C2) Measuring and Test Equipment Calibration Programs are not implemented in a consistent and uniform manner throughout Savannah River Laboratory.

QV.6 INSPECTIONS

PERFORMANCE OBJECTIVE:

Prerequisites are provided in written inspection procedures with provisions for documenting and evaluating inspection results.

FINDING:

- SRL maintenance project procedures are routed to SRL QA for review of inspection requirements adequacy only if the procedure originator first includes some type of inspection requirements. SRL QA does not verify the appropriateness of a procedure originators' decision not to include any inspection requirements.

CONCERN: See Concern QV.1-3.

4.5.3.3 Operations

4.5.3.3.1 Overview

This appraisal addressed all eight performance objectives for Operations as well as applicable portions of the performance objectives for Experimental Activities. Representative examples of the wide variety of operations conducted by SRL employees were reviewed. This included the activities in laboratory services support, laboratory operations, intermediate level cells, shielded cells, the californium facilities, the Fuel Fabrication Laboratory, the Robotics Laboratory, the Heat Transfer Laboratory, and the waste disposal areas at the SRL 700 Technical Area. Activities conducted by SRL in other SRS areas were also covered; this included the TNX Facility in the 600-T Area, the Plutonium Experimental Facility in the 200-F Area, the Materials Test Facility in the 200-H Area, and the Reactor Tank Inspection Program in the 300-A Area.

Operational activities at SRL are conducted with considerable attention to safety. Every supervisor and manager interviewed expressed responsibility for the safety of all activities under his or her jurisdiction. A variety of audit practices are in place to assist supervision in exercising this responsibility. Largely for safety reasons, SRL activities involving significant quantities of tritium or plutonium-238 are conducted in the 200-H and 200-F Areas rather than in the 700 Technical Area as they formerly were. Housekeeping in all operational areas visited was satisfactory.

Laboratory activities were controlled, monitored, and conducted in a professional manner with considerable attention to safety. Entry to laboratories was found to be controlled and disciplined.

Pilot plant activities at the TNX Facility are also conducted in a professional manner. They are controlled by nearly 600 operating procedures which cleverly blend disciplined control with the necessary flexibility for research and development activities.

SRL activities in the 200 and 300 Areas were being carefully coordinated with other activities in the area and were in compliance with area-specific requirements.

Responsibilities and authority of each position in SRL operations were well defined and documented. Administrative controls were being effectively employed.

Conduct of SRL operations lacked adequate discipline in control rooms and in alarm responses which led to the expression of three concerns.

During this appraisal, WSRC was beginning the process of making all its operating procedures uniform in format and content and

standardizing the review and approval process. At the time of this assessment, however, a variety of formats and procedure practices existed at SRL. Two concerns are expressed concerning operating procedures.

Facility status controls did not completely conform to standard nuclear industry practices. This led to the expression of three concerns.

Operator knowledge varied considerably, but was generally satisfactory. During interviews, all operators responded properly when asked what they would do if a particular malfunction occurred. Some were able to improvise intelligently beyond the steps covered by procedures. A concern is expressed about the lack of a documented control system to assure assignment of only qualified operators to duties on nights and weekends.

Shift turnover was conducted effectively at control rooms in the TNX Facility and in the Technical Area. Both oral and written communication ensured accurate transfer of information between shift personnel.

The old alarm panel in the Bldg. 773-A Control Room was being deactivated during this assessment and alarm signals were being transferred to a new video console. Careful planning minimized disruptions of control room activities during the move. When the project is completed, human factors considerations will be significantly improved.

4.5.3.3.2 Findings and Concerns

OP.2 CONDUCT OF OPERATIONS

PERFORMANCE OBJECTIVE:

Operational activities should be conducted in a manner that achieves safe and reliable operation.

FINDINGS:

- The main Control Room in Bldg. 672-T at the TNX Facility also serves other functions and is frequently congested. No restrictions on entry were evident.

- The Precipitate Hydrolysis Experimental Facility Control Room in Bldg. 692-T is extremely small and frequently congested. No restrictions on entry were evident.

- The main Technical Area Control Room in the basement of Bldg. 773-A was frequently congested due to construction activities associated with installation of a new alarm and control console. Access was, however, physically limited by performing routine business through a window and by locked doors. The Control Room for waste disposal activities in Bldg. 776-1A was devoted exclusively to that function. Although no restrictions on entry were evident, the isolated location resulted in little opportunity for distracting activities. Standing instructions require that this room be locked whenever an operator is not present.

CONCERN: (OP.2-1) (H2/C2) Access to control rooms is not limited to appropriate personnel.

FINDING:

- Alarms in the Bldg. 773-A Control Room for a low-level drain exhaust fan vacuum and a high-level drain exhaust fan vacuum were not functioning during this appraisal. Labels below each alarm light gave a work order number for their repair which was dated November 3, 1989. Although field instruments exist for both of these vacuum measurements which could have been read periodically during the long period of alarm disablement, no such readings were made.

CONCERN: (OP.2-2) (H2/C2) When safety system equipment is disabled, alternative means to ensure safety are not always implemented, and the length of time the system is disabled is not always minimized.

FINDING:

- An operator leaving the Bldg. 773-A Control Room after shift change was observed to silence a fire alarm and proceed to leave the facility without taking the required alarm response actions or informing any remaining control room operator that the alarm had been received. (He later phoned from the gate to inform the control room that the fire truck was entering the gate in response to the alarm.)

CONCERN: (OP.2-3) (H2/C2)

The system in place at the Savannah River Laboratory does not assure adequate response to alarms by all operators.

OP.3 OPERATING PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE:

Approved written procedures, procedure policies and data sheets should provide effective guidance for normal and abnormal operation of each facility on a site.

FINDINGS:

- Authority and guidance for preparation of operating procedures was contained in the SRL Quality Assurance (QA) Manual, DPSTM-87-700-1, Section 5, dated October 1, 1987. This document does not require an independent safety review in accordance with accepted nuclear industry practice for similar facilities. A safety review is obtained for some procedures if the author or line manager requests it.

- During the course of this assessment, document WSRC-1-03-MRP 3.27, "Management of Division and Department Procedures" was approved and was in the process of being issued. Section 5.7.2 of that document stated that "all operating procedures shall be reviewed by...organizations that have been chartered by the WSRC President's Office with oversight responsibility for the specific task addressed by the procedure." The author of that document stated that this means that the Environment, Safety, Health and Quality Assurance Division has the authority to request an independent safety review for particular groups or types of operating procedures.

- SRL has a total of about 1500 operating procedures, coordinated by several different persons or organizations.

- Each procedure coordinator interviewed stated that a required independent safety review of every operating procedures would be devastating to their present system.

CONCERN: (OP.3-1) (H2/C2)

Savannah River Laboratory is neither performing nor currently organized to perform a timely independent safety review of its operating procedures.

FINDINGS:

- Review of operating procedures is required by Section 5 of the SRL QA Manual, dated October 1, 1987, to be performed at least every 2 years. This is in agreement with nuclear industry practice for this type of facility.

- The SRL Technical Area operations procedure manual contains only a handful of procedures with dates within the past 2 years. About 90 of the 139 operating procedures have not been reviewed in the past 20 years.

- The 50 shielded cell operations procedures have not been reviewed and reissued since 1978. Half were currently under review, but none had been sent to SRS Document Control for issue.

- Not all of the 250 operating procedures used by the Equipment Engineering Section have been revised in the past 2 years.

- Of the nearly 600 operating procedures at the TNX Facility the majority have been reviewed within the past 2 years; about 10 percent are out-of-date but under review; 7 procedures for active operating activities have dates between March 1985 and December 1987 but no review has started on them. Procedure reviews often take several months for completion, but are not started until shortly before the 2-year deadline.

CONCERN: (OP.3-2) (H2/C2) Operating procedures at Savannah River Laboratory are not all reviewed every 2 years as internal documents require. (Also see Concern OA 7-1.)

OP.4 FACILITY STATUS CONTROLS

PERFORMANCE OBJECTIVE:

Operations personnel should know the status of the systems and equipment under their control, should know the effect of non-operational systems and equipment on continued operations. They should ensure that systems and equipment are controlled in a manner that supports safe and reliable operation.

FINDING:

- Several alarm lights were observed to be on in the Bldg. 672-T Control Room at the TNX Facility. When questioned, none of the on-duty operators were aware of the status or necessarily the existence of any corrective actions. These lights had come on prior to the start of the shift. Entries had been made in the log book as to corrective action taken by the operator who first responded to only one of these alarms.

CONCERN: (OP.4-1) (H2/C2)

Control room practices do not ensure knowledge and control of facility status.

FINDINGS:

- Most hoods in SRL laboratories are designed to have the same linear face velocity at any door position by having a louvered opening above the door that admits as much air as the closed portion is excluding.

- Hood louvers in several laboratories in B-wing of Bldg. 773-A had plastic sheeting covering them which was held in place with masking tape. This plastic cover limited the area of intake air flow and increased the inlet velocity when the hood door was not fully open. Stops were in place on these hoods to limit the extent of hood opening.

- The standard face velocity notation labels were in place, but did not state whether the measurement was made with or without the plastic covers.

- Neither the laboratory supervisor nor any other operations person questioned was aware that they had to leave the plastic in place to achieve desired face velocities. Some stated it was just an extra measure of safety someone had arbitrarily introduced.

- Upon questioning, the health protection employee who had performed the face velocity

measurements stated that he had installed the plastic covers in order to achieve safe velocities and that they were in place when the recorded velocities were measured.

CONCERN: (OP.4-2) (H2/C2) Adequate communication about facility safety features and necessary controls is not rigidly employed.

FINDINGS:

- The masking tape and plastic sheeting employed to ensure adequate face velocities on hoods as described in findings leading to Concern OP.4-2 was unsightly.
- Some of the masking tape was not tightly affixed to the metal.

CONCERN: (OP.4-3) (H2/C2) There is a lack of procedural requirements to provide effective remedial measures to maintain adequate face velocity on laboratory hoods. (Also see Concern OA.7-1.)

OP.6 OPERATOR KNOWLEDGE AND PERFORMANCE

PERFORMANCE OBJECTIVE:

Operator knowledge and performance should support safe and reliable operation of the equipment and systems for which they are responsible.

FINDINGS:

- Shift operators at the TNX Facility are trained and reported to be qualified to perform all six duty functions on shift. Day operators are trained and reported to be qualified only on one or two of the duty areas.

- At the TNX Facility day and shift operators are on the same overtime selection list. No document is available to the Control Room Operators as to which persons are fully qualified for which jobs.

- With the "self-management" system in place, the operators themselves make the duty assignments, which are rotated on a regular basis.

- In the Bldg. 773-A Control Room on nights and weekends there are three separate work assignments that are rotated among the operators through a "self-management" system. Day operators are placed on the same overtime selection list only when the training coordinator considers them to be qualified for all three assignments. However, no document is available in the control room as to who is fully qualified for each job.

CONCERN: (OP.6-1) (H2/C2) No documented control system is in place to prevent assignment of unqualified operators to specific duties.

4.5.3.4 Maintenance

4.5.3.4.1 Overview

All eight performance objectives were addressed during this appraisal. Maintenance activities of the SRL Works Engineering (WE) and the sitewide Central Services Works Engineering (CSWE) were reviewed. An in depth appraisal of SRL WE and an overview of CSWE was made.

The Maintenance activities were evaluated by interviewing personnel, reviewing documents and observing work activities. SRL facilities maintenance is provided by WE under the Laboratory Services Section (LSS). LSS provides engineering, operation, and maintenance services to SRL.

SRL WE provides SRL with maintenance and support services, including a machine shop for fabrication and modification of research and development prototype/mock-up equipment.

SRL WE has no formalized maintenance management system as required by DOE 4330.4, and most personnel contacted were unfamiliar with the order.

Most of the SRL WE maintenance activities are reactive rather than proactive, that is, much of the maintenance is for repair and is accomplished by Work Request using the Work Management System (WMS). Entry of work on the WMS is the responsibility of LSS operations. Implementation of the WMS by SRL WE is incomplete and some aspects of maintenance activities have not been given the attention required by the DOE Order.

The area of concern deals with the incomplete use of preventive, predictive, and corrective maintenance. Formalized programs and documentation for these areas is not adequate. The work control system is incomplete and, therefore, does not provide management with the means for determining the status of planning, scheduling and control of maintenance work. Maintenance planning is not being performed by a group dedicated to the maintenance management program as required by DOE 4330.4.

SRL WE maintenance facilities, equipment and tools are maintained in good repair and the personnel are enthusiastic about improving maintenance. Sitewide there are a number of WE organizations that are essentially autonomous operations and are accomplishing maintenance without formal sitewide direction from WSRC or oversight by DOE-SR. One of these organizations is CSWE.

The overview appraisal of the sitewide CSWE maintenance activities indicates a broader knowledge of DOE 4330.4 than was evident for SRL WE. In general, the maintenance being provided by CSWE and the condition of the shops inspected was good, but some of the maintenance activities are not in compliance with DOE 4330.4. CSWE is responsible for providing sitewide landlord

maintenance for roads and railroads, site power and distribution, pumps and pump houses, fleet vehicles and heavy equipment, certain buildings and facilities, and accountability of associated capital equipment.

CSWE uses an advanced, but still incomplete WMS for scheduling and controlling many of its activities. A plan to improve work control functions in CSWE has been prepared and was submitted for approval in May 1989.

Brief inspection tours of some of the CSWE shops in the 700 Area revealed some deficiencies, such as: poor or no maximum load markings on hoists, cranes and other lifting equipment; illegible writing on recall tags for equipment servicing; independent oversight review for procedures and calibration/test records is not required in most areas; poor posting of the need for wearing safety equipment (safety glasses) in some areas; and poor housekeeping in the Fleet Maintenance Shop.

4.5.3.4.2 Findings and Concerns

MA.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Maintenance organization and administration should ensure effective implementation and control of maintenance activities.

FINDINGS:

- The WSRC organizational charts show that maintenance functions sitewide are accomplished by several Works Engineering (WE) organizations.
- The WE organizations are independently accomplishing maintenance with no sitewide direction from WSRC or DOE-SR.
- The Works Management System is under the direction of the Technical Area Support operations and directs all SRL WE maintenance work.

CONCERN: (MA.1-1) (H2/C2)
Lack of a sitewide maintenance organization inhibits effective and efficient implementation and control of maintenance activities. (Also see Concern OA.1-1.)

FINDINGS:

- SRL WE does not have a written maintenance program or policy.
- SRL WE is currently reviewing WSRC-RP-89-495 (December 15, 1989) to determine if this policy can be adapted to SRL.
- DOE 4330.4 was not being used in developing the SRL WE maintenance program.

CONCERN: (MA.1-2) (H2/C1)
A policy for the overall direction of the Savannah River Laboratory Works Engineering Maintenance Program is not established in accordance with the requirements of DOE 4330.4.

MA.2 CONDUCT OF MAINTENANCE

PERFORMANCE OBJECTIVE:

Maintenance should be conducted in a safe and effective manner to support each facility condition and operation on the site.

FINDINGS:

- Procedures for preventive and corrective maintenance are incomplete and no directed effort has been assigned for their completion.
- There are no procedures for maintenance and operational checks to assure that source material is not leaked to the environment from the Cobalt 60 Facility in Bldg. 774-A.
- Scope of Work on all equipment is not available on Works Management System. Personnel must review DPSOLs, DPSTOMs, SARs, and other SRS Safety Manuals to determine work to be accomplished.

CONCERN: (MA.2-1) (H2/C2)

There is no program to assure that procedures exist or are updated to conduct maintenance in a safe and effective manner. (Also see Concern OA.7-1.)

MA.3 MAINTENANCE FACILITIES, EQUIPMENT AND MATERIAL

PERFORMANCE OBJECTIVE:

Facilities, equipment, and material should effectively support the performance of maintenance activities.

FINDINGS:

- Some stationary and mobile hoists and cranes in the Fleet Maintenance Shop, Bldg. 716-A, do not have clearly marked load capacity.
- Stationary and mobile hoists, cranes and lifting hooks observed in the 700 Area do not have any physical evidence such as tags, indicating that they have been periodically load tested.

CONCERN: (MA.3-1) (H2/C1)

Due to lack of clear marking and/or periodic load tests, lifting and rigging equipment are not in compliance with DOE 5480.4.

MA.4 PLANNING, SCHEDULING, AND WORK CONTROL

PERFORMANCE OBJECTIVE:

The planning, scheduling and control of work should ensure that identified maintenance actions are properly completed in a safe, timely, and effective manner.

FINDINGS:

- The Works Management System (WMS) provides Works Engineering (WE) with information for planning, scheduling and controlling maintenance work. Not all maintenance items are included.
- First-line supervisors plan and schedule maintenance, thereby taking time away from maintenance supervision. Planning and scheduling is often informal.
- The WMS is the only systems to control maintenance work.

CONCERN: (MA.4-1) (H2/C1) Management is not provided information to plan, schedule, and control maintenance in accordance with DOE 4330.4.

FINDINGS:

- Most of the maintenance work performed by SRL WE is planned by the first-line supervisor whose major responsibility is getting the maintenance work completed.
- Other forms of planning SRL WE maintenance work is accomplished by Technical Area Support personnel, Facilities Engineering and, in some cases, second-line supervisors.

CONCERN: (MA.4-2) (H2/C1) Maintenance planning is not being performed by a group dedicated to the Maintenance Management Program as required by DOE 4330.4.

MA.5 CORRECTIVE MAINTENANCE

PERFORMANCE OBJECTIVE:

The material condition of components and equipment should be maintained to support safe and effective operation of all facilities on the site.

FINDINGS:

- Works Management Systems does not provide Works Engineering (WE) with documentation of all equipment failures to assure effective corrective maintenance.
- Trend analysis and equipment failures are not documented for all equipment. A pilot program is established on some equipment at SRL WE.

CONCERN: (MA.5-1) (H2/C1)

Corrective maintenance is not documented as required by DOE 4330.4. (Also see Concern TS.4-1.)

MA.6 PREVENTIVE MAINTENANCE

PERFORMANCE OBJECTIVE:

Preventive maintenance should contribute to optimum performance and reliability of systems and equipment important to operations.

FINDINGS:

- The Works Management System for preventive maintenance does not include all equipment.
- Preventive maintenance is scheduled on a monthly basis with 30 days to complete. DOE 4330.4 requires a weekly schedule.
- Records of preventive maintenance are incomplete.
- Techniques such as vibration and oil analysis are only being used to assess equipment performance on a small portion of SRL Works Engineering equipment.

CONCERN: (MA.6-1) (H2/C1) The Savannah River Laboratory preventive maintenance program does not meet all the requirements of DOE 4330.4.

MA.7 PREDICTIVE MAINTENANCE

PERFORMANCE OBJECTIVE:

Maintenance history evaluation and system root cause analyses should be used to support maintenance activities and optimize equipment performance.

FINDINGS:

- Maintenance history records for most SRL Works Engineering (WE) equipment is limited. A program has been established on some items, but is incomplete.
- Age-related degradation of equipment is not documented in the SRL WE maintenance history records.
- The SRL Risk Assessment Methodology group has compiled maintenance history for the 200 Area equipment. However, no such history exists for SRL WE.

CONCERN: (MA.7-1) (H2/C1) The predictive maintenance program at Savannah River Laboratory Works Engineering does not meet all the requirements of DOE 4330.4.

4.5.3.5 Training and Certification

4.5.3.5.1 Overview

All performance objectives in the Training and Certification area were reviewed with the exception of TC.2, TC.10 and TC.11 which were judged not applicable to SRL. This appraisal reviewed training programs of the staff of SRL which included support personnel from divisions outside SRL.

There is no organization tasked with training or training overview at SRL. The training activities are administered by the 20-plus independent sections composing SRL. Four of these sections were selected for appraisal based on the appraisal team's perceived comparability to other nuclear facilities. Records and programs were reviewed for job specific certifications/qualifications, for these four sections. Ten sections were selected for review of occupational health training and emergency preparedness training records.

The training and certification/qualification programs at SRL were found to be in transition and varied widely in scope and depth. While some Laboratory training programs were comprehensive and well documented, other sections with comparable technical activities did not have a training program beyond a qualification card of basic skills. Some of these programs provided retraining; others did not. Some personnel that support SRL activities receive training from sitewide programs. These training programs also varied, with respect to scope, detail, and vigor of documentation, from satisfactory to rudimentary. This variable quality of training programs should be improved by the implementation of the sitewide Training Integration Program.

The SRL is a nuclear research and development facility with two job classifications comparable to other nuclear facilities. These jobs include the 21 Area Operators (AOs) who staff the SRL Technical-Area Control Rooms and numerous Technical Assistants (TAs) who perform a variety of highly technical analytical or processing procedures on nuclear materials. All of the AOs are in Laboratory Services Section of SRL. The TAs are found in 11 sections of which three routinely deal with nuclear materials. None of the training programs reviewed at SRL were in full compliance with DOE 5480.5.

The general employee training is in transition. The program for new hire training under development appears to meet all requirements. Continuous training programs intended to meet OSHA and DOE 5480.11 requirements lack sufficient documentation to prove full compliance.

Training programs for fissile material handlers, maintenance personnel, Quality Assurance Inspectors, and Nondestructive Examination Technicians were found to be satisfactory. The maintenance personnel training administered by Central Services

Works Engineering was sufficiently developed to be near accreditation.

The site Health Protection (HP) Inspector training was found to be informal, subjective and in transition. The SRL site-specific training for HP Inspectors was also found to be informal and not job performance based. Neither training program currently meets requirements of DOE 5480.11; however, at the time of appraisal a group of HP Inspector candidates began a training program designed to meet requirements of DOE 5480.11.

4.5.3.5.2 Findings and Concerns

TC.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

The training organization and administration should ensure effective implementation and control of training activities.

FINDINGS:

- The 20-plus independent training programs at SRL are administered and conducted at the section level by multiple Section Training Coordinators. In some sections individual training coordinator are assigned to specific training subjects.
- Section Training Coordinators receive no formal training and lack central guidance outlining their responsibilities.
- Job-specific training requirements are established by the Section Managers.
- The section training programs varied in scope, detail and vigor of documentation.

CONCERN: (TC.1-1) (H3/C2) A program is not in place to ensure coordination between the various training activities at the Savannah River Laboratory.

FINDING:

- Independent oversight of the training at SRL exists only for criticality training.

CONCERN: (TC.1-2) (H2/C1) Management does not provide independent review of training as required by DOE 5480.5.

TC.3 NUCLEAR FACILITY OPERATIONS OTHER THAN REACTORS

PERFORMANCE OBJECTIVE:

The nuclear facility operator and supervisor training and certification programs should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDINGS:

- Training of SRL Technical-Area Control Room Operators is not job performance based and lacks documentation of achievement, retraining programs, verification by management, and formal examinations.
- A job performance based training program for SRL Control Room Operators was being planned and the associated Job Task Analysis has been completed.
- All of the training programs for SRL Technical Assistants (TAs) who handle nuclear materials lack biennial management verification.
- Some training programs for SRL TAs who handle nuclear materials lack retraining, formal documentation, management verification, and documentation of achievement.

CONCERN: (TC.3-1) (H2/C1) None of the training programs reviewed at the Savannah River Laboratory were in full compliance with DOE 5480.5.

TC.4 GENERAL EMPLOYEE/PERSONNEL PROTECTION TRAINING

PERFORMANCE OBJECTIVE:

The general employees and personnel protection training programs should ensure that site/facility personnel, subcontractors and visitors have an understanding of their responsibilities and expected safe work practices, and have the knowledge and practical abilities necessary to effectively implement personnel protection practices associated with their work.

FINDINGS:

- About 10 percent of line supervisors interviewed knew of the written guidance for SRS occupational health training specified in DPSOP-40.

- About half of the occupational health training records reviewed lacked documented evidence that employees were informed of their right to access medical record as required by DPSOP-40. Actual compliance with this item of 29 CFR 1910.20 was verified.

CONCERN: (TC.4-1) (H3/C2)
Occupational health training coordinators were unaware of the specific requirements governing occupational health training. (Also see Concern TC.1-1.)

FINDING:

- About 25 percent of the emergency preparedness training records reviewed indicated that annual required fire extinguisher training was not completed.

CONCERN: (TC.4-2) (H2/C1)
Continued general employee fire extinguisher training is not in full compliance with 29 CFR 1910.

TC.9 RADIOLOGICAL PROTECTION PERSONNEL

PERFORMANCE OBJECTIVE:

The radiological protection personnel training and qualification program should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDINGS:

- Continued training for Health Protection (HP) Inspectors at SRL consists of a reading log, monthly information meetings and a lessons-learned log of which none are formally directed as training.

- There is no documented class room training for HP Inspectors following initial training. A sitewide retraining program had been initiated for HP inspectors but SRL HP Inspectors had not been included at the time of appraisal.

CONCERN: (TC.9-1) (H2/C1) Training for Health Protection Inspectors does not fully comply with DOE 5480.5 or DOE 5480.11.

4.5.3.6 Auxiliary Systems

4.5.3.6.1 Overview

All nine Performance Objectives in Auxiliary Systems were addressed.

The 700 Technical Area facilities were reviewed, including Bldgs. 773-A through 773-F, the Bldg. 776 Liquid Waste Handling area, Hazardous Material Satellite and Staging areas, and the Bldg. 794 Sand Filter, the Solid Waste Storage Pad and the Bldg. 786 Heat Transfer Laboratory. The TNX Facility was also inspected. Specific auxiliary systems reviewed in detail include the radioactive gaseous effluent systems, the low level and the high level liquid waste systems, the solid waste management system, testing of the standby diesel-generator emergency power systems, the heat removal systems and engineered safety systems. Handling and storage of fissile material was also inspected but not reviewed in depth since these are covered in greater detail in other functional areas, e.g., Criticality Safety and Operations.

The Auxiliary Systems activities were evaluated by reviewing documents, observing equipment and operations, interviewing exempt and nonexempt employees of SRL, and verifying records. Activities by SRL on auxiliary systems generally were conducted in a professional, controlled manner. However, the organization was still reacting to changes brought about by the change of operating contractor. Additionally, the contractor was handicapped by old facilities that were not designed to meet modern safety standards. Many of the problems were recognized by SRL and were being resolved by a dedicated professional staff that has a solid safety consciousness.

Auxiliary systems were considered by SRL to be under the same level of functional requirements as the structural and primary process systems. Systems were operable under normal and off-normal conditions, and they were included in the facility status control system. However, clear functional requirements were not documented for each system. Gaseous and liquid effluent holdup and treatment generally was well managed within the limits of present equipment design. Effluent monitoring, isolation capability, and diversion control were in place with adequate redundancy.

Solid wastes were handled and stored according to written procedures, some of which were still in draft form. A waste minimization plan was being implemented, and a waste reduction goal was included in the Fiscal Year (FY) 1990 award fee contract.

Ventilation systems were based on old design and performance standards. Separate systems existed for the differing levels of contamination, and adequate sampling and redundancy capability existed. An FY 1990 funded project was in place to upgrade about

75 percent of the high-efficiency particulate air filters to meet ANSI 510-1980. There is no plan to upgrade all of these systems. Most of the filters had neither pressure differential measurement nor in place DOP filter efficiency test measurement capability. Both are required to meet ANSI N13.1-1969.

Vital supply systems and engineered safety systems were tested on routine schedules according to written procedures. However, appropriate bounding conditions and safe operating envelopes for the facilities were not well defined. SRL did not employ Technical Specifications/Operational Safety Requirements but they were reviewing this policy.

Four concerns were identified in four performance areas. All concerns were Category III.

4.5.3.6.2 Findings and Concerns

AX.1 SYSTEMS REQUIREMENTS

PERFORMANCE OBJECTIVE:

Auxiliary systems shall be considered under the same functional criteria for design, engineering, operations, maintenance, and modifications as the structural, confinement, and primary process system of the facility.

FINDINGS:

- Auxiliary systems were operable under normal and off-normal conditions.
- Auxiliary systems were included in the facility status control system with appropriate alarms and response directions.
- Auxiliary Systems were described in the draft SAR DPSTSA-700-38. In a few instances, e.g., radiological monitoring of gaseous effluents, action set points were defined. However, the functional requirements generally were inadequate.

CONCERN: (AX.1-1) (H2/C2)

Functional requirements for each auxiliary system operating under normal and off-normal conditions were not documented.

AX.5 VENTILATION SYSTEMS

PERFORMANCE OBJECTIVE:

Ventilation system should reliably direct all airborne effluents from contaminated zones or potentially contaminated zones through cleanup systems to ensure that the effluent reaching the environment is below the maximum permissible concentration and is ALARA.

FINDINGS:

- Most Technical Area high-efficiency particulate air (HEPA) filters did not have instrumentation to measure pressure drops.
- The HEPA filter system was not designed to be able to comply with ANSI N510-1980. However, a project was funded to upgrade about 75 percent of the filters to comply with this ANSI standard. The central hood system upgrade was not funded.
- There was no program to upgrade the gaseous effluent system to comply with ANSI N13.1-1969 regarding proper sampling of gaseous effluents. The sampler line in the duct leading to the sand filter was especially bad in its design which has multiple 90° bends between the sample point and analyzer.

CONCERN: (AX.5-1) (H2/C1) Design and testing of high-efficiency particulate air filter systems did not meet ANSI N510-1980 and N13.1-1969.

AX.6 VITAL SUPPLY SYSTEMS

PERFORMANCE OBJECTIVE:

The electric, water, and emergency power systems should reliably provide vital services as required by all facilities on the site.

FINDINGS:

- Standby electric power systems were tested according to written procedures (e.g., DPSTOL-32-17.01). These procedures are thorough but they are not exactly in accordance with the Institute of Electrical and Electronic Engineers Standard (IEEE) 308-1980 and IEEE 338-1977 which are for testing of nuclear power generating stations.

- SRL did not employ Technical Specifications/ Operational Safety Requirements documents in the 700 Area. They are planning to reconsider this position when accepted criteria for OSR requirements are available.

CONCERN: See Concern OA.7-5.

AX.8 ENGINEERED SAFETY SYSTEMS

PERFORMANCE OBJECTIVE:

Engineered Safety Systems should be reliable and available to provide protection to the facility when required.

FINDINGS:

- The appropriate minimum number of available engineered safety features needed to continue operations was not defined in the SAR, nor was an operating envelope for vital supply system.
- In several SRL locations (Naval Fuels, Liquid Waste Sampling Area, and the SED Facility) the pressure drops across high-efficiency particulate air filters was 3-5 in. water. This indicates excessive filter plugging and imminent failure. Effective routine surveillance was lacking.
- A Works Management System is being utilized to strengthen the reliability of inspection of critical systems.

CONCERN: (AX.8-1) (H2/C2) The minimum operating envelope required for safe operation of the facility was not documented.

4.5.3.7 Emergency Preparedness

4.5.3.7.1 Overview

Emergency preparedness (EP) was evaluated with respect to seven performance objectives. Findings with regard to EP.3, Training, are included with EP.4, Drills and Exercises.

The appraisal team asked SRL to conduct an unannounced drill to assist in evaluating emergency readiness. However, when the drill was conducted on March 2, 1990, the time, location, and scenario were so widely known by the players that the appraisal team asked for a remedial drill. The remedial drill was conducted on March 6, 1990. Organization for and conduct of the drill was much improved, and while there was room for improvement in several player's actions, a degree of expertise was demonstrated in coordination of responders activities, use of Scott Air Packs and radiological control. Support groups (fire protection, medical and security) performed well in both drills.

Although protection of the public from serious emergencies has received considerable management emphasis since WSRC took over the SRS contract, the response to and mitigation of lesser events has not. Management of EP and response functions within the Laboratory is fractionated and has not received oversight. Emergency plans and procedures are out-of-date. Although a plan for the Laboratory has been written, it has been rejected.

EP training records for SRL have not been kept current and some required training has not been given. Training of rescue teams in use of the Scott Air Pack is done within the Laboratory for the Technical Area by the fire department for TNX Facility teams.

Both the fire department and emergency medical functions are well equipped and professionally staffed. Emergency equipment for first aid injuries and chemical spills is in place at the TNX Facility. Self-contained breathing apparatus are available throughout SRL facilities and rescue team personnel are trained in their use. Availability of medical supplies in the SRL Technical Area was a concern.

Arrangements are in place to hospitalize a contaminated, injured person. Personnel accountability is not assured by the SRL method, as past drills have demonstrated.

4.5.3.7.2 Findings and Concerns

EP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Emergency preparedness organization and administration should ensure effective planning for, and implementation and control of, site/facility emergency response.

FINDINGS:

- The site Emergency Duty Officer (EDO), with responsibilities for major incidents, reports to the WSRC Emergency Preparedness (EP) Section.
- The Area Emergency Coordinator for the SRL technical area is the power operations Supervisor, reporting to another division of WSRC.
- The Laboratory Operations group trains the rescue teams. All of the rescue team members are operators, except for the health protection member who reports to the SRS health protection organization.
- The SRL Facility Emergency Coordinator is a staff member appointed by the Laboratory Services Section Manager. He has no responsibility for the training of Laboratory emergency response personnel and no interface with the WSRC EP group. He seldom interfaces with the Area Emergency Coordinator or the site EDO.
- There is also a Laboratory EP Coordinator who serves on the WSRC EP Subcommittee. He also serves on the Laboratory EP Subcommittee.
- Each of these entities appear to function largely without overview except by DOE-SR who have not involved themselves with EP at this level.

CONCERN: (EP.1-1) (H1/C2) Provisions for management of operational emergencies at Savannah River Laboratory are not coordinated, often weak, and have not received oversight.

EP.2 FACILITY EMERGENCY PLAN

PERFORMANCE OBJECTIVE:

The emergency plan, emergency plan implementing procedures, and their supporting documentation should provide for effective response to operational emergencies.

FINDINGS:

- DPSTOM 34, SRL Emergency Management Plan was issued in May 1987 and is out-of-date in that it indicated that SRL personnel participate in fire fighting, indicated emergency contact would be with the Emergency Operations Center rather than the Technical Support Center, etc.
- DPSTOM 34 was revised, finally approved by WSRC, and was sent to DOE-SR. DOE-SR returned it, unapproved.
- DOE 5500.1A requires appropriate emergency plans, approved by the cognizant field element.
- Emergency implementing procedures, such as DPSTOL 32-7, Procedure 1.03, "Response to Alarm 160," (available in the Bldg. 773A Control Room) are also out-of-date.

CONCERN: (EP.2-1) (H2/C1)

Emergency plans and procedures required by DOE 5500.1A, covering Savannah River Laboratory facilities, are out-of-date. (Also see Concern OA.7-1.)

EP.4 EMERGENCY PREPAREDNESS DRILLS AND EXERCISES

PERFORMANCE OBJECTIVE:

Emergency preparedness programs should include provisions for simulated emergency drills and exercises to develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

FINDING:

- Required annual practice evacuations Nuclear Incident Monitor alarm drills at the Laboratory are overdue because of the logistics of implementing the security requirement of frisking all uncleared people on reentry. Although they were twice scheduled they have not been done.

CONCERN: See Concern CS.5-1.

FINDINGS:

- Unannounced drills have not been done in SRL prior to this appraisal.
- During an emergency drill on March 6, 1990, an operator entered a room where a simulated accident had occurred carrying a Scott Air Pack but not using it.
- During the drill, 29 minutes passed before anyone approached the "victim" to assess his condition.
- Undue consideration for uranium contamination delayed assistance to the victim during the drill.
- Radio communications between participants during the drill were extremely difficult because of other traffic on the channel. There is no dedicated emergency channel.
- Operators had no way to communicate directly with incoming emergency vehicles to assure that they knew where to go. One of the two available rescue team members was dispatched to meet the ambulance while the other remained in the control room.
- Rescue team training is to be bimonthly, according to the Emergency Preparedness Training Documentation Form, OSR 10-201 (7-89). Rescue team training records in the SRL Technical Area indicated that most rescue team

members had been trained only twice since January 1989. A few had been trained three times.

- Records of training in the TNX Facility were incomplete.
- There is no established system to identify, track and correct deficiencies observed during SRL drills.

CONCERN: (H1/C2) (EP.4-1) First responders lack training and drill experience to respond to emergency conditions.

EP.5 EMERGENCY FACILITIES, EQUIPMENT AND RESOURCES

PERFORMANCE OBJECTIVE:

Emergency facilities, equipment, and resources should adequately support site/facility emergency operations.

FINDINGS:

- Six Scott Air Packs and one emergency stretcher are stored in Bldg. 773-A for emergency use. The air packs are wall mounted and their availability easily verified. The stretcher is not maintained in a permanent, identified storage location and at least one rescue team member was unaware of its existence.

- At three different locations in the TNX Facility there are well stocked and inventoried emergency cabinets with stretchers, first aid kits and other supplies to support the three-member rescue team. In the 700 Area, there are no first aid supplies available to the rescue team even though they are to render first aid any time the victim is in a contaminated area.

CONCERN: (EP.5-1) (H2/C2) Stretchers and other first aid supplies are not readily available to the rescue team in Bldg. 773-A.

EP.7 PERSONNEL PROTECTION

PERFORMANCE OBJECTIVE:

Personnel protection procedures should control and minimize personnel exposure to any hazardous materials during abnormalities, ensure that exposures are accurately determined and recorded, and ensure proper medical support.

FINDINGS:

- The only system for personnel accountability is a manual system requiring each supervisor to account for his/her employees and their visitors.
- Several employees stated that during 300/700 Area drills (scheduled and announced) there were cases of employees reported missing when they were temporarily in other areas on the plant.
- A security project which will provide cardreader-type accountability in SRL is scheduled to be funded in 1992 and completed in 1994. In the interim, accountability may be degrading since it has not been exercised annually as required. (Also see Concern CS.5-1.)
- DOE 5500.3 requires that procedures for personnel evacuation and accountability include "Determination and implementation of a personnel accountability system."

CONCERN: (EP.7-1) (H2/C1) Personnel accountability in the Savannah River Laboratory is not assured as required by DOE 5500.3.

4.5.3.8 Technical Support

4.5.3.8.1 Overview

Six of the eight performance objectives were reviewed. (The last two performance objectives, TS.7 Reactor Engineering and TS.8 Criticality Safety, were not included.) The first four performance objectives primarily focused on the engineering functions within the Laboratory Services Section (LSS) and at the TNX Facility. The review of SRL activities related to TS.5 Environmental Impact and TS.6 Packaging and Transportation of Hazardous Materials was limited to activities within the SRL Technical Area. Interviews were conducted with SRL and SRS personnel (including supervisors) performing these functions. Documents reviewed included program description documents, procedures, standards, and engineering drawings and packages for facility modification projects. Additional information was gathered through facility tours.

The technical support organizations reviewed were generally found to be capable of supporting SRL activities, though some deficiencies were found in the engineering functions relating to facility modification activities.

SRL technical support personnel are knowledgeable and have the expertise needed to resolve facility problems. The organizational structure is well defined and personnel understand their responsibilities and authorities, which are documented. Projects costing more than $1 million are initiated by SRL, transferred to the WSRC Projects Department, and carried out by Bechtel. Interface documents specify SRL safety responsibilities and authorities for these larger projects.

The engineering organizations are using site standards and procedures; however, inconsistences were seen in the use of locally approved procedures for controlling engineering functions. The SRL LSS engineering organizations are operating under controlled and approved procedures, whereas the TNX Facility engineering procedures are only now being developed. Process hazards reviews are performed to define safety requirements; however, DOE approved safety limits such as OSRs are not available for use as design bases.

Overall, the engineering activities relating to facility modifications appear to be well disciplined and technically appropriate. The engineering staff were found to be very capable. Deficiencies were identified in areas relating to drawing as-built status and reviews by other technical organizations.

Inadequacies were found in the area of equipment performance monitoring. Trend analyses and equipment failure analyses are neither effectively used nor is sufficient documentation provided to support these activities. A comprehensive analysis of

equipment failures has been completed within one element of SRL at the 200 Area, but this has not been applied as a resource for supporting maintenance engineering activities throughout the rest of SRL.

Organizational responsibilities are defined for monitoring both radioactive and hazardous material environmental releases. The activities are being performed by competent professional and technical personnel within SRL and SRS technical organizations such as the Environmental Monitoring Section, and are integrated with the SRS site environmental program defined in the Environmental Implementation Plan, WSRC-RP-89-453. Release data is being collected and records are maintained.

The handling and movement of hazardous and radioactive materials within the Laboratory appear to be controlled by procedures and qualified personnel as well as being appropriately integrated with inter-site and offsite transportation. Criticality control plans are prepared before fissile materials are moved through the laboratory. Personnel receive training on hazardous materials. A single deficiency was identified with the storage of hazardous materials at the SRL receiving location.

Five concerns were developed with two references to a generic concern in the Organization and Administration Section.

4.5.3.8.2 Findings and Concerns

TS.2 PROCEDURES AND DOCUMENTS

PERFORMANCE OBJECTIVE:

Technical support procedures and documents should provide appropriate direction, allow for adequate record generation and maintenance for important activities, and should be properly and effectively used to support safe operation of all facilities on the site.

FINDING:

- At present, SRL has no approved SARs or OSRs as defined by the current DOE Orders. (See Section OA.7.) On some design projects Process Hazards Reviews are performed to establish design requirements. However, formally approved safety limits analogous to OSRs do not exist for use as design bases for design activities.

CONCERN: (TS.2-1) (H2/C1)

Department of Energy approved safety limits have not been developed for use as design bases in facility modification projects as required by DOE 5480.5.

FINDINGS:

- The SRL engineering organizations use a collection of various organization-specific, SRS sitewide, and Du Pont Corporate procedures and standards. (The Du Pont Corporate documents are used based on agreements between Du Pont, WSRC, and DOE-SR.)

- There is inconsistency between the various SRL engineering organizations in the approach taken to control procedures. For example, the Laboratory Services Section engineering uses the central site documentation control organization for document control and distributes controlled copies of procedures to individuals. The TNX Facility engineering organization controls procedures locally (i.e., they are not using the central site document control organization), and maintains a single master set of procedures rather than distributing controlled copies of procedure manuals to individuals.

- Procedures specific to the TNX Facility engineering function are just now being developed. Many design control functions are performed without approved procedures specific to the TNX Facility. Practices and procedures

from other site organizations have been adopted by TNX Facility engineering as interim guidance.

CONCERN: See Concern OA.7-1.

TS.3 FACILITY MODIFICATIONS

PERFORMANCE OBJECTIVE:

Technical support services required by each facility on the site to execute modifications should be carried out in accordance with sound engineering principles that should ensure proper design, review, control, implementation, and documentation in a timely manner.

FINDINGS:

- Design reviews are generally kept within the engineering organization. Safety-related disciplines are included in the review process only if judged necessary by the cognizant engineering organization.

- Review of TNX Facility Project S-2003, Fire Suppression and Alarm System, indicated that drawing revisions were not reviewed by the same organizations that reviewed the original drawings (e.g., the SRS Fire Protection Oversight organization). At present there are no approved procedures at the TNX Facility for review and approval of drawing changes. Drawing control procedures are currently being developed.

CONCERN: (TS.3-1) (H2/C2) Facility modification projects do not always receive appropriate review by safety-related disciplines.

FINDINGS:

- SRL facility as-built drawings are not up-to-date. This is known to SRL and as-built backlogs are continually worked by drafting personnel when available.

- As-built drawings are not marked as such. The last release-for-construction revision is considered to be the as-built drawing. For projects reviewed, it was observed that drawings are being revised for as-built conditions.

CONCERN: (TS.3-2) (H3/C2) There is no system in place for positively identifying as-built status on drawings.

TS.4 EQUIPMENT PERFORMANCE TESTING AND MONITORING

PERFORMANCE OBJECTIVE:

Effective equipment performance testing and monitoring should be performed by technical support groups to assure that equipment and system performance is within established safety parameters and limits.

FINDINGS:

- The Works Management System does not provide SRL engineering organizations with documentation of all equipment failures to ensure effective corrective maintenance.

- Trend analysis and equipment failure are not documented for all equipment. A pilot program is established on some equipment at SRL. A total program on trend analysis and equipment failure has been established on all equipment dating back to 1959 at the 200 Area by SRL personnel, but is not being used by SRL engineering organizations.

CONCERN: (TS.4-1) (H3/C2)

Performance testing and monitoring to ensure that equipment and systems perform within safety parameters is incomplete. (Also see Concerns MA.5-1 and RP.8-2.)

TS.5 ENVIRONMENTAL IMPACT

PERFORMANCE OBJECTIVE:

The impact on the environs from the operation of each facility on the site should be minimized.

FINDING:

- Resource Conservation Recovery Act (RCRA) data is being collected at the 776 Area control building. The requirements for completing the RCRA data sheets have not been incorporated into the local procedures (DPSTOM 33). The operators are completing these sheets based on informal instructions provided by the supervisor.

CONCERN: See Concern OA.7-1.

TS.6 PACKAGING AND TRANSPORTATION OF HAZARDOUS MATERIALS

PERFORMANCE OBJECTIVE:

Performance of the packaging and transportation (PT) functions should assure conformance with existing standards and accepted practices as given in DOE 5480.3, and other DOE and Federal regulations.

FINDINGS:

- Hazardous combinations of chemicals are not segregated at the SRL chemical receiving storage location at Bldg. 773A Technical Stores area. Large quantities of acids and bases, (e.g., sulfuric acid and ammonium hydroxide) are stored together in the storage shed designated as "acid storage."

- The person in charge of the storage area had been given conflicting instructions on various occasions as to the proper placement of these chemicals in the storage area.

CONCERN: (TS.6-1) (H2/C2) Appropriate guidance is not being provided for storing hazardous materials in the Savannah River Laboratory receiving areas.

4.5.3.9 Nuclear Criticality Safety

4.5.3.9.1 Overview

This part of the appraisal consisted of inspection at the Shielded Cell Section and the Separation Engineering Facility of the Laboratory Services Section of SRL, inspection of all Nuclear Incident Monitors (NIMs) in the 700 Area, and in-depth interviews of approximately 20 SRL, SRS, and DOE-SR personnel. All criteria of the performance objectives were considered.

SRL's attention to, and performance of nuclear criticality safety is of high quality, however concerns were identified.

The nuclear criticality safety program is well documented, with clear lines of responsibility. The personnel involved in it are aware of their responsibilities and carry them out conscientiously. The internal audit and review system is well defined and covers training, review of criticality safety procedures and mass limits, and accountability. Documents, including internal memoranda as much as 14 years old were identified and located. Finally, it was noted in this area that DOE-SR is not adhering to the required schedule for nuclear criticality safety appraisals at SRL.

Nuclear criticality safety at SRL is based on mass control which in turn derives from ANSI/ANS-8.1-1988. In particular, all mass control is based on the single parameter limits set forth in that standard. It should be noted that those single parameter limits do not allow for contingencies such as over-batching. However, because of the small inventory at SRL, because of the physical form, and because of the stringent administrative controls, use of the single parameter limit is justified.

Nuclear criticality safety evaluations at SRL have been of high caliber. They have been mostly performed by persons independent of operational responsibilities, have properly considered contingencies, are independently confirmed, and are well documented. An issue in this regard is that until recently there were two scientists at SRL well versed in these matters. There is now but one. This level of support compromises the in-depth coverage generally believed to be essential to this area of safety concern.

Operating procedures are available in operational areas and mass limits are prominently posted. Some discrepancies in posting forms were noted. The cognizant SRL staff are now aware of these discrepancies and have documented them as an action item (SRL-CRC-900122).

The responsibilities relating to NIMs are well organized and documented as to maintenance and testing. There are, however, some issues of concern in this area, and these are identified and discussed in Section CS.5.

4.5.3.9.2 Findings and Concerns

CS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

All operations with fissionable material should be conducted to provide effective nuclear criticality control during all activities.

FINDINGS:

- SRL has a well-defined and documented criticality safety organization. There are, however, some inconsistencies with DOE 5480.5, ANSI/ANS-8.1-1988, and ANSI/ANS-8.3-1986.

- The prime point of contact for nuclear criticality safety issues is the Criticality Review Committee (CRC). The composition and responsibilities of the CRC are set forth on pp. 35-37 of "Savannah River Laboratory Criticality Control Procedures," DPST-68-108. The Committee as presently comprised consists of three permanent members, four temporary members, and one ex-officio member.

- Three members of the CRC are members of SRL organizations that are affected by nuclear criticality safety concerns (Actinide Technology Section, Laboratory Services Section, Analytical Development Section). The nuclear criticality safety function is thus not independent of operational responsibilities.

- The four temporary members of the CRC serve terms of 2 years and then leave the CRC. Good practice in the area of nuclear criticality safety suggests that greater continuity is desirable.

- The CRC presently reports to the Central Safety Committee. Later, it will report to the Nuclear Criticality Safety Review Committee when that body has been implemented. It will be important to confirm that is a reporting level high enough to accomplish any necessary corrective actions.

CONCERN: (CS.1-1) (H3/C2)

The organization and administration of nuclear criticality safety at Savannah River Laboratory does not assure nonconflict of interest, continuity, and reporting at a level of management sufficiently high to take any necessary corrective action.

FINDINGS:

- There is only one person, without backup, at SRL who is routinely assigned to perform complex criticality safety analyses. This duty includes criticality safety evaluations for SRS, and maintaining and validating the computer programs necessary to carry out these responsibilities.
- Nuclear criticality safety evaluations are not being carried out on a timely basis.
- A Request for Personnel has been issued to remedy this deficiency, but no suitable candidate has been produced.

CONCERN: (CS.1-2) (H2/C2)
At this time, the Savannah River Laboratory provides insufficient backup for performance of its nuclear criticality safety evaluations.

FINDING:

- SR 5482.1A requires that DOE-SR conduct a nuclear facility safety appraisal for criticality safety at SRL once every 3 years. The last such appraisal was conducted during October and November 1984 (report issued January 1985). The most recent preceding appraisal was completed in November 1977.

CONCERN: (CS.1-3) (H3/C1)
The Savannah River Operations office is not maintaining the required nuclear criticality safety appraisal schedule.

FINDINGS:

- The basic document governing nuclear criticality safety at SRL is DPST-68-108 and its appendices.
- A new revision of DPST-68-108 is in preparation and has received all necessary approvals, but quality assurance is not represented among these approvals.
- The current version of DPST-68-108 has only a cursory indication of the required elements of the criticality safety training program. It does not satisfy DOE 5480.5, paragraph 10.a(1).

CONCERN: (CS.1-4) (H2/C2)
The basic Savannah River Laboratory nuclear criticality safety document (DPST-68-108) does not receive sufficient independent review.

CS.3 NUCLEAR CRITICALITY SAFETY EVALUATION

PERFORMANCE OBJECTIVE:

Nuclear criticality safety evaluations of the design and operation of process equipment should assure that subcriticality is maintained under normal and credible abnormal operating conditions.

FINDINGS:

- "Savannah River Laboratory Criticality Control Procedures," DPST-68-108 (revised March 1988) states on p. 11 that "...The Administrative Mass Limit may be based on either of two methods, called Method 'A' and Method 'B.'"

- Method "B" consists of multiplying the actual isotope masses by their respective Q factors given in Table 2, p. 26 of DPST-68-108. The Q factors' origins are not given but are apparently the reciprocals of the single parameter limits for each material.

- ANSI/ANS-8.1-1988, Section 5, states that "A limit may be applied to a mixture of fissile nuclides by considering all components of the mixture to be the one with the most restrictive limit." Method "B" will result in a less restrictive (that is, larger) mass limit than the procedure just quoted from the standard.

- DPST-68-108 also states that "A Division is free to choose <u>either</u> Method 'A' or 'B' for control of material in a given Working Area." Thus, nuclear criticality safety review and evaluations could be performed by persons who are not independent of operational responsibilities. It also makes commission of an error more likely. (A simple example of such an error would be application of an incorrect Q value, as Table 2 of DPST-6-108 is hard to read.)

- There is no documentation at SRL to support the safety of mass limits (including contingencies) derived by Method "B" as required by ANSI/ANS-8.1-1988 and DOE 5480.5.

CONCERN: (CS.3-1) (H1/C1)

The method of arriving at the administrative mass limit has not been analyzed and documented to confirm safety of its application to Savannah River Laboratory processes as required by DOE 5480.5.

CS.4 OPERATING PROCEDURES AND CRITICALITY SAFETY LIMITS

PERFORMANCE OBJECTIVE:

The approved written operating procedures should address criticality safety limits in providing effective guidance for all aspects of facility activities.

FINDINGS:

- "Savannah River Laboratory Criticality Control Procedures," DPST-68-108, shows the authorized fissile material emblem (OSR 24-C234) in Figure 4. At various locations in Bldg. 773-A, other emblems were found in use (e.g., OSR 24-234C in Rooms E-002 and E-004; OSR 24-C234A in Room F151).

- In Room F151, a single enclosure was provided with two mass limit emblems. The two emblems indicated different inventories of fissile material.

- These inconsistencies were identified during this appraisal and an action plan was developed to remedy them. A target date for completion is not given.

CONCERN: (CS.4-1) (H2/C2) There are inconsistencies in the mass limit posting forms and their use.

C8.5 CRITICALITY ALARM SYSTEM AND EMERGENCY PROCEDURES

PERFORMANCE OBJECTIVE:

All reasonable steps should be taken to mitigate the consequences of a nuclear criticality accident.

FINDINGS:

- During the November 14, 1988, evacuation drill, exiting personnel were held up at the Entrance Control Facility (701-1A) until the vehicle gate was opened.
- No evacuation drill was held during 1989. This was because negotiations with DOE-SR and WSI about how to deal with reentry were still in progress.
- Negotiations with WSI to resolve these problems were still in progress at the time of this appraisal.

CONCERN: (CS.5-1) (H2/C2) Evacuation drills are not being conducted on schedule.

FINDINGS:

- The 700-Area contains 17 nuclear incident monitors (NIMs). Inspection of these revealed that all instruments were at the locations indicated on the map, and that all tests and calibrations were up-to-date.
- The coverage of these instruments has been documented (DPST-77-238), but the documentation is old and appears to be out-of-date. The Radiological Engineering Group has been tasked to confirm and update these locations for coverage. This confirmation has not been performed as yet because of low priority.
- The NIM audible alarms are only checked once per year (although not at all in 1989) during the annual evacuation drill. This does not satisfy the recommendation in the criticality accident alarm system standard (ANSI/ANS-8.3-1986, Section 6.4), which calls for checking every 3 months.
- The NIMs are response tested every 2 months. In the course of this testing, the supervisory alarms are reset and in the event the NIM door were left open, the NIM would be inoperable, but no supervisory alarm would be received.

CONCERN: (CS.5-2) (H2/C2) Nuclear incident monitor procedures do not satisfy requirements of DOE 5480.5.

4.5.3.10 Security/Safety Interface

4.5.3.10.1 Overview

SRL security operations, provided by Wackenhut Services Inc. (WSI), were examined with respect to four performance objectives. The safety of security activities conducted outside of the facilities operated by SRL was given only a cursory review. The firing range, which had numerous deficiencies during a July 1989 Firearms Technical Appraisal of Savannah River Operations Office Facilities by DOE-HQ, was not visited.

Security and safeguards improvements are handled by the same process as other improvements, which does not included a mandatory health and safety review. The projects to date at SRL have been few and have not compromised personnel safety.

Observations of drills and discussions with paramedics have indicated that access to facilities to provide emergency medical care has not been a problem. Security personnel seemed to be well versed on building and door locations and able to assist fire and medical teams in locating facilities. Nuclear Incident Monitor (NIM) alarm drills for the 300/700 Area have been delayed because of the requirement to search all uncleared personnel each time they enter the facility. The assembly point is outside the facility and searching the large number of uncleared people at the end of the drill would be time consuming. The failure to perform these drills on the required frequency is the subject of Concern CS.5-1 in Section 4.5.3.9.2.

The safety of security drills in plant facilities is given considerable attention with participation by both WSI and WSRC safety staff. WSRC health protection staff also participate. Security inspectors are given the general worker training in radiation protection. However, the consequence of using weapons in SRL facilities has not been determined and communicated as required by DOE 5480.16.

Sampling records for lead exposure of security inspectors on the firing range are not adequate to demonstrate that they are not being exposed in excess of permissible limits. They do, however, document one overexposure. WSI relies on WSRC for industrial hygiene services.

Security inspectors are all trained in the use of the Scott Air Pack. Air packs are carried in all patrol vehicles along with first aid kits, highway flares and other emergency equipment.

4.5.3.10.2 Findings and Concerns

SS.3 FACILITY PLANNING FOR SECURITY/SAFEGUARDS EMERGENCIES

PERFORMANCE OBJECTIVE:

Safety authorities and responsibilities for all types of security/ safeguards emergencies should be well defined and understood by all involved parties.

FINDINGS:

- DOE 5480.16 requires an analysis of the consequence of the use of weapons, vehicles and other protective force equipment in DOE facilities. No analysis of the effect of use of protective force equipment in SRL facilities was available.
- SRL facilities have special nuclear materials. Hence, protective forces could be required to use force to protect them.

CONCERN: (SS.3-1) (H2/C1) The consequence associated with the use of weapons, vehicles and other protective force equipment in Savannah River Laboratory facilities has not been analyzed as required by DOE 5480.16.

SS.4 SAFETY OF SECURITY ACTIVITIES

PERFORMANCE OBJECTIVE:

Safety aspects of security activities involving use of weapons and other protective force equipment in the vicinity of safety systems and/or hazardous processes and materials should be identified and understood by all involved parties.

FINDINGS:

- A schedule of quarterly air sampling for lead exposures has been established to determine the levels security inspectors and instructors are exposed to on the firing range. Sampling and analysis services are provided by WSRC.

- Initial sampling was done in April 1988 at the small arms training area. Breathing zone samples were taken on five employees; three were instructors and two were security inspectors firing the weapons. One of the two security inspectors received an 8-hour time weighted average exposure to lead in air of 58.2 micrograms/M^3. The OSHA permissible exposure limit is 50 micrograms/M^3. The other employees were not overexposed.

- No follow-up blood lead sampling was performed on the security inspector. However, blood samples are taken on WSI instructors every 6 months and the lead results are maintained in their medical files. No summaries were available.

- Additional exposure data for lead in breathing air on this firing range was taken on five employees in August 1988. It was not possible to determine from the report if they were instructors or inspectors. These results were not transmitted to WSI until May 1989, approximately 8 months later. This report shows no overexposure.

- The results of a single breathing air sample taken in July 1989 were transmitted to WSI in March 1990. It indicated no detectable lead list was not in sufficient detail to determine the lower list of detection. Samples were reportedly taken in January 1990, but results were not available to WSI by March when the appraisal was performed.

CONCERN: (SS.4-1) (H2/C1)

Sampling results are inadequate to demonstrate that security inspectors are not being overexposed to lead during small arms practice and qualification.

4.5.3.11 Experimental Activities

4.5.3.11.1 Overview

Experimental Activities are reported in Operations and Site/Facility Safety Review, as appropriate.

4.5.3.12 Site/Facility Safety Review

4.5.3.12.1 Overview

All six of the Site/Facility Safety Review performance objectives were appraised as part of this TSA. The appraisal was based on interviews with various levels of SRL management ranging from the Vice President and SRL Laboratory Director to positions just below the section level. Additionally, selected management and staff within the WSRC Environmental, Safety, Health, and Quality Assurance Division were interviewed as well as safety review and line management staff within DOE-SR. Review of applicable DOE Orders and references, WSRC policies, procedures, manuals, and reports served as a basis of understanding and comparison to practice. Also, tours and interviews were conducted in different areas of the SRL and its associated facilities. Finally, discussions were held with the Site/Facility Safety Review counterparts on the Waste Management and Tritium Facilities TSA Teams during the course of this appraisal.

Concern for safety at the SRL continues to receive priority. The SRL Area Safety Committee along with its various subcommittees have effectively functioned to carry out their responsibilities as defined in the previous contractor's safety manuals and charters. However, as the SRS moves towards a compliance posture and new WSRC systems are implemented, management must continue to track the complete integration of the SRL into these systems. This is particularly important because of the historical independent organizational relationship of SRL with the previous contractor.

The SRL Area Safety Committee with its various subcommittees effectively function to handle and communicate general safety matters, review process hazards, propose annual safety programs, and review incident investigation reports for the Laboratory.

Procedures and systems exist that require the review of experiments and experimental programs for safety. The procedures and systems, although not succinctly described in any single set of documents, combine to provide the necessary safety reviews of experiments and experimental programs. A change to Item 51 of the Savannah River Plant Safety Manual is scheduled to be made by March 31, 1990 requiring verification that process hazards criteria are met and that independent inspections are completed or not required for experiments. The Process Hazards Management Manual, DPSTM-PH-1 defines general criteria that trigger formal process hazards reviews which are well documented. These criteria combined with other general safety requirements on experimental systems provide a safety envelope for assuring the review of experiments and experimental systems.

Annual reviews of SRL facilities were performed by the previous contractor but are not presently being done. The document "Triennial Review of the Contractor Independent Safety Review

System of the SRS Non-Reactor Facilities" (ESH-FSE-890068, November 1989) was prepared by the Facility Safety Evaluation Section using DOE TSA Performance Objectives and input from four operating units not including the SRL. This approach did not represent an independent assessment as required by DOE 5482.1B. WSRC is presently developing procedures for a Triennial Appraisal System that will provide for independent appraisals of reactor, nonreactor, and environmental systems on a 3-year cycle.

A program to disseminate the results from operating experience is based largely on incident reports and recommendations from investigation reports. This information is provided by the SRL safety office to SRL Management and is based on the classification of the incident and its applicability at SRL. This program is not documented, however, and is not a part of any SRS system.

4.5.3.12.2 Findings and Concerns

FR.4 ANNUAL FACILITY SAFETY REVIEW

PERFORMANCE OBJECTIVE:

An annual operating review of the facility should be performed by a committee appointed by top contractor management.

FINDINGS:

- The SRL Safety Activities Subcommittee has the charter to inspect new or revised facilities and to propose the annual safety program for SRL. This charter is set forth in the Savannah River Laboratory Safety Manual (January 1, 1973).
- Although annual facility safety reviews were performed in the past by the previous contractor, they are not presently being performed as required by DOE 5480.5.

CONCERN: (FR.4-1) (H2/C1) Annual operating reviews of Savannah River Laboratory facilities are not being performed as required by DOE 5480.5.

FR.5 TRIENNIAL APPRAISAL OF SITE/SAFETY REVIEW SYSTEM

PERFORMANCE OBJECTIVE:

A triennial appraisal of the safety review system should be performed by contractor management.

FINDINGS:

- The document "Triennial Review of the Contractor Independent Safety Review System of the SRS Non-Reactor Facilities" (ESH-FSE-890068, November 1989) was prepared by the SRS Facility Safety Evaluation Section using DOE TSA Performance Objectives as a basis.
- ESH-FSE-890068 was not prepared as an independent assessment of the safety review system as required by DOE 5482.1B.
- A triennial review of the SRL safety review system has never been performed.

CONCERN: (FR.5-1) (H3/C1) A triennial review system meeting the requirements of DOE 5482.1B has not been established at the Savannah River Site.

FR.6 OPERATING EXPERIENCE REVIEW

PERFORMANCE OBJECTIVE:

Operating experiences should be evaluated, and appropriate actions should be undertaken to improve safety and reliability.

FINDINGS:

- Incident reports and recommendations from incident investigations are sent to SRL line management for their review and incorporation, as appropriate, from the SRL Safety Office. Depending on the severity classification of the incident, line management is required to sign-off as having read and incorporated, as appropriate, any recommendations from these reviews as a method to improve safety of their operations.

- Although the dissemination of operating experiences is accomplished in several ways at SRL, this program is not documented and is not incorporated as part of a sitewide initiative.

- There is no formal plant-wide system to communicate operating experiences from events internal or external to SRS. The Facility Safety Evaluation Section is in the process of establishing a system similar to the one developed for the Reactor Restart Division.

CONCERN: (FR.6-1) (H2/C2)

A documented sitewide system to communicate operating experiences, internal and external to the Savannah River Site, does not exist.

4.5.3.13 Radiological Protection

4.5.3.13.1 Overview

All performance objectives for the Radiological Protection area were reviewed with the exception of those with sitewide aspects. Those performance objectives with sitewide aspects were assigned to the four TSA Team members assigned to Radiological Protection in order to avoid duplication of efforts. Performance Objectives RP.6 Internal Radiation Exposure Control, RP.7 Internal Radiation Dosimetry, and RP.12 Records are reported in the Safety and Health (S&H) Subteam Assessment of the Tritium Facilities.

The overall WSRC Radiation Protection Program, as conducted and implemented at SRL, provides adequate protection to the health and safety of its workers. However, improvements are needed in order to comply with recognized standards, recommendations and DOE Orders.

The Environmental and Health Protection (E&HP) Department is managed by well-qualified professionals, many having national recognition. Beyond the manager and professional levels, the remainder of staff, i.e., first-line supervisors and Health Protection (HP) Inspectors, have HP Inspector Care Training and little additional secondary education. Furthermore, due to rapid increases in E&HP staff, the experience and training is less and is particularly evident within the HP Inspector ranks. This situation is more evident in divisions outside of SRL. Within SRL there is a concern over lack of training especially for nonroutine situations. The training program is being given the highest priority by senior management.

The complexity of the existing procedure system in use at WSRC is recognized as being cumbersome and difficult to understand and use. Actions are being taken to revise the existing system of procedures including the technical contents. Once accomplished the system should be more user friendly and eliminate concerns over some of the noncompliance issues, the use of Radiation Work Permits (RWPs) being an example.

The internal audit program was found to be adequately documented and functioning satisfactorily. Deficiencies identified in the Waste Management Facilities and the Tritium Facilities S&H Subteam Assessments are applicable sitewide. In 1989, 35 assessments of three major areas were completed. The appraisals were found to be adequate in scope and thorough in content. Management review of the internal appraisal process is not being done triennially. The ability to assess all areas of interest yearly is probably overly optimistic. Investigation and documentation of unusual radiological occurrences was found to be adequate. A review of Special Hazards Investigations and Contamination Cases showed them to be thorough in investigation and capable of identifying root causes.

Procedures covering some jobs are incomplete and give poor and sometimes incorrect guidance. Furthermore, instances of not following established procedures have been noticed. WSRC is in the process of addressing the concerns by updating and revising their procedure and posting requirements and when finished will comply with DOE 5480.11

The posting and labeling at SRS was found to be generally good. It is obvious WSRC expended considerable effort in the reposting and labeling of the site. The results are very evident. Instances of noncompliance were identified in the Waste Management Facilities and Tritium Facilities S&H Subteam Assessment Reports. At SRL, several isolated instances of inconsistencies or noncompliance were observed. Redefinition of the Radiologically Controlled Areas (RCAs) would provide the basis for proper control and consistency with good practices.

WSRC has a centralized source control program already in place in which they are attempting to maintain current data on radiation sources. When the system was reviewed it was found to be inaccurate in two out of two instances. Proper utilization of in place procedures needs to be emphasized.

The external exposure control program is acceptable. External exposure, both individual and collective at SRL is generally low. Performance to goals over the past years has been satisfactory.

The external dosimetry program at WSRC meets or exceeds DOE Laboratory Accreditation Program requirements and is fully accredited. Turnover of qualified staff is a concern within the External Dosimetry group as is the lack of an adequate supply of personnel dosimeters. Actions are being taken to correct the condition.

The lack of adherence to the required wearing of a personal dosimeter within an RCA and the absence of anyone challenging staff not wearing one is a problem. Staff have been observed sitewide within RCAs without proper dosimeters. Dosimeters are needed in order to comply with DOE 5480.11.

Internal radiation exposure control is generally good at SRL. Reduction of airborne activity areas, work planning, use of engineering controls and use of respiratory protection have contributed to success in this area. SRL has had one confirmed assimilation in 10 years. Internal radiation dosimetry is discussed in detail in the S&H Subteam Assessment of Tritium Facilities.

There is an inadequate supply of properly maintained and calibrated portable survey instruments. Instrumentation is not being calibrated in accordance with applicable standards. WSRC is actively pursuing the procurement of a new calibration facility and upgrading of instrumentation.

The air monitoring systems are deficient and do not meet the technical requirements of DOE 5480.11. The calibration requirements of ANSI-N323 are not being met. WSRC has undertaken initiatives to evaluate replacement systems and upgrading of the existing calibration program.

The contamination control program is generally satisfactory. About 9 percent of the RCA is contaminated. The design of Bldg. 773-A, with its extensive compartmentalization, serves to keep radiation levels low and helps to minimize the spread of contamination. A more proactive approach by line management to eliminate contaminated areas is needed. The access and egress requirements for the RCAs under the control of SRL need to be reevaluated.

Severe deterioration of glovebox gloves and associated "O" rings was observed in the SED Facility. This area has equipment which has been "abandoned in place." The degree of deterioration coupled with the storage of excess combustibles and inadequate fire protection results in a high potential for the spread of plutonium contamination. The high potential of a contamination spread, if failure did occur, resulted in a Category II concern.

While WSRC does not have a formal documented ALARA program they practice most of the elements required by DOE 5480.11. Some non-uniformities were noted amongst the various divisions, where individual doses were perhaps overemphasized at the expense of collective doses (see Section 4.5.1.13.2, Concern RP 11-1) and where personnel were housed in rather high background areas. (See Section 4.5.3.13.2, Concern RP 11-1.)

Records are discussed in detail in the S&H Subteam Assessment of Tritium Facilities.

4.5.3.13.2 Findings and Concerns

RP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Facility/site organization and administration should ensure effective implementation and control of radiological protection activities on the facility/site.

FINDING:

- Experience of the Health Protection (HP) staff assigned to SRL is considerably greater than in the other divisions within WSRC. However, training and retraining is on the same level which for routine operations appears adequate but for nonroutine operations needs improvement. This was observed during the second SRL emergency preparedness (EP) exercise conducted during this appraisal and during interviews with several of the HP Inspectors. Overall lack of training was also stated to be of the highest concern of the Environmental and Health Protection Department manager.

CONCERN: See Concern TC.9-1.

FINDINGS:

- Position descriptions have been prepared for most exempt staff positions and for some nonexempt positions. However, in several cases this information has not been communicated to the staff but is in the transition of being done.

- Interviews with HP staff indicates they do not have a good understanding of who is responsible for what. Most often during the conduct of this appraisal, the appraiser had to contact several individuals before finding the responsible individual or at least one that knew who was the responsible person. In no instance was anyone trying to deliberately mislead, it was a matter of not knowing and too often the reason given was "we are in transition." While being in transition is a fact it is not the root cause of the finding and resultant concern.

CONCERN: (RP.1-1) (H2/C2) Individual responsibilities within Environmental and Health Protection Department are not clearly defined.

FINDING:

- The basis for the fundamental personnel and environmental radiation and contamination protection program is contained within Special

Hazards Bulletins (SHB) of which there are nine, all appearing in DPSOP 40, Rev. 82, September 1989. SHB-1, September 1989, contains a requirement for a Radiation Work Permit (RWP) or a Standing Radiation Work Permit (SRWP) to conduct work within a Radiologically Controlled Area (RCA). The use of RWPs has been discontinued for years; however, neither the procedures nor SHB-1 has been changed.

CONCERN: (RP.1-2) (H2/C1) Radiation Work Permits or Standing Radiation Work Permits are not used even though required by Westinghouse Savannah River Company procedures and accepted industry standards.

RP.2 INTERNAL AUDITS AND INVESTIGATIONS

PERFORMANCE OBJECTIVE:

The internal audit program for both routine operations and unusual radiological occurrences should provide adequate performance assessments.

FINDING:

- The triennial review of the internal appraisal system has not been performed by management as required by DOE 5482.1B.

CONCERN: See Concern FR.5-1.

RP.3 RADIOLOGICAL PROTECTION PROCEDURES AND POSTING

PERFORMANCE OBJECTIVE:

Radiation protection procedures for the control and use of radioactive materials and radiation generating devices should provide for safe operations and for clearly identified areas of potential consequences.

FINDINGS:

- WSRC has a procedure in place for the purpose of maintaining a record of radiation sources as to type, quantities, location, custodian and other features. The procedure is "DPSOP 40 II D, Revision 81, February 1989, page 2302." This procedure requires the source custodian to provide data to facility Health Protection (HP) offices and the HP Department Source Control Coordinator 300-M HP Area Unit Supervisor semi-annually. Sources numbered M522 and M233 were checked to see if they were properly recorded in the system. Source No. M522 was listed in the inventory but not located correctly and Source No. M233 could not be located. No further inquiries regarding this system were made.

- Whenever a source is moved or custodian changes are made, completion of transfer form (OSR-194) is required by procedure DPSOL 193-115. Apparently that was not done for Source No. M522 since it was in the system as being located at Bldg. 105C.

CONCERN: (RP.3-1) (H2/C1) Westinghouse Savannah River Company is not in compliance with their internal radiation source control procedures and DOE 5480.11.

FINDING:

- The procedure "DPSOL 193-115, Revision 7, March 10, 1989," requires semi-annual source integrity checks. The procedure does not specify smearing the sources for contamination which is a requirement in ANSI-N54.2.

CONCERN: (RP.3-2) (H2/C2) Westinghouse Savannah River Company is not in compliance with ANSI N54.2 for determining radioactive source integrity.

FINDINGS:

- The surveillances of the Cobalt Irradiation Facility in Bldg. 774-A are conducted in an informal manner without the use of approved procedures.

- Water samples are taken from the pool to test for source integrity approximately every

2 months. Additionally a radiation reading is taken on a filter component in the water recirculation system weekly.

- The HP weekly surveillance checklist stated "check radiation level of ion-exchange column in 774-A and make spot smear."
- It was determined by the appraisal team that the ion-exchange column was not in service and had been isolated more than 2 years.
- HP Inspectors have continued to monitor the dose rate on the ion-exchange column when in fact the mechanical cuno filter should have been surveyed.

CONCERN: (RP.3-3) (H2/C2) There is no procedure to assure the proper conduct of the surveillance program for the Cobalt-60 source at the Bldg. 774-A Irradiation Facility. (Also see Concerns OA.7-1, MA.2-1, and QV.6-1.)

RP.5 EXTERNAL RADIATION DOSIMETRY

PERFORMANCE OBJECTIVE:

The routine and accident personnel radiation dosimetry programs should ensure that personnel radiation exposures are accurately determined and recorded.

FINDING:

- The turnover of laboratory technicians within the External Dosimetry Section averages between 20 and 30 percent annually with some years being greater than 50 percent.

CONCERN: (RP.5-1) (H3/C2)

External dosimetry accreditation could be lost due to shortage of qualified staff.

FINDING:

- Staff within Radiologically Controlled Areas (RCAs) not wearing proper dosimeters were observed throughout SRL and other facilities. A similar finding was reported in DOE/EH-0085, "Health Physics Review of SRP September 1988." (Also see Section PT.8.)

CONCERN: (RP.5-2) (H2/C2)

The proper use of personnel dosimeters is not in compliance with requirements of DOE 5480.11 and Westinghouse Savannah River Company procedures. (Also see Concerns RP.10-3 and OA.7-1.)

RP.8 FIXED AND PORTABLE INSTRUMENTATION

PERFORMANCE OBJECTIVE:

Personnel dosimetry and radiological protection instrumentation used to obtain measurements of radioactivity should be calibrated, used, and maintained so that results are accurately determined.

FINDINGS:

- A shortage of spare parts for portable survey instrumentation has caused the following.
  - One hundred Ludlum alpha probes were out of service due to a need of photo multiplier tubes.
  - An additional 100 Ludlum alpha probes were in need of other various parts (e.g., probe assemblies, etc.).
  - Forty-eight probes were in need of Pancake GM Tubes.
- Portable survey instrument needs which are determined annually do not include a reserve inventory.
- Count rate meters without alarming capabilities are being used for personnel contamination monitoring.
- Procurement of replacement instrumentation for outdated equipment is slow and cumbersome.

CONCERN: (RP.8-1) (H2/C2)
There is an inadequate supply of portable instruments to assure daily operations are in compliance with DOE 5480.11.

FINDINGS:

- Portal Monitors (PM-6) at SRL Bldg. 773-A have not been calibrated since they were installed by the vendor 2 to 3 years ago.
- Count rate meters and hand and foot monitors used at the exits from the Radiologically Controlled Areas (RCAs) and contaminated areas are not calibrated.
- There is no procedure detailing the methodology and criteria for the performance of instrument response checks.
- At the SRL Technical Area there are 12 hand and foot monitors and over 25 portable count rate meters at exits from the RCA. In addition, 75 count rate meters are located at exits from individual labs, contaminated areas and other

areas where the potential for loose contamination exists. There is no method in place to determine if specific instruments have been response checked at the required frequency.

- Portable survey instruments are not being calibrated on each scale.

- Equipment history of survey instrumentation is not available to allow the tracking and trending of equipment performance.

- The inability to calibrate and maintain survey instrumentation in accordance with accepted standards and practices is recognized by management at WSRC. The design and construction of a new calibration facility (Project No.92-SR-105) will address many of the identified deficiencies. A review of the status of this project indicates the draft Conceptual Design Report is under review. Construction is scheduled for Fiscal Year 1992.

- WSRC has recognized the deficiencies that exist in the various systems and instrumentation used for personnel contamination monitoring. WSRC has addressed this problem by the reorganization of Environmental and Health Protection Department to include a group called Field Engineering which reports to the manager of Health Protection Operations. One of the responsibilities of this group is to develop calibration programs for personnel contamination monitoring devices. A review of efforts to date indicate procedures are being drafted and reviewed. Lacking approved procedures, no further assessment could be done.

CONCERN: (RP.8-2) (H2/C1) Radiological survey instrumentation is not being calibrated and checked in accordance with DOE 5480.11 and other accepted industry standards.

RP.9 AIR MONITORING

PERFORMANCE OBJECTIVE:

Air monitoring systems through selection, location, calibration, and maintenance should ensure reliable estimates of air activity for radiological control purposes.

FINDINGS:

- The low flow air monitoring system (referred to as Continuous Air Monitor (CAM) in SRL) has about one half the sensitivity required by DOE 5480.11.
- The CAMs are not calibrated. A calibration procedure has been drafted and was in review during the appraisal.
- The air monitoring system is old and maintaining an inventory of spare parts is becoming more difficult.
- No documentation could be found to explain why the GELMAN Type E Filter Paper is the sample filter of choice.
- Upgrading of the air monitoring systems is addressed in the WSRC Radiological Improvement Plan.

CONCERN: (RP.9-1) (H2/C1) The low flow air monitoring system neither complies with DOE 5480.11 nor is calibrated in accordance with accepted industry standards.

RP.10 RADIATION MONITORING/CONTAMINATION CONTROL

PERFORMANCE OBJECTIVE:

The radiation monitoring and contamination control program should ensure worker protection from radiation exposures.

FINDINGS:

- During the inspection of the SED Facility severe deterioration of glovebox gloves and their "O" rings were observed. Since these gloveboxes are known to be contaminated with plutonium, the potential for loss of contamination control is high in the event of loss of glove integrity. The problem could be further exacerbated because the glove ports are covered with metal plates which upon removal could result in complete glove failure. The net result could be gross contamination of the SED Facility, the personnel doing the work and perhaps the high bay area on the back side of the enclosure.

- Operations in the SED Facility were terminated about 20 years ago. However, the service level area was being used to store excess miscellaneous fissile material.

- The SED Facility was being used as a storage area for SED Facility associated waste in plastic covered plywood boxes, small radiation sources in combustible packaging and filters and other supplies in cardboard containers. These combustibles were in addition to the combustibles that are inherent in the facility such as plexiglass gloveboxes and rubber gloves. The result was a high fire loading. The area does have a sprinkler system; however some of the system is elevated to about 30 feet, and therefore, its operation may be delayed in the event of a fire. Improper fire response procedures were posted on the entrance door.

CONCERN: (RP.10-1) (H1/C1) (CAT II)

The combination of miscellaneous excess plutonium, deteriorated glovebox gloves, storage of excess combustibles, and inadequate fire protection in the SED Facility results in a high potential for the spread of plutonium contamination to surrounding areas and their occupants.

FINDINGS:

- Loose surface contamination has existed on the top of Tank A-6 in Bldg. 678-T and in the southwest corner of Bldg. 677-T for over 2 years.

- Rooms B-001 and B-002 in Bldg. 773-A have loose surface contamination present.

CONCERN: (RP.10-2) (H2/C2) Contaminated areas are not being decontaminated in a timely manner.

FINDINGS:

- Requirements in DOE 5480.11 has caused WSRC to change the access and egress controls to the Technical Area of SRL from a Regulated Area to a Radiologically Controlled Area (RCA).

- The Thermoluminescent Dosimeter (TLD) and Thermoluminescent Neutron Dosimeter (TLND) storage racks are located inside the RCA. This requires personnel to violate the requirement that a TLD is required for entry into an RCA.

- An unwritten policy is being followed where casual visitors, transient workers or personnel not performing work inside the RCA are permitted access to the RCA without required dosimetry.

- Functions not normally associated with operations inside an RCA such as Technical Stores and Stationary Stores are located inside the RCA.

- The PM-6 Portal Monitors are arranged in such a manner that personnel who have cleared a portal monitor comingle with personnel who have not been surveyed.

- The appraisal team observed personnel working within the RCA without the proper dosimetry devices, and also exiting the RCA without performing the correct personnel monitoring.

CONCERN: (RP.10-3) (H2/C1) The radiological controls placed on the access or egress from the Radiologically Controlled Areas at the Technical Area of the Savannah River Laboratory are not in compliance with DOE 5480.11.

RP.11 ALARA PROGRAM

PERFORMANCE OBJECTIVE:

A formally structured, auditable program should be in place with established milestones to ensure that exposures are maintained as low as reasonably achievable (ALARA).

FINDINGS:

- WSRC does not have a formal documented ALARA program as required by DOE 5480.11. They do have an ALARA policy statement contained in Special Hazard Bulletin in SHB9, December 1987 and they do establish Radiation Exposure Goals by WSRC division and department. Progress in meeting or staying within department goals are reported on a monthly basis.

- There are division, department and individual goals established for external radiation. The division goals vary from a low of 25 rem for SRL to 700 rem for the 200 Area with a WSRC goal of 1025 rem for Calendar Year 1990. Specific radiation exposure goals for individuals are not established other than the WSRC administration limit of 1750 mrem per year. Individual exposure goals should reflect the radiological conditions of the work locations to which individuals are assigned.

- Goals for limiting assimilations are also set with zero confirmed assimilations to date this year.

- F-Wing of Bldg. 773-A has background dose rates in occupied areas which average between 0.25 and 0.35 mrem/hr with the fast neutron dose equivalent rate being 80 percent of the total. In those backgrounds, the personnel housed there approach 500 to 600 mrem/yr or approximately 10 times the WSRC site average of less than 70 mrem/year. This situation is counter to ALARA.

CONCERN: (RP.11-1) (H2/C2)

Staff housed in offices within the F-Wing of Bldg. 773-A are unnecessarily exposed to radiation. (Also see Section 4.5.1.13.2, Concern RP.11-1.)

4.5.3.14 Personnel Protection

4.5.3.14.1 Overview

All Personnel Protection performance objectives were evaluated through review of industrial safety and industrial hygiene (IH) practices in place at the SRL. Activities of both disciplines are conducted at SRL by assigned representatives of the SRS industrial safety and industrial hygiene organizations, housed in SRL facilities and reporting directly or through SRL Health Protection (HP) to SRL management.

Health and safety program documents at SRS and SRL are in a state of change. Documents prepared by the previous SRS contractor and the current contractor are both in use, with a transition to a single system of documents anticipated sometime in the near future. In the interim, prescribed review and revision of the older documents has been deferred. Nevertheless, all relevant safety and industrial hygiene issues are being addressed even though not all DOE Order requirements are currently being met. Staffing is at a minimal level of one professional, though not certified, industrial hygienist, supported by measurements made by HP Inspectors, and one non-degreed safety engineer assisted by a trainee and two safety counselors. The wide variety of IH measurements made in the workplace by the HP Inspectors are all reviewed by the SRL industrial hygienist.

Both disciplines are significantly augmented by a remarkably wide involvement in safety and IH by the operating staff in all elements of SRL. Formal occupational health (OH) walk-throughs, which include IH, are conducted biannually for each SRL section. A wide variety of industrial safety walk-throughs and/or audits are conducted on a regular and frequent basis throughout SRL. Both safety and OH audits involve operational workers and managers as well as safety and OH staff. The system of audits/walk-throughs is well documented and follow-up is prompt. With this degree of oversight, repeating safety violations, for example the OSHA electrical deficiencies, should begin to disappear. Since this is not the case, the level of hazard recognition capability among the auditors is to be questioned.

Monthly inspections of emergency self-contained breathing apparatus were not following prescribed procedures and records of the inspections were not being filed as required or reviewed for completeness.

Many recent OSHA citations have been for electrical deficiencies. A serious, frequent violation, has been eliminated from SRL in the past few months; another repeated violation continues to occur although a single effective remedy has been applied in two buildings.

4.5.3.14.2 Findings and Concerns

PP.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE:

Procedures and documentation should provide appropriate direction, record generation, and support for the personnel protection program.

FINDING:

- There is no requirement for safety, industrial hygiene or fire protection review of Work Clearance Permits unless specified by the requestor of the work.

CONCERN: (PP.2-1) (H2/C2)

Work Clearance Permits are not required to be reviewed by safety-related disciplines.

PP.5 COMPLIANCE WITH OCCUPATIONAL HEALTH STANDARDS

PERFORMANCE OBJECTIVE:

Site/facility operations should comply with DOE-prescribed standards for the evaluation and control of occupational health standards.

FINDINGS:

- Monthly checks performed by custodians for proper condition/operation of emergency self-contained breathing apparatus (SCBA) in Bldg. 773-A were not in accordance with DPSOP 40-4 prescribed procedures in that steps required to check the pressure regulator were omitted.
- There is no single individual responsible for the respiratory protection program as required by mandatory standard ANSI Z88.2 1980.
- Inspection forms were not regularly filed and forwarded as required in DPSOP 40-4.
- Effective overview of SCBA monthly inspection has not been done.

CONCERN: (PP.5-1) (H1/C1) The Savannah River Site respiratory protection program is not in compliance with DOE 5480.4.

PP.6 COMPLIANCE WITH OCCUPATIONAL SAFETY STANDARDS

PERFORMANCE OBJECTIVE:

Work places should be free of uncontrolled physical hazards and be in compliance with DOE-prescribed occupational safety standards.

FINDINGS:

- One serious OSHA electrical violation, cited four times in most recent appraisal but occurring at dozens of locations were permanently corrected; no uncorrected violations were found during this TSA.
- Another OSHA violation, blockage of electrical disconnects was found repeatedly in OSHA appraisals over the last 4 years. Repeated electrical disconnect blockages were seen during this TSA even though the problem had been simply and effectively corrected in two SRL buildings.

CONCERN: (PP.6-1) (H2/C3) There is no documented program to correct Occupational Safety and Health Administration violations at the Savannah River Laboratory.

4.5.3.15 Fire Protection

4.5.3.15.1 Overview

All performance objectives in the Fire Protection areas were addressed during the appraisal. This appraisal was exclusive to the Savannah River Laboratory and specific support functions. Fire Protection Oversight (FPO) and Fire Protection Services (FPS) were addressed only on their organizational support to SRL. The Power Area organization was inspected as they own and control firewater supply, tanks, and pumps to SRL. Computer rooms located in Bldgs. 703-A and 703-44A were inspected due to their support function to SRL. Tours were made of most SRL facilities concentrating on major facilities with potential higher hazard of occupancy.

SRL had no specific fire protection program. They depend upon SRS Fire Protection for guidance. Authority and responsibilities for fire protection was left to the sitewide FPO and the FPS groups under the Environment, Safety, Health and Quality Assurance Division. FPO was a new organization with a designated charter to provide all necessary oversight services to the SRS as well as SRL. There was no formal fire protection program in the FPO group; however, a program was being drafted with an ambitious date of March 31, 1990 for completion. FPO has qualified and enthusiastic engineers, but overall, is understaffed and cannot perform the required oversight for all WSRC.

The FPS group maintained the sitewide Fire Department and had the responsibility for maintenance, inspections and testing of most fire protection systems and equipment. FPS procedures maintained the functions which have officially been turned over to FPO. These procedures were to be modified once the responsibilities of each organization had been established.

FPS appears adequately staffed for the present operations with competent State certified firefighters with at least 3 years of experience. Presently there are three fire stations at SRS.

SRL had a good program in place assigning fire and safety responsibilities to first line management. First-line management and Building Custodians conduct monthly safety inspections of all facilities. Unfortunately, most of these individuals do not have adequate training to recognize many minor fire protection violations.

SRL management had a sincere interest in fire protection but lacked the internal knowledge and support for this discipline. In many cases during this appraisal, minor problems were immediately corrected or proper paperwork was initiated for corrections.

Projects involving new facilities, modifications to existing buildings, and building occupancy changes have lacked proper fire

protection review. Consequently, many of these building have deficiencies with regard to life safety or property damage. Part of this problem may be solved as the Systems Engineering and Design Engineering groups are also obtaining Fire Protection Engineers.

The major criteria used for this fire protection appraisal are outlined in DOE 5480.1B, DOE 5480.7, and DOE/EP-0108. Additionally, NFPA and Factory Mutual Data Sheets codes and standards were used to obtain the "Improved Risk" criteria outlined in DOE 5480.7. SRL does not meet this required "Improved Risk" level of protection. These criteria are similar to the insurance companies' "Highly Protected Risk" philosophy that pertains to the best protected class of industrial facilities.

4.5.3.15.2 Findings and Concerns

FP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Fire Protection organization and administration should ensure the effective implementation and control of fire protection equipment and activities.

FINDINGS:

- The fire protection organizational structure was not well defined and understood within SRL. Fire protection was structured through the sitewide Fire Protection Oversight (FPO) and Fire Protection Service (FPS) groups. FPO was a new organization and there were no procedures in place defining authority and responsibilities of the fire protection interfaces. Support was being provided to bring the staffs up to anticipated demand.

- Facility and site fire protection procedures are being developed by FPO to cover all aspects of a fire protection program.

- The FPS group had procedures in place, but they define responsibilities they had prior to establishment of FPO. Accountability for all necessary fire protection programs were not understood or documented.

- There was no fire protection engineer for SRL to provide the required expertise for the facility and to act as a single interface with other fire protection groups.

- Many unfilled positions in FPO mean that minimal support was provided to SRL for fire protection guidance.

CONCERN: (FP.1-1) (H2/C1)

The fire protection program at the Savannah River Laboratory does not meet the requirement of DOE 5480.7. (Additional support for this Concern can be found in the findings of Sections FP.2, FP.5, FP.6, and FP.7.)

FP.2 LIFE PROTECTION

PERFORMANCE OBJECTIVE:

All facilities onsite should provide adequate life safety provisions against the effects of fire.

FINDINGS:

- Most buildings at SRL did not comply with NFPA 101 Life Safety Code.
- There is no program in place to assure that the facilities comply to NFPA 101.
- Inadequate fire wall separation was noted in Bldg. 723-A between the machine shop and exit corridor, in Bldg. 773-43A north exit from second floor is through kitchen (break room), and in Bldg. 773-A the library is not separated from the exit corridor.
- There were inadequate exit routes through stairwells that discharge back into corridors, through fire walls with double sliding fire doors, and into hazardous areas. These were noted in Bldgs. 773-A, 723-A, 305-A, and 735-11A.
- Many buildings were noted where Life Safety Code violations exist due to poor housekeeping or storage practices.
- Emergency lighting and exit lights were inadequate in many buildings, e.g., Bldgs.748-A, 773-A, 735-A and 735-11A.
- Battery powered emergency lights were not properly tested monthly by Building Custodians. There was no method to assure deficiencies were corrected and no training or procedures exist on testing.
- Control Access cipher type locks have been installed in most major buildings at SRL. These type locks require two actions to open the doors. These were noted in Bldgs. 748-A, 774-3A, and 773-A.
- Dead-bolt or hasp and staple type locks have been installed on doors. This was noted in the Bldg. 679T Drafting Room, the Bldg. 749-A Tool Room, and Bldg. 773-A Acid Shed.

CONCERN: (FP.2-1) (H2/C1) Savannah River Laboratory facilities are not in compliance with NFPA 101.

FP.5 PROPERTY PROTECTION

PERFORMANCE OBJECTIVE:

A maximum credible fire, as defined in DOE 5480.7, Section 6.f, should not result in an unacceptable property loss.

FINDINGS:

- The SAR Fire Hazard Analysis did not contain the information required to assure that the loss expectancies would be kept below the prescribed criteria outlined in DOE 5480.7.

- Property values have not been provided to DOE-SR as required by DOE 5480.7. This information is vital to determine the normal loss expectancies and to evaluate the degree of fire protection required to assure property loss will be within acceptable limits.

- Automatic sprinklers are not provided in many buildings and some of the buildings with sprinklers do not have complete coverage. A Line Item Project has been initiated for fire protection upgrades that include providing automatic fire protection to most of these facilities.

- Bldg. 774-3A was used partially for storage of computer equipment valued up to $2 million. There is no automatic fire detection or suppression systems for this area.

- Bldg. 773-A A-wing Computer Room has a value of about $5 million. The room originally had a Halon system installed, but was not functional. The room had automatic sprinklers in the computer equipment space only. Large amounts of unnecessary combustible electric cables were in the unprotected space of the raised floor. There were extensive unnecessary combustibles in the equipment space.

CONCERN: (FP.5-1) (H2/C1) Savannah River Laboratory had not provided assurance that fire losses will not exceed the guidelines of DOE 5480.7.

FP.6 FIRE DEPARTMENT OPERATIONS

PERFORMANCE OBJECTIVE:

The Fire Department should have the capacity to promptly terminate and mitigate the effects of a fire in a safe and effective manner.

FINDINGS:

- The Fire Protection Service group had conducted a self-appraisal of the Fire Department operations for compliance to NFPA 1500 with a 5-year plan for completion. This appraisal was completed in November 1989 and submitted and approved by management in January 1990. In March the appraisal was submitted to DOE-SR which was designated as the "authority having jurisdiction" as outlined by NFPA 1500.

- DOE-SR had not established a date to achieve compliance with the requirements of NFPA 1500. They had also not accepted or rejected the WSRC Fire Department self-appraisal. This results in the Fire Department not being in compliance with NFPA 1500.

- The self-appraisal had outlined a training program for compliance to NFPA 1500 with a 4-year schedule for compliance.

- Equipment required to fully stock the existing response vehicles to comply with NFPA 1500 was outlined in the self-appraisal and has been ordered.

- Firefighters do not receive annual medical examinations as required by NFPA 1500. However, a DOE-HQ memorandum dated September 29, 1988 requires the Fire Department to follow existing site practices until guidance is issued by the Director of DOE Medical Programs. DOE has not established these guidelines.

- There are no facilities provided for physical fitness and there was no program in place to assure firefighters physical fitness. No program exists to rehabilitate firefighters that do not meet the physical fitness standards.

CONCERN: (FP.6-1) (H1/C1)

Pending action by the Savannah River Operations Office on the Fire Department self-appraisal, the Fire Department training, equipment, medical examinations, and physical fitness do not conform to NFPA 1500 requirements.

FINDINGS:

- The Fire Department has a 14-minute response time to the TNX Facility.
- The TNX Facility had no fire brigade established and manual firefighting equipment had been removed from all hydrant hose cabinets.

CONCERN: (FP.6-2) (H2/C2)

There was inadequate response to the TNX Facility for an emergency fire situation.

FINDINGS:

- SRL Technical Area had no fire brigades. Personnel still respond to an actual fire situation.
- During an observed training exercise, SRL Fire Wardens failed to adequately direct the Fire Department to the proper location.
- The Fire Department Operation Manual requires the building fire wardens to meet the Fire Department at the main entrance to the building. This was not done during the fire drill.
- Personnel have no remote communication capabilities with Fire Department personnel during a drill or actual emergency.
- During a fire situation no one checks the sprinkler control valve to assure it is open.
- Procedures for responding to fire alarms were located in the Bldg. 773-A Control Room. The procedures were not dated or current. Operators in this area were not trained and kept current in their use. Three operators interviewed had different interpretations of actions to take for the same fire alarm. (Also see Concerns OP.3-2 and TC.3-1.)
- The Fire Department Operations Manual requires pre-fire plans to be prepared by building custodians. Most existing pre-fire plans consist only of a building floor plan and do not reflect hazards involved. Therefore, the Fire Department was required to respond to a fire occurrence without adequate information on building occupancy and the hazards involved. (Also see Concern EP.2-1.)

CONCERN: (FP.6-3) (H2/C2)

Response by Savannah River Laboratory during a fire emergency was inadequate. (Also see Concerns EP.4-1 and OP.2-3.)

FP.7 PROGRAM IMPLEMENTATION

PERFORMANCE OBJECTIVE:

A fire protection engineering program should be in place to effectively provide and maintain an "improved risk" level of fire protection.

FINDINGS:

- There was no program in place requiring review and approval by fire protection oversight for planning and design of all new projects, or building modifications. (Also see Concern TS.3-1. Additional findings in FP.2, FP.3, and FP.5 support this finding.) Evidence of this includes the following.

  - The Bldg. 773-A Control Room modification. This room was not 1-hour fire rated, had extensive control wire in the cable trays, unsealed conduit, doors had unapproved exit locks, and there was an overhead domestic waterline.
  - Bldg. 694-T was modified and turned over from the construction contractor. The buildings had no sprinklers and do not meet the Life Safety Code.
  - In Bldg. 735-A, the new D-Wing mass spectrometer clean rooms were not adequately designed to Factory Mutual Data Sheet 1-56. The room was lacking automatic sprinklers, adequate fire wall separation, smoke control system, uninterrupted power supply system, etc.
  - In Bldg. 773-A, A-wing Computer Rooms 703-A, and 703-44A were noted as not being designed to DOE/EP-0108, the Life Safety Code, and "Improved Risk" criteria.

- Fire protection systems and equipment were not adequately tested, inspected and maintained in accordance with NFPA and "Improved Risk" standards. (Also see Concern MA.6-1.) Examples noted include the following.

  - Fire pumps: procedures for testing were inadequate, running time too short, and tanks not inspected.
  - Emergency lights: no training or procedures for monthly tests and annual preventive maintenance procedures were not adequately prepared and documented.
  - Inadequate procedures for out-of-service fire systems. (Also see Concern OP.2-2.)

- Fire Protection Engineering Surveys were not being done by Fire Protection Oversight or DOE-SR as defined in DOE 5480.7.

- There were no temporary exemptions in place for deficiencies noted that are to be corrected.

- A complete fire water supply analysis had not been conducted for the 300/700 Area and the TNX Facility. Deficiencies noted include the following.

  - Two electric drive fire pumps without approved controllers.
  - Starting pressures of fire pumps was too low.
  - Redundant firewater tank of 80,000 is inadequate.

- Internal audits of the fire protection program were not being conducted.

- There was no fire barrier maintenance/inspection program as evident in the Bldg. 773-41A Electrical Room and the Bldg. 773-A A-Wing Computer Room.

- FPO had an excellent program for tracking recommendations from previous appraisals. There was no program to track Fire Protection Services recommendations or internal recommendations from routine monthly inspections by custodians.

CONCERN: See Concern FP.1-1.

4.5.3.16 Aviation Safety

4.5.3.16.1 Overview

This appraisal covered all Performance Objectives in Aviation Safety regarding the helicopter security mission provided by Wackenhut Services, Inc., Helicopter Support Section (WSI/HSS) at the SRS. In general, operational activities are conducted in a manner that is conducive to safe and reliable operations. However, maintenance management procedures are not consistent with DOE Orders, Federal regulations, and acceptable standards.

The WSI/HSS air operations manual has been published and distributed. However, it has not been approved by the Safeguards and Security Division of DOE-SR. Because the manual has been formatted to meet Wackenhut standards, some critical elements required by 14 CRF 135 have been omitted.

Flight planning is deficient due to the lack of weather forecasting facilities. Fire protection training, procedures, and coordination have not been implemented.

Waste fuel storage exceeds quantity limits and is not properly labeled. The waste fuel and oil storage tank dike is inadequate.

Aircrew ground and flight training is conducted in a professional manner. Record keeping for flight operations is complete and accurate.

4.5.3.16.2 Findings and Concerns

AS.1 AVIATION MANAGEMENT

PERFORMANCE OBJECTIVE:

Aviation organization, administration, and safety programs should ensure the provision of proper aircraft, facilities, and effective implementation and control of aviation and associated safety activities.

FINDINGS:

- The Wackenhut Services, Inc. (WSI) Helicopter Support Section (WSI/HSS) aviation operations manual must be approved by WSI and DOE-SR Safeguards and Security. The current revision, dated September 1, 1989, has not been approved. Approval was most recently granted in May 1988.
- The aviation operations manual does not meet the requirements of DOE 5480.13, Aviation Safety, and 14 CFR 135, Air Taxi Operators and Commercial Operators.
- WSI/HSS personnel are not properly trained in the operation of fire suppression systems located in and around the hangar and flight line.
- There is a lack of coordination, training, and communication between WSI/HSS and the Westinghouse-operated Fire Protection Service.
- The aviation safety representative conducts hazard inspections on a bimonthly basis through discussion with the individual responsible for each area (e.g., maintenance, training, etc.), not through personal observation.
- Corrective actions identified on aviation safety bimonthly inspections are incomplete.
- The WSI/HSS preaccident plan has not been coordinated with organizations listed as participants.

CONCERN: (AS.1-1) (H2/C1) The implementation and control of the safety programs for the helicopter support service is not sufficient and does not comply with DOE 5480.13 and FAA requirements.

AS.2 AVIATION OPERATIONS

PERFORMANCE OBJECTIVE:

Aviation operations should provide the administrative support, publications, equipment, and training to maintain knowledge and skills to conduct the aviation mission safely in accordance with DOE and FAA standards.

FINDING:

- The weather forecasting system is less than adequate. The Augusta Federal Aviation Administration Flight Service Station (FAA FSS), which provided weather forecasting service to WSI/HSS, has been closed. The closest FAA FSS is now in Anderson, South Carolina, more than 85 miles away. This distance hinders weather observation and forecasting.

CONCERN: (AS.2-1) (H2/C1)

Adequate weather forecasting facilities are not being provided to perform the aviation mission in accordance with DOE 5480.13 and FAA regulations.

FINDING:

- The two BK-117 helicopters operated by WSI/HSS are equipped with radar altimeters to determine actual height above the ground. The warning system in each aircraft is different. One system uses a light; the other system uses both a light and an audible tone. These different systems can lead to confusion on the part of the pilot. The system that uses only a light was found to be a factor in a recent collision with the ground at another DOE facility.

CONCERN: (AS.2-2) (H2/C2)

Dissimilar flight instrument equipment could lead to operator error during a high-stress situation.

AS.4 REFUELING OPERATIONS AND FACILITIES

PERFORMANCE OBJECTIVE:

Refueling procedures will comply with appropriate DOE, FAA, DOT, or state requirements and provide for the safe handling, storage, and dispensing of fuel and lubricants, and the training of appropriate personnel.

FINDINGS:

- The grounding cables in the hangar and the ground cable on the ramp were not checked for electrical continuity.
- The sandbag dike around the waste fuel and oil tanks was inadequate.
- There are no testing procedures to determine whether petroleum, solvents, or cleaning agents are contained in storage tank waste water.

CONCERN: (AS.4-1) (H2/C1) Refueling operations and procedures do not comply with DOE 5480.13 and OSHA 29 CFR 1910.

AS.5 MAINTENANCE MANAGEMENT

PERFORMANCE OBJECTIVE:

Maintenance Management should ensure safe operations and control of maintenance activities, and that these activities are conducted in a safe, accountable manner, following DOE and FAA standards and procedures and accepted practices to support each facility condition and operation.

FINDINGS:

- DOE 5480.13 and 14 CFR 135.21 require the preparation of a manual setting forth the procedures and policies to be followed by the operator's flight, ground, and maintenance personnel. The Helicopter Support Section does have a manual; however, the maintenance portion lacks much of the information required by 14 CFR 135 and other pertinent parts of the Federal Aviation Regulations.

- Wackenhut Services, Inc., Helicopter Support Section (WSI/HSS) has no procedure to ensure that the pilot in command knows that the aircraft has been approved for return to service, in violation of the maintenance requirements of 14 CFR 135.

- Inspection sign-off on WSI/HSS 25-, 50-, 75-, 100-, 125-, and 150-hour forms is executed incorrectly. Inspection items require individual sign-off in appropriate blocks by the mechanic and in an additional block by the inspector. The inspector did not initial all boxes as required.

- The format of maintenance inspection forms can lead to failure to perform required inspections.

- Performance of an Airworthiness Directive could be overlooked because no accounting procedure has been provided by WSI/HSS.

- Installation of unacceptable parts is possible on the WSI/HSS Helicopters because of the method of component storage.

- The instrument and tool calibration procedure required that calibration data affixed to each component specify the date of last calibration. This could result in inadvertent use of outdated equipment.

- Helicopters in the hangar were not statically grounded, in violation of OSHA and WSI/HSS requirements.

- There was no inspection tag affixed to the aircraft fire extinguisher located between the two pilot seats. Personnel were relying on the extinguisher pressure gauge to determine the status of the extinguisher.

- There is no form provided on which to record the observation of "Non-Routine Inspection Items." The various inspection forms, i.e., 25-hour, 50-hour, etc., require inspections of specific areas. In the event defects are observed, corrective action is taken. Under present procedures, there are no provisions for recording what was found or what action was taken. A non-routine inspection form would fulfill this purpose and be retained with the other inspection forms, as required by 14 CFR 135.419.

CONCERN: (AS.5-1) (H2/C1) A fully detailed procedures manual, as required by 14 CFR 135, has not been developed and implemented for use by Wackenhut Services, Inc., Helicopter Support Section maintenance personnel.

4.5.3.17 Medical Services

4.5.3.17.1 Overview

The appraisal has covered all of the performance objectives of the Medical Services area. For this appraisal, medical aspects of performance objective OA.8, Fitness for Duty, were addressed in the Medical Services area as performance objective MS.6. The appraisal included the major medical facility and three of the larger satellite facilities. The primary sources of information included interviews of employees, reviews of medical records and procedure standards. Workload statistics, including changes and trends in workload, were supplied by medical administration. Site visits and inspection of facilities were provided by the Medical Director.

The previous medical appraisal was completed in February 1989 and a primary contractor change has occurred since that time. The Medical Department support policies and procedures remain essentially unchanged except for the Construction Medical Department which has been integrated with the Site Medical Department. The Medical Director reports to the Environment, Safety, and Health and Quality Assurance (ESH&QA) Division. Previously, the Medical Director reported to the Human Resources Division.

Overall, performance of the Westinghouse Medical Department is excellent. The Department functions well and ranks as one of the best organized departments in the DOE system. It provides services to employees in a very diversified and complex industrial environment. There are a total of 10 satellite facilities in addition to the main medical building. All of the functions and procedures are well documented including nursing orders, emergency services, and job descriptions. The main medical building contains laboratory and x-ray areas as well as an emergency and decontamination room. Office and waiting areas are spacious and functionally situated.

Members of the professional medical staff are licensed and qualified. The Medical Director is board certified in Preventive Medicine and has experience in Occupational Medicine. There is a full time Medical Administrator and two certified Registered Record Administrators. There are seven physicians and 25 nurses on the staff and all are provided with further professional training opportunities. In the past 3 months all of the medical staff have received updated training in radiological protection. The equipment (i.e., audiometry, chemistry, etc.) is "state of the art," and all required calibrations are documented. The medical records are of good quality and are legible. All of the medical records are in a computerized system. This system is capable of administrative tracking of all examinations including scheduling and the type of examination or service offered. In addition, the diagnosis is coded and stored for future epidemiologic use. The system tracks temporary disability, past and

present, and is used in conjunction with Personnel to monitor sickness-absence.

The emergency medical and ambulance service is staffed with qualified Emergency Medical Technicians certified by the State of South Carolina. The service offers comprehensive 24-hour, 7-day coverage. Drill participation is documented.

The Medical Department administers a random substance abuse testing program including pre-employment and for cause testing. The testing program was instituted in January 1986 and over 35,000 tests have been performed. It is the most extensive program in the DOE contractor system.

The Construction Medical Department building was substandard and the staffing levels were inadequate. There is a lack of privacy and the waiting room area is barren.

There is no "wellness" program or health education program at the SRS. Throughout the industry, such a program is recognized as a backbone of Preventive Medicine.

There is an absence of an established Employee Assistance Program (EAP) at the Savannah River Site. Such a formalized program should exist to assist employees with drug, alcohol and family problems. An EAP is not in existence and a fitness for duty program has not been established.

4.5.3.17.2 Findings and Concerns

MS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Site and facility organization and administration should ensure effective implementation and control of the medical services program. Adequate resources are provided to support the medical resources needed for the facility and site.

FINDINGS:

- The Construction Medical Department building is substandard. The entrance is hazardous, and there is a maze of corridors and stairs. The waiting room is barren with through-traffic from other areas. There is a lack of privacy throughout. It is an inefficient and uncomfortable building - the most inadequate that this author has encountered in the entire DOE system.

- The Construction Medical Department is understaffed especially with the increased hiring activities. Staffing is not in compliance with DOE (Medical Order) 5480.8 which stipulates four physicians for this population instead of the present 1 2/3. As a result, there is no opportunity for a physician to monitor work environments, serve on safety and health committees, and participate in alcohol, drug, and hazard education.

CONCERN: (MS.1-1) (H2/C1) The Construction Medical Department building and staffing do not meet the requirements specified in DOE 5480.8.

MS.5 PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE:

Site/Facility personnel should be adequately informed of the medical hazards that may be encountered and of the medical services that are available. An active health awareness and wellness program is implemented at the site/facility.

FINDINGS:

- No organized health education program exists. This is contrary to most DOE facilities and industry in general. Education is recognized as the backbone of Preventive Medicine.
- The lack of a health education program is out of compliance with DOE 5480.8.

CONCERN: (MS.5-1) (H2/C1) A health education program does not exist as required by DOE 5480.8.

MS.6 FITNESS FOR DUTY

PERFORMANCE OBJECTIVE:

A fitness for duty program should be capable of identifying persons who are unfit for their assigned duties as a result of drug or alcohol use, or other physical or psychological conditions, and should provide procedures to remove them from such duty and from access to vital areas of the site or facility pending rehabilitation or remedial action. An employee assistance program is available to all personnel and is well publicized.

FINDINGS:

- There is no formalized substance abuse program. Personnel are not assigned to this area either for counseling or education.
- DOE 5480.8 requires a Fitness for Duty Program that is a documented, publicized, organized effort.

CONCERN: (MS.6-1) (H2/C1)

There is no fully implemented Fitness for Duty Program at the Savannah River Site that meets the requirements of DOE 5480.8.

4.5.3.18 Packaging and Transportation (Sitewide)

4.5.3.18.1 Overview

The sitewide appraisal of Packaging and Transportation includes all performance objectives. Concerns are noted in each performance objective except Intra-Building Movements and Records. Prior to the TSA Team arrival, WSRC performed a self-assessment which discussed some of the concerns noted here.

There are 22 SRS locations from which hazardous materials, hazardous substances, and hazardous wastes (hereafter called hazardous materials) are shipped offsite. Because of time limitations, the TSA Team was able to sample activities at only five of these locations. The appraisal revealed that there is no single line organization (point of contact) responsible for SRS shipments.

A review of recent shipping records indicates the shipments comply with DOE 5480.3 (49 CFR 100-199). Outbound shipments are checked by the appropriate "Remember How You Treat Hazardous Materials" (RHYTHM) representative and the Hazardous Materials Section (HMS) Compliance Examiner before the package leaves the shipping location.

RHYTHM representatives are specially trained for their packaging and transportation responsibilities, a function they perform in addition to their normal job, and without benefit of additional compensation. The RHYTHM Committee composed of HMS staff and RHYTHM representatives provides the only coordination among the all of the various shipping organizations. The RHYTHM concept - RHYTHM representatives and the RHYTHM Committee - performs an outstanding function at SRS.

HMS is organizationally located in the Quality Assurance (QA) Department of the Environmental, Safety, Health and Quality Assurance Division (ESH&QA). The staff is trained, competent and dedicated, however they perform QA staff functions, such as oversight and audits, as well as line functions, such as records maintenance, training and voting members of the RHYTHM Committee. The HMS line function activities conflict with their QA responsibilities.

On each hazardous material shipping paper SRS lists an emergency telephone number (803-725-3333) so that carriers and emergency response personnel may obtain pertinent information regarding emergency response to DOE cargoes that may be involved in offsite transportation incidents. On the evening of February 21, a TSA Team member called the emergency number to verify SRS ability to provide technical information and/or technical assistance. Although the requested information was obtained, the SRS Technical Support Center (TSC) was not fully prepared to provide technical information about an actual hazardous materials shipment.

There is no assurance all personnel who actually handle, store, package and transport hazardous materials receive adequate initial or recurrent training. Some training, namely, 49 CFR 100-199, is obtained offsite, some is obtained onsite, and most via On-The-Job Training (OJT). In general, the OJT is not supported by lesson plans, check lists, or examinations. There is no requirement that instructors be qualified or receive additional technical training or instructor training.

Neither DOE, DOE-SR, nor WSRC has established onsite packaging requirements for all hazardous materials. WSRC was unable to provide quality assurance, specification, or maintenance documentation for several 30-year-old onsite packages. The continued safe use of these packages could not be verified.

When the performance criteria for Onsite Transfers was evaluated against the DOE general safety requirements of DOE 5480.1B, the TSA Team noted several deficiencies. Procedures for, and approval of, onsite transfers do not require review by QA or technical specialties. Although some RHYTHM representatives check onsite transfers of hazardous materials the check is not required. The highway vehicles and railroad equipment used for onsite transfers are appropriately maintained and the operation of the onsite railroad is exemplary.

SRS procedures require facilities ensure protection against groundwater contamination; however the TSA Team observed many bulk storage tank locations without definitive spill prevention procedures and suitable secondary containment. In addition many tanks were observed to be improperly labeled.

DOE 1540.1 requires DOE contractors provide shipping and receiving information to the Shipment Mobility and Accountability Collection (SMAC). DOE-SR and WSRC have resisted compliance with this requirement - using "personnel availability" as the issue. At present WSRC makes a xerox copy of each shipping paper and invoice and sends them to Science Applications International Corporation (SAIC), which maintains the database for DOE. SAIC must manually enter the data into SMAC for WSRC. Other DOE contractors have automated this procedure and comply with the requirements, as well as the spirit, of DOE 1540.1. Interviews with WSRC personnel indicate they are unable to verify that all hazardous materials shipments and receipts are documented and forwarded to SMAC.

4.5.3.18.2 Findings and Concerns

PT.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Management should develop and implement a system of policies and directives that will provide for effective implementation of DOE Orders, particularly DOE 5480.3, Federal and State regulations, and good industrial practices in operations involving packaging and transportation of hazardous materials.

FINDINGS:

- The Hazardous Materials Section (HMS) is located in the Quality Assurance (QA) Department; however, the section performs several line functions, which include reviewing each hazardous material shipment before it leaves SRS, signing Radioactive Materials shipping papers over to DOE, providing voting members to the Remember How You Treat Hazardous Materials (RHYTHM) Committee, and administering the RHYTHM qualification tests.

- There are 22 SRS locations which prepare hazardous materials packages for offsite shipment. There is no single line organization (point of contact) responsible for the packaging and transportation activities at SRS, such as control and documentation of DOT Spec 7A packaging.

CONCERN: (PT.1-1) (H3/C1) Hazardous Materials Section line function activities conflict with their Quality Assurance responsibilities required by DOE 5700.6B.

FINDINGS:

- DOE-HQ, Transportation Management Division (TMD) sends memoranda to DOE-SR as reminders regarding Federal Register notices, but the notices are not passed to HMS.

- TMD sends "for your information" (FYI) memoranda to WSRC, but the information is not getting to HMS.

CONCERN: (PT.1-2) (H3/C2) The flow of information between the Savannah River Operations Office and Westinghouse Savannah River Company and within Westinghouse Savannah River Company is not adequate. (Also see Concern FR.6-1.)

FINDING:

- DOE 1540.2, published September 30, 1986, has not been implemented by DOE-SR.

CONCERN: (PT.1-3) (H3/C2)

DOE 1540.2 has not been implemented by the Savannah River Operations Office.

FINDINGS:

- DOE 1540.1 requires DOE contractors to provide shipping and receiving data to the Shipment Mobility and Accountability Collection (SMAC). Information from this database is required for safety evaluation of DOE shipping activities, preparing responses to Congress and the various States, and generating statistics used for rate negotiations with carriers. Although instituted in 1984, SRS did not begin to send any data to SMAC until 1987. It was not until mid-1989 that SRS included shipments and receipts in their SMAC data. DOE-SR and WSRC have resisted compliance with this requirement - using "personnel availability" as the issue.

- WSRC sends a xerox copy of each shipping paper and invoice to Science Applications International Corporation (SAIC), Oak Ridge, which maintains the database for DOE. SAIC must enter the data manually for WSRC rather than input the data from a floppy disk. Other DOE contractors comply not only with the requirements, but with the spirit, of DOE 1540.1.

- Interviews with WSRC personnel indicate that WSRC is unable to verify that all hazardous materials shipments and receipts are documented and forwarded to SMAC.

CONCERN: (PT.1-4) (H3/C1)

The Savannah River Site is not in compliance with the Shipment Mobility and Accountability Collection requirements of DOE 1540.1.

PT.2 TRAINING

PERFORMANCE OBJECTIVE:

Personnel should be trained, qualified, and certified in handling hazardous materials as required by DOE 5480.3 and 49 CFR.

FINDINGS:

- WSRC has not performed job task analyses to determine the specific qualifications or training needed by personnel with packaging and transportation responsibilities.

- DPSOP 176-414 require non-supervisory and supervisory personnel be given compliance familiarization training by their Remember How You Treat Hazardous Materials (RHYTHM) representatives. Not all affected WSRC supervisors or mid-level managers receive such training; nor is the training documented.

- RHYTHM representatives receive initial training for hazardous materials, air shipments, radioactive shipments, and hazardous waste. Procedures and requirements for retraining have been drafted but have not been implemented. An on-the-job (OJT) training requirement for RHYTHM representatives has been drafted but has not yet been implemented.

- Some Railroad train crews, who receive loaded tank cars from offsite, are not trained to recognize DOT placards.

- For railroad switchman, the same multiple choice exam has been used for a number of years. If an individual fails the exam, that person can retake the exact same exam. The same is true for heavy equipment driver training.

- Record keeping of safety-related training for railroad personnel and heavy equipment drivers is not adequately documented. A training status sheet to be included in each employee's file folder has not yet been fully implemented.

- Packaging supervisors in Bldg. 234-H receive additional hazardous materials training, but only at the suggestion of the RHYTHM representative. The training is not required.

- Packaging operators in Bldg. 234-H receive basic safety training annually and OJT related to procedures every 2 years. Retraining to new and revised procedures is required; however,

documentation and records for examinations and certification is generally incomplete and not centrally located.

- All personnel (not the RHYTHM representatives) who actually prepare hazardous materials for offsite shipment are not covered by a documented training program.

- RHYTHM representatives' training records are not centrally located. They must maintain their own personal training file.

CONCERN: (PT.2-1) (H2/C1)

The Westinghouse Savannah River Company training program for qualification of packaging and transportation personnel does not meet all the requirements of DOE 5480.3 (49 CFR), DOE 5480.1B, and DOE 5480.5.

PT.3 QUALITY ASSURANCE

PERFORMANCE OBJECTIVE:

A system of checks and balances exist that assures the quality assurance (QA) requirements of the applicable DOE Orders and ANSI NQA-1-1986 are met.

FINDINGS:

- DOE 5480.3 and DOE 5482.1B require routine audits of packaging and transportation, and contractor self-appraisals, respectively.
- The Hazardous Materials Section (HMS) has an operational goal to perform a compliance examine of 100 percent of hazardous materials packages that leave the site; however, this is not a written policy. There are no hold points to ensure that the compliance examination is completed before the package leaves the site.
- The SRS Self-Appraisal Program, as applied to packaging and transportation functions, is implemented by all SRS facilities.
- DOE 5700.6B (NQA-1) requires quality assurance (QA) audits of contractor operations.
- HMS (a QA organization) has published annual audit/appraisal schedules, however the schedule has not always been met.
- HMS line-function activities conflict with their quality oversight responsibilities. (Also see Concern PT.1-1.)

CONCERN: (PT.3-1) (H3/C1)
The Savannah River Site Quality Assurance and Internal Self-Appraisal Programs do not meet all the requirements of DOE 5700.6B, DOE 5480.3, and DOE 5482.1B. (Also see Concern FR.1-1.)

FINDINGS:

- A review of available records and an interview with Environment, Safety, Health and Quality Assurance staff indicate that Environment, Safety and Health Programs (ES&HP) oversight does not include packaging and transportation.
- ES&HP staff does not include a packaging and transportation specialist.

CONCERN: (PT.3-2) (H3/C1)
Westinghouse Savannah River Company safety oversight of packaging and transportation activities does not meet all the requirements of DOE 5480.1 and DOE 5482.1B.

FINDINGS:

- Tritium Facilities personnel were unable to verify that the drums used for the AL-S1 Type B package had met appropriate QA requirements.
- Tritium Facilities personnel check the AL-S1 Type B package and package components prior to use, however the results of the check are not documented.
- QA records of several onsite radioactive materials packages, including the Tritium Crucible Cask, the High Level Waste Cask Trailer, and the 70-ton Railroad Cask, all of which were built in the early 1960s, were not available for review by the TSA Team.

CONCERN: (PT.3-3) (H3/C1)

The Westinghouse Savannah River Company Quality Assurance Program for Packaging and Transportation does not meet all the requirements of DOE 5700.6B, DOE 5480.3, and DOE 5610.1.

PT.4 REGULATORY COMPLIANCE

PERFORMANCE OBJECTIVE:

All PT operations involving hazardous materials shall be conducted in compliance with the applicable State and Federal regulations, including those of Department of Transportation (DOT), Nuclear Regulatory Commission (NRC), Occupational Safety and Health administration (OSHA), and Environmental Protection Agency (EPA).

FINDINGS:

- DOE 5480.3, paragraph 10.d. requires some shipping records be kept for 2 years.
- DOE 5480.4 and DOE 5480.3 require compliance with 10 CFR 71.91, which requires the same records be kept for 3 years.

CONCERN: DOE 5480.3 is in conflict with 10 CFR 71.
(PT.4-1)
(H3/C1)

PT.5 ACCIDENTS AND INCIDENTS

PERFORMANCE OBJECTIVE:

Accidents and incidents involving packaging and transportation of hazardous materials should be reported in a timely manner to DOE.

FINDINGS:

- SRS shipping papers for hazardous materials offered to common carriers indicate a 24-hour telephone number (803-725-3333) to be used if there are any questions regarding the shipment while it is in transit. On at least one of the shipping papers reviewed, the telephone number was blurred beyond recognition.

- DPSOP 287, "SRP Emergency Operating Center Procedures for EOPC Personnel," contains a procedure for providing technical information and, if needed, technical assistance to offsite Incident Commanders at the scene of a transportation incident involving a DOE cargo or radioactive materials.

- At approximately 9:00 PM on February 21, 1990, a TSA Team member called the SRS 24-hour telephone number (803-725-3333). The SRS Technical Support Center (TSC) watchstander who answered the phone displayed the utmost patience, professional courtesy and competence. The watchstander was aware the phone number was listed on SRS shipping papers. Following a procedure outlined in DPSOP 287 the watchstander asked specific questions regarding the information requested, proceeded to attempt to contact persons on the Radiological Assistance Program (RAP) call list. There is no similar list for transportation incidents.

- The SRS RAP list contains only two names, down from about seven a month or two ago. Neither person could be contacted immediately; however, one was contacted about 15 minutes later. The RAP member could not provide specific information regarding the contents of the shipment.

- Next, the person whose name appeared on the shipping paper was contacted. This person remembered the actual shipment and was able to provide detailed information about the contents.

- The SRS telephone system for incoming calls can conference only three people, e.g., the caller, the watchstander, and a third person.

- The watchstander did not have a copy of the Bill of Lading or the Bill of Lading number, to match documentation available in the TSC.

- Emergency Communications regulations of 49 CFR 172.600, effective June 4, 1990, require a 24-hour telephone number on hazardous materials shipping papers.

CONCERN: (PT.5-1) (H1/C2)

Preparation for response to offsite transportation incidents involving a Department of Energy cargo, or a radioactive materials cargo, does not meet the intent of Westinghouse Savannah River Company DPSOP 287.

PT.6 OPERATIONS

PERFORMANCE OBJECTIVE:

Sitewide operations involving packaging and transportation of hazardous materials should be conducted in a safe, consistent, and accountable manner, following approved procedures, in conformance with applicable standards and accepted practices.

FINDINGS:

- The SRS Spill Prevention Control and Countermeasures (SPCC) Plan does not establish definitive, sitewide requirements for: spill prevention (e.g., procedures and tankage standards); spill control (e.g., secondary containment, sumps); or countermeasures (e.g., cleanup protocol).

- The SPCC Plan must, and does, address oil and petroleum products. A separate plan, Best Management Practices (BMP), addresses other hazardous materials. Good practice would suggest these plans be combined to address any, and all, spilled material.

- The SRS SPCC Plan consists of a compilation of information from each operating area. There is no consistency among the information provided; e.g., tank surveillances are conducted at different intervals.

- DPST-85-1126 requires that facilities ensure protection against groundwater contamination; however, many bulk storage tanks did not have suitable secondary containment, concrete pads, or spill prevention procedures. DPSOLs 40-5-116 and 40-5-117 require container labeling and OSHA hazard communication labels. Locations having tanks or drums not meeting these requirements included the following.

  - Central Shops Area - a 55-gallon gasoline drum, permanently installed; three 10,000-gallon diesel tanks and the tank loading station.
  - TNX Facility Area - the chemical tank, and the diesel tank (drain valve for the secondary containment properly closed, but not locked in the closed position).
  - Naval Fuels Facility - the diesel fuel tank for the emergency generator (berm drain valve is not locked in the closed position). The berm around the aluminum nitrate, nitric acid, and caustic tanks is not raised above the tank foundations to retain spilled material.

- At the F-Area and K-Area Gas Stations - no berms around the vehicle fueling areas or the cargo tank unloading (tank loading) area.
- SRL Bldg. 773-45A Drum Storage Area - drums improperly labeled.
- SRL, between Bldgs. 735-11A and 735-6A - a low-level waste tank, marked as a Radiologically Controlled Area, was not properly diked.
- SRL near Bldg. 779 - a 10,000-gallon tank: improperly labeled, and secondary containment consisted only of dirt and gravel.
- F-Canyon Area - bulk storage tanks in the 500, 600, 700 and 800 Aprons not properly diked; temporary drum storage area at the north end of Bldg. 221 improperly diked; two horizontal (green) compressed (breathing air) gas cylinders on the west side of Bldg. 221 were not labeled.
- Stores, Bldg. 733-A, Flammable Materials Storage - incomplete diking.

CONCERN: (PT.6-1) (H2/C1) The Savannah River Site Spill Prevention, Control and Countermeasures Program does not meet all of the requirements of DOE 5480.1 and DOE 5480.4 (40 CFR 112).

PT.8 ONSITE TRANSFERS

PERFORMANCE OBJECTIVE:

Onsite transfers of hazardous materials should be conducted in a safe, consistent, and accountable manner, following approved procedures, in conformance with applicable standards and accepted practices.

FINDINGS:

- DOE has not established safety requirements for the onsite transfers of hazardous materials; therefore, the TSA Team used DOE 5480.1B to evaluate the overall safety aspects of SRS onsite transfers of these materials.

- DOE 5480.3A (Draft) contains requirements for onsite movements of hazardous materials. DOE-HQ has circulated DOE 5480.3A (Draft) to all operations offices and most contractors. Although this Order remains a draft, some contractors have been told (orally) to begin implementation.

- DPSTSY-200-5, "Transportation of Radioactive Materials by Truck and Rail at the Savannah River Plant," (November 1977) is a systems analysis for these operations. It does not include all hazardous materials. A SAR, WSRC-RP-89-715, was submitted to DOE-SR on September 30, 1987. Subsequent DOE-SR comments have been addressed, and the latest version of the SAR was submitted to DOE-SR on September 30, 1989; DOE-SR has not completed its review of the SAR.

- WSRC has not established requirements for fabrication of onsite packages. The Packaging and Transportation Branch of the Nuclear Processes Safety Research Division is not used for evaluation of onsite packages.

- The Hazardous Materials Section (HMS) does not examine onsite transfers, nor are Remember How You Treat Hazardous Materials (RHYTHM) representatives required to check hazardous materials packages being transferred from their facility to another onsite facility.

- Except for the HLW trailer, there is no required speed limit other than posted speed limits for onsite transfers of hazardous materials. Some onsite radioactive materials packages are almost 30 years old and may not meet today's structural standards.

- Records verify that tractors, trucks, and heavy trailers receive preventive maintenance, but a signed checklist is not a required part of the record. A procedural checklist has been drafted but has not been implemented.

- There are no requirements that specific specialties and/or quality assurance review special procedures for onsite transfers.

- At the Naval Fuels Facility, the portable tanks which contain aluminum nitrate, nitric acid and caustic must be disconnected, loaded on a dumpster transporter, transported to F-Canyon to be filled, and then transported back to Naval Fuels and reconnected.

- There is no program to evaluate the older containers for continued onsite use.

- The two Tritium Crucible Casks were built in the early 1960s. There are no maintenance requirements, maintenance records or pre-operational check list for the casks.

- There is no safety analysis for the Reactor Scrap Casks (EP-383). There are no prescribed maintenance requirements.

- WSRC was unable to verify the construction standards of the SRL High Level Waste (HLW) Cask and there is no preventive maintenance program for the cask. Presumably tested to a pressure of 10 pounds per square inch when constructed in 1960, WSRC was unable to verify any additional, or routine, leak testing.

- The SRL HLW Trailer cannot be moved during hours of darkness. It is escorted during its move, but there is no assurance that casual observers, e.g., personnel near the cafeteria or the credit union, are excluded from all potential hazards during the transfer.

- Stores relies solely on the vendor to provide compressed gas cylinders which have been hydrostatically tested. There is no WSRC spot check to verify cylinders have been hydrostatically tested.

- DPSOL 302-EM&GS-3012 (December 17, 1987), "Locomotive Maintenance Inspection," does not

include maintenance requirements for the General Electric locomotive which was received in June 1989.

- DPSOP 301, "Traffic & Transportation Department General Operating Procedures," Chapter V, Regulated Cars, paragraph 10, states, "Cask will not be moved unless at least eight hold-down bolts are in place." It is the opinion of the TSA Team that use of any number of hold-down bolts less than the total number provided by design is inconsistent with the overall safety margins built into the cask.

- Railroad operating personnel do not check incoming rail cars for the appropriate Department of Transportation (DOT) placards.

- The receipt inspection of inbound hazardous materials packages includes package integrity, e.g., leaks, but does not include a compliance review; e.g., for compliance with 49 CFR.

CONCERN: (PT.8-1) (H2/C1) The handling, storage and intrasite movements of hazardous materials do not meet all of the health and safety requirements of DOE 5480.1B.

PT.9 OFFSITE SHIPMENTS

PERFORMANCE OBJECTIVE:

Offsite shipments of hazardous materials should be conducted in a safe, consistent, and accountable manner, following approved procedures, in conformance with applicable standards and accepted practices.

FINDINGS:

- At the Naval Fuels and Tritium Facilities the procedures, and actual practice, for securing locking rings on the Department of Transportation (DOT) Specification 6M and the AL-S1 packages, respectively, did not contain torquing requirements. An established industry practice to "torque-tap-torque" the locking ring was neither used nor required by procedure.

- Locking rings on the AL-S1 do not contain a locking nut. An attached metal band keeper prevents loss of, but does not prevent loosening of, the closure nut.

- Locking rings on AL-S1 packages received from some military commands contain neither a metal band keeper nor a locking nut. Tritium Facilities personnel were unable to verify that the military commands were informed of the discrepancy.

CONCERN: (PT.9-1) (H3/C2)

Westinghouse Savannah River Company does not have adequate procedures to ensure proper closure of drums.

4.5.3.19 Emergency Preparedness (Sitewide)

4.5.3.19.1 Overview

Emergency Preparedness at the SRS was evaluated relative to the seven performance objectives. Findings regarding compliance of sitewide documentation are not given in this appraisal report, as they were thoroughly covered in an audit by DOE-HQ, Emergency Preparedness (EP) Group in January 1990. That audit found 17 areas of noncompliance with DOE Orders and prescribed standards. WSRC considers that 14 of these will be corrected by issuing the new Site Emergency Plan which was delivered to DOE-SR for approval on March 2, 1990. While the team concurs that this plan addresses these areas, it is the responsibility of the DOE-HQ EP Group to close out the audit when the Plan is functional.

One of the teams principal methods of evaluating sitewide EP was a formal sitewide EP exercise held February 28, 1990. The findings regarding EP at the Tritium Facilities, where the simulated accident took place, are contained in that portion of this report, and are repeated here only where they indicate a sitewide EP deficiency.

DOE-SR maintains a data base of EP deficiencies from past drills, exercises and audits. That data base had 108 open items at the beginning of March, indicating there is much to be done in EP. While many of these deficiencies are significant enough to constitute a concern in this report, we have not written concerns where satisfactory progress is being made.

The DOE-SR and contractor EP staffs repeatedly expressed the shared goal of an EP program that meets or exceeds commercial nuclear industry standards. Considerable progress has been made toward achieving this goal since the current contractor has taken over. These efforts have addressed the sitewide program first, with the development of a functional Technical Support Center (TSC), Emergency Operations Facility and Joint Information Center. WSRC has selected and trained an emergency cadre and developed provisions for emergency notifications of DOE-HQ, appropriate officials and the general public. As a result, the sitewide exercise demonstrated the ability to protect the health and safety of the public. It also demonstrated the ability to protect personnel in onsite areas potentially affected by accidental releases. There were, however, numerous deficiencies and opportunities for improvement recognized by the contractor and field office. The drill did not demonstrate the ability to protect workers in the tritium facility during accident conditions.

The current Emergency Plans are seriously out-of-date and a new plan for the site has been prepared by WSRC and transmitted to DOE for approval. Supplemental plans have yet to be written. Mutual

aid agreements with offsite emergency organizations such as fire and ambulance are seriously out-of-date but are being renegotiated.

Two emergency response training classes have been developed, one an EP Overview class and the other specifically for the TSC. These classes are excellent and most of the current emergency cadre and alternates have attended, however, additional courses, such as a dose assessment course, are needed and planned.

The contractor has adopted an aggressive program of one drill per month and one exercise per quarter. This frequency is necessary so that all areas will be exercised annually. Small scale training drills for on-scene responders have not been done in the operating areas and attempts to do them during the appraisal did not demonstrate competence in mitigating small scale events. Medical personnel hold drills and they demonstrated good performance. The ability to protect plant personnel and prevent the escalation of minor events was a significant concern of this appraisal.

The TSC is designed to be habitable during plant accidents, and has the necessary communications and dose assessment equipment (with the possible exception of provisions to communicate with offsite monitoring teams). The design and appointment of the TSC was, however, a concern because numerous violations of the Life Safety Code compromise emergency exit.

Other plant areas had violations of the Life Safety Code such as failure to label emergency routes. Emergency egress deficiencies are discussed in greater detail in the fire protection sections of this report. The inability to accurately account for personnel during evacuations was also a concern.

4.5.3.19.2 Findings and Concerns

EP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE:

Emergency preparedness organization and administration should ensure effective planning for, and implementation and control of, site facility emergency response.

FINDINGS:

- The major exercise at the Tritium Facilities revealed that radiological protection of personnel was not adequately considered.
- A drill at the Waste Tank Farm revealed deficiencies in dealing with onsite events.
- Neither WSRC nor DOE-SR has provided oversight of all SRS onsite emergency preparedness (EP).
- Line organization participation in EP is a performance indicator in the award fee process.

CONCERN: (EP.1-1) (H1/C2) Management of operational emergencies is variable and often weak.

FINDINGS:

- The most recent agreement between DOE-SR and Eisenhower Army Medical Center to provide treatment for contaminated injured worker was signed in July 1985 and has not been updated since. It does not provide funds for hospital employees to be trained in radiation protection.
- The DOE agreements with the States of Georgia and South Carolina were signed in 1987 and have not been updated since.
- DOE-SR also has agreements in place with 9 NRC licensees in the NRC Region 2. These were entered into in 1985. A letter reaffirming these is being prepared by WSRC for DOE-SR.
- DOE 5500.1A, February 26, 1987, requires heads of DOE field organizations to develop and execute mutual assistance understandings or agreements.
- The WSRC and DOE-SR EP Managers were aware of the outdated status of the mutual aid agreements and are making an effort to bring them up-to-date. However, these agreements do not appear in the DOE-SR tracking system.

CONCERN: (EP.1-2) (H2/C2)

Savannah River Site liaison with local emergency assistance agencies has been neglected.

EP.2 EMERGENCY PLAN AND IMPLEMENTING PROCEDURES

PERFORMANCE OBJECTIVE:

The emergency plan, the emergency plan implementing procedures, and their supporting documentation should provide for effective response to operational emergencies.

FINDINGS:

- Traffic is often a serious problem at shift change such that it may take more than an hour for personnel to leave some production areas.
- Practice evacuations do not include personnel leaving in vehicles.
- Real evacuations have only involved a single accident effected area. Downwind areas have not been evacuated.
- Some credible incidents would require evacuation of multiple production areas.
- Evacuation times have not been estimated using computer models; however, the new production reactor Environmental Impact Statement will require some.

CONCERN: (EP.2-1) (H2/C2) Timely evacuation of multiple areas is not assured.

EP.3 EMERGENCY RESPONSE TRAINING

PERFORMANCE OBJECTIVE:

Emergency response training should develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

FINDINGS:

- There has not been a program or requirement to prevent modification of the Weather Information Display (WIND) System without formal notification of Emergency Duty Officers and others who use the system.

- Emergency action levels were adopted by the reactor areas without any formal review by the emergency preparedness organization or orientation of the Emergency Duty Officers.

CONCERN: (EP.3-1) (H2/C2) Changes may be made in emergency equipment, software and hardware without informing the users.

EP.4 EMERGENCY PREPAREDNESS DRILLS AND EXERCISES

PERFORMANCE OBJECTIVE:

Emergency preparedness programs should include provisions for simulated emergency drills and exercises to develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

FINDINGS:

- Although there is an aggressive schedule for drills and exercises involving the Technical Support Center (TSC) and Emergency Operations Facilities (EOF), small scale training drills for on-scene responders have been left to individual work groups without guidance or oversight.

- In past drills most Rescue Team Members and Health Protection Inspectors contacted were informed of scenario details prior to the drill.

- During drills held in SRL, the Tank Farm and the Tritium Facilities, most players appeared to be unfamiliar with the concept of obtaining instrument readings and similar information from controllers.

CONCERN: (EP.4-1) (H1/C2) There is no program of small scale drills within facilities to assure rapid response to emergencies.

EP.5 EMERGENCY FACILITIES, EQUIPMENT AND RESOURCES

PERFORMANCE OBJECTIVE:

Emergency facilities, equipment, and resources should adequately support site/facility emergency operations.

FINDINGS:

- Plant training and documentation indicates that plant-wide alarms for sheltering, evacuation and toxic gas are consistent.
- The TNX Facility has no alarms and uses only the public address (PA) system for emergency notifications.
- The lack of standardization of sitewide alarms was the subject of discussion among the Area Emergency Coordinators at their February meeting. While they are considering changing the sitewide system to a single alarm followed by a PA announcement, the TNX Facility is changing to the current sitewide system.

CONCERN: Sitewide alarms are not standardized.
(EP.5-1)
(H2/C2)

FINDINGS:

- The Technical Support Center (TSC) is a converted vault area consisting of 16 rooms. Many routes lead to dead ends. Doorways are normal width.
- As many as 70 people may be in the TSC during drills. Occupancy during real events and day-to-day operations is less.
- The TSC complex has only two exits. One is to the outside through an unapproved exit door, partially blocked by file cabinets. The other, the main entrance, is to an interior building hallway. (The sand filled exit shaft is not an emergency exit.)
- There were no "exit" or "not an exit" signs in the facility.
- Smoking is permitted in the TSC.
- Two portions of the TSC are protected by fire protection systems. Two meeting rooms have sprinklers. The mechanical equipment room contains air supply filters, breakers for incoming electrical power, and two emergency diesels with starting batteries. It is

protected by a Halon Fire System (although portions were labeled freon). If an electrical spark would ignite diesel or hydrogen from the batteries the Halon would dump, leaving the facility unprotected from reignition. The power sources are vulnerable to a common failure and there are no other emergency lights.

- Although the facility is generally of non-combustible construction, there is carpet on some walls, in violation of the NFPA Life Safety Code. There is also a very high density of computer and communications cables in the false ceiling. A fire in this area might be well advanced before being detected, and would release large quantities of toxic fumes.

- Walls have unsealed penetrations, diminishing their capacity as fire barriers. Many fire doors were blocked open or missing.

CONCERN: (EP.5-2) (H1/C1) (CAT II) The Technical Support Center has significant violations of the Life Safety Code and most portions have neither fire detection nor suppression.

EP.7 PERSONNEL PROTECTION

PERFORMANCE OBJECTIVE:

Personnel protection procedures should control and minimize personnel exposure to any hazardous materials during abnormalities, ensure that exposures are accurately determined and recorded, and ensure proper medical support.

FINDINGS:

- The principal system for personnel accountability is a manual system requiring each supervisor to account for his/her employees and their visitors.
- Several employees stated that during drills (scheduled and announced) there were cases of employees reported missing when they were elsewhere on the plant.
- The deficiency in personnel accountability is listed on the tracking system as having been identified in May 1987.
- Some areas are progressing on various access control/accountability systems, but the effort seems to be security driven rather than emergency driven.
- DOE 5500.3 requires that procedures for personnel evacuation and accountability include "determination and implementation of a personnel accountability system."

CONCERN: (EP.7-1) (H2/C1) Personnel accountability is not assured as required by DOE 5500.3.

4.6 NOTEWORTHY PRACTICES

Noteworthy Practices are exceptional ways of accomplishing a Performance Objective or some aspect of it. Other DOE facilities are encouraged to adopt these practices when they are applicable to their operation.

4.6.1 WASTE MANAGEMENT FACILITIES

OP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Operations organization and administration should ensure effective implementation and control of operations activities.

NOTEWORTHY PRACTICE: The Waste Minimization Chargeback Program that became effective in March 1990 uses unique features that reward the departments making progress in reducing waste.

The departments are charged according to the amount and type of waste projected. If the amount of waste produced exceeds the projected amount, the charge is doubled.

Those departments that produce less than the projected amount of waste are eligible for a return of a portion of these charges. The returned funds must be used on projects that further reduce waste.

4.6.2 TRITIUM FACILITIES

The Tritium Facilities Subteam did not identify any Noteworthy Practices that would have generic applicability to other DOE sites or contractors.

4.6.3 SAVANNAH RIVER LABORATORY

MA.2 CONDUCT OF MAINTENANCE

PERFORMANCE OBJECTIVE: Maintenance should be conducted in a safe and effective manner to support each facility condition and operation on the site.

NOTEWORTHY PRACTICE: SRL has maintained a database of operating problems and equipment failures that have accrued in the fuel reprocessing areas of the SRS since 1973. This compilation applies primarily to the F Canyon reprocessing facility and contains over 200,000 entries ranging from minor equipment failures to incidents. The intended purpose of compiling this database is to provide failure and frequency information needed for equipment failure and trend analysis as well as for Probabilistic Risk Assessment. Extension of this database to include other facilities and equipment would improve maintenance activities at the SRS.

AX.2 EFFLUENT HOLDUP AND TREATMENT

PERFORMANCE OBJECTIVE: Effluent holdup and treatment should ensure that the amount of hazardous substances released to the environment as escaping emissions and/or as effluent gaseous or liquid releases are less than DOE and EPA standards and are ALARA.

NOTEWORTHY PRACTICE: In the new Waste Minimization Plan, operations will be backcharged for waste shipped. Most DOE contractors have initiated waste minimization plans, but most do not include a cost penalty to the waste generator. Cost penalty is the most effective way to minimize waste.

CS.3 NUCLEAR CRITICALITY SAFETY EVALUATIONS

PERFORMANCE OBJECTIVE: Nuclear criticality safety evaluations of the design and operation of process equipment should assure that subcriticality is maintained under normal and credible abnormal operating conditions.

NOTEWORTHY PRACTICE: Both DOE 5480.5 and ANSI/ANS-8.1-1988 mandate that computer programs to be used for nuclear criticality safety evaluations be validated against experimental data. This requirement has been carried out at SRL in an unusually comprehensive manner. These validations have been reported on extensively both in SRL documents and in the open literature. The validations have included surveys of ^{239}Pu, ^{235}U, and ^{233}U critical experiments.

MS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site and facility organization and administration should ensure effective implementation and control of the medical services program.

NOTEWORTHY PRACTICE: The computer program of the Medical Department is the most extensive operation in the DOE medical complex. It performs administrative functions such as scheduling and also tracks the health status of an employee through his/her entire career. It will form a valuable data base for future epidemiologic studies.

MS.6 FITNESS FOR DUTY

PERFORMANCE OBJECTIVE: A fitness for duty program should be capable of identifying persons who are unfit for their assigned duties as a result of drug or alcohol use, or other physical or psychological conditions, and should provide procedures to remove them from such duty and from access to vital areas of the site or facility pending rehabilitation or remedial action.

NOTEWORTHY PRACTICE: The Westinghouse Medical Department has a comprehensive abuse testing program. It includes random testing of all employees, pre-employment applicants and for cause testing. Their policy and procedures are well documented and executed. It is the most exemplary program in the DOE contractor complex.

4.7 SYSTEM FOR CATEGORIZING CONCERNS

Each concern contained in this report has been characterized using the following three sets of criteria.

A. CATEGORY I: Addresses a situation for which a "clear and present" danger exists to workers or members of the public. A concern in this category is to be immediately conveyed to the managers of the facility for action. If a clear and present danger exists, the Assistant Secretary for Environment, Safety, and Health, or his/her designee, is to be informed immediately so that consideration may be given to exercising the Secretary's facility shutdown authority or directing other immediate mitigation measures.

CATEGORY II: Addresses a significant risk or substantial noncompliance with DOE Orders but does not involve a situation for which a clear and present danger exists to workers or members of the public. A concern in this category is to be conveyed to the manager of the facility no later than the appraisal closeout meeting for immediate attention. Category II concerns have a significance and urgency such that the necessary field response should not be delayed until the preparation of a final report or the routine development of an action plan. Again, consideration should be given to whether compensatory measures, mitigation, or facility shutdown are warranted under the circumstances.

CATEGORY III: Addresses significant noncompliance with DOE Orders, or the need for improvement in the margin of safety, but is not of sufficient urgency to require immediate attention.

B. Hazard Level 1: Has the potential for causing a severe occupational injury, illness, or fatality, or the loss of the facility.

Hazard Level 2: Has the potential for causing minor occupational injury or illness or major property damage, or has the potential for resulting in, or contributing to, unnecessary exposure to radiation or toxic substances.

Hazard Level 3: Has little potential for threatening safety, health, or property.

C. Compliance Level 1: Does not comply with DOE Orders, prescribed policies or standards, or documented accepted practices. The latter is a professional judgment based on the acceptance and applicability of national consensus standards not prescribed by DOE requirements.

Compliance Level 2: Does not comply with DOE references, standards, or guidance, or with good practice (as derived from industry experience, but not based on national consensus standards).

Compliance Level 3: Has little or no compliance considerations. These concerns are based on professional judgment in pursuit of excellence in design or practice, i.e., these are improvements for their own sake and are not deficiency driven.

4.8 CATEGORIZATION AND TABULATION OF CONCERNS

Based on the criteria in Section 4.7, the majority of the concerns have been categorized as Category III for seriousness. Five concerns have been identified as Category II issues requiring prompt management attention. The concerns have also been characterized by potential risk and compliance considerations. Section 4.8.1 of this report summarizes the results of the characterizations.

All of the concerns are tabulated in Section 4.8.2 of this report, without their supporting bases. The reader is cautioned that to fully understand any concern, it is necessary to read its basis in Section 2.2 of this report.

4.8.1 WASTE MANAGEMENT

4.8.1.1 Categorization of Concerns (Waste Management)

Concerns Number	Potential Hazard Level	Compliance Level
OA.1-1	3	2
OA.1-2	3	2
OA.1-3	3	2
OA.6-1	2	2
OA.7-1	2	2
OA.7-2	2	1
OA.7-3	3	1
QV.1-1	2	1
QV.4-1	2	1
QV.5-1	2	1
QV.6-1	2	1
OP.1-1	3	2
OP.2-1	3	2
OP.4-1	2	2
OP.6-1	2	2
OP.8-1	2	3
MA.1-1	3	2
MA.2-1	2	2
MA.3-1	2	2
MA.3-2	2	2
MA.4-1	2	2
MA.4-2	2	2
MA.5-1	2	2
MA.6-1	2	2
MA.7-1	2	2
TC.1-1*	2	1
TC.3-1	2	2
TC.4-1	2	1
TC.4-2	2	1
TC.10-1	2	1
TC.11-1	2	2
AX.1-1	2	2
AX.1-2	2	2
AX.2-1	2	1
AX.2-2	2	1
AX.2-3	2	1
AX.3-1	3	1
AX.5-1	2	1

*Designates a Category II Concern

Concerns Number	Potential Hazard Level	Compliance Level
AX.6-1	2	2
AX.6-2	2	1
AX.8-1	2	1
EP.1-1	1	1
EP.2-1	2	1
EP.3-1	2	1
EP.4-1*	1	1
EP.5-1	1	1
EP.5-2	1	1
EP.6-1	2	1
EP.6-2	2	1
EP.7-1*	1	1
EP.7-2	1	1
TS.2-1	2	1
TS.3-1	2	2
TS.3-2	2	2
TS.3-3	2	2
TS.4-1	2	2
TS.8-1	2	1
SS.3-1	2	1
SS.4-1	2	1
FR.4-1	2	1
FR.5-1	2	1
FR.6-1	3	2
RP.1-1	2	2
RP.1-2	2	1
RP.3-1	2	3
RP.3-2	3	2
RP.5-1	2	1
RP.8-1	2	2
RP.9-1	3	1
RP.10-1	3	2
RP.11-1	3	1
PP.1-1	2	1
PP.1-2	3	3
PP.2-1	3	2
PP.3-1	2	1
PP.3-2	2	1
PP.3-3	2	2
PP.4-1	2	1

*Designates a Category II Concern

Concerns Number	Potential Hazard Level	Compliance Level
PP.5-1	2	1
PP.5-2	2	1
PP.5-3	2	1
PP.5-4	2	1
PP.5-5*	1	1
PP.6-1	2	1
PP.7-1	2	1
FP.1-1	2	1
FP.2-1	2	1
FP.2-2	2	1
FP.5-1	2	1
FP.6-1*	1	1
FP.7-1	2	1

*Designates a Category II Concern

4.8.1.2 Tabulation of Concerns (Waste Management)

4.5.1.1 Organization and Administration

CONCERN: (OA.1-1) (H3/C2) The functional organization, accountabilities, and interactions between Waste Management Projects and the Engineering and Projects Division are not well defined, causing internal work coordination problems that are disruptive to an orderly and supportive work process.

CONCERN: (OA.1-2) (H3/C2) There is no central point of authority for coordination of personnel protection policies and procedures on a sitewide basis.

CONCERN: (OA.1-3) (H3/C2) Relationships between WSRC and DOE are strained and not conducive to a positive, responsive, and supportive work atmosphere, which is an important component of a safe, productive, and professional environment.

CONCERN: (OA.6-1) (H2/C2) Inadequate facilities and the overstressing and fatiguing of staff contribute to reduced safety margins for activities that require human interaction and decision making.

CONCERN: (OA.7-1) (H2/C2) There is no effective configuration control system for Waste Management facilities.

CONCERN: (OA.7-2) (H2/C1) Records storage practices are in violation of DOE 5480.4, its referenced NFPA-232, Standard for Protection of Records, and 32 CFR 1220.

CONCERN: (OA.7-3) (H3/C1) The document control system in use by Waste Management Projects does not meet the requirements of NQA-1 Basic Requirement 6 and Supplement 6S-1.

4.5.1.2 Quality Verification

CONCERN: (QV.1-1) (H2/C1) A quality assurance program as required by ANSI/ASME NQA-1 and DOE-SR 5700.6C has not been fully developed and implemented for Waste Management.

CONCERN: (QV.4-1) (H2/C1) The calibration program as implemented does not assure that measuring and test equipment used in process control, environment, health, and safety applications is functionally accurate.

CONCERN: (QV.5-1) (H2/C1) The control of items between central receiving and the end user does not meet the requirements of NQA-1 Supplement 13S-1.

CONCERN: (QV.6-1) (H2/C1) Not all inspection requirements and oversight activities are recognized, planned for, or conducted in a way that complies with Basic Requirement 10 and Supplement 10S-1 of NQA-1.

4.5.1.3 Operations

CONCERN: (OP.1-1) (H3/C2) Responsibilities and authority of each management, supervisory, and professional position are not documented for ready access.

CONCERN: (OP.2-1) (H3/C2) Written policies are not available to direct the work assignments of trainees to assure that qualified persons are used.

CONCERN: (OP.4-1) (H2/C2) The lock, tag, and try procedure (WSRC-8Q) does not recognize the importance of process status control, and lacks elements of industry good practice with regard to independent alignment verification, validation frequency, and tag information. Implementation is not in accordance with the SRS Safety Manual (WSRC-8Q), DOE 5482.1A, and 29 CFR 1910.150.

CONCERN: (OP.6-1) (H2/C2) Less experienced operators do not adequately monitor the condition of the equipment involved in their work.

CONCERN: (OP.8-1) (H2/C3) Providing two different digital control systems in the in-tank precipitation control room is not a good human factors practice.

4.5.1.4 Maintenance

CONCERN: (MA.1-1) (H3/C2) Lack of a unified sitewide maintenance organizational structure inhibits implementation of effective and efficient maintenance activities.

CONCERN: (MA.2-1) (H2/C2) Inadequate attention to good maintenance practices can result in unsafe conditions and/or release of radioactive materials.

CONCERN: (MA.3-1) (H2/C2) The small size of the H-Area maintenance shops contributes to crowded working conditions, which inhibit safe performance of maintenance activities.

CONCERN: (MA.3-2) (H2/C2) Due to the lack of periodic load tests, hoists, cranes, forklifts, and/or rigging slings may be used outside of their load range or may fail in use.

CONCERN: (MA.4-1) (H2/C2) The WMS and "Tickler" system are not providing identification of all needed maintenance actions and requirements.

CONCERN: (MA.4-2) (H2/C2) Temporary installations do not receive adequate technical review and follow-up.

CONCERN: (MA.5-1) (H2/C2) Documentation of corrective maintenance of equipment is incomplete.

CONCERN: (MA.6-1) (H2/C2) Optimum reliability, safety, and performance of equipment is not being achieved because of the lack of a complete formal preventive maintenance program.

CONCERN: (MA.7-1) (H2/C2) Optimal equipment performance is not being achieved because of an incomplete predictive maintenance program.

4.5.1.5 Training and Certification

CONCERN: (TC.1-1) (H2/C1) (CAT II) Operators and supervisors at the Waste Management facilities have not been trained to operate the facilities as required by DOE 5480.5, Safety of Nuclear Facilities (September 23, 1986).

CONCERN: (TC.3-1) (H2/C2) Comprehensive job knowledge is not measured prior to assigning personnel to operating tasks.

CONCERN: (TC.4-1) (H2/C1) Not all Waste Management employees receive required annual retraining on OSHA-related topics, as required by 29 CFR 1910.120.

CONCERN: (TC.4-2) (H2/C1) Not all personnel have been appropriately trained in accordance with DOE 5480.11.

CONCERN: (TC.10-1) (H2/C1) There is no assurance that first-line supervisors have proper and adequate knowledge and experience to direct normal and emergency activities of the operators whom they supervise, as required by DOE 5480.5.

CONCERN: (TC.11-1) (H2/C2) No facility exercise (drill) program is in place to assure that operators and supervisors have the skills, knowledge, and ability to respond to abnormal and emergency operating situations.

4.5.1.6 Auxiliary Systems

CONCERN: (AX.1-1) (H2/C2) The functional requirements for each auxiliary system have not been developed and documented.

CONCERN: (AX.1-2) (H2/C2) Waste Management has not fully implemented a program addressing human factors conventions and standards as applicable to auxiliary systems.

CONCERN: (AX.2-1) (H2/C1) The design and testing of effluent monitoring systems is not in accordance with ANSI N13.1-1969 and ANSI N42.18-1980.

CONCERN: (AX.2-2) (H2/C1) Analyses have not been performed to demonstrate that the effluent monitors can provide relevant and timely indication and notification of radioactive releases to the operators given existing background radiation levels, as required by DOE 6430.1A.

CONCERN: (AX.2-3) (H2/C1) High-level radioactive waste is not monitored in accordance with the requirements of DOE 5820.2A and DOE 5480.4.

CONCERN: (AX.3-1) (H3/C1) WSRC has not implemented a documented program to reduce the hazardous waste generated at all facilities, as required by DOE 5400.3 and DOE 5820.2A.

CONCERN: (AX.5-1) (H2/C1) Testing of HEPA filters does not meet the requirements of DOE 5480.4 and ANSI N510-1980.

CONCERN: (AX.6-1) (H2/C2) The operating envelope and testing and surveillance requirements for the normal and emergency power systems important to the safe operation of the facility are not specified in the applicable Safety Analysis, Operational Safety Requirements, or Technical Standard.

CONCERN: (AX.6-2) (H2/C1) Normal and emergency power systems are not tested and maintained in accordance with IEE 308-1980, as referenced by DOE 5480.4, and with generally accepted industrial practices for facilities and systems of similar complexity.

CONCERN: (AX.8-1) (H2/C1) Waste Management limiting conditions for operations have not been completely and adequately identified, and Engineered Safety Systems, as defined in DOE 6430.1A, have not been identified.

4.5.1.7 Emergency Preparedness

CONCERN: (EP.1-1) (H1/C1) Significant elements of the emergency preparedness program (e.g., training, exercises, and drills; program reviews; correction of deficiencies; and assignment of personnel) have not been developed and implemented as required by DOE 5500.3.

CONCERN: (EP.2-1) (H2/C1) The Emergency Plans and Procedures are missing program elements, are inconsistent, and are not effectively coordinated between areas and facilities, and have not been kept up-to-date, as required by DOE 5500.3.

CONCERN: (EP.3-1) (H2/C1) The absence of any trained planning staff and missing or deficient program elements required by DOE 5500.3 could result in inadequate response to emergencies.

CONCERN: (EP.4-1) (H1/C1) (CAT II) There is no assurance that the Waste Management facilities can adequately and consistently respond to a range of emergencies.

CONCERN: (EP.5-1) (H1/C1) During an emergency, communication may not be adequate to keep the Area Emergency Coordinator and the Technical Support Center informed of status.

CONCERN: (EP.5-2) (H1/C1) The emergency facilities and equipment have deficiencies that, during an emergency, could result in hazards to emergency workers and degraded response to the emergencies.

CONCERN: (EP.6-1) (H2/C1) The Waste Management facilities' emergency action level (EAL) scheme is not in compliance with DOE 5500.2A.

CONCERN: (EP.6-2) (H2/C1) The notification program and its implementation do not provide for timely, consistent, and documented notifications and communications.

CONCERN: (EP.7-1) (H1/C1) (CAT II) Evacuation procedures to protect F- and H-Area Tank Farm personnel during releases from the canyon buildings are not adequate.

CONCERN: (EP.7-2) (H1/C1) Accountability procedures to protect personnel during emergencies are not developed and implemented for the Waste Management facilities.

4.5.1.8 Technical Support

CONCERN: (TS.2-1) (H2/C1) A current and complete Safety Analysis Report is not available for each Waste Management facility, as required by DOE 5480.5.

CONCERN: (TS.3-1) (H2/C2) Procedures for engineering project design do not require formal review and approval by all safety-related disciplines.

CONCERN: (TS.3-2) (H2/C2) Work requests and procedures for small process or facility modification projects and maintenance do not require formal review and approval by all safety-related disciplines.

CONCERN: (TS.3-3) (H2/C2) Completion of as-built drawings, revised procedures, and operations training following facility modifications is not required prior to restart of operations.

CONCERN: (TS.4-1) (H2/C2) Analytical laboratory services for the F- and H-Area Tank Farms are inadequate to effectively support operations.

CONCERN: (TS.8-1) (H2/C1) Waste Management does not have a fully implemented nuclear criticality safety program.

4.5.1.9 Security/Safety Interface

CONCERN: (SS.3-1) (H2/C1) The risk of using weapons, vehicles, and protective force equipment in the vicinity of facility systems, components, and processes has not been determined, as required by DOE 5480.16.

CONCERN: (SS.4-1) (H2/C1) The training required by DOE 5480.16 on use of weapons and other equipment has not been conducted.

4.5.1.10 Facility Safety Review

CONCERN: (FR.4-1) (H2/C1) WSRC has not provided for an annual facility safety review that meets the requirements of DOE 5480.5.

CONCERN: (FR.5-1) (H2/C1) The Triennial Review represented by ESH-FSE-890068 does not meet the requirements of DOE 5480.5.

CONCERN: (FR.6-1) (H3/C2) Waste Management does not have a program in place to incorporate external sources of information about operating experiences.

4.5.1.11 Radiological Protection

CONCERN: (RP.1-1) (H2/C2) The organization and administration of the radiological protection program does not ensure the effective implementation of radiological protection programs.

CONCERN: (RP.1-2) (H2/C1) The Health Protection Department's appraisal program is not in compliance with DOE 5480.5.

CONCERN: (RP.3-1) (H2/C3) The criteria for posting radiation areas and recording survey results for beta doses are not based on technical criteria.

CONCERN: (RP.3-2) (H3/C2) Source control programs are not adequate to ensure control of radioactive sources.

CONCERN: (RP.5-1) (H2/C1) The dose to personnel driving waste trucks is not properly determined as required by DOE 5480.11.

CONCERN: (RP.8-1) (H2/C2) Fixed field radiological protection instruments are not all currently calibrated so that accurate measurements can be made.

CONCERN: (RP.9-1) (H3/C1) The air monitoring program does not ensure reliable estimates of air activity, as required by DOE 5480.11.

CONCERN: (RP.10-1) (H3/C2) The contamination control program does not minimize the spread of contamination.

CONCERN: (RP.11-1) (H3/C1) The ALARA program does not ensure that collective exposures are kept as low as reasonably achievable, as required by DOE 5480.11.

4.5.1.12 Personnel Protection

CONCERN: (PP.1-1) (H2/C1) Current personnel protection programs do not meet the requirements of DOE 5483.1A, DOE 5480.4, DOE 5480.9, DOE 5480.10, 29 CFR 1910, and 29 CFR 1926.

CONCERN: (PP.1-2) (H3/C3) Site construction and industrial safety policies are administered differently because a central point of authority has not been established and a consolidated safety program has not been defined.

CONCERN: (PP.2-1) (H3/C2) The written safety and health programs are not in compliance with DOE 5483.1A, DOE 5480.10, and applicable DOE mandatory consensus standards.

CONCERN: (PP.3-1) (H2/C1) Periodic reviews of designated standards and walk-through surveys by professional industrial hygiene personnel are being performed only sporadically, and therefore are not in compliance with DOE 5480.10.

CONCERN: (PP.3-2) (H2/C1) Safety reviews of purchase orders for safety concerns are not being performed in accordance with good management practices.

CONCERN: (PP.3-3) (H2/C2) Safety staff walk-throughs of Waste Management facilities are not performed in accordance with good management practices.

CONCERN: (PP.4-1) (H2/C1) The current program for periodic chemical monitoring of both construction and operations personnel does not meet the requirements of DOE 5480.10 and ANSI Z88.2-1980.

CONCERN: (PP.5-1) (H2/C1) The SRS asbestos program does not meet the requirements of 29 CFR 1926 and DOE 5480.10.

CONCERN: (PP.5-2) (H2/C1) The SRS hearing-conservation program does not meet the requirements of 29 CFR 1926.

CONCERN: (PP.5-3) (H2/C1) The SRS carcinogen control program does not comply with the requirements of DOE 5480.10.

CONCERN: (PP.5-4) (H2/C1) Emergency notification capabilities in the Tank Farm areas are not in compliance with 29 CFR 1910.20 or 40 CFR 264.

CONCERN: (PP.5-5) (H1/C1) (CAT II) The SRS respiratory protection program is not in compliance with ANSI Z88.2-1980 requirements regarding monitoring and administrative controls for respirator usage, as mandated by DOE 5480.4.

CONCERN: (PP.6-1) (H2/C1) OSHA noncompliance items within the Waste Management areas have not been identified and corrected.

CONCERN: (PP.7-1) (H2/C1) The hazards communication program is not adequately addressing the health and safety risk associated with chemicals that do not carry the NFPA label, as required by 29 CFR 1910.1200.

4.5.1.13 Fire Protection

CONCERN: (FP.1-1) (H2/C1) The Fire Protection organization and administration necessary for the effective implementation and control of the fire protection program are not in place, as required by DOE 5480.7.

CONCERN: (FP.2-1) (H2/C1) Compliance to NFPA 101, Life Safety Code, has not been achieved, and alternate measures have not been provided.

CONCERN: (FP.2-2) (H2/C1) There is no program in place to ensure that facilities meet the requirements of WSRC Policy Statement 4.7, or NFPA 101, Life Safety Code, or that conformance is verified by periodic field inspections.

CONCERN: (FP.5-1) (H2/C1) There is no assurance that the maximum property loss, due to credible fire scenarios, will not exceed the $1 million limits established by DOE 5480.7.

CONCERN: (FP.6-1) (H1/C1) (CAT II) The Fire Department is not in compliance with the requirements of NFPA 1500, "Standard on Fire Department Occupational Safety and Health Program," as mandated by DOE 5480.4, for such items as annual medical examinations, specific training, physical fitness, and Personal Alert Safety System devices.

CONCERN: (FP.7-1) (H2/C1) The requirements for improved risk, as mandated by DOE 5480.7, are not met by the Fire Protection Engineering program.

4.8.2 TRITIUM FACILITIES

4.8.2.1 Categorization of Concerns (Tritium Facilities)

Concerns Number	Potential Hazard Level	Compliance Level
OA.1-1	2	2
OA.2-1	2	2
OA.7-1	3	1
OA.8-1	2	2
QV.1-1	2	1
QV.4-1	2	2
QV.5-1	2	1
QV.6-1	2	1
OP.2-1	2	2
OP.3-1	2	2
OP.4-1	2	2
OP.6-1	2	2
OP.7-1	2	2
OP.8-1	2	1
OP.8-2	2	1
MA.1-1	2	2
MA.3-1	3	2
MA.6-1	3	2
MA.7-1	3	1
TC.1-1	3	1
TC.3-1	2	1
TC.4-1	1	1
TC.4-2	1	1
TC.10-1	2	1
TC.11-1	2	1
AX.1-1	3	2
AX.1-2	3	1
AX.2-1	2	3
AX.2-2	2	2
AX.3-1	3	1
AX.3-2	2	2
AX.5-1	2	2
AX.5-2	2	2
EP.2-1	2	1
EP.3-1	2	1
EP.5-1	2	1
EP.7-1	2	1

*Designates a Category II Concern

Concerns Number	Potential Hazard Level	Compliance Level
TS.2-1	3	1
TS.2-2	3	1
TS.3-1	3	1
TS.3-2	3	2
TS.4-1	3	2
TS.5-1	3	2
TS.5-2	3	2
SS.4-1*	2	1
FR.2-1	2	1
FR.4-1	2	1
FR.5-1	2	1
FR.6-1	3	2
FR.6-2	3	2
RP.1-1	2	1
RP.2-1	3	2
RP.3-1	3	2
RP.3-2	3	1
RP.7-1	2	1
RP.10-1	3	1
RP.12-1	3	1
PP.1-1	2	2
PP.1-2	2	2
PP.2-1	2	1
PP.2-2	2	1
PP.3-1	2	1
PP.3-2*	1	2
PP.4-1	2	1
PP.4-2	2	1
PP.5-1	2	1
PP.5-2	2	1
PP.5-3	2	2
PP.5-4	2	1
PP.6-1	2	1
PP.6-2	2	1
PP.7-1	2	1
FP.1-1	2	1
FP.2-1*	1	1
FP.2-2*	1	1
FP.4-1	2	1
FP.5-1	2	1
FP.6-1	1	1
FP.7-1	2	1

*Designates a Category II Concern

4.8.2.2 Tabulation Of Concerns (Tritium Facilities)

4.5.2.1 Organization and Administration

CONCERN: (OA.1-1) (H2/C2) Organizational documents that define the mission, responsibility, and interfaces of the various organizational elements coupled with approved job descriptions that define the individual's role, responsibility, and accountability in accomplishing the mission are lacking.

CONCERN: (OA.2-1) (H2/C2) WSRC management may not have a realistic view of current staffing needs and the ability to obtain sufficient, qualified staff for timely implementation of Performance Improvement Program initiatives.

CONCERN: (OA.7-1) (H3/C1) DOE 5700.6B requirements to control and store safety and quality assurance documents are not being met.

CONCERN: (OA.8-1) (H2/C2) New supervisors are not always provided substance abuse training, and periodic refresher training for all supervisors is lacking.

4.5.2.2 Quality Verification

CONCERN: (QV.1-1) (H2/C1) A quality assurance program, as required by NQA-1 and DOE 5700.6B, has not been fully developed and implemented for the Tritium Project Management Team.

CONCERN: (QV.4-1) (H2/C2) The calibration program for the Tritium Facilities does not assure the accuracy of measuring and test equipment used in process control and in health and safety applications.

CONCERN: (QV.5-1) (H2/C1) The present storerooms and procedures used at the Tritium Facilities for the storage and control of safety-related or quality-designated hardware and materials do not meet the requirements of NQA-1.

CONCERN: (QV.6-1) (H2/C1) Inspections and verifications are not performed by persons independent of the organization doing the work as required by NQA-1.

4.5.2.3 Operations

CONCERN: (OP.2-1) (H2/C2) Lack of double containment leads to effluents that are not at a level that is As Low As Reasonably Achievable (ALARA) and may result in major releases of tritium to the environment with attendant potential personnel risks and potential programmatic impacts.

CONCERN: (OP.3-1) (H2/C2) Procedures are not verified and validated prior to use.

CONCERN: (OP.4-1) (H2/C2) Up-to-date or as-built drawings of the process do not exist.

CONCERN: (OP.6-1) (H2/C2) Operations and technical support personnel are not knowledgeable of the applicable state-of-the-art of tritium process technology.

CONCERN: (OP.7-1) (H2/C2) Shift turnover procedures do not meet the guidelines of the Institute of Nuclear Power Operations.

CONCERN: (OP.8-1) (H2/C1) Human factors considerations have not been adequately addressed in the control room.

CONCERN: (OP.8-2) (H2/C1) Piping and equipment are not adequately labeled or color coded.

4.5.2.4 Maintenance

CONCERN: (MA.1-1) (H2/C2) There is no formal process to assure that facility management receives timely information on the status of support equipment that might affect safe and reliable operation of the facility.

CONCERN: (MA.3-1) (H3/C2) Storage space for supplies and spare parts is not adequate to support an effective maintenance program.

CONCERN: (MA.6-1) (H3/C2) Preventive maintenance is not adequately addressing degradation of equipment because of age or weather exposure.

CONCERN: (MA.7-1) (H3/C1) Maintenance activities are not being supported by trend analyses or failure analysis.

4.5.2.5 Training and Certification

CONCERN: (TC.1-1) (H3/C1) Training records management is not in accordance with applicable DOE Orders.

CONCERN: (TC.3-1) (H2/C1) Operators and supervisors have not completed and maintained an adequate level of training as required by DOE 5480.5.

CONCERN: (TC.4-1) (H1/C1) All employees are not receiving the required OSHA training commensurate with their job duties.

CONCERN: (TC.4-2) (H1/C1) Radiation worker training does not meet the requirements of DOE 5480.11.

CONCERN: (TC.10-1) (H2/C1) Personnel are assigned to supervisory positions prior to obtaining the training necessary to act in a supervisory capacity.

CONCERN: (TC.11-1) (H2/C1) Operators and supervisors do not have the training necessary for adequate response to emergency and abnormal conditions.

4.5.2.6 Auxiliary Systems

CONCERN: (AX.1-1) (H3/C2) There is no management plan which addresses the identification, review, upgrade, refurbishment, etc., of the auxiliary systems equipment.

CONCERN: (AX.1-2) (H3/C1) The auxiliary systems are not specifically considered in the facility status control program.

CONCERN: (AX.2-1) (H2/C3) A second catalytic reactor bed is not installed and ready for service in the event of a catalyst bed failure.

CONCERN: (AX.2-2) (H2/C2) The leak rate of the Divert Hold Volume is not periodically determined.

CONCERN: (AX.3-1) (H3/C1) There is no waste minimization program or policy for the Tritium Facilities.

CONCERN: (AX.3-2) (H2/C2) Tritium contaminated solid waste accumulating in a fines settling tank and machining tray in hoods is not periodically removed for disposal.

CONCERN: (AX.5-1) (H2/C2) The face velocities of high-velocity air hoods are not in conformance with industry or DOE standards.

CONCERN: (AX.5-2) (H2/C2) Minimum volume flow rate requirements have not been established for each area of all buildings, and the ventilation systems have not been balanced to meet these requirements.

4.5.2.7 Emergency Preparedness

CONCERN: (EP.2-1) (H2/C1) The absence of both critical emergency plan elements and emergency plan implementing procedures could result in failure to implement emergency responses in a timely manner.

CONCERN: (EP.3-1) (H2/C1) The lack of appropriate personnel training on emergency preparedness could result in failure to implement emergency responses.

CONCERN: (EP.5-1) (H2/C1) The H-Area emergency alarms and public address announcements are not adequate to provide warning to all personnel during an emergency.

CONCERN: (EP.7-1) (H2/C1) Adequate emergency equipment and supplies are not readily available.

4.5.2.8 Technical Support

CONCERN: (TS.2-1) (H3/C1) The facility Safety Analysis Report is incomplete and not in compliance with DOE Orders.

CONCERN: (TS.2-2) (H3/C1) The current Operational Safety Requirements document is incomplete and not in compliance with DOE requirements.

CONCERN: (TS.3-1) (H3/C1) Not all codes and standards mandated by DOE Orders have been addressed in designing facility modifications.

CONCERN: (TS.3-2) (H3/C2) The design review process does not include a requirement for an independent environment, safety, and health review to address potential safety and As Low As Reasonably Achievable (ALARA) concerns.

CONCERN: (TS.4-1) (H3/C2) Data are not reviewed to enable operations personnel to anticipate critical wear and equipment or process failure before they occur.

CONCERN: (TS.5-1) (H3/C2) The amount of radioactive particulates downstream of the high-efficiency particulate air filter in the Line III stack of Bldg. 232-H is not accurately determined.

CONCERN: (TS.5-2) (H3/C2) Laboratory calibrations of an 18-L Kanne chamber tritium monitor and a high range 320-ML chamber tritium monitor over their defined or intended use ranges have never been adequately performed.

4.5.2.9 Safety/Security Interface

CONCERN: (SS.4-1) (H2/C1) (CAT II) The Security Inspectors in the entry control facilities and Control Access Station in H-Area have no means to verify whether or not radionuclides released from an event can cause unacceptable dose rates or breathing air concentrations. NOTE: Separations plant and reactors are not a factor until operations resume at these facilities.

4.5.2.10 Site/Facility Safety Review

CONCERN: (FR.2-1) (H2/C1) There is no formally chartered and functioning independent safety review committee consistent with the requirements of DOE 5480.5.

CONCERN: (FR.4-1) (H2/C1) Annual facility safety appraisals, consistent with the requirements of DOE 5480.5, have not been performed.

CONCERN: (FR.5-1) (H2/C1) A triennial safety review consistent with the requirements of DOE 5480.5, has not been performed.

CONCERN: (FR.6-1) (H3/C2) There is no system to communicate operating experiences from within and outside of WSRC.

CONCERN: (FR.6-2) (H3/C2) A centralized tracking system incorporating verified closure, query capability, and status of all outstanding commitments is lacking.

4.5.2.11 Radiological Protection

CONCERN: (RP.1-1) (H2/C1) Training provided to Health Protection Inspectors has not been adequate, and some Inspectors are not fully qualified.

CONCERN: (RP.2-1) (H3/C2) Health Protection internal audit findings were closed out before the corrective actions were completed.

CONCERN: (RP.3-1) (H3/C2) There is no firm schedule to revise and reorganize 29 of the 31 policy and procedure manuals used by the Environmental and Health Protection staff.

CONCERN: (RP.3-2) (H3/C1) Radiological posting and labeling in the Tritium Facilities does not fully comply with DOE 5480.11.

CONCERN: (RP.7-1) (H2/C1) The sitewide internal dosimetry program does not comply with the requirements of DOE 5480.11.

CONCERN: (RP.10-1) (H3/C1) The contamination control program at the Tritium Facilities does not comply with the requirements of DOE 5480.11.

CONCERN: (RP.12-1) (H3/C1) Comprehensive sitewide records related to occupational radiation exposure are not retained consistent with ANSI N13.6.

4.5.2.12 Personnel Protection

CONCERN: (PP.1-1) (H2/C2) Industrial and health safety reviews of Tritium Facilities modifications and projects are not being addressed sufficiently early to ensure that the health and safety of the workers and the public is protected.

CONCERN: (PP.1-2) (H2/C2) The DOE Savannah River Operations Office does not have the capability to provide health and safety oversight of the Tritium Facilities personnel protection program.

CONCERN: (PP.2-1) (H2/C1) Worker industrial hazard exposure records are not in compliance with DOE Orders and other industry standards.

CONCERN: (PP.2-2) (H2/C1) Health and safety policy and procedures documents are not current as required by WSRC policy and DOE Orders.

CONCERN: (PP.3-1) (H2/C1) Chemical, physical, and/or other environmental stresses arising in the workplace are not being adequately identified, evaluated, and controlled.

CONCERN: (PP.3-2) (H1/C2) (CAT II) The potential for release of reservoir contents through an open process hood access door could result in the unnecessary radiological exposure to personnel and contamination of the room.

CONCERN: (PP.4-1) (H2/C1) The respiratory protection program is not in compliance with DOE 5480.10 with regard to surveillance and standards.

CONCERN: (PP.4-2) (H2/C1) The Tritium Facilities are not receiving adequate industrial hygiene and safety inspections to ensure that the workplace is free of hazards as required by DOE Orders.

CONCERN: (PP.5-1) (H2/C1) The hearing conservation program does not ensure that the hearing of high risk workers is protected as required by DOE 5480.10 or OSHA 1910.95.

CONCERN: (PP.5-2) (H2/C1) The carcinogen control program does not ensure protection of an employee's health and is not in compliance with DOE 5480.10.

CONCERN: (PP.5-3) (H2/C2) The Laser Safety Program at the Savannah River Site does not ensure that personnel are protected as required by ANSI Z136.1-1986.

CONCERN: (PP.5-4) (H2/C1) The respiratory protection program does not comply with ANSI Z88.2.

CONCERN: (PP.6-1) (H2/C1) The Tritium Facilities are not free of occupational hazards as required by OSHA standards and DOE Orders.

CONCERN: (PP.6-2) (H2/C1) Electrical circuit identification and lockout procedures are not in compliance with all applicable electrical codes.

CONCERN: (PP.7-1) (H2/C1) Personnel are not being provided adequate information on their exposures to hazardous materials or conditions, nor are they being provided other hazards information as required by DOE 5483.1A.

4.5.2.13 Fire Protection

CONCERN: (FP.1-1) (H2/C1) National fire codes are not being properly applied to site and facility projects as required by DOE Orders.

CONCERN: (FP.2-1) (H1/C1) (CAT II) National Fire Protection Association requirements for emergency egress are not met in some Tritium Facilities buildings.

CONCERN: (FP.2-2) (H1/C1) (CAT II) The Bldg. 232-H basement is not safe for assembling personnel during shelter events.

CONCERN: (FP.4-1) (H2/C1) Automatic fire suppression systems are not provided throughout the Tritium Facilities.

CONCERN: (FP.5-1) (H2/C1) Property losses resulting from credible fire scenarios, as defined in DOE 5400.7, will be unacceptable.

CONCERN: (FP.6-1) (H1/C1) The Fire Department is not in compliance with the requirements of National Fire Protection Association Code 1500 as required by DOE 5480.4.

CONCERN: (FP.7-1) (H2/C1) The requirements for "Improved Risk," as mandated by DOE 5480.7, are not being met.

4.8.3 SAVANNAH RIVER LABORATORY

4.8.3.1 Categorization of Concerns (Savannah River Laboratory)

Concerns Number	Potential Hazard Level	Compliance Level
OA.1-1	3	2
OA.7-1	2	2
OA.7-2	2	1
OA.7-3	2	2
OA.7-4	2	1
OA.7-5	2	1
OA.8-1	2	2
QV.1-1	3	1
QV.1-2	3	2
QV.1-3	2	2
QV.4-1	3	2
OP.2-1	2	2
OP.2-2	2	2
OP.2-3	2	2
OP.3-1	2	2
OP.3-2	2	2
OP.4-1	2	2
OP.4-2	2	2
OP.4-3	2	2
OP.6-1	2	2
MA.1-1	2	2
MA.1-2	2	1
MA.2-1	2	2
MA.3-1	2	1
MA.4-1	2	1
MA.4-2	2	1
MA.5-1	2	1
MA.6-1	2	1
MA.7-1	2	1
TC.1-1	3	2
TC.1-2	2	1
TC.3-1	2	1
TC.4-1	3	2
TC.4-2	2	1
TC.9-1	2	1
AX.1-1	2	2
AX.5-1	2	1
AX.8-1	2	2

*Designates a Category II Concern

Concerns Number	Potential Hazard Level	Compliance Level
EP.1-1	1	2
EP.2-1	2	1
EP.4-1	1	2
EP.5-1	2	2
EP.7-1	2	1
TS.2-1	2	1
TS.3-1	2	2
TS.3-2	3	2
TS.4-1	3	2
TS.6-1	2	2
CS.1-1	3	2
CS.1-2	2	2
CS.1-3	3	1
CS.1-4	2	2
CS.3-1	1	1
CS.4-1	2	2
CS.5-1	2	2
CS.5-2	2	2
SS.3-1	2	1
SS.4-1	2	1
FR.4-1	2	1
FR.5-1	3	1
FR.6-1	2	2
RP.1-1	2	2
RP.1-2	2	1
RP.3-1	2	1
RP.3-2	2	2
RP.3-3	2	2
RP.5-1	3	2
RP.5-2	2	2
RP.8-1	2	2
RP.8-2	2	1
RP.9-1	2	1
RP.10-1*	1	1
RP.10-2	2	2
RP.10-3	2	1
RP.11-1	2	2
PP.2-1	2	2
PP.5-1	1	1
PP.6-1	2	3

*Designates a Category II Concern

Concerns Number	Potential Hazard Level	Compliance Level
FP.1-1	2	1
FP.2-1	2	1
FP.5-1	2	1
FP.6-1	1	1
FP.6-2	2	2
FP.6-3	2	2
Sitewide Areas		
AS.1-1	2	1
AS.2-1	2	1
AS.2-2	2	2
AS.4-1	2	1
AS.5-1	2	1
MS.1-1	2	1
MS.5-1	2	1
MS.6-1	2	1
PT.1-1	3	1
PT.1-2	3	2
PT.1-3	3	2
PT.1-4	3	1
PT.2-1	2	1
PT.3-1	3	1
PT.3-2	3	1
PT.3-3	3	1
PT.4-1	3	1
PT.5-1	1	2
PT.6-1	2	1
PT.8-1	2	1
PT.9-1	3	2
EP.1-1	1	2
EP.1-2	2	2
EP.3-1	2	2
EP.4-1	1	2
EP.5-1	2	2
EP.5-2*	1	1
EP.7-1	2	1

*Designates a Category II Concern

4.8.3.2 Tabulation of Concerns (Savannah River Laboratory)

4.5.3.1 Organization and Administration

CONCERN: (OA.1-1) (H3/C2) A Westinghouse Savannah River Company management system to prioritize and integrate the implementation of key initiatives is not in place.

CONCERN: (OA.7-1) (H2/C2) The lack of management attention to the overall procedures development and implementation process has led to a proliferation of independent systems and the improper use of procedures.

CONCERN: (OA.7-2) (H2/C1) Storage facilities used to control vital records and documents do not meet the requirements of NQA-1 and DOE 5700.6B.

CONCERN: (OA.7-3) (H2/C2) The Savannah River Operations Office has not provided timely responses to Safety Analysis Reports.

CONCERN: (OA.7-4) (H2/C1) The Savannah River Laboratory Technical Area does not have an approved Safety Analysis Report as required by DOE 5480.5.

CONCERN: (OA.7-5) (H2/C1) There are no Operational Safety Requirements for the Savannah River Laboratory Technical Area.

CONCERN: (OA.8-1) (H2/C2) Substance abuse training is only being partially administered to Westinghouse Savannah River Company supervisory and management personnel. Refresher training in substance abuse detection is not being provided.

4.5.3.2 Quality Verification

CONCERN: (QV.1-1) (H3/C1) A Savannah River Laboratory Quality Assurance Program has not been fully and consistently implemented in accordance with DOE 5700.6B and NQA-1.

CONCERN: (QV.1-2) (H3/C2) The Savannah River Laboratory Quality Assurance organization placement does not provide appropriate levels of independence and top level management access.

CONCERN: (QV.1-3) (H2/C2) Savannah River Laboratory verification activities are not fully addressing safety and health protection activities within the Laboratory.

CONCERN: (QV.4-1) (H3/C2) Measuring and Test Equipment Calibration Programs are not implemented in a consistent and uniform manner throughout Savannah River Laboratory.

4.5.3.3 Operations

CONCERN: (OP.2-1) (H2/C2) Access to control rooms is not limited to appropriate personnel.

CONCERN: (OP.2-2) (H2/C2) When safety system equipment is disabled, alternative means to ensure safety are not always implemented, and the length of time the system is disabled is not always minimized.

CONCERN: (OP.2-3) (H2/C2) The system in place at the Savannah River Laboratory does not assure adequate response to alarms by all operators.

CONCERN: (OP.3-1) (H2/C2) Savannah River Laboratory is neither performing nor currently organized to perform a timely independent safety review of its operating procedures.

CONCERN: (OP.3-2) (H2/C2) Operating procedures at Savannah River Laboratory are not all reviewed every 2 years as internal documents require.

CONCERN: (OP.4-1) (H2/C2) Control room practices do not ensure knowledge and control of facility status.

CONCERN: (OP.4-2) (H2/C2) Adequate communication about facility safety features and necessary controls is not rigidly employed.

CONCERN: (OP.4-3) (H2/C2) There is a lack of procedural requirements to provide effective remedial measures to maintain adequate face velocity on laboratory hoods.

CONCERN: (OP.6-1) (H2/C2) No documented control system is in place to prevent assignment of unqualified operators to specific duties.

4.5.3.4 Maintenance

CONCERN: (MA.1-1) (H2/C2) Lack of a sitewide maintenance organization inhibits effective and efficient implementation and control of maintenance activities.

CONCERN: (MA.1-2) (H2/C1) A policy for the overall direction of the Savannah River Laboratory Works Engineering Maintenance Program is not established in accordance with the requirements of DOE 4330.4.

CONCERN: (MA.2-1) (H2/C2) There is no program to assure that procedures exist or are updated to conduct maintenance in a safe and effective manner.

CONCERN: (MA.3-1) (H2/C1) Due to lack of clear marking and/or periodic load tests, lifting and rigging equipment are not in compliance with DOE 5480.4.

CONCERN: (MA.4-1) (H2/C1) Management is not provided information to plan, schedule, and control maintenance in accordance with DOE 4330.4.

CONCERN: (MA.4-2) (H2/C1) Maintenance planning is not being performed by a group dedicated to the Maintenance Management Program as required by DOE 4330.4.

CONCERN: (MA.5-1) (H2/C1) Corrective maintenance is not documented as required by DOE 4330.4.

CONCERN: (MA.6-1) (H2/C1) The Savannah River Laboratory preventive maintenance program does not meet all the requirements of DOE 4330.4.

CONCERN: (MA.7-1) (H2/C1) The predictive maintenance program at Savannah River Laboratory Works Engineering does not meet all the requirements of DOE 4330.4.

4.5.3.5 Training and Certification

CONCERN: (TC.1-1) (H3/C2) A program is not in place to ensure coordination between the various training activities at the Savannah River Laboratory.

CONCERN: (TC.1-2) (H2/C1) Management does not provide independent review of training as required by DOE 5480.5.

CONCERN: (TC.3-1) (H2/C1) None of the training programs reviewed at the Savannah River Laboratory were in full compliance with DOE 5480.5.

CONCERN: (TC.4-1) (H3/C2) Occupational health training coordinators were unaware of the specific requirements governing occupational health training.

CONCERN: (TC.4-2) (H2/C1) Continued general employee fire extinguisher training is not in full compliance with 29 CFR 1910.

CONCERN: (TC.9-1) (H2/C1) Training for Health Protection Inspectors does not fully comply with DOE 5480.5 or DOE 5480.11.

4.5.3.6 Auxiliary Systems

CONCERN: (AX.1-1) (H2/C2) Functional requirements for each auxiliary system operating under normal and off-normal conditions were not documented.

CONCERN: (AX.5-1) (H2/C1) Design and testing of high-efficiency particulate air filter systems did not meet ANSI N510-1980 and N13.1-1969.

CONCERN: (AX.8-1) (H2/C2) The minimum operating envelope required for safe operation of the facility was not documented.

4.5.3.7 Emergency Preparedness

CONCERN: (EP.1-1) (H1/C2) Provisions for management of operational emergencies at Savannah River Laboratory are not coordinated, often weak, and have not received oversight.

CONCERN: (EP.2-1) (H2/C1) Emergency plans and procedures required by DOE 5500.1A, covering Savannah River Laboratory facilities, are out-of-date.

CONCERN: (EP.4-1) (H1/C2) First responders lack training and drill experience to respond to emergency conditions.

CONCERN: (EP.5-1) (H2/C2) Stretchers and other first aid supplies are not readily available to the rescue team in Bldg. 773-A.

CONCERN: (EP.7-1) (H2/C1) Personnel accountability in the Savannah River Laboratory is not assured as required by DOE 5500.3.

4.5.3.8 Technical Support

CONCERN: (TS.2-1) (H2/C1) Department of Energy approved safety limits have not been developed for use as design bases in facility modification projects as required by DOE 5480.5.

CONCERN: (TS.3-1) (H2/C2) Facility modification projects do not always receive appropriate review by safety-related disciplines.

CONCERN: (TS.3-2) (H3/C2) There is no system in place for positively identifying as-built status on drawings.

CONCERN: (TS.4-1) (H3/C2) Performance testing and monitoring to ensure that equipment and systems perform within safety parameters is incomplete.

CONCERN: (TS.6-1) (H2/C2) Appropriate guidance is not being provided for storing hazardous materials in the Savannah River Laboratory receiving areas.

4.5.3.9 Nuclear Criticality Safety

CONCERN: (CS.1-1) (H3/C2) The organization and administration of nuclear criticality safety at Savannah River Laboratory does not assure nonconflict of interest, continuity, and reporting at a level of management sufficiently high to take any necessary corrective action.

CONCERN: (CS.1-2) (H2/C2) At this time, the Savannah River Laboratory provides insufficient backup for performance of its nuclear criticality safety evaluations.

CONCERN: (CS.1-3) (H3/C1) The Savannah River Operations office is not maintaining the required nuclear criticality safety appraisal schedule.

CONCERN: (CS.1-4) (H2/C2) The basic Savannah River Laboratory nuclear criticality safety document (DPST-68-108) does not receive sufficient independent review.

CONCERN (CS.3-1) (H1/C1) The method of arriving at the administrative mass limit has not been analyzed and documented to confirm safety of its application to Savannah River Laboratory processes as required by DOE 5480.5.

CONCERN: (CS.4-1) (H2/C2) There are inconsistencies in the mass limit posting forms and their use.

CONCERN: (CS.5-1) (H2/C2) Evacuation drills are not being conducted on schedule.

CONCERN (CS.5-2) (H2/C2) Nuclear incident monitor procedures do not satisfy requirements of DOE 5480.5.

4.5.3.10 Security/Safety Interface

CONCERN: (SS.3-1) (H2/C1) The consequence associated with the use of weapons, vehicles and other protective force equipment in Savannah River Laboratory facilities has not been analyzed as required by DOE 5480.16.

CONCERN: (SS.4-1) (H2/C1) Sampling results are inadequate to demonstrate that security inspectors are not being overexposed to lead during small arms practice and qualification.

4.5.3.12 Site/Facility Safety Review

CONCERN: (FR.4-1) (H2/C1) Annual operating reviews of Savannah River Laboratory facilities are not being performed as required by DOE 5480.5.

CONCERN: (FR.5-1) (H3/C1) A triennial review system meeting the requirements of DOE 5482.1B has not been established at the Savannah River Site.

CONCERN: (FR.6-1) (H2/C2) A documented sitewide system to communicate operating experiences, internal and external to the Savannah River Site, does not exist.

4.5.3.13 Radiological Protection

CONCERN: (RP.1-1) (H2/C2) Individual responsibilities within Environmental and Health Protection Department are not clearly defined.

CONCERN: (RP.1-2) (H2/C1) Radiation Work Permits or Standing Radiation Work Permits are not used even though required by Westinghouse Savannah River Company procedures and accepted industry standards.

CONCERN: (RP.3-1) (H2/C1) Westinghouse Savannah River Company is not in compliance with their internal radiation source control procedures and DOE 5480.11.

CONCERN: (RP.3-2) (H2/C2) Westinghouse Savannah River Company is not in compliance with ANSI N54.2 for determining radioactive source integrity.

CONCERN: (RP.3-3) (H2/C2) There is no procedure to assure the proper conduct of the surveillance program for the Cobalt-60 source at the Bldg. 774-A Irradiation Facility.

CONCERN: (RP.5-1) (H3/C2) External dosimetry accreditation could be lost due to shortage of qualified staff.

CONCERN: (RP.5-2) (H2/C2) The proper use of personnel dosimeters is not in compliance with requirements of DOE 5480.11 and Westinghouse Savannah River Company procedures.

CONCERN: (RP.8-1) (H2/C2) There is an inadequate supply of portable instruments to assure daily operations are in compliance with DOE 5480.11.

CONCERN: (RP.8-2) (H2/C1) Radiological survey instrumentation is not being calibrated and checked in accordance with DOE 5480.11 and other accepted industry standards.

CONCERN: (RP.9-1) (H2/C1) The low flow air monitoring system neither complies with DOE 5480.11 nor is calibrated in accordance with accepted industry standards.

CONCERN: (RP.10-1) (H1/C1) (CAT II) The combination of miscellaneous excess plutonium, deteriorated glovebox gloves, storage of excess combustibles, and inadequate fire protection in the SED Facility results in a high potential for the spread of plutonium contamination to surrounding areas and their occupants.

CONCERN: (RP.10-2) (H2/C2) Contaminated areas are not being decontaminated in a timely manner.

CONCERN: (RP.10-3) (H2/C1) The radiological controls placed on the access or egress from the Radiologically Controlled Areas at the Technical Area of the Savannah River Laboratory are not in compliance with DOE 5480.11.

CONCERN: (RP.11-1) (H2/C2) Staff housed in offices within the F-Wing of Bldg. 773-A are unnecessarily exposed to radiation.

4.5.3.14 Personnel Protection

CONCERN: (PP.2-1) (H2/C2) Work Clearance Permits are not required to be reviewed by safety-related disciplines.

CONCERN: (PP.5-1) (H1/C1) The Savannah River Site respiratory protection program is not in compliance with DOE 5480.4.

CONCERN: (PP.6-1) (H2/C3) There is no documented program to correct Occupational Safety and Health Administration violations at the Savannah River Laboratory.

4.5.3.15 Fire Protection

CONCERN: (FP.1-1) (H2/C1) The fire protection program at the Savannah River Laboratory does not meet the requirement of DOE 5480.7.

CONCERN: (FP.2-1) (H2/C1) Savannah River Laboratory facilities are not in compliance with NFPA 101.

CONCERN: (FP.5-1) (H2/C1) Savannah River Laboratory had not provided assurance that fire losses will not exceed the guidelines of DOE 5480.7.

CONCERN: (FP.6-1) (H1/C1) Pending action by the Savannah River Operations Office on the Fire Department self-appraisal, the Fire Department training, equipment, medical examinations, and physical fitness do not conform to NFPA 1500 requirements.

CONCERN: (FP.6-2) (H2/C2) There was inadequate response to the TNX Facility for an emergency fire situation.

CONCERN: (FP.6-3) (H2/C2) Response by Savannah River Laboratory during a fire emergency was inadequate.

4.5.3.16 Aviation Safety

CONCERN: (AS.1-1) (H2/C1) The implementation and control of the safety programs for the helicopter support service is not sufficient and does not comply with DOE 5480.13 and FAA requirements.

CONCERN: (AS.2-1) (H2/C1) Adequate weather forecasting facilities are not being provided to perform the aviation mission in accordance with DOE 5480.13 and FAA regulations.

CONCERN: (AS.2-2) (H2/C2) Dissimilar flight instrument equipment could lead to operator error during a high-stress situation.

CONCERN: (AS.4-1) (H2/C1) Refueling operations and procedures do not comply with DOE 5480.13 and OSHA 29 CFR 1910.

CONCERN: (AS.5-1) (H2/C1) A fully detailed procedures manual, as required by 14 CFR 135, has not been developed and implemented for use by Wackenhut Services, Inc., Helicopter Support Section maintenance personnel.

4.5.3.17 Medical Services

CONCERN: (MS.1-1) (H2/C1) The Construction Medical Department building and staffing do not meet the requirements specified in DOE 5480.8.

CONCERN: (MS.5-1) (H2/C1) A health education program does not exist as required by DOE 5480.8.

CONCERN: (MS.6-1) (H2/C1) There is no fully implemented Fitness for Duty Program at the Savannah River Site that meets the requirements of DOE 5480.8.

4.5.3.18 Packaging and Transportation

CONCERN: (PT.1-1) (H3/C1) Hazardous Materials Section line function activities conflict with their Quality Assurance responsibilities required by DOE 5700.6B.

CONCERN: (PT.1-2) (H3/C2) The flow of information between the Savannah River Operations Office and Westinghouse Savannah River Company and within Westinghouse Savannah River Company is not adequate.

CONCERN: (PT.1-3) (H3/C2) DOE 1540.2 has not been implemented by the Savannah River Operations Office.

CONCERN: (PT.1-4) (H3/C1) The Savannah River Site is not in compliance with the Shipment Mobility and Accountability Collection requirements of DOE 1540.1.

CONCERN: (PT.2-1) (H2/C1) The Westinghouse Savannah River Company training program for qualification of packaging and transportation personnel does not meet all the requirements of DOE 5480.3 (49 CFR), DOE 5480.1B, and DOE 5480.5.

CONCERN: (PT.3-1) (H3/C1) The Savannah River Site Quality Assurance and Internal Self-Appraisal Programs do not meet all the requirements of DOE 5700.6B, DOE 5480.3, and DOE 5482.1B.

CONCERN: (PT.3-2) (H3/C1) Westinghouse Savannah River Company safety oversight of packaging and transportation activities does not meet all the requirements of DOE 5480.1 and DOE 5482.1B.

CONCERN: (PT.3-3) (H3/C1) The Westinghouse Savannah River Company Quality Assurance Program for Packaging and Transportation does not meet all the requirements of DOE 5700.6B, DOE 5480.3 and DOE 5610.1.

CONCERN: (PT.4-1) (H3/C1) DOE 5480.3 is in conflict with 10 CFR 71.

CONCERN: (PT.5-1) (H1/C2) Preparation for response to offsite transportation incidents involving a Department of Energy cargo, or a radioactive materials cargo, does not meet the intent of Westinghouse Savannah River Company DPSOP 287.

CONCERN: (PT.6-1) (H2/C1) The Savannah River Site Spill Prevention, Control and Countermeasures Program does not meet all of the requirements of DOE 5480.1 and DOE 5480.4 (40 CFR 112).

CONCERN: (PT.8-1) (H2/C1) The handling, storage and intrasite movements of hazardous materials do not meet all of the health and safety requirements of DOE 5480.1B.

CONCERN: (PT.9-1) (H3/C2) Westinghouse Savannah River Company does not have adequate procedures to ensure proper closure of drums.

4.5.3.19 Emergency Preparedness (Sitewide)

CONCERN: (EP.1-1) (H1/C2) Management of operational emergencies is variable and often weak.

CONCERN: (EP.1-2) (H2/C2) Savannah River Site liaison with local emergency assistance agencies has been neglected.

CONCERN: (EP.2-1) (H2/C2) Timely evacuation of multiple areas is not assured.

CONCERN: (EP.3-1) (H2/C2) Changes may be made in emergency equipment, software and hardware without informing the users.

CONCERN: (EP.4-1) (H1/C2) There is no program of small scale drills within facilities to assure rapid response to emergencies.

CONCERN: (EP.5-1) (H2/C2) Sitewide alarms are not standardized.

CONCERN: (EP.5-2) (H1/C1) (CAT II) The Technical Support Center has significant violations of the Life Safety Code and most portions have neither fire detection nor suppression.

CONCERN: (EP.7-1) (H2/C1) Personnel accountability is not assured as required by DOE 5500.3.

4.9 TEAM COMPOSITION AND AREAS OF RESPONSIBILITY

4.9.1 WASTE MANAGEMENT FACILITIES

Area of Responsibility	Name/Organization
Senior EH Manager	James P. Knight Office of Safety Appraisals Department of Energy
Team Leader	Braj K. Singh Office of Safety Appraisals Department of Energy
Assistant Team Leaders	Scott E. Harlow Office of Safety Compliance Department of Energy
	Richard J. Serbu (Part-time) Office of Safety Appraisals Department of Energy
Organization and Administration Facility Safety Review	Roger W. Griebe Organizational Analysis Corp.
Quality Verification	Rex N. Lutz ARINC Research Corp.
Operations	Robert W. Powell Private Consultant
Maintenance	Harry W. Heiselmann SCIENTECH, Inc.
Training and Certification	Nels C. Jensen EG&G Idaho, Inc.
Auxiliary Systems	Thomas L. Van Witbeck TOMA Enterprises
Emergency Preparedness Security/Safety Interface	Mark I. Good COMEX Corp.
Technical Support	Glenn A. Whan Private Consultant
Radiological Protection	Steve R. Velen M.H. Chew & Associates, Inc.
Personnel Protection	Ronald E. Alexander Environmental Management Associates

Area of Responsibility	Name/Organization
Fire Protection	Steven D. Jansen Allied Signal Inc. Kansas City Division
Report Support and Liaisons	
Appraisal Specialists	Mary Meadows Office of Safety Appraisals Department of Energy
	Fran Kimball Office of Safety Appraisals Department of Energy
Assistant Appraisal Coordinator in Training	Donna Nottingham Office of Savannah River Restart Department of Energy
Technical Editor	Denise K. Grimsman SCIENTECH, Inc.
SR Liaison	Anthony L. Watkins Savannah River Operations Office Department of Energy
EM Program Liaison	Sondra Ordway Office of Waste Operations Department of Energy

4.9.2 TRITIUM FACILITIES

Area of Responsibility	Name/Organization
EH Senior Manager	Robert Barber Acting Deputy Assistant Secretary for Safety, Health and Quality Assurance Department of Energy
Team Leader	Owen Thompson Office of Safety Appraisals Department of Energy
Assistant Team Leader	Steve Singal Office of Safety Appraisals Department of Energy
Organization and Administration Facility Safety Review	David Schweller DBS Associates
Quality Verification	Leonard Lojek Office of Quality Programs Department of Energy
Operations	Paul Lamberger EG&G - Mound Plant
Maintenance	George Morris Lawrence Livermore National Laboratory
Training and Certification	Bobby Picker EG&G Idaho, Inc.
Auxiliary Systems	William Wall Sandia National Laboratory
Emergency Preparedness Security/Safety Interface	Carl Corbit Pacific Northwest Laboratories
Technical Support	Roland Jalbert Private Consultant
Radiological Protection	Jerome Martin Pacific Northwest Laboratories
Personnel Protection	Douglas Serpa Private Consultant
Fire Protection	James Shurick Private Consultant

Report Support and Liaisons

Appraisal Specialists	Mary Meadows Office of Safety Appraisals Department of Energy
	Patricia Davidson Office of Safety Appraisals Department of Energy
Assistant Appraisal Coordinator in Training	Heidi Coblentz Office of Savannah River Restart Department of Energy
Technical Editor	Larry Warren Private Consultant
SR Liaison	W. Bruce Wilson, Chief Weapons Branch Savannah River Operations Office

4.9.3 SAVANNAH RIVER LABORATORY AND RADIATION SAFETY, MEDICAL SERVICES, PACKAGING AND TRANSPORTATION, AND EMERGENCY PREPAREDNESS

Area of Responsibility	Name/Organization
EH Senior Manager	Lewis G. Hullman Director Office of Quality Programs
Team Leader	Blake P. Brown Office of Safety Appraisals Department of Energy
Assistant Team Leaders	James C. Snell (Part-time) Office of Safety Appraisals Department of Energy
	Scott E. Harlow (Part-time) Office of Safety Compliance Department of Energy
Organization and Administration Facility Safety Review	Bernard R. Kokenge EG&G/Private Consultant
Quality Verification Technical Support	Robert A. Babione ARINC Research Corp.
Operations	James A. Buckham Private Consultant
Maintenance	William G. Jacobs Reynolds Electrical & Engineering Co., Inc.
Training and Certification	Timothy Bardell Battelle-Pacific Northwest Laboratory
Auxiliary Systems	Joseph A. Leary TRU Engineering Co., Inc.
Emergency Preparedness Security/Safety Interface	Linda F. Munson Evergreen Innovations, Inc.
Nuclear Criticality Safety	O. Clinton Kolar Private Consultant
Experimental Activities	Blake P. Brown Office of Safety Appraisals Department of Energy

Area of Responsibility	Name/Organization
Radiological Protection	Wilbert G. Zurliene General Dynamics Services Co.
	Leo G. Faust Battelle-Pacific Northwest Laboratory
Personnel Protection	Jerome E. Dummer, Jr. M.H. Chew & Associates, Inc.
Fire Protection	Kirk R. Russell Rockwell, INEL

Sitewide Responsibility	Name/Organization
Aviation Safety	William Wallace Office of Safety Appraisals Department of Energy
Medical Services	Paul B. Mossman, M.D. Private Consultant
Packaging and Transportation	John M. Cece Menehune Marine Services
	Glenn A. Whan (Part-time) Private Consultant
Emergency Preparedness (Sitewide)	Linda F. Munson Evergreen Innovations, Inc.

Report Support and Liaisons	
Appraisal Specialist	Mary Meadows Office of Safety Appraisals Department of Energy
Appraisal Coordinators	Lydia Reyes WINCO
	Stephanie West WMCO
Technical Editor	Larry D. Warren Private Consultant

Report Support and Liaisons

Liaisons with Team	Donna H. Jackson Savannah River Operations Office Department of Energy Don Scott Savannah River Operations Office Department of Energy

5.0 OCCUPATIONAL SAFETY AND HEALTH

5.1 INTRODUCTION

In private industry, the health and safety of workers is protected, in part, by periodic workplace inspections by the Department of Labor's Occupational Safety and Health Administration (OSHA). Under the 1970 Act that established OSHA, most DOE facilities are exempted from OSHA inspections. That Act, however, requires DOE to enforce all standards comparable to or more severe than OSHA regulations at its facilities. OSHA regulations fill several volumes of the Code of Federal Regulations and contain standards and requirements for health and safety at workplaces that range from the most traditional forms of manual labor to the most modern technological skills. Included are such topics as electrical safety, construction safety, hazard identification and communication, and control of equipment during maintenance to prevent inadvertent operation.

5.2 PURPOSE

The purpose of an OSHA-type inspection in this assessment was to assist the Department of Energy (DOE) in the evaluation of contractor responsibilities for occupational safety and health at the Savannah River Site (SRS). OSHA had not made previous inspections of SRS, or most other DOE contractor operated facilities, because a 1974 interagency agreement under the Occupational Safety and Health Act provides for DOE oversight of its facilities which are covered by the Atomic Energy Act.

DOE recognizes its responsibilities under the Occupational Safety and Health Act of 1970 to maintain a safe and healthful workplace free from recognized hazards capable of causing serious physical harm or death to employees using good standards. For example, DOE 5483.1A states that contractors of government-owned contractor-operated (GOCO) DOE facilities shall comply with all applicable OSHA standards.

DOE has contracted with OCCUSAFE, INC. to conduct OSHA-type inspections similar to those carried out by OSHA at three DOE facilities in 1990. The purpose of this inspection was to perform a compliance-type evaluation of SRS. The OCCUSAFE report is provided in Appendix D.

5.3 MAJOR OCCUSAFE FINDINGS AND RECOMMENDATIONS

The OCCUSAFE inspection team reached the following conclusions concerning the industrial and construction safety and health programs:

5.3.1 Major Findings

1) The number of types of OSHA violations found during the survey are significant.

2) The respiratory protection program should be looked at closely by Westinghouse Savannah River Company (WSRC) management.

5.3.2 Recommendations

Based on the inspection, the following recommendations are given:

1) Establish a systematic safety, industrial hygiene and health physics potential hazards/evaluation on the SRS.
2) Initiate a respiratory protection breathing zone air sampling program that conducts representative breathing zone air samples for every type of job that requires respiratory protection.
3) Conduct a systematic breathing zone air sampling survey of operations identified in the systematic survey listed in (1) above.
4) Upgrade the Health Protection Inspector training and qualification if these individuals are to monitor work requiring respirators.
5) Assure that all respiratory protection is specific by industrial hygienists or health physicists in writing.
6) Provide additional training for safety inspectors, industrial hygienists and health physicists so they may perform routine OSHA-type safety and hygiene inspections.
7) Require yearly safety and health physics and industrial hygiene inspections that cover OSHA-type criteria.
8) Provide showers for all asbestos abatement projects that do not meet OSHA criteria for small scale jobs.
9) Initiate random microvacuum sampling for asbestos abatement projects to verify clean-up efficiency.
10) Provide Bechtel with adequate industrial hygiene resources.

5.4 TIGER TEAM ASSESSMENT CONCLUSIONS

OCCUSAFE conducted an intensive two week inspection of a small fraction of the work areas at the SRS. Emphasis was placed on assessing workplace compliance with the safety and hygiene requirements of OSHA, requirements that have been adopted by DOE. Over 250 violations were noted, many of which were corrected quickly by the contractors without apparently incurring significant costs.

Several program deficiencies were identified, and recommendations made for improvement. Significant among the OCCUSAFE findings were important deficiencies in asbestos control, respiratory protection device control, hearing conservation, hazard communication, the number and training of contractor safety personnel, hazard recognition and abatement, and the reporting of incidents and injuries. The findings indicate that many of the most common safety requirements are not fully implemented by DOE, the contractors, workers and their immediate supervisors. These deficiencies manifest themselves in workplace hazards that often go unidentified and uncorrected, except after an appraisal or an incident. Many of the findings also reflect deficiencies in discipline of operations and concern with safety at the worker and supervisory levels. WSRC has also identified many similar deficiencies in worker safety in their self-assessments and has proposed initiatives to address them. These initiatives should be supplemented by training in hazards recognition and abatement and a strong program of workplace monitoring.

Further, there is evidence of a move at SRS toward compliance with OSHA worker safety requirements. When workers, their supervisors, and DOE are fully trained and able to recognize and correct many of the noted common deficiencies in a timely manner, the goal of an improved worker safety program will become a reality at SRS.

6.0 MANAGEMENT ASSESSMENT

6.1 PURPOSE

The Management and Organization Subteam conducted an assessment of management practices; environment, safety, and health (ES&H) and quality assurance programs; and non-reactor operations at the Savannah River Site (SRS). The objectives of this assessment were to (1) evaluate the adequacy of DOE Savannah River Operations Office (DOE-SR) and Westinghouse Savannah River Company (WSRC) ES&H programs; (2) compare current WSRC nuclear material processing operations with commercial nuclear industry standards and good practices; (3) evaluate the effectiveness of WSRC self-assessment and performance improvement initiatives; and (4) identify probable root causes for ES&H findings and concerns.

6.2 SCOPE AND APPROACH

The scope of the management assessment included site-wide WSRC management practices and non-reactor operations at SRS. Reactor operations were excluded as directed by the DOE Headquarters Office of the Assistant Secretary for Environment, Safety, and Health. The scope included activities and operations performed by DOE-SR and WSRC. The contractual interfaces between WSRC and other prime contractors including Wackenhut Services, Incorporated (Security Services), University of Georgia (Ecology Laboratory), University of South Carolina (Archeology), U.S. Forest Service (Land Management), and U.S. Army Corps of Engineers (Construction Management), were also evaluated.

The assessment was conducted in accordance with the Tiger Team Guidance Manual (February 1990). The performance objectives used by the Management Subteam were based on the Performance Objectives and Criteria for "Technical Safety Appraisals at DOE Facilities and Sites", dated January, 1990. These objectives were modified as necessary to fully assess the management practices at SRS.

The Management Subteam identified a range of topics for review, including the following:

- Cultural change expectations
- Self-assessments
- Performance improvement initiatives
- Conduct of operations
- Performance measurement and feedback mechanisms
- Award fee process
- NQA-1 program
- Incident reporting, tracking, and trend analysis
- Communications, including lessons learned
- Facility startup criteria and authorities

- DOE-SR and WSRC organizations and capabilities, including structure, staffing, and training
- WSRC corporate oversight and support
- Resource needs and allocations
- SRS prime contractor interfaces
- ES&H policy and priorities.

In conducting this review, Management Subteam members attended briefings and site-wide committee meetings, observed the performance of actual operations, toured non-reactor and reactor facilities, held interviews with appropriate contractor and DOE staff, and examined documentation. Management Subteam members attended daily debriefings with the Tiger Team Leader and other Subteam leaders. Where appropriate, members of the Management Subteam accompanied members of other Subteams in making observations of operations and conducting interviews. At the conclusion of all Subteam reviews, the Management Subteam performed a root cause analysis of all findings and concerns.

6.3 MANAGEMENT ASSESSMENT SUMMARY

The Management Subteam conducted a review of site-wide management practices and Conduct of Operations in nuclear material processing facilities to assess the adequacy of DOE and WSRC ES&H programs at SRS. The three Safety and Health (S&H) Subteam reports, and the Environmental Subteam report were also reviewed to identify any additional issues that had site-wide implications requiring management attention.

The Management Subteam identified 13 findings which are listed in Table 6-1. These findings are classified as either "Best Management Practice Findings" (M-BMPF) or "Compliance Findings" (M-CF). None of the 13 findings was significant enough to cause an interruption of any SRS activities. Six findings relate to Best Management Practices and seven involve Compliance. Many of the findings were previously identified in DOE-SR and WSRC self-assessments, and corrective actions are in various stages of development and implementation.

The Management Subteam assessment of these findings resulted in the following summary conclusions:

- WSRC senior managers are strongly committed to excellence in SRS operations as demonstrated by the number and quality of critical self-assessments and performance improvement plans.

- The lack of detailed implementation strategies incorporating near-term goals, priorities, and performance indicators has led to differences in award fee and

performance improvement expectations between DOE-SR and WSRC.

- The effectiveness of WSRC management oversight is diminished by the lack of an effective quality assurance program that provides independent evaluations of operations and management control systems.

- WSRC organizational and individual accountability for ES&H activities is being adversely affected by the absence of a complete set of clearly defined authorities, responsibilities, and interfaces between organizational elements.

- DOE-SR has reorganized to provide improved oversight of SRS operations and is actively recruiting new personnel with commercial and Naval nuclear backgrounds; however, understaffing and the lack of technical training are contributing to inconsistent technical interactions and insufficient oversight of SRS operations.

- WSRC managers, supervisors, and operators express a strong desire to improve Conduct of Operations; but performance deficiencies continue in areas such as procedural adherence and control of testing, maintenance, and operations.

- WSRC does not effectively use tracking, trending, "lessons learned", or root cause analysis systems to identify and correct deficiencies in a proactive manner.

- More timely and aggressive action is required at the facility level to implement INPO guidelines and industry "good practices".

The Management Subteam grouped the 13 findings into three categories: (1) Management and Oversight of ES&H Activities; (2) Performance Improvement Initiatives; and (3) Conduct of Operations. Detailed assessments for each of these three categories are found in Sections 6.4.1, 6.4.2, and 6.4.3. These detailed assessments contain conclusions based upon the Management Subteam's analysis of all Subteam findings and concerns and other information gained during the Tiger Team compliance assessment. The intent of the conclusions is to provide balanced perspectives of activities reviewed by the Management Subteam.

The root cause analysis of all Subteams findings and concerns identified five probable root causes and two contributing causes. The five probable root causes are:

1. DOE-SR and WSRC are not effectively communicating management expectations, responsibilities, authorities, and accountabilities across and within organizations.

2. DOE-SR and WSRC management are not obtaining enough accurate information reflecting actual performance and status to determine all the actions necessary to meet commitments and expectations.

3. DOE-SR and WSRC are not providing sufficient training to their personnel in specific expectations, supervisory management skills, and management policies, programs, and procedures.

4. DOE-SR and WSRC have not agreed upon an implementation strategy incorporating near-term goals, priorities, and feedback mechanisms for performance improvement initiatives.

5. WSRC quality assurance organizations are not adequately proactive or effective in providing independent oversight.

The two contributing causes are:

1. WSRC management does not always implement steps to ensure high standards are demanded and maintained. Where these standards are not being met, management does not always take on-the-spot effective corrective actions in order to promote their expectations.

2. WSRC management is not requiring effective system and process reviews for determining SRS risk/hazard assessments for facilities, personnel and equipment.

Three noteworthy practices were identified. Two are associated with WSRC computer programs: Performance Criteria and Evaluation System (PCES) for radiation safety criteria and Compliance Matrix Program (COMAX) for facility design criteria. The third noteworthy practice is WSRC's incident reporting system (Site Item Reportability and Issue Management - SIRIM).

No special issues were identified.

TABLE 6-1
MANAGEMENT ASSESSMENT FINDINGS

MANAGEMENT AND OVERSIGHT OF ES&H ACTIVITIES

M-BMPF-1 The ES&H responsibilities and interfaces of SRS prime contractors have not been defined by DOE-SR.

M-BMPF-2 The substantial number of tracking systems utilized by DOE-SR and WSRC to provide ES&H and quality assurance corrective action status do not always provide meaningful, current, accurate, or consolidated information for senior management oversight.

M-CF-3 WSRC's controlled document system for policies, requirements, drawings, and procedures is not adequately implemented nor are all documents protected against loss of information from adverse events.

M-CF-4 The DOE-SR staff is not providing a sufficient level of ES&H oversight for SRS operations.

M-CF-5 NQA-1 requirements are not being consistently and effectively implemented by WSRC.

M-CF-6 The system for communicating internal and external operating experiences to the WSRC non-reactor organizations does not reflect a proactive "lessons learned" program.

M-CF-7 Deficiencies and weaknesses exist in the SRS non-reactor emergency preparedness program that could degrade effective responses to site or facility emergencies. The current emergency preparedness program is not in compliance with DOE orders.

M-CF-8 The authority and criteria for startup of key SRS facilities have not been finalized among DP, EM, DOE-SR and WSRC.

PERFORMANCE IMPROVEMENT INITIATIVES

M-BMPF-9 WSRC has not developed implementation strategies incorporating near-term goals, priorities, and feedback mechanisms for many performance improvement initiatives.

CONDUCT OF OPERATIONS

M-CF-10 The implementation of Conduct of Operations at the working level does not meet the current Institute of Nuclear Power Operation (INPO) standards.

M-BMPF-11 The continuing existence of known deficiencies in operations indicates inadequate identification of root causes and tracking and closure of corrective actions by WSRC.

M-BMPF-12 Procedure adherence deficiencies, identified in previous assessments of NMPD, continue to be a major area of weakness. In addition, WSRC managers do not fully understand the extent of these continuing deficiencies.

M-BMPF-13 The current level and quality of WSRC's operations monitoring effort do not provide management an accurate understanding of progress in day-to-day operations.

6.4 MANAGEMENT ASSESSMENT FINDINGS

6.4.1 Management and Oversight of ES&H Activities

6.4.1.1 Overview

WSRC assumed the Management and Operating contract for SRS in April 1989. Since that time, WSRC and DOE-SR have undergone major organizational changes.

Under Du Pont administration of SRS, there were three separate operating organizational entities: Operations, SRL, and Construction. Each organizational entity had a separate mission, and operated under different procedures. The interpretation of ES&H requirements and setting priorities also varied among these entities. The Construction and some of the administrative and business support organizational elements were not located at SRS; and upon contract termination, these elements remained with Du Pont.

The principal organizational change made by WSRC was the establishment of an integrated and self-sufficient organizational structure at the SRS. This involved the re-creation of the construction, business, and support elements at contract transfer; the establishment of new line operating organizations; and the establishment of new organizational elements to provide independent and integrated ES&H oversight.

DOE-SR organizational changes were approved by DOE-HQ in January 1990. The primary reason for the reorganization was to separate the Environmental Restoration and Waste Management Programs from the production responsibilities which were all in the same organizational entity. This reorganization provided alignment of DOE-SR Waste Management and Environmental Program management with DOE-HQ and strengthened line management oversight capabilities for implementation of DOE ES&H criteria.

The Management Subteam review of these organizational changes resulted in eight Management Findings and the following conclusions:

- The new WSRC organization and structure, while still evolving, should facilitate the implementation of ES&H policies and DOE requirements.

- WSRC has established a hierarchial set of policies and procedures common to all organizations, including Bechtel's responsibility for construction; however, the implementation of standardized procedures in the operating units needs to be accelerated.

- WSRC organizational and individual accountability for ES&H activities is being adversely affected by the absence of a complete set of clearly defined authorities, responsibilities, and interfaces between organizational elements.

- WSRC does not effectively use tracking, trending, "lessons learned", or root cause analysis systems to identify and correct deficiencies in a proactive manner.

- The effectiveness of WSRC management oversight is diminished by the lack of an effective quality assurance program that provides independent evaluation of operations and management control systems.

- WSRC is not in compliance with many DOE ES&H Orders. Major areas of concern are the radiological health, quality assurance, training, emergency preparedness, and maintenance programs.

- DOE-SR has reorganized to provide improved oversight of SRS operations and is actively recruiting new personnel with commercial and Naval nuclear backgrounds; however, understaffing and the lack of technical training are contributing to inconsistent technical interactions and insufficient day-to-day surveillance of SRS operations.

6.4.1.2 Findings

ASSESSMENT FINDING NUMBER: M-BMPF-1

ASSESSMENT FINDING TITLE: Organizational Interfaces

PERFORMANCE OBJECTIVE:

Employees and contractors understand the safety significance, impact, and level of cooperation with interfacing organizations necessary for the safe performance of activities at the site.

FINDING:

The ES&H responsibilities and interfaces of SRS prime contractors have not been defined by DOE-SR.

DISCUSSION:

DOE-SR has not adequately documented WSRC responsibilities and interfaces with the other SRS prime contractors regarding site-wide ES&H planning, self-assessment, and self-improvement initiatives. Prime contractors at SRS include Wackenhut Service Inc. (Security Service), University of Georgia (Ecology Laboratory), University of South Carolina (Archeology), U.S. Army Corps of Engineers (Construction Management) and the U.S. Forest Service (Land Management).

A recently issued Protocol between DOE-SR, WSRC, and the U.S. Army Corps of Engineers defined interfaces between the parties. However, there continue to be problems associated with effective implementation of the Protocol.

As another example, compliance problems exist with EPA and South Carolina Hazardous Waste Management regulations. Permitting of hazardous waste management activities at SRS is under one set of permits and one EPA Identification Number (i.e., EPA treats SRS as a single entity for regulating generation, storage, treatment and disposal of hazardous materials). While WSRC has increased staff and proceduralized activities to meet permit obligations, DOE-SR has not adequately defined the roles and responsibilities of the other prime contractors in this area.

Specific interface areas requiring clarification and/or documentation include responsibilities for NPDES permits, the storage/disposal of hazardous waste, RCRA site closure plans, environmental restoration, emergency planning/preparedness, suppression of wildfires, and public deer hunts.

In addition, most of the existing Community Mutual Aid Agreements date back to the 1960s and do not reflect current conditions. These are in the process of being updated; however, interviews with the parties indicate that there is some confusion as to the roles and responsibilities of WSRC and DOE-SR.

ASSESSMENT FINDING NUMBER: M-BMPF-2

ASSESSMENT FINDING TITLE: Tracking Systems

PERFORMANCE OBJECTIVE:

Management systems are in place which provide to managers and supervisors at all levels timely, objective, and reliable indication of ES&H performance.

FINDING:

The substantial number of tracking systems utilized by DOE-SR and WSRC to provide ES&H and quality assurance corrective action status do not always provide meaningful, current, accurate, or consolidated information for senior management oversight.

DISCUSSION:

Over 25 DOE-SR and WSRC tracking systems and subsystems are used to track all types of commitments including ES&H and quality assurance requirements. The major tracking systems in use at SRS are the DOE-SR "Recommendations and Findings Tracking System (RAFTS)" and the WSRC "Commitment Management System (CMS)"; however, many other subsystems have been created by individual DOE-SR and WSRC organizations to meet specific needs. These systems vary in capability, are not uniformly accessible for management querying, and are not being effectively used by management for trending purposes.

In many cases the tracking systems are duplicative, do not always provide for appropriate management oversight, do not always contain meaningful status information, and are not always used to perform timely follow-up on outstanding commitments. The following examples illustrate these points:

1. SR Order 100X.2A describes RAFTS which is intended to be used for the tracking and verification of recommendations and findings which result from all types of evaluations of DOE-SR and SRS prime contractors. Under this order, the DOE-SR Personnel and Management Evaluation Division is responsible to: (1) provide the Manager, DOE-SR with monthly summary status reports on recommendations and findings, (2) provide the Manager, DOE-SR with a monthly report of all Priority A findings, and (3) perform verification of selected closed recommendations and findings to ensure adequate correction of the deficiency. These actions are not being performed. This indicates that the DOE-SR Manager is not being provided the

necessary status information to perform his management oversight responsibilities.

2. CMS is a computerized system that is required to be used for recording and tracking essentially all actions and commitments of WSRC. A review was conducted of the CMS report generated for the Environmental & Health Protection Department. This report showed over 22 items overdue from 35 to 152 days. Further research revealed that the WSRC Environmental & Health Protection Department was using a separate subsystem to track open action items and did not update the CMS Report. In reviewing the CMS report of February 25, 1990, eighteen entries were found, exclusive of reactor operations, that showed "days overdue" from 200 to 482 days which is indicative of the fact that CMS commitments are not being closed in a timely manner by management.

3. WSRC Facility Safety Evaluation Section (FSES) had recommended actions, resulting from their participation in the Separations Area Deliberate Operations phase during April 1989, that have yet to be implemented. FSES personnel stated they do not have a formal procedure or process that defines responsibility for the identification, tracking and resolution of findings. It was determined that recommended actions are not consistently tracked to closure. In short, FSES is not making use of CMS, or any other formal tracking system, to provide appropriate status information on outstanding commitments.

In order to improve the control and utility of tracking systems, action is underway by DOE-SR and WSRC to establish a single, site-wide tracking system that will encompass commitments in all functional areas.

ASSESSMENT FINDING NUMBER: M-CF-3

ASSESSMENT FINDING TITLE: Document Control

PERFORMANCE OBJECTIVE:

Communication, liaison, and coordination of written administrative and operating documents in the organization are timely and effective as a positive contribution to ES&H performance.

FINDING:

WSRC's controlled document system for policies, requirements, drawings, and procedures is not adequately implemented nor are all documents protected against loss of information from adverse events.

DISCUSSION:

The current WSRC document control program (DCP) procedures could provide control of the administrative and operating documents, if strictly adhered to by personnel. The proposed WSRC DCP revisions should enhance the program by making the procedures for each Program Management Team (PMT) identical in format, content and control. Nevertheless, there are deficiencies in the implementation of the current program.

The following are some examples of noted deficiencies:

1. Safety documents (Safety Analyses Reports, Operational Safety Requirements), as built drawings, and procedures are not always current and representative of facility status.

2. PMTs maintain the most current operating documents for their respective area. Storage facilities for the operating documents in these field areas are not in accordance with current requirements for protection from fire and natural disasters.

3. The Central Files facility maintains SRS site documents and fills requests for site documents. However, the organization is not required to ensure that replacement documents and documents sent to requestors are up to date.

4. The DCP procedures are not consistent among the various WSRC organizational elements. Guidance for writing procedures differ from PMT to PMT. Company level procedures have been prepared to establish requirements. However, these requirements have not been included in

all procedures for new facilities and all procedures under revision. For personnel who may work in multiple organizations, the proposed revisions, when implemented, should enhance their performance and more rapidly bring about change.

5. Ownership of the DCP is diverse and duplicative. Many subgroup coordinators exist within WSRC organizations. These coordinators are not responsible to the Information Services Section. The Information Services and Records Management personnel consider their function as primarily clerical and record keeping, not control.

6. Document Managers and Coordinators interviewed stated that comprehensive site-wide audits or appraisals to assure controlled documentation is in place have not been performed on the SRS DCS since contract turnover.

ASSESSMENT FINDING NUMBER: M-CF-4

ASSESSMENT FINDING TITLE: DOE-SR Management Oversight

PERFORMANCE OBJECTIVE:

The DOE-SR organization has well defined authorities and responsibilities; provides technically competent and trained staff; and supports the staff activities to ensure meeting appropriate DOE ES&H requirements and objectives.

FINDING:

The DOE-SR staff is not providing a sufficient level of ES&H oversight for SRS operations.

DISCUSSION:

DOE-SR has recently reorganized to provide improved surveillance and oversight of ES&H activities. The DOE-SR staff has been aggressively identifying training needs and recruiting new staff. The DOE-SR manager has assembled a team of competent and experienced assistant managers, several with past experience in the commercial and/or Naval nuclear areas, to assist in establishing a culture that will enhance compliance with ES&H requirements.

The DOE-SR Manager, Deputy Manager, and Assistant Manager for Facility Operations have been conducting weekly unannounced tours through WSRC facilities to observe and assess a variety of site activities including operating and maintenance activities, plant material conditions, and quality and use of procedures and log books. They also discuss operational conditions with the operators and their management staff and generally develop direct impressions of how activities are being conducted. Immediate feedback is given to facility managers upon completion of these tours.

Some DOE-SR managers have improved their oversight capability dramatically by locating their whole organization in the field at the site of the operation they are to oversee. This has produced positive results in providing significantly increased technical interaction and day-to-day surveillance of operations.

The DOE-SR has obtained support contractors to supplement the DOE-SR staff in their oversight activities. Eleven support service contracts are currently in place with the major support in the area of ES&H compliance, ES&H audit and surveillance

activities, environmental planning and surveillance, training and other general management oversight.

However, the following weaknesses were identified:

- Understaffing is contributing to the lack of sufficient oversight. Although DOE-SR has had some success in recruiting staff from commercial industry and other DOE sites, DOE-SR is not up to the authorized level of staffing and is not able to fulfill more than the minimum oversight responsibilities. Technical Engineers have not been assigned to some areas and adequate surveillance and oversight is not being provided in all areas. It was stated that adequate surveillance and oversight in these areas could not be accomplished until DOE-SR was properly staffed and "up to speed".

- Insufficient technical training is another contributor to oversight deficiencies. Last year the DOE-SR staff recognized the need for a comprehensive site-wide training program. This program calls for a DOE-SR commitment to provide 20% of staff time for training. Most division and branch managers do not feel this commitment achievable considering the current staffing level and work schedule. Training of existing DOE-SR staff is below the desirable level. Many do not have recent QA, specific industrial or radiological safety, environmental compliance, or other training to supplement their specific technical capabilities.

- It is not clear that DOE-SR divisions are coordinating their efforts in identifying essential, appropriate and quality training resources. Currently, each division has the responsibility for identification of training requirements for their staff. Some divisions are identifying off-site classes to attend, while others are evaluating training courses to bring to SRS.

ASSESSMENT FINDING NUMBER: M-CF-5

ASSESSMENT FINDING TITLE: Quality Implementation NQA-1

PERFORMANCE OBJECTIVE:

Administrative programs and controls should be in place to ensure policies concerning quality are administered for each facility throughout the site.

FINDING:

NQA-1 requirements are not being consistently and effectively implemented by WSRC.

DISCUSSION:

The following are the NQA-1 areas of concern:

- Application of witness and hold points
- Review of procurement documents
- Implementing procedure reviews
- Implementation of the Nonconformance Report (NCR) and Corrective Action Report (CAR)
- Design control
- Independent verification of critical steps
- Surveillance program implementation
- Independence of the Quality Organizations
- Control of Measuring and Test Equipment

Management Subteam members interviewed various QA Managers, and attended a Quality Assurance Coordination Committee (QACC) meeting. During these discussions the current implementing procedures, various tracking systems, NCR's, CAR's, procedure review and witness and hold point requirements were reviewed and specific examples discussed.

Little information is transferred across the quality groups to ensure "lessons learned" are implemented on a site-wide basis instead of a case-by-case basis. The overall implementation of NQA-1, as required by DOE 5700.6B, since 1981, was inconsistent from PMT to PMT. Although past attempts at implementation of issued NQA-1 programs have been less than effective, aggressive and uniform implementation of the new site-wide QA Manual should address the concerns noted above.

During the discussions on implementation of the individual quality assurance programs, it was found that no written guidance was available for the application of witness and hold points nor what procedures required review by the Quality Departments. Each PMT had a different level of interpretation as to what the criteria

was. One PMT reviewed all categories 1, 2, and 3 procedures and establishes witness and hold points. Another PMT relied on the group that writes the procedure to establish witness and hold points.

Although procurement document reviews are in the pilot stage in the Separations Area, there are still minimal procurement reviews in the other PMT's to ensure the correct level of documentation is requested and the correct class of component is being ordered for configuration control.

Responsibilities and authorities have not been clearly defined in the area of design control and maintaining configuration control. At the time of release, the new site QA Manual (Procedure Manual 1Q, effective 4/1/90) did not contain the section on Design Control.

The effective use of the NCR and CAR programs on a site-wide basis is affected by the decentralized quality organization. It was incorrectly stated by two QA Managers that NCR's can not be written across PMT's and the PMT is responsible for only the "Corrective Actions To Prevent Recurrence" within their PMT even if it has generic site-wide implications. An example occurred on an NCR in Separations. When the documentation for a vacuum test rig was found to be insufficient, the "Corrective Actions to Prevent Recurrence" was to not buy from that vendor again. A root cause, however, was that the purchase specification did not require drawings or parts lists to be provided. Further questioning indicated that there had been other NCR's of this nature, but they were not reviewed for commonality of cause. The sharing of NCR's and their associated "Corrective Actions to Prevent Recurrence" on a site-wide basis could eliminate repetitive problems from PMT to PMT.

The team reviewed surveillance schedules and finding and closure documentation of five PMTs. The level of program implementation was inconsistent. When the philosophy of surveillance findings was discussed with the QA surveillance/inspection managers in one PMT, the QA management had detailed findings, systems, assigned accountabilities, field and closure verifications. Another PMT QA manager stated that his organization does not want the reputation of causing delays in the operation. As a result, they are not as aggressive as other PMTs in finding problems. The lack of a surveillance strategy across the PMT's has led to an ineffective program in the majority of the areas that were assessed.

Many responses to QA surveillance findings were 30 to 120 days overdue. Management attention to resolve and close these overdue findings was not apparent.

ASSESSMENT FINDING NUMBER: M-CF-6

ASSESSMENT FINDING TITLE: Lessons Learned

PERFORMANCE OBJECTIVE:

Internal and external operating experiences should be evaluated, and appropriate actions should be undertaken to improve safety and reliability.

FINDING:

The system for communicating internal and external operating experiences to the WSRC non-reactor organizations does not reflect a proactive "lessons learned" program.

DISCUSSION:

WSRC has assigned the primary responsibility for a "lessons learned" program to the Facility Safety Evaluation Section (FSES) of ESH&QA. FSES is in the process of establishing a system similar to the one developed by the Reactor Safety Evaluation Section (RSES) of ESH&QA. The RSES has implemented a "lessons learned" program for reactor related events occurring within SRS and from external sources such as DOE, NRC, and INPO. This information is being provided to the Reactor Restart Division and is being used to improve safety and reliability.

Reactor type information is communicated to the non-reactor departments via departmental meetings, conversations and courtesy copy of various letters. This information is not compiled for evaluation, trending and/or applicability to specific operations. The lack of directed and formal exchange of action items could lead to recurring problems and slower implementation of Conduct of Operations.

Reactor incidents and previous investigative reports and corrective actions, though common and/or generic, were not well known outside the reactor areas. Personnel within the non-reactor groups are not fully aware of the corrective actions resulting from the P and K reactor events of a year ago nor are they knowledgeable of the recent heavy water spill and release incident of Feb. 7, 1990, at K reactor.

ASSESSMENT FINDING NUMBER: M-CF-7

ASSESSMENT FINDING TITLE: Emergency Preparedness

PERFORMANCE OBJECTIVE:

The emergency preparedness program should provide adequate plans, procedures, training, facilities and equipment to assure effective response to site and facility emergencies.

FINDING:

Deficiencies and weaknesses exist in the SRS non-reactor emergency preparedness program that could degrade effective responses to site or facility emergencies. The current emergency preparedness program is not in compliance with DOE orders.

DISCUSSION:

The SRS Emergency Preparedness Program is an area requiring special management attention. The need for major improvements in the SRS Emergency Preparedness Program was previously identified and documented in a DOE-SR compliance audit in January 1990. WSRC and DOE-SR personnel have stated that the goal of the Emergency Preparedness program is to meet or exceed commercial nuclear industry standards. A new site Emergency Plan is in review and implementation of this plan should correct many of the deficiencies in area plans and procedures.

The three S&H Subteams conducted assessments of facility emergency preparedness, including witnessing of emergency exercises in each facility (one being a site-wide exercise). In addition, the Management Subteam was involved in an inadvertent evacuation alarm in M-Area. The ability to protect the health and safety of the public was demonstrated during the site-wide exercise. However, at the area and facility level, numerous deficiencies and program weaknesses were identified. The concerns and observations from these assessments reflect general weaknesses as follows:

- There was a lack of qualified emergency planning personnel, a lack of coordination of various functions and inadequate independent/management review and oversight as required by DOE orders.

- Many site and area emergency plans and implementing procedures are out of date, provide conflicting information and do not address major elements required by DOE orders.

- Management plans do not adequately cover emergency preparedness training requirements. Initial and continuing

training is either not provided for, or is not provided at the level and frequency required by procedures. Required drills and exercises have not been performed. The generally poor performances noted in the exercises conducted during this assessment and the unplanned M-Area evacuation observed by the Management Subteam reflect the need for effective, periodic drills and exercises in all facilities.

- All three S&H Subteams reported problems with telephone and radio communications during the planned exercises, and communication problems were noted during the unplanned evacuation witnessed by the Management Subteam. There are no dedicated telephone lines or radio channels for emergency use. Malfunctions in normal telephone service and routine radio traffic adversely affected the drill responses. Public address announcements for evacuation and all clear during the unplanned evacuation of M-Area were not in accordance with procedures, and the Area and Facility Coordinators were out of communication for a period of time during the Waste Management exercise due to personnel error.

- During the three facility exercises, problems were identified with a lack of first aid materials, health protection equipment and clothing, stretchers, and other equipment that might be needed by operators or emergency responders (tools, flashlights, survey maps, etc.). An ambulance was unable to respond due to a dead battery.

A number of these deficiencies were recurrences and were documented during previous assessments. Many of the weaknesses noted above could be corrected at the facility level with implementation of existing policies, plans and resources. Although the new site-wide emergency plan will provide upper tier direction, management must provide the direction, resources and oversight to assure that Emergency Plans and DOE Order requirements are aggressively and thoroughly implemented at the facility level.

ASSESSMENT FINDING NUMBER: M-CF-8

ASSESSMENT FINDING TITLE: Facility Startup Authority

PERFORMANCE OBJECTIVE:

Clear guidelines are in place defining authority and criteria for startup of facilities.

FINDING:

The authority and criteria for startup of key SRS facilities have not been finalized among DP, EM, DOE-SR and WSRC.

DISCUSSION:

SRS has several key facilities preparing for startup in the near term as noted below:

Facility	Shutdown	Est.Startup
F Canyon	11/89	3/90
FB Line	12/89	4/90
H Canyon	11/89	5/90
HB Line	2/88	6/90
Saltstone	New	6/90
Tank Farm Evaporator-1H	11/88	7/90
DWPF	New	9/90
PuFF	1984	10/91

DOE-SR and WSRC have started developing the criteria and authorities required for startup of these facilities. However, there is a lack of understanding within some elements of DOE-SR and WSRC as to which facilities require special startup criteria and authorization. Further, this effort will require that DP, EM, DOE-SR, and WSRC reach early agreement on acceptable startup criteria to ensure that facilities begin operations in an environmentally sound and safe manner. In developing the criteria and authorities, WSRC and DOE-SR must take into consideration the requirements of SEN-16-90 and be aware of the importance of completing this task expeditiously to meet the planned startup schedules.

6.4.2 Performance Improvement Initiatives

6.4.2.1 Overview

The Savannah River Site (SRS) is in the early stages of sweeping cultural changes in management approaches and site operations. Westinghouse Savannah River Company (WSRC) senior managers are strongly committed to developing an environment at SRS where the culture is oriented towards (a) satisfying the customer's expectations, (b) complying with both the letter and spirit of DOE directives, and (c) achieving excellence in all aspects of site operations.

Evidence of WSRC responsiveness to DOE requirements and expectations is reflected in efforts to achieve compliance with DOE directives. WSRC is currently assessing the level of compliance with Secretary of Energy Notices, applicable DOE Orders, and referenced industry standards. WSRC is also rapidly developing and implementing a hierarchical structure of management systems, policies, and procedures to achieve compliance with DOE requirements.

The strong commitment to achieving excellence in SRS programs is demonstrated by both the number and quality of critical self-assessments and performance improvement initiatives. One key improvement initiative is the effort to establish a Total Quality culture for all WSRC activities. The WSRC Total Quality Program is based on the concept of continuous improvement and is being implemented through annual Quality Improvement Plans. Another important improvement initiative is the commitment to implement Institute of Nuclear Power Operation (INPO) guidelines in WSRC non-reactor as well as reactor facilities. The INPO guidelines will be used to establish standards of excellence in conduct of operations, maintenance, and training.

Some key performance improvement plans that have been developed include the following: the Reactor Operations Management Plan (ROMP), Reactor Safety Improvement Program (RSIP), NMPD Performance Improvement Plan (PIP), SRS Waste Minimization Plan, and Radiological Improvements Program.

The Management Subteam review of these initiatives resulted in one finding and the following conclusions:

- WSRC senior managers are strongly committed to achieving excellence in SRS operations.
- Mid-level managers, supervisors, and operators express a strong desire to improve operations; however, many of these individuals lack the requisite knowledge in Conduct of Operations.

- WSRC self-assessments have been critical and comprehensive. Combined with the extensive number of external reviews, these self-assessments form a sound basis for performance improvement plans.

- The NMPD PIP provides a comprehensive top-down approach for implementing INPO guidelines in nuclear material processing operations and clearly defines long-range expectations; however, detailed implementation strategies have not been fully developed.

- WSRC needs to accelerate performance improvement initiatives to meet DOE expectations. Four main actions are required:

  (1) DOE-SR and WSRC need to reach agreement on realistic near-term expectations.

  (2) WSRC needs to develop detailed implementation strategies, near-term goals, and meaningful performance indicators.

  (3) Senior WSRC management expectations need to be effectively communicated through mid-level managers to line supervisors and operators.

  (4) Sufficient training must be provided to DOE-SR and WSRC managers, supervisors, and operators to develop the required knowledge base in INPO guidelines and practices.

ASSESSMENT FINDING NUMBER: M-BMPF-9

ASSESSMENT FINDING TITLE: Expectations - Performance Improvement Initiatives

PERFORMANCE OBJECTIVE:

Communication, liaison, and coordination between groups and individuals in the organization are timely and effective as a positive contribution to ES&H performance.

FINDING:

WSRC has not developed implementation strategies incorporating near-term goals, priorities, and feedback mechanisms for many performance improvement initiatives.

DISCUSSION:

WSRC senior managers are strongly committed to achieving excellence in SRS operations and have initiated numerous self-assessments and performance improvement plans over the past year.

Implementation strategies for the reactor restart program have been clearly defined, and there is agreement between DOE and WSRC on both near-term and long-range expectations. The same level of understanding and agreement has not been achieved for many of the other performance improvement initiatives as noted below.

A number of new company-level policies, management systems, and procedures are being developed to establish a hierarchical WSRC management control structure for site-wide activities. Priorities, near-term goals, and feedback mechanisms have not been clearly defined or communicated for many of these evolving programs. As a result, some DOE-SR individuals interviewed believe that WSRC is moving too slowly in achieving compliance with DOE directives while others believe that the rate of change may in fact be too fast. Although improvements in many programs are evident, the scope of activities to be completed is placing considerable pressure on the entire WSRC management structure.

An NMPD PIP has been developed to provide a comprehensive top-down approach for implementing INPO guidelines and good practices in nuclear materials processing operations. This plan clearly defines long-range expectations; however, detailed implementation strategies, near-term goals, and meaningful performance indicators have not been fully developed or communicated to the appropriate operating levels. Senior WSRC managers clearly state their expectations for fundamental changes in operating philosophies, but actual operations do not always reflect this commitment. Selected operating practices are receiving emphasis, but operating deficiencies continue in many areas. WSRC will need to accelerate

performance improvements in all operating practices to meet DOE expectations.

The failure to reach agreement on near-term expectations and meaningful performance indicators is being reflected in the Cost-Plus-Award-Fee (CPAF) process. Disagreements between DOE-SR and WSRC over performance evaluations surfaced during the first award fee period (April 1 - September 30, 1989) under the current contract. Several difficulties relating to the development of award fee objectives, criteria, and performance indicators are also being experienced for the current award fee period (October 1, 1989 - March 31, 1990).

Positive steps are being taken by DOE-SR and WSRC to correct deficiencies in the award fee process. For example, the monthly Performance Evaluation Committee (PEC) meetings between DOE-SR and WSRC are now being attended by the appropriate DOE-SR Assistant Managers. Further, the DOE-SR Manager, his key staff, and WSRC senior management have begun meeting monthly to ensure that the DOE-SR expectations are understood.

6.4.3 Conduct of Operations

6.4.3.1 Overview

WSRC has committed to implementing INPO guidelines and good practices for the Conduct of Operations in non-reactor facilities. The INPO guidelines are intended to provide facilities with specific guidance in achieving a high level of performance in plant operations.

In addition to the Subteam reports that address conduct of operations in specific PMTs, the Management Subteam performed a separate limited review of activities related to operating the facilities in the NMPD. Team members observed field activities, interviewed personnel and examined documents related to a number of elements of INPO "Guidelines for the Conduct of Operations at Nuclear Power Stations" (INPO 85-017, Revision 1). This review, by personnel experienced in commercial nuclear plant operations, was conducted to determine the progress made in implementing the INPO guidelines and to establish a baseline of current operational activities in several key subject areas.

Implementation of INPO guidelines at SRS is a very extensive, long term effort which affects all areas of operations, policies, procedures, personnel, facilities and equipment. Much of this effort, which began in April 1989, is still in the early stages of implementation. It must be recognized that the commercial nuclear industry took many years to develop the programs and policies targeted at achieving excellence and many commercial facilities still have not achieved all of these standards. During the review no attempt was made to address each of the many aspects of Conduct of Operations for every facility at SRS (INPO guidelines include 115 separate elements in 18 areas).

From April through July 1989, the Separations Area facilities conducted a controlled operational and self-assessment effort called Deliberate Operations. This Deliberate Operation phase resulted in general enhancement of operating activities and identified deficiencies in several areas, especially procedure adherence and use. At the conclusion of the Deliberate Operations phase, activities continued under various interim operating plans. However, it does not appear that adequate corrective actions have been taken in the interim or that continued improvements in operating practices have been aggressively pursued.

Although WSRC Management Policy 4.6, Nuclear Facility Safety, was issued on April 1, 1989, only two of 23 implementing division level procedures have reached a draft stage and none has been approved and issued. Management has not established the scope of affected procedures in the various program areas or schedules for procedure preparation, review and revision. The recently

initiated PIP provides a comprehensive assessment of resources, establishes priorities and provides tracking systems for measuring progress. However, the details of how this is to be accomplished have not been determined.

The Management Subteam noted improvements and performance reflecting industry standards in the areas of professional behavior of control room personnel, personal safety consciousness, and shift turnover. Some of these activities have been implemented in pilot programs; and performance improvements will be enhanced if the intended assignment of shift advisors from the commercial nuclear industry is implemented. Discrepancies or concerns were identified in the areas of resetting of protective devices, radio and telephone communications, staffing levels, on-shift training, tagouts, independent verification, procedure adequacy and adherence, operator aid program, and equipment labeling.

The Management Subteam identified four findings and the following conclusions were drawn in the area of Conduct of Operations:

- More timely and aggressive action is required at the facility level to implement INPO guidelines and industry "good practices." Additional changes will be required as WSRC upper level documents are issued and experience gained. It appears that improvements in operating level procedures and activities are being delayed in some areas until upper level procedures are issued.

- Operating level knowledge and familiarity with INPO guidelines and commercial nuclear practices need to be elevated. Although there is an awareness of the need for improvements in operating practices and personnel talk of INPO guidelines, it does not appear that the operating level staff and supervision have any direct experience or input from the commercial nuclear industry. Providing this experience or input using outside resources could expedite the implementation process and help to avoid the possibility of "reinventing the wheel" in many areas.

- Procedure use and adherence require formality and discipline. Although instructions for procedure use have been issued and supervisors state that personnel know what is required, the facts indicate that workers still do not fully understand the importance and concepts of verbatim procedural compliance.

ASSESSMENT FINDING NUMBER: M-CF-10

ASSESSMENT FINDING TITLE: Control Of Plant Activities

PERFORMANCE OBJECTIVE:

Operations organization and administration should ensure effective implementation and control of operations activities.

FINDING:

The implementation of Conduct of Operations at the working level does not meet the current INPO standards.

DISCUSSION:

Improvements have been made in areas such as log-keeping and housekeeping; however, performance in important areas such as control of testing, configuration control, and work control remain well below current INPO standards.

The specific areas found to be below INPO standards were procedural compliance, equipment labeling, work order control, interlock bypass logs, human factors, lockout and tag program, and configuration control.

The team identified several deficiencies in the adequacy and implementation of INPO guidelines for the Conduct of Operations. Following are two examples:

a) A direct replacement of a close coupled pump and motor in H-Area in January 1990 resulted in an event where 480 volts arced to ground in the motor control center (MCC). The following poor work control practices were apparent from the issued management report: (1) the Electrical and Instrument (E & I) mechanic failed to identify that the motor was wired for 220 volts when he connected the motor to the 480 volt lines, (2) the mechanic failed to manually rotate the pump shaft prior to installation (which would have identified the manufacturers' lockdown for shipment); and, (3) after the fuses blew the first time the mechanic failed to note that 30 amp fuses are excessive for a 2 HP motor and that the overload heaters had been damaged due to the overcurrent conditions. In summary, when a significant failure occurred during pump restart, the mechanics and operators failed to adequately assess the conditions and troubleshoot the problem in a formal manner.

b) Interlock Bypass logs, which control the installation and removal of electrical jumpers, in the Defense Waste Processing Facility (DWPF) "S" Area are not being controlled in accordance with DPSOL HOST-S-5001A or standard good practices. A sequential numbering system is not in use and cross-outs are made without initials and dates. The duration of interlock bypass often exceeds that listed on the installation form. In addition, some removal record sheets remain in the logbook without the required installation documentation.

ASSESSMENT FINDING NUMBER: M-BMPF-11

ASSESSMENT FINDING TITLE: Corrective Actions

PERFORMANCE OBJECTIVE:

Operational activities should be conducted in a manner that achieves safe and reliable operation.

FINDING:

The continuing existence of known deficiencies in operations indicates inadequate identification of root causes and tracking and closure of corrective actions by WSRC.

DISCUSSION:

Proper awareness of required actions to identify and correct deficiencies efficiently was not demonstrated. "Lessons learned" recommended actions and resolutions are often not formally documented, tracked, or closed. Procedures are not in place to detail the responsibilities or requirements for corrective action activities.

The following are some examples of weaknesses noted:

a) Although events and incidents are being addressed by the Issues Management System, the implementation in some cases fails to achieve the program's intent. For example, an otherwise thorough event report (WM-IM-90-12) generated in response to a 480 volt arc to ground in a motor control center (MCC) failed to address several key potential root causes of the event. The programmatic impact block of the event report was marked "none". Corrective action was limited to "educational contacts to emphasize appropriate hookup and testing of motors". The investigation failed to determine why the replacement motor was incorrectly wired, how the previous "identical" motor had been successfully installed and tested, why 30 amp fuses versus 10 amp fuses were installed, or whether the maintenance work instructions provided were adequate.

b) A review of a false FB-Line Nuclear Incident Monitor (NIM) alarm in May 1989 indicated that weaknesses existed in procedures, documentation, formal debriefing and immediate evacuation actions. Over six months later, during the occurrence of a building evacuation as

a result of a false alarm in M-Area, the same problems were evident.

c) In June 1989, during a NIM alarm evacuation drill in M-area, it was identified that the procedures for emergency responses (facility and area) were inadequate, that evacuations were not proper and the Facility Emergency Coordinator (FEC) resources were inadequate. These same issues were apparent during the February 22, 1990 unplanned evacuation in M-Area.

d) The Facility Safety Evaluation Section (FSES) has recommended actions, resulting from their participation in the Separations Area Deliberate Operations phase during April 1989, that have yet to be implemented. FSES does not have a procedure or documented process that defines responsibility for assessments or the identification, tracking and resolution of findings. Further, other than "Stop Work", the authority of the FSES is not defined and there are no requirements for responding to FSES recommendations or findings. FSES recommended actions are not consistently tracked to closure.

ASSESSMENT FINDING NUMBER: M-BMPF-12

ASSESSMENT FINDING TITLE: Procedural Adherence

PERFORMANCE OBJECTIVE:

Approved written procedures, procedure policies and data sheets should provide effective guidance for normal and abnormal operation of each facility on a site.

FINDING:

Procedure adherence deficiencies, identified in previous assessments of NMPD, continue to be a major area of weakness. In addition, WSRC managers do not fully understand the extent of these continuing deficiencies.

DISCUSSION:

Although progress has been made, especially during the period of Deliberate Operations a year ago, procedural adherence weaknesses continue to exist. An aggressive program is not in place to identify these issues, as they occur, and ensure timely resolution of their root cause.

Several cases of noncompliance or use of out-of-date procedures were noted by the Management Subteam. Two examples were:

a) An inadvertent NIM alarm and a building evacuation were caused by the improper execution of a maintenance procedure during February 1990. The steps of the procedure, if followed, provide for completion of the maintenance without the actuation of an alarm. A review of the completed procedure reveals several other inconsistencies that are not in keeping with current standards for procedural adherence - The Area Emergency Coordinator was not notified as required by the procedure, unauthorized changes were made to the procedure, and other sign-off irregularities existed.

b) A procedure required the notation of "Unusual Conditions." The testing could not be conducted as specified in the procedure because of missing wiring in a connection block and because of an incomplete electrical circuit in another portion of the system. These conditions were not noted in the section "Unusual Conditions."

Two primary reports that management uses to monitor procedure adherence are PMT supervisor and technical staff procedure audits. PMT supervisory procedure compliance monitoring audits are being used in a manner that does not effectively measure procedure non-compliance. Specifically, each "audit" is simply an after-the-fact check for completed paperwork, e.g., omitted data or obvious documentation errors. Compliance figures are based not on what percent of procedures reviewed had errors in their execution, but rather on what percent of the total steps in the procedure had some administrative deficiency. The resulting procedure compliance figures can distort the true extent of procedure adherence problems.

PMT technical audits were observed to be more thorough and detailed, but, again, the reporting focus is more on documentation than performance. For example, one report documented that 4 of 13 procedures required to be completed on one shift could not be located indicating that procedures may not have been used, as required, during the evolution the previous day. However, these missing procedures were not counted as non-compliance steps, a Non-Conformance Report (or other such document) was not submitted, and further corrective action was not documented. Non-compliance such as an operator omitting a step or not taking required data are categorized as "low significance" in audit reports.

ASSESSMENT FINDING NUMBER: M-BMPF-13

ASSESSMENT FINDING TITLE: Monitoring of Operational Activities

PERFORMANCE OBJECTIVE:

Management and supervisory personnel should monitor and assess facility activities to improve performance in all aspects of the operation.

FINDING:

The current level and quality of WSRC's operations monitoring efforts do not provide management an accurate understanding of progress in day-to-day operations.

DISCUSSION:

WSRC has implemented a "Green Eyes" program that provides a monthly review of field activities by a team of about three individuals. The results of this effort are reported to senior managers during a monthly meeting. This program is a worthwhile initiative; however, several actions could be taken to strengthen the program. The following weaknesses were observed during a Policy Review Committee Meeting at which the results of a "Green Eyes" inspection were presented to senior WSRC managers:

a) The individuals are utilized for the field observations on a one-time basis and are not trained to maximize their capabilities. The results of their efforts are limited and focus on symptoms rather than root causes.
b) The field activities are limited to about one day each month, which presents only a limited view of current status.
c) The presentations to senior managers stimulated limited discussion on root causes.

WSRC department and facility manager tours were initiated after the Separations Area Deliberate Operation phase in April 1989 and have been incorporated into the NMPD/PIP with issuance of a division level procedure. Guidance issued to Separations managers listed 10 areas for monitoring: seven areas related to conduct of operations as well as housekeeping, industrial safety, and material condition. Management tours were to monitor important plant functions and activities and be based on the importance of equipment and activities. A review of 12 management tour reports issued between August 1989 and January 1990 indicated the overwhelming emphasis had been placed on material condition and housekeeping, not conduct of operations. Corrective actions

appeared to be limited to fixing individual discrepancies without any review for root causes or programmatic concerns.

NMPD Organization and Administration Procedure OP1.06, Management Overview Program, was issued February 5, 1990. WSRC management must assure that appropriate personnel receive sufficient training and all of the goals for monitoring activities important to safety are achieved.

6.5 NOTEWORTHY PRACTICES

6.5.1 Projects Compliance Matrix (COMAX) Computer Program

WSRC Systems Engineering Group developed a computerized Compliance Matrix (COMAX) Program for ensuring project compliance with the requirements of DOE 4700, 6430, and selected 5480 series orders.

The Compliance Matrix (COMAX) program is a personal-computer-based system of selected DOE Orders to aid designers and engineers with criteria. COMAX has applications for many personnel at DOE sites. The user-friendly system is structured on a data base of criteria compiled from DOE 4700, 6430, and selected 5480 series orders. Worklists for reviews can be created without the time it takes to perform an exhaustive literature search for criteria. Based on a given set of conditions provided by the user, COMAX will search for criteria and print them out. COMAX utilizes off-the-shelf, readily available personal computer software. However, familiarity with the related criteria is essential.

This program has increased productivity and assures a greater degree of compliance to DOE Orders and Standards for the WSRC Engineering Section. The COMAX Program has been in use for evaluation over the past year. However, this program is not yet validated.

6.5.2 Noteworthy Practice Performance Criteria and Evaluation System (PCES)

The Performance Criteria and Evaluation System (PCES) is a personal-computer-based system of radiation safety criteria. PCES has applications for radiation safety personnel at DOE sites. The user-friendly system is structured on a data base of radiation safety criteria compiled from DOE Order, mandatory standards, nonmandatory standards, and good practice documents that are applicable to reactor and nonreactor nuclear facilities.

Worklists for reviews, appraisals, and surveillance can be created and modified efficiently without the time it takes to perform an exhaustive literature search for criteria. Based on a given set of conditions provided by the user, PCES will rapidly search for criteria and print them out in a matrix format. Familiarity with the radiation safety criteria is essential.

In addition to containing a data base of criteria, PCES allows users the option to add questions and notes (lines of inquiry) to guide them in field interviews and observing objective evidence.

Responses and findings can also be entered by the user for each criterion evaluated.

PCES is designed to be user friendly and has a two volume manual for operation. Volume 1, the User's Guide, gives step-by-step instructions for running the program. Volume 2 is the reference manual which contains appendices on the contents of the data base and how the records are categorized and sorted.

The PCES is a validated program and has a disciplined configuration control program in place. The PCES program was recently presented at the DOE Health and Safety Conference at Washington D.C. where it was favorably received. DOE has also initiated efforts with the National Energy Software Center (NESC) to turn the PCES program over to them for control and distribution.

6.5.3 Issue and Incident Reporting - Site Item Reportability and Issue Management System

WSRC has developed an issue management (incident reporting) system called SIRIM (Site Item Reportability and Issue Management System). It consists of a set of procedures specifying what to do should an ES&H or security issue or incident occur: who to notify, steps to take in investigating and evaluating the incident, reporting instructions, and the tracking mechanism through closure. Included in the system are instructions for reporting Unusual Occurrences (UORs). As noted in WSRC's self assessment, site-wide procedures for SIRIM have been written and approved. Training and implementation of SIRIM at the lower WSRC levels is in process.

From discussions with DP-6 personnel in DOE Headquarters, it was determined that SIRIM is the first incident reporting system within DOE that combines all the elements noted above into one comprehensive set of procedures. In fact, by letter of November 13, 1989, the DOE Acting Principal Deputy Assistant Secretary for Defense Programs announced that SIRIM would be used as a DOE incident reporting pilot program, first to gain experience with the system, and "later as the basis for modifying DOE Orders for reporting requirements." He pointed out that it was one step in implementing SEN-11-89, "Setting the New DOE Course."

6.6 PROBABLE ROOT CAUSES

An analysis of the concerns, findings, and supporting discussions in all Subteam Reports was performed by the Management Subteam to identify the basic or root causes. Root causes are defined as: (a) those items which if corrected could prevent occurrence or recurrence of the situations and conditions that were found, and (b) those specific/systemic factors that could cause or create conditions that may be less than adequate or could result in accidents or incidents.

The approach utilized was based on Systems Safety Development Center (SSDC) MORT-Based Root Cause Analysis materials and additional materials from other DOE complexes, including SRS. The process utilized proven techniques such as Barrier Analysis, Change Analysis, and Causal Factors methodology to provide a disciplined and consistent focus. Thirty-three criteria were used to check each piece of data.

The root cause analysis was performed by a cadre of experts with management and technical backgrounds. The personnel performing the analysis had extensive and diverse experience with the government and civilian sectors, nuclear operations and management principles.

An independent SSDC review was performed on the Probable Root Causes. The SSDC representative reviewed the team's thirty-three root cause analysis criteria and the root cause approach and results. It was determined that the team's approach and determination of the Probable Root Causes were appropriate and identified the problems with the SRS management systems.

The general process involved:

1. Examining all Subteams concerns and related findings and evaluating the concern against a list of thirty-three criteria. A concern could fit more than one of the criteria.

2. Evaluating the resulting data base and establishing related groupings of information. The same finding may fit into one or more groups.

3. Analyzing the groups to identify "Typical and/or Important" groups.

4. Analyzing "Typical and/or Important" groups to define Probable or Causal Factors.

5. Analyzing the Probable or Causal factors to identify if these were a Root Cause themselves or, in combination with each other, formed a common Root Cause.

The Management Subteam analysis resulted in the identification of five root causes and two contributing causes. These results are presented in this section.

6.6.1 Probable Root Causes

1. DOE-SR and WSRC are not effectively communicating management expectations, responsibilities, authorities, and accountabilities across and within organizations.

For an organization or an individual to function effectively they must know what their mission, authorities, and responsibilities are and have interfaces clearly defined. Management can hold organizational elements and individuals accountable when responsibilities and authorities have been defined and the requisite knowledge base has been provided.

All Subteams found deficiencies in several areas, including: (a) lack of approved job descriptions, (b) lack of organizational manuals and/or contractual requirements that describe mission, responsibility, authority, and interface requirements among and within groups, (c) less than adequate independent safety review and quality assurance programs, (d) ineffective communications of expectations and, (e) inadequate training.

These deficiencies were caused by a lack of understanding of what was expected, inconsistencies between organizations, lack of independent ES&H review, repetitive abnormal event occurrences, and management unfamiliarity with the status of activities.

2. DOE-SR and WSRC management are not obtaining enough accurate information reflecting actual performance and status to determine all the actions necessary to meet commitments and expectations.

For management to effectively control activities, management must establish performance standards consistent with planning objectives, compare actual performance against these standards, measure and assess the significance of deviations from expected performance, and take actions to correct existing and developing deviations.

All Subteams indicated that DOE-SR and WSRC management is not obtaining an accurate picture of actual performance. This includes: (a) repeated abnormal event occurrences, (b) misperceptions on the part of WSRC senior and mid-level managers of the degree of procedural compliance, (c) ineffective tracking systems, (d) deficiencies in trending activities, and (e) an ineffective "Lessons Learned" program.

3. DOE-SR and WSRC are not providing sufficient training to their personnel in specific expectations, supervisory management skills, and management policies, programs, and procedures.

Management's responsibility for organizing activities includes providing competent and qualified personnel to perform the organizational tasks. Specific skills are acquired through experience and a comprehensive training program. Courses developed using a systematic approach to training are necessary in the nuclear industry. Further, courses addressing performance based training and training for supervisors in management skills should be included. Training is particularly important for WSRC since substantial behavioral modifications are needed due to the rapidly changing policies, procedures and expectations that are in progress.

All of the Subteams indicated deficiencies in various aspects of training requiring vigorous management attention for corrective action.

4. DOE-SR and WSRC have not agreed upon an implementation strategy incorporating near-term goals, priorities, and feedback mechanisms for performance improvement initiatives.

One of management's primary roles is to effectively plan the accomplishment of activities. This includes defining the current situation, establishing goals and priorities, identifying aids and barriers to goal accomplishment, and developing implementation plans to reach the goals.

Through the various assessments, WSRC has determined the current baseline status of the ES&H program, and has developed numerous plans that, when implemented, should accomplish the stated goals. However, WSRC has not established near term goals, assessed the barriers to goal accomplishment, or prioritized the plans and tasks. Further, management information systems that provide status on commitments and deficiencies were not accurate and did not present trending information representative of site-wide happenings and activities.

5. WSRC Quality Assurance organizations are not adequately proactive or effective in providing independent oversight of SRS operations.

One of management's primary control mechanisms is the independent oversight provided by the Quality Assurance (QA) organization. QA is also a vital link in supplementing management's feedback system and providing accurate tracking and trending of organizational activities.

All of the Subteams reported several areas of noncompliance with NQA-1 requirements. Deficiencies include a lack of independence, trending, calibration programs, and document control deficiencies. Taken collectively there appears to be an absence of understanding or distinction between Quality Control and Quality Assurance. These deficiencies must be addressed and management must provide support for a proactive QA function to implement the necessary changes.

6.6.2 Contributing Causes

Although not a root cause in themselves, these additional causal factors were identified to be of enough significance to highlight as contributing causes.

1. Management does not always implement steps to ensure high standards are demanded and maintained. Where these standards are not being met, management does not always take on-the-spot effective corrective actions in order to promote their expectations.

Management's ability to successfully achieve its mission and goals is a function of past practices, degree of behavioral change needed, employee's understanding of management's expectations, and perception of fair and equitable treatment. WSRC is in the process of making major improvements in all of these areas.

All the Subteams indicated that Conduct of Operations, handling of overdue corrective actions, out-of-date SARs and OSRs, the number of material deficiencies, and training areas needed greater management attention and rigor to assure that improvements are achieved. Inconsistent treatment of requirements, procedures, and programs and/or the perception that this is a "phase" or "exercise" can undermine the "ownership" of goals and objectives.

The concepts of verbatim procedural compliance are not understood by many personnel within WSRC and become less understood the deeper one goes into the organization.

2. WSRC Management is not requiring effective system and process reviews for determining SRS risk/hazard assessments for facilities, personnel and equipment.

For Management, the risk/hazard analysis process is fundamental to effectually process technical information for making operating decisions that are germane to the health and safety of the public and the SRS workforce. The current WRSC management system does not provide for adequate independent reviews and approvals. The current system allows risks to be assumed at lower levels of management, often the PMT level or lower. Assumed risks must be made at the appropriate level of management, based on applicable technical data. All Subteams identified deficiencies in the hazard analysis system as well as numerous areas where risk assessments and or safety reviews were not performed or required. The net effect of these deficiencies is the delegation of responsibility for risk acceptance without independent oversite review.

APPENDIX A

Assessment Personnel and Biographical Sketches

APPENDIX A-1

Biographical Sketches of
Compliance Assessment Team Leader
and Team Leader Staff
Savannah River Site

NAME: K. Dean Helms

AREA OF RESP: Tiger Team Leader

ASSOCIATION: U. S. Department of Energy
Oak Ridge Operations Office
CEBAF Site Manager

EXPERIENCE: 23 years

- U. S. Department of Energy
  - Site Manager, Continuous Electron Beam Accelerator Facility (CEBAF); a nuclear physics research laboratory under construction
  - Chief of Staff and Executive Assistant to the Under Secretary of Energy. Served as principal assistant to the Under Secretary, the Department's Chief Operating Officer
  - Deputy Director of Administration, responsible for development and implementation of Department-wide management systems and administrative services
  - Director of Organization and Management Systems - responsible for development and implementation of many Department-wide management information and control systems
  - Staff positions in organization, management analysis, and personnel at Savannah River Operations and Albuquerque Operations Offices

EDUCATION: B.A., Duke University
Graduate Studies, University of North Carolina at Chapel Hill

NAME: Gordon W. Dean

AREA OF RESP: Special Assistant - Tiger Team Leader

ASSOCIATION: U. S. Department of Energy
San Francisco Operations Office
Assistant Manager, Energy Programs

EXPERIENCE: 27 years

- U. S. Department of Energy Programs/Projects
  - Assistant Manager, Energy Programs
  - Director, Nuclear Energy Programs Division
  - Director, Magnetic Fusion Test Facility Project Office
  - Director, Engineering and Property Management Division
  - Acting Director, Bartlesville Energy Technology Center
  - Director, Fossil Energy Programs Division
- U. S. Department of Interior, Bureau of Mines
  - Director, San Francisco Energy Technology Center
- U. S. Department of Commerce, NOAA
  - Assistant Director, Marine Minerals Technology Center

EDUCATION: B.S., Engineering, University of California, Berkeley, CA
M.S., Engineering, University of California, Berkeley, CA
Graduate Studies: University of California, Los Angeles; George Washington University, Washington, DC

NAME: Mary Meadows

AREA OF RESP: Tiger Team Administrator

ASSOCIATION: U. S. Department of Energy Headquarters
Office of Safety Appraisals

EXPERIENCE:

- U. S. Department of Energy
  - Appraisal Specialist, Office of Safety Appraisals. Participant in planning and conducting all Tiger Team Compliance Assessments, Technical Safety Appraisals, Management Appraisals, Nuclear Safety Program Appraisals, Design Reviews, and Comprehensive Appraisals
  - Staff Assistant, Office of Environmental Compliance and Overview
  - Staff Assistant, Office of Bio-Medical and Environmental Research USAEC, ERDA
  - Staff Assistant, Office of the Commissioner, USAEC
  - Administrative Assistant, Office of the Assistant General Manager for Research and Development, USAEC
- Other Related Experience
  - Administrative and conference planning positions within the USAEC, ERDA, and DOE

EDUCATION: Numerous work-related courses and workshops at various colleges and training centers.

OTHER: Member of U.S. Delegation to Disarmament Conference, Geneva, Switzerland, USAEC
Recipient of Federal Government Awards for superior performance

NAME: Monica L. Salazar

AREA OF RESP: Special Assistant - Tiger Team Leader

ASSOCIATION: U. S. Department of Energy

EXPERIENCE:

- U. S. Department of Energy
  - Currently in the Management Intern Development Program (MIDP) assigned to Nevada Operations Office
- Nevada Operations Office (NVO)
  - Assigned to Special Projects related to the Nuclear Weapons Testing Program
- DOE - Headquarters, Office of Fossil Energy
  - Assigned to Office of Petroleum Reserves with projects related to Naval Petroleum Reserves and Strategic Petroleum Reserves which included horizontal wells, deep testing, remedial programs and research and development projects
- San Francisco Operations Office (SAN)
  - Assigned to Environment, Safety and Quality Assurance Division, Nuclear Facilities Safety Branch
  - Member of Source Evaluation Board for the Liquid Metal Reactor Program
  - Assisted in the SAN Emergency Preparedness Program
  - Participant in Compass Rose (1988) Emergency Exercise

EDUCATION: B.S., Petroleum Engineering, New Mexico Institute of Mining & Technology
Graduate Work: University of California, Hayward; University of California, Los Angeles

OTHER: Faculty Member, National Institute for Professional Development
Member, Society of Petroleum Engineers
Member, American Management Association

APPENDIX A-2

Biographical Sketches of Team Members
Tiger Team Compliance Assessment
Environmental Subteam
Savannah River Site

Name:	Vincent Fayne
Association:	U.S. Department of Energy, Office of Environmental Audit
Experience:	12 Years
1988-Present	Manager of the Environmental Survey Sampling and Analysis Program. Responsible for survey-related sampling and analysis (S&A) and implementation of EPA's Contract Laboratory Program requirements to the S&A Program.
1986-1988	Environmental Survey Team Leader; Responsible for surveys of Feed Materials Production Center, Hanford and Savannah River Sites, Pinellas Plant, Sandia National Laboratories-Albuquerque, Lawrence Berkeley Laboratory, Stanford Linear Accelerator Center, and Laboratory of Energy-Related Health Research.
1984-1986	Environmental engineer for Oak Ridge Operations Office. Conducted regulatory compliance audits; reviewed environmental permit applications; interacted with DOE contractors and Federal, state, and local regulatory agencies on environmental issues.
1980-1984	Environmental engineer on Clinch River Breeder Reactor Plant Project. Assisted in U.S. Nuclear Regulatory Commission (NCR) licensing activities, participated in environmental, safety, and construction design reviews; and responsible for the acquisition of non-NRC permits and other regulatory interactions with Federal, state, and local agencies.
1978-1980	Health and safety engineer at INEL. Responsible for providing industrial hygiene services for one-sixth of INEL. Participated in health and safety design reviews of various construction projects related to nuclear facilities, high-temperature and pressure laboratories, and hot cell operations. Developed and implemented initial laser safety training program.
Education:	B.S., Environmental Health/Civil Engineering, Northwestern University, 1978
Assigned Area:	Environmental Subteam Leader

Name:	Susan Barisas
Association:	Argonne National Laboratory
Experience:	14 years
1985-Present	Provided technical assistance to U.S. DOE in the development and execution of environmental survey and audit programs. Principal responsibilities include: conducting environmental surveys at eight major DOE operating facilities; evaluation of audit and appraisal procedures used by DOE and private industry; and development of guidance manuals to be used by DOE facilities and field organizations.
1978-1985	Worked on various projects related to hazardous waste and materials management. Specific responsibilities include: development of hazardous waste and materials management plans; evaluation of applicability of treatment and disposal options for synthetic fuels facilities; evaluation of technologies for the treatment and disposal of PCB waste; and assessment of the environmental impacts of different energy scenarios.
1975-1978	Developed task force reports on Water for Energy Production. Water for Commercial and Recreational Navigation, and Water Quality for a State Comprehensive Water Plan. Aided in the development of a public participation program.
Education:	M.S., Water Resources/Agricultural Engineering, Iowa State University, 1975 B.A., Biology, Grinnell College, 1973
Assigned Area:	Technical Coordinator

Name:	Richard A. Barringer
Association:	JAYCOR/Oak Ridge National Laboratory (ORNL)
Experience:	5 Years
1989-Present	Participant in Tiger Team environmental assessment at Pinellas Plant.
1989	Prepared Environmental Impact Statement (ESI) for the U.S. Forest Service (Eldorado and Stanislaus National Forests) for Mokelumne River Wild and Scenic designation.
1988-1989	Prepared Environmental Impact Statement (EIS) detailing the environmental consequences of vegetation treatment in 13 Western States, for the Bureau of Land Management (BLM).
1988-1989	Evaluated contractor-prepared Defense Facilities Decommissioning Program and FUSRAP RI/FS work plan documents for compliance with the National Environmental Policy Act (NEPA) and EPA guidelines, and technical accuracy for DOE.
1988-1989	Reviewed and evaluated NRC policy guidance documents concerning ground-water protection standards and alternate concentration limit application procedures for active/inactive uranium mill tailing sites for the DOE.
1987-1988	Prepared EPA Uncontrolled Hazardous Waste Site Ranking System environmental evaluations of DOD installations for the EPA in support of nominations to the NPL.
1987-1988	Assisted in the development and technical review of the revised version of Guidance Criteria for Identifying Areas of Vulnerable Hydrogeology for the EPA Office of Solid Waste.
Education:	USDA Graduate School, National Environmental Policy Course, 1989. M.S., Geological Sciences, Old Dominion University, 1987. B.S., Geological Sciences, Old Dominion University, 1982.
Assigned Area:	National Environmental Policy Act (NEPA)

Name:	James D. Berger
Association:	Oak Ridge Associated Universities, Oak Ridge, TN
Experience:	30 years
1980-Present	Director, Environmental Survey and Site Assessment Program. Direct a staff of 65 in providing technical assistance to DOE, NRC, EPA, DOD, and other federal and contractor organizations on issues of radiation safety and environmental protection. Conduct independent radiological surveys of decommissioning facilities and assessments of ES&H programs. Personally participated in many program evaluations, including DOE Environmental Surveys at Savannah River Site and Sandia National Laboratories.
1967-1980	Safety Officer, Oak Ridge Associated Universities, Responsible for assuring compliance with all areas of ES and H, including radiation protection, industrial hygiene, emergency response, industrial safety, fire protection, environmental protection, and waste disposal.
1963-1966	Industrial Hygienist/Health Physicist, Bettis Atomic Power Laboratory. Radiation protection responsibilities for reactor fuel fabrication facilities, designed ventilation and stack monitoring systems.
1960-1963	Physicist, U.S. Public Health Services' Bureau of Radiological Health. Research and development of instruments and methods for measurement of low-level radionuclide contamination in the environment.
Education:	M.S., Radiation Protection, Northwestern University, 1968 B.S., Physics, Bowling Green State University, 1960 Certified by the American Board of Health Physics
Assigned Area:	Radiation

Name: Robert T. Browne

Association: Argonne National Laboratory

Experience: 20 Years

1987-present Argonne National Laboratory

- Led and participated in environmental assessments/audits throughout the lower 48 states, Hawaii, and Alaska, covering TSCA/FIFRA, natural resources, and other environmental protocols.

- Developed various environmental guidance documents for the U.S. Force Space Command to implement and support their environmental compliance programs.

1970-1986 U.S. Department of the Interior

- Recipient of Department of the Interior Gold Medal for Distinguished Service (agency's highest award) 1986 (for managerial/environmental accomplishments).

- Recipient of the Department of the Interior Silver Medal for Meritorious Service 1979 (for environmental accomplishments).

- Director of Data Systems, U.S. Bureau of Land Management; established and managed national automated systems for natural resources management on federal lands (over 400 million acres) throughout the western U.S. and Alaska.

- Asst. Team Leader, Western Energy and Land Use Team, U.S. Fish and Wildlife Service; participated in research projects with priority on energy development in the western U.S.

- Chief of Environmental Analysis/Land Use Planning, U.S. Bureau of Land Management, Wyoming; directed and participated in regional and site-specific EIS's/environmental assessments, and land use planning for energy development throughout the state of Wyoming.

Education: Business Administration/Computer Sciences-Universities of Md/Colo - 3 yrs. Numerous federal and private training courses.

Assigned Area: TSCA/FIFRA

Name:	Glenn F. Cada
Association:	Oak Ridge National Laboratory
Experience:	13 Years
1989-present:	Participated in Tiger Teams for the Rocky Flats Plant, West Valley Demonstration Project, Pantex Plant, and Kansas City Plant.
1985-present	Technical support for DOE's Office of NEPA Project Assistance (EH-25), including document review, development of categorical exclusions and Tigers Team NEPA protocols, and preparation of the NEPA Compliance Guide.
1977-present	Preparation of numerous NEPA documents for DOE, NRC, and FERC. Research relating to the effects of energy technologies (nuclear power, hydroelectric power, synfuels) on aquatic resources.
Education:	Ph.D., Zoology, University of Nebraska, 1977 M.S., Zoology, Colorado State University, 1973 B.S., Zoology, University of Nebraska, 1971
Assigned Area:	National Environmental Policy Act (NEPA)

Name: Thomas Cuscino, Jr., P.E.

Association: Argonne National Laboratory

Experience: 17 Years

1987-Present • Argonne National Laboratory

- Performed air quality impact analysis presented in the Supplemental EIS for the Superconducting Super Collider.
- Performed air quality impact analysis as part of a combined EA/RI-FS for a proposed action at a DOE facility on the National Priority List for Superfund sites.
- Participated in environmental audits of Air Force facilities under the Environmental Compliance and Management Program (ECAMP).
- Led a team at 6 Air Force facilities to prepare VOC air emission inventories.
- Contributed to air quality impact analysis for the High Level Nuclear Waste Repository.

1976-1984 • Midwest Research Institute

- Designed sampling programs to quantify both controlled and uncontrolled fugitive dust emissions.
- Designed and field tested a portable wind tunnel to quantify in-situ wind erosion from storage piles and exposed areas.
- Performed and directed particulate emission inventories for facilities in several industries.
- Performed and directed dispersion modelling for fugitive dust emissions.
- Performed cost-effective analyses for fugitive dust control strategies.

1975-1976 • Pennsylvania State University

- Wrote a computerized dispersion modelling program to predict uptake of gaseous and particulate pollutants into the Upper Great Lakes.
- Performed particle size analysis using optical and electron microscopy.

Education: M.S., Mech. Eng., Pennsylvania State Univ., 1976
B.S., Mech. Engr, Pennsylvania State Univ., 1972

Assigned Area: Air

Name: Phebe Davol

Association: Argonne/Mittelhauser Corp.

Experience: 10 Years

1989-present Private consultant to Mittelhauser, A. T. Kearney, Donley Environmental. Conducting work for the U.S. EPA, DOE, and commercial clients in the areas of groundwater, soil, surface water environmental contamination and remediation. Currently the manager of two corrective action projects for sites in Vermont and Massachusetts. Both sites have complex soil and groundwater contamination which has impacted surface water through discharges and seepage. Evaluated technologies for the remediation of contaminated groundwater, soil and surface water. As a contractor to EPA, reviewed RFI Work Plans and the Remedial Action Project Plan for the Gaseous Diffusion Plant (K-25) at Oak Ridge, TN

1987-1989 A. T. Kearney, Inc.

Conducted several groundwater Comprehensive Monitoring Evaluations, (CME) for EPA Region VI to determine the facility's groundwater monitoring system's compliance with 40 CFR 265 Subpart F and 270 requirements.

Conducted over 50 RCRA Facility Assessments (RFA) and sampling visits for EPA's Corrective Action Program in Regions I, II, III, IV, V, and VI. For EPA she managed and conducted RI/FS and RCRA Facility Investigation (RFI) oversight for major permitted hazardous waste storage treatment, and disposal facilities in PA and NY, respectively.

1980-1987 Texas A&M University & K.W. Brown and Associates

Conducted laboratory and field experiments for EPA's Office of Research and Development contracts and commercial clients to determine the rate of migation and fate of constituents in soil and groundwater. Conducted bench-scale studies on the permeability of clay and synthetic liners. Developed techniques and instruments (lysimeters) for monitoring hazardous constituents in soil and the vadose zone.

Education: M.S., Soil Science, Texas A&M University, 1987
B.S., Agronomy, Texas A&M University, 1982

Assigned Area: Hydrogeology

Name:	James A. DePadro
Association:	Argonne National Laboratory
Experience:	18 Years
1988-present	Environmental/project engineer, responsibilities include U.S. Air Force environmental assessments, a U.S. Army remedial action project and environmental database projects.
1983-1988	Divisional Administrator, Biomedical Division, responsibilities included facility operations, divisional environmental and safety compliance/coordination and projects coordination.
1977-1983	Plant/project engineer, responsibilities include utilities overview, project engineering, and operations for the sites energy monitoring and control system.
1973-1977	Project engineering/manager, Union Carbide Corporation, responsibilities included various facilities, safety, and environmental engineering projects.
1970-1973	Applications engineer, Dunham-Bush
Education:	M.B.A., Operations Management, Illinois Institute of Technology, 1980 M.S., Physics, Northern Illinois University, 1969 B.S., Physics, Spring Hill College, 1966
Assigned Area:	Surface Water and Drinking Water

Name: David M. Diodato

Association: Argonne National Laboratory

Experience: 2 Years

1989-present Assistant Environmental Scientist. Coauthor of multiphase, saturated-unsaturated, 2d, heterogeneous, anisotropic, fluid flow code module of in situ volatilization simulator, implemented on an 80386 platform. Technical lead for geology section of New Production Reactor Environmental Impact Statement. Responsible for Savannah River Site Water Resources section of New Production Reactor Environmental Impact Statement. Constructed geologic and hydrogeologic database for a U.S. Army ammunition plant site.

1988 Part-time consultant, Nittany Geoscience. Field work included sampling domestic and industrial water wells for hazardous wastes using well wizards, conventional and bladder pumps and teflon bailers.

Office work included the analysis of slug-test data using the Hvorslev analytical relation. Other duties included the determination of spatial distribution of volatile organic compounds by kriging shallow soil gas data.

1985-1989 Teaching Assistant/Research Assistant, The Pennsylvania State University. Laboratory instructor for geology course. Research assistantship duties included sample acquisition and data base design and management for an ongoing acid mine drainage abatement demonstration project. Maintained ongoing hydrologic budget investigation. Designed and conducted unsaturated zone tracer test. Designed and conducted unsaturated zone moisture content, bulk density, total porosity, and unsaturated hydraulic conductivity investigation.

Summer 1985 Consultant, Duffield and Associates, Consulting Geotechnical Engineers. Field work included landfill water quality sampling and the determination of aquifer and aquitard properties.

Education: M.S., Geology, The Pennsylvania State Univ., 1989
B.S., Geology, University of Delaware, 1985

Name: Roger L. Dirkes

Association: Battelle-Pacific Northwest Laboratories

Experience: 13 Years

1986-present Manager of the Hanford Drinking Water Monitoring Project and the Surface Water Monitoring Task of the Hanford Environmental Monitoring Project. Activities include regulatory interpretation and compliance evaluations (Clean Water Act and Safe Drinking Water Act), program design, sampling system and procedure development, data evaluation and reporting, environmental impact analysis, quality control, and emergency response. Primary contributor in preparation and review of several Hanford Site Operable Unit remedial investigation/ feasibility study work plans.

1985-1986 Supervisor of the Environmental Monitoring Group which was responsible for the collection of environmental samples (air, surface water, ground water, soil, vegetation, foodstuffs and wildlife) in support of the Hanford Environmental Monitoring Project. Responsible for scheduling, training, procedure development, sample collection accountability and sampling system maintenance activities.

1979-1985 Technical support to the Hanford Environmental Monitoring Project. Responsibilities include oversight of air, soil, vegetation and foodstuffs sampling activities and procedure development. Member of the Hanford and DOE Region Eight Radiological Emergency Response Team.

1977-1979 Rockwell Hanford Operations: Environmental Protection Section technical support to nuclear fuels reprocessing facility. Responsible for oversight of effluent control and monitoring systems. Assistance provided in the development of internal environmental and effluent monitoring requirements and standards.

Education: M.S., Environmental Engineering, Washington State University, 1976
B.S., Environmental Science, Washington State University, 1975

Assigned Area: Surface Water

Name:	Gerald K. Eddlemon
Association:	Oak Ridge National Laboratory Environmental Sciences Division
Experience:	16 Years
1985-present	Participated in the development and implementation of environmental compliance auditing programs for DOE and the U.S. Air Force. Conducted environmental compliance audits of 14 Department of Defense facilities and four Tiger Team assessments of NEPA compliance at DOE facilities (West Valley Demonstration Project, Pantex Plant, Nevada Test Site, and Savannah River Site); developed Environmental and Occupational Safety Manual for the U.S. Inactive Fleet.
1980-present	Conducted NEPA assessment of environmental effects of energy-and defense-related technologies; performed technical analyses and interpretations of environmental laws and regulations;
1976-1980	Conducted research in transport, fate, and effects of trace metals and organic contaminants in aquatic ecosystems (Synthetic Fuels Program).
19740-1976	Conducted NEPA reviews of aquatic ecology and water quality impacts of nuclear power generating stations for the NRC.
Education:	M.S., Zoology The University of Tennessee, 1974
	B.S., Zoology The University of Tennessee, 1970
Assigned Area:	National Environmental Policy Act

Name: David A. Flowers, P.E.

Association: Argonne National Laboratory

Experience: 17 Years

1989-present David A. Flowers, P.E., Environmental Specialist/Consulting Operator, Cedarburg, Wisconsin. Providing operations, maintenance and design services for Argonne National Laboratory on a groundwater contamination site in the Midwest.

1986-1989 Metcalf & Eddy Services, Inc., Regional Manager, Milwaukee, Wisconsin. Responsible for all environmental training activities within the Midwest region.

1982-1986 Camp Dresser and Mckee Inc., Principal Engineer, Milwaukee, Wisconsin. Provided general supervision of CDM's design efforts for the Milwaukee area office. Participated in environmental projects including a hazardous waste site remediation in central Wisconsin, constructing the Brookfield, Wisconsin wastewater treatment plant.

1979-1982 Camp Dresser and McKee Inc., Environmental Engineer, Detroit, Michigan.

1976-1979 BSP Division , Envirotech Corporation, Operations Coordinator, Belmont, California. Responsible for training, supervision, and coordination of clients' operational personnel on wastewater treatment equipment.

1973-1976 Monroe County Pure Waters Agency, Assistant Engineer, Rochester, New York. Responsible for the full administration and operation of a 15 mgd secondary/tertiary wastewater treatment facility and three area pump stations.

Education: B.S. Degree in Civil and Environmental Engineering from Clarkson University, Potsdam, New York. Graduated in December, 1972.

Assigned Areas: Inactive Waste Sites and Surface Water

Name: J. Carl Frostenson

Association: Los Alamos Technical Associates, Inc.

Experience: 16 Years

1988-present Program Manager responsible for DOE facilities environmental contracts and EPA Regions VI and VIII ARCS contracts. Supervises and coordinates a multidisciplinary team of professionals performing environmental assessments, surveys, audits, and remediation activities for hazardous, radioactive, and mixed wastes. These compliance activities include RCRA, CERCLA/SARA, asbestos, PCB, and DOE Orders.

1986-1988 Section Manager for the Environment and Safety Analysis Section involved in federal facility environmental impact statements and safety analyses. Also worked as Project Manager of operations analyses and dose assessment for the high-level waste repository.

1980-1986 Project Manager for toxicological assessments, coal permits, uranium leach-site remediation, risk evaluations, quality planning, and energy audits.

1978-1980 Performed engineering evaluations for pond and ditch closures at Rockwell Hanford. Also analyzed biological transport pathways, and characterized disposal areas.

1973-1976 Conducted initial hazardous waste inspections and regulation development for the N.M. Environmental Improvement Agency.

Education: M.S., Civil Environmental Engineering, Vanderbilt University, 1978
M.S., Ecology, Eastern New Mexico University, 1972
B.S., Biology, Eastern New Mexico University, 1970

Assigned Area: Waste Management

Name: Frank A. Gheesling, C.E.P.

Association: ERM-Southeast, Inc.

Experience:

1987-present ERM-Southeast, Inc. Project Manager for property transfer audits, facility environmental compliance assessments, jurisdictional wetland delineations and NEPA related studies. Conducted a hazardous waste assessment of the Marine Corps Logistics Base, Albany, GA (MCLB , Albany) and updated the base hazardous waste management plan. Prepared an environmental compliance report for a major pharmaceutical company including two existing chemical storage/distribution centers and one proposed construction site. Conducted an environmental compliance audit and site assessment for a newspaper printing blanket (fabric coating) facility. Conducted a hazardous waste and chemical storage site assessment for a polyester film converter (metallic and chemical applications) and prepared a preparedness, prevention and contingency plan based on the assessment finding.

1985-1987 Self employed. Conducted NEPA-related assessments for a state agency. Projects included new construction of hospital-type projects and a proposed national cemetery.

1982-1985 Applied Biology, Inc. Manager of special projects and laboratory administrator.

Served as project manager for an EPA Generic Environmental Impact Statement on hydrocarbon resource development. Designed and implemented a lab sample/results tracking system.

1973-1985 Soil System, Inc. Military terrain analysis manager and natural resource assessment manager. Performed a series of military terrain analysis studies, evaluating the natural and manmade environments of Army installations and classified areas of the world. Conducted environmental site evaluations for property transfer activities to identify possible toxic/hazardous waste contamination.

Education: B.S. - Forest Research, University of Georgia, 1972

Assigned Area: Toxic Substances Control Act (TSCA) and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

Name: Lyle E. Harris

Association: Department of Energy

Experience: 12 Years

1987-present Environmental Protection Specialist, Office of NEPA Project Assistance, Department of Energy, Washington, D.C.

- Oversight of NEPA activities related to uranium mill tailings remedial actions, and high-level radioactive waste repository development.
- Tiger Team NEPA Assessments at Y-12 Plant and Portsmouth Gaseous Diffusion Plant.

1987-1983 Physical Scientist, Office of Mineral Policy and Analysis, U.S. Bureau of Mines, Washington, D.C.

- Analysis of mineral industry trends, mining law, and effects of environmental regulation on domestic mineral supply.
- Development of probabilistic models of mineral resource potential.

1978-1983 Geologist, Eastern Field Operations center, U.S. Bureau of Mines, Pittsburgh, PA.

- Mineral resource appraisals of Federal Wilderness Areas and Roadless Areas.
- Mapping and appraisal of mineral resources on the Fort Berthold Indian Reservation and the Cherokee Indian Reservation.

Education: B.S., Geology, Eastern Michigan University, 1977

Assigned Area: National Environmental Policy Act

Name:	Cynthia G. Heckman
Association:	Martin Marietta Energy Systems, Inc.
Experience:	5 Years
1989-present	Participated in Tiger Team assessments for the Rocky Flats Plant, Feed Materials Production Center, Pantex Plant, and Kansas City Plant.
April 1988-present	Maintain and update a database of Department of Energy (DOE) National Environmental Policy Act (NEPA) Memoranda-to-File; assisted in the development of the NEPA Compliance Audit Protocol for the DOE Office of NEPA Project Assistance. Currently maintain and update a series of Environmental Guidance Program Reference Books on 14 major environmental statutes for DOE's Office of Environmental Guidance and Compliance.
January 1985-1988	Staff scientist for the Environmental Technology March Division, MAXIMA Corporation. Staff of this division of the information management firm conduct technical analyses and manage databases related to the protection of environmental quality, public health, and occupational health and safety. Reviewed spill cleanup technologies using foams and other retardants on floating hazardous chemicals for the U.S. Coast Guard. Provided support to the Environmental Compliance Group of the Environmental Sciences Division, Oak Ridge National Laboratory through review of applicable environmental laws and regulations.
Education:	M.S., Biology, University of Kentucky, Lexington, Kentucky, 1985 B.A., Biology, Thomas More College, Crestview Hills, Kentucky, 1980
Assigned Area:	National Environmental Policy Act

Name: Andrea J. Heintzelman

Association: U.S. Department of Energy
Office of Environmental Audit

Experience: 17 Years

1988-present Environment Assistant Team Leader for the 1989 Tiger Team Environmental Assessments at the Y-12 and Kansas City Plants. Assistant Program Manager for Prioritization of DOE-wide, major defense and non-defense production facilities Environmental Survey findings.

1985-1988 Project Coordinator and Compliance Specialist in the Federal Energy Regulatory Commission, (Washington, D.C.), assessing cumulative environmental impacts on proposed and existing hydroelectric dams, and noncompliances on operating hydroelectric facilities Nation-wide.

1983-1985 Self-employed Resources Management Consultant on numerous environmental engineering projects (local, state, and Federal) conducted throughout the Mid-Atlantic area.

1978-1983 Project Site Director and Site Resources Manager at Deleuw, Cather/Parsons, Consulting Engineers, (Washington, D.C.) reviewing engineering construction design impacts and assessing environmental impacts on the upgrading of the Northeast Corridor (Amtrak corridor between Washington, D.C. and Boston, Massachusetts).

1973-1978 Project Coordinator and Site Resources Manager at James F. MacLaren, Ltd. Consulting Engineers, (Toronto, Ontario), assessing environmental impacts from the proposed construction of hexafluoride, thermal, coal-fired, and hydro generating nuclear facilities located in five Provinces of Canada.

Education: M.A., Applied Anthropology, American Univ., 1985
B.A., Anthropology, Kansas State University, 1971

Assigned Area: Special Assistant to the Environmental Team Leader

Name: Lisa A. Hughey

Association: ERM-Southeast, Inc.

Experience: 8 Years

1987-present: Prepared closure and post-closure plans for RCRA facilities, including a wood treating facility in Alabama and a non-ferrous foundry in Tennessee. Project Manager for a remedial investigation of an inactive chemical manufacturing facility in Tennessee, focusing on groundwater and soil contamination. Prepared a RI for a chlor-alkali facility which is included on the National Priorities List. Participated in the oversight of EPA activities for a chlor-alkali facility while an evaluation of potential off-site mercury contamination was assessed by EPA.

1985-1987: Regional Manager for the Tennessee Department of Health and Environment, Division of Superfund. Responsibilities included the preparation of preliminary assessments, conducting site inspections, and preparation of hazard ranking system documents for sites submitted as candidates to the National Priorities List. Project management duties included overseeing site investigation activities and the implementation of remedial designs at numerous Superfund sites in Tennessee. Extensive on-site work at various sites was conducted which included the installation of monitoring wells, determination of sampling points, and parameters for which analyses were performed, collection of groundwater, surface water, soil and sediment samples according to EPA approved methods.

Education: B.E., Civil Engineering
Vanderbilt University, 1981

Assigned Area: Inactive Waste Sites

Name: Ted V. Jennings

Association: Argonne National Laboratory

Experience: 31 Years

1986-present
- Argonne National Laboratory
  - DOE, Tiger Team Survey at Kansas City Plant as groundwater specialist
  - DOE, Research, Logging methods for determination o well integrity, hazardous waste injection systems
  - DOE, Analysis and tracking of environmental legislation impacting DOE sites
  - BLM, Expanded site investigations, New Mexico landfills, geological and geophysical investigatio of potential groundwater contamination-DOD, Environmental impact investigation of buried exploded ordinance, Base closure program, Fort Meade, Md.
  - DOD, Technical review of RI/FS documents, groundwater contamination, army ammunition plants
  - DOE, review of geologic and geophysical aspects, Site Characterization Plans, High Level Waste Repository Program, Hanford, Nevada, and Deaf Smit Co., Texas
  - DOE, review of study plans involving geology and hydrogeology, High Level Waste Repository Program, Nevada
  - DOE, Fluid migration research, movement of water through evaporite sequences

1980-1986
- Willow Bend Resources, Inc.
  - Energy and Environmental Consulting

1967-1980
- Purdue University, Department of Geosciences
  - Teaching and research in engineering geophysics, subsurface geologic methods, logging and well design, and solution mining

1958-1964
- Chevron Oil Company
  - Subsurface geologic analysis, geophysics, and reservoir engineering

Education: B.S., 1956; MS., 1958; Ph.D., 1967 - Geology, Universit of Iowa

Assigned Area: Hydrogeology

Name:	Peter C. Lindahl
Association:	Argonne National Laboratory
Experience:	18 years
1984-Present	Group leader of the Environmental Analysis Group in the analytical Chemistry Laboratory. Also served as the Analytical Chemistry Laboratory Project Manager for the DOE Environmental Survey Program.
1979-1984	Senior Research Specialist with Exxon Production Research Company
1974-1979	Senior Atomic Absorption Product Specialist with the Perkin-Elmer Corporation
1972-1974	Post-doctoral appointee and assistant chemist at the Illinois State Geological Survey
Education:	Ph.D., Analytical Chemistry, Southern Illinois University, 1972 M.A., Inorganic Chemistry, Southern Illinois University, 1967 B.A., Chemistry, Lake Forest College, 1964
Assigned Area:	Quality Assurance

Name:	Louis Martino
Association:	Argonne National Laboratory
Experience:	15 Years
1987-present	Environmental Systems Engineer Participated in Tiger Team Audit of Mound Plant, provided regulatory interpretation support to DOE Headquarters, performed RCRA Compliance Audits and hazardous waste minimization studies at DOD facilities. Provided training in hazardous waste compliance for U.S. and international DOD activities and prepared RI/FS reports for DOD and Department of Commerce.
1985-1987	Project manager for three Superfund sites. Performed environmental audits for industries requiring environmental impairment insurance. Remedial program manager for a dioxin and leaking UST remediation effort.
1980-1985	Section head, Maryland Hazardous Waste Division, reviewed and prepared RCRA B Permits. Performed RCRA Compliance inspections. Supported state and Superfund activities.
1977-1980	Research assistant in toxicological studies.
1975-1977	Hydrologic analyst for FEMA flood insurance studies.
Education:	Post Graduate studies - Johns Hopkins University M.S., Environmental Toxicology, Tenn. Tech, 1977 B.S., Water Resource Management, University of MD, 1975
Assigned Area:	Waste Management

Name:	John P. McCann
Association:	Civil & Environmental Consultants, Inc. (CEC) Pittsburgh, Pennsylvania
Experience:	10 Years
1989-present	Director of CEC's Health, Safety and Regulatory Compliance Program and Senior Project Manager. Principal responsibilities include program management in Corporate Health and Safety, Chemical Hazard Evaluation/Risk Assessment, Hazardous Waste Site Assessments, and Environmental Compliance Audits. Participated in the Tiger Team Audit at Y-12 Plant in Oak Ridge, Tennessee. Served as the CERCLA/SARA specialist in performing the inactive waste site assessment portion of the audit.
1985-1989	Manager of the Environmental Health Department of ICF Corporation's regional office in Pittsburgh involved in investigations of uncontrolled hazardous waste sites under contract to the EPA. Project Manager of a Remedial Investigation to determine the extent of groundwater and soil contamination at an abandoned tanker-truck facility in eastern Texas. Also managed a DOD Installation Restoration Program environmental assessment concerning a jet fuel spill at an Air Force Base in southern Florida.
1980-1985	Worked on various Superfund/CERCLA related projects as Scientist and Project Manager in the Environmental Chemistry and Toxicology group of NUS Corporation. This work primarily involved preparing extent of contamination and quantitative risk assessment at numerous Superfund sites across the eastern states.
Education:	B.S., Environmental Health, Colorado State University, 1979 M.S., Environmental Chemical Hazard Assessment, University of Pittsburgh, Graduate School of Public Health, Anticipated 1991
Assigned Area:	Inactive Waste Sites and Superfund Amendments and Reauthorization Act

Name: James R. Orr

Association: ERM-Southeast

Experience: 11 Years

1981-present ERM-Southeast - Biologist in charge of various aquatic ecology and aquatic toxicological projects.

Laboratory supervisor for a certified biomonitoring laboratory including investigations of toxic compounds in the environment through studies with various life stages of numerous invertebrate and fish species. Constructed several types of toxicant delivery systems for continuous flow, and acute and chronic bioassays.

Manager of human and ecological risk assessments, with a specific experience with mercury and organic contaminants in surface water, sediment and soil.

Project manager for preparation of EA and EIS studies for plant sittings, channel modifications and other development, as well as water quality studies and stream assessments.

Project Manager for Wetlands delineations, mitigation plans, channel relocation and aquatic habitat assessment; with experience using the WET and HSI models.

1979-1981 Biologist in charge of biomonitoring laboratory. Water quality investigations, stream and river ecology studies and invertebrate and fish taxonomy.

Education: M.S., Biology, Tennessee Technological University, 1979
B.S., Biology, Chemistry minor, Missouri Southern State College, 1976
Laboratory certification through the state of South Carolina #84003

Assigned Area: Surface Water: Thermal Mitigation
Wetlands
Creeks
Ambient Monitoring

ame:	John W. Peel
ssociation:	Tetra Tech, Inc. Pasadena, CA
xperience:	20 Years
989-present	Tetra Tech, Inc. Senior Vice President. Responsible for program development/project management radiological/hazardous/mixed waste programs
986-1989	Vice President and General Manager Energy and Environment Division, Los Alamos, N.M. - Los Alamos Technical Associates - Responsible for program development/project management engineering and environmental programs for Federal/commercial operations including plutonium process/facility engineering and environmental corrective actions/restoration and NEPA programs for DOE/EPA.
985-1986	National Marketing Director/Program Management. Jacobs Engineering, Pasadena, CA duties included development of hazardous/toxic materials remediation programs including radioactive waste Management/Nuclear facility decontamination/ decommissioning.
981-1985	Westinghouse Advanced Energy Systems Division (Pittsburgh, PA) Manager, low level/waste programs (and hazardous waste site restoration) responsible for commercial low level waste site development activities/low level waste treatment technology development and project management for commercial hazardous waste site restoration.
973-1981	DOE (AEC/ERDA) Health Physics/Environmental Health assignments including Chicago and Idaho Operations Offices; the Division of Operational and Environmental Safety, Germantown , and the Office of the Secretary, Washington, D.C.
970-1973	Ph.D. Candidate/Coursework Purdue University.
968-1970	Research Institute of Pharmaceutical Sciences, Radioimmuno Assay of Insulin, Oxford, Mississippi.
ducation:	Ph.D., Environmental Health/Health Physics/ Bionucleonics Purdue Univ., 1974 M.S., Biology/Invertebrate Zoology, University of Mississippi, 1970 B.S., Biology, Millsaps College, 1968
ssigned Area:	Radiation: Airborne emissions/surface water effluents

Name:	Ted M. Poston
Association:	Battelle, Pacific Northwest Laboratory
Experience:	15 years
1987-Present	Supervised studies dealing with environmental issues at the Hanford Site, preparation of Endangerment Assessments, Health and Safety Plans, a ranking system for priority pollutants for the U.S. Environmental Protection Agency and research publications in the open literation dealing with environmental toxicology. Also oversees compliance with applicable regulations in regard to RCRA at PNL and has assisted in QA/QC audits of environmental research projects within the laboratory.
1979-1986	Principal investigator overseeing studies addressing the fate and effects of actinide in aquatic organisms. Addition research areas address effects of military observants on aquatic organisms and the preparation of environmental impact assessments.
1974-1978	Worked as a research technician at the Hanford site performing laboratory and field studies on the cycling of actinides in aquatic environments, radiation effects on aquatic organisms, and aquatic toxicology.
Education:	M.S., Fisheries University of Washington, 1978 B.A., Biology Central Washington University, 1973
Assigned Area:	Waste Management

Name: John M. Searing

Association: United States Department of Energy
Brookhaven Area Office (BHO)

Experience: 5 Years

1989-present USDOE-BHO: Construction and Environmental Project Engineer responsible for all site construction projects (GPP, IHEM, AIP, AIM) and for various environmental projects. Environmental aspects of the position include oversight of underground storage tank program, chemical storage, waste management activities, site spills and remediation, inactive sites, and inspectional/assessment activities.

1988-1989 Suffolk County Dept. of Health Services - Bureau of Hazardous Materials Management: Public Health Engineer responsible for administration and enforcement of county sanitary code, and for management of two U.S. Environmental Protection Agency Studies involving underground hazardous materials storage tanks (non-corrodible tanks and removals of steel tanks). Reviewed plans for hazardous materials storage facilities, reviewed submittal for SARA Title III reporting requirements, performed field inspections of existing and new facilities, and was a member of the County Emergency Response Team.

1985-1988 Long Island Lighting Company - Shoreham Nuclear Power Station: Plant System Engineer responsible for being 'expert' on several plant systems including hypochlorination, seawater systems, and emergency diesels. Developed and managed the station's Hazardous Materials and Hazardous Waste Program, Compressed Gas Program, and Waste Oil Reclamation Program. Responsible for oversight of two station SPDES outfalls monitoring programs and reporting to state.

Education: M.S., Industrial Management, State University of New York at Stony Brook (anticipated 1991)
B.S., Mechanical Engineering, Carnegie-Mellon University, 1985

Assigned Area: Environmental Subteam Assistant Leader

Name: Philip R. Sticksel

Association: Battelle Columbus Division; Columbus Ohio

Experience: 25 Years

1969-present

- Battelle Columbus Division
  - Participated in Tiger Team Assessment at Nevada Test Site
  - Deputy Field Director for collection of water, soil, and air samples at DOE's Mound Plant and Nevada Test Site
  - Directed preparation of statewide air pollutant emission inventories for Indiana and Montana
  - Directed projects which assisted Indiana and Arizona in the preparation of their state implementation plans for attaining air quality standards
  - Prepared air quality and climatology portions of Environmental Impact Reports analyzing the effects of converting several power plants from oil-firing to coal-firing
  - Analyzed the air quality and meteorological data for the characterization environmental conditions at the site for a proposed power plant in South Carolina
  - Prepared an instructional package for training state and local air pollution control agency inspectors to make visible emissions observations
  - Compiled air quality data used in the Environmental Impact Assessments prepared for the siting of a high level nuclear waste repositories in salt sites in Utah, Texas, Mississippi, and Louisiana

1959-1969

- National Oceanic and Atmospheric Administration (1967-1969 assigned to Environmental Protection Agency)
  - Presented lectures on air pollution meteorology and visible emissions evaluations for EPA's Training Program

Education: Ph.D., Meteorology, Florida State University, 1966
M.S., Meteorology, Florida State University, 1959
B.S., Physics, University of Cincinnati, 1952

Assigned Area: Air

Name: John Tschanz

Association: Argonne National Laboratory

Experience: 20 Years

1986-present Participated in a number of environmental assessments of DOD and DOE facilities, including a document review and preliminary environmental assessment at the Twin Cities Army Ammunition Plant; development of VOC inventories for five air force bases; Air Force ECAMP air emissions and POL assessments at eight air force bases; development of an air emissions source and permit data base for the Air Force Logistic Command and collection of relevant data for Wright-Patterson AFB; and air emission assessment with the DOE Tiger Team at Pantex.

1976-1986 Manager of the Community Energy Management and Site Design Section of Community Systems Program at Argonne National Laboratory. The section's responsibilities were to develop and test concepts for the planning and implementation of energy conservation in energy supply and demand at community scales ranging from neighborhoods to metropolitan areas.

1973-1976 Environmental Systems Engineer at Argonne National Laboratory. Projects included an assessment of air quality impacts from proposed operations changes at the Atlanta Hartsfield Airport, evaluation of a proposal Illinois indirect source regulations, development of Air Quality Management Area planning methods and workshops, and an inventory of state land use information systems.

1968-1970 Physicist at Lawrence Radiation Laboratory - Livermore. Worked on the design of nuclear excavation devices for the Plowshare Program.

1967-1968 Research Associate, Department of Physics and Astronomy, University of Kansas. Experimentation in low-temperature nuclear orientation as a means for studying fields in crystals.

Education: M.U.P., Urban Planning, Univ. of Michigan, 1973
Ph.D., Nuclear Physics, Ohio State University, 1967
B.S., Engineering Physics, Ohio State Univ., 1958

Assigned Area: Air

Name:	Herbert F. Vogel
Association:	Tetra Technology, Pasadena, CA
Experience:	38 Years
1987-present	Engineering Physics for DOE contractors, including Los Alamos National Laboratory
1967-1987	Los Alamos-National Laboratory: Diagnostics, analysis and modeling in the fields of nuclear and conventional weapons physics, plasma physics, accelerator physics, and nuclear isotope chemistry.
1961-1967	Argonne National Laboratory High voltage/high current technology, accelerator beam optics, and system analysis.
1957-1961	Allis Chalmers Mfg. Co., Milwaukee, WS: High voltage system and insulation development.
1952-1957	Brown Borein Lts., Baden, Switzerland: High voltage/high current instrumentation, insulation, and system development.
Education:	Ph.D., Electrical Engineer, University of Texas at Austin, 1980 M.S., Electrical Engineer, Univ. of Munich, 1952
Assigned Area:	Radiation

Name:	D. Wallace
Association:	ERM, SE, INC.
Experience:	32 Years
1987-present	ERM-SE, INC., Environmental Engineer. Serves as company Health and Safety Coordinator, performs audits for potential real estate transfers, involved in all aspects of site investigations and remediation.
1979-1987	Manager of Environmental, Industrial Hygiene and Safety Engineering at an industrial complex.
1957-1979	Bio-Environmental Engineer, USAF
Education:	Post graduate Studies, University of Southern California, Environmental Management, 1973 MSPH, Air and Industrial Hygiene, University of North Carolina, 1971 B.S., Civil Engineering, University of South Carolina, 1957
Assigned Area:	Waste Management

Name:	J. Warren Webb
Association:	Oak Ridge National Laboratory
Experience:	12 Years
1989-present	Participant in DOE Tiger Team at Nevada Test Site
1985-present	Technical reviewer and review coordinator for NEPA documents relating to DOE's Uranium Mill Tailing Remedial Action Program, in support of DOE's Office of NEPA Project Assistance.
1978-present	Extensive experience in preparation of NEPA documents for DOE, NRC, EPA, USA,. and FERC.
1979-1981	Research on effects of acid rain on forest soil systems.
Education:	Ph.D., Insect Ecology, Rhodes University, South Africa, 1975 Graduate Studies, Neurobiology and Behavior, Cornell University, 1967-69 B.A., magna cum laude, Zoology, University of Texas, Austin, 1967
Assigned Area:	National Environmental Policy Act

Name: Charles Alvin Wentz Jr.

Association: Argonne National Laboratory

Experience: 28 years

1987-Present Waste and Safety Engineering Manager. Responsible for research for hazardous waste, safety systems, and technology transfer.

1986-1987 Waste Management Manager, North Dakota Energy Research Center. Responsible for treatment of hazardous waste. Taught hazardous waste management.

1984-1986 Visiting Lecturer, Southern Illinois University. Taught solid waste and hazardous waste engineering.

1983-1984 President, Ensco. Responsible for a hazardous waste and PCB incineration operation.

1982-1983 President, Newpark Waste Treatment Systems. Responsible for cleanup of oil field waste reserve pits.

1961-1982 Phillips Petroleum Company. Responsible for oil shale, oil field chemicals, budgets, federal legislation, investor relations, plastics marketing, European joint ventures, and petrochemical research.

Education: Ph.D., Chemical Engineering, Northwestern University, 1961.
M.S., Chemical Engineering, Missouri-Rolla, 1959.
B.S., Chemical Engineering, Missouri-Rolla, 1957.
MBA., Southern Illinois University, 1985.
Diploma, Sloan School for Senior Executives, MIT, 1975.

Author of two recent textbooks. Hazardous Waste Management, 1989. Occupational and Environmental Safety Engineering and Management, (Co-authored with H. R. Kavianian), 1990.

Assigned Area: Waste Management

APPENDIX A-3

Biographical Sketches of Team Members
Tiger Team Compliance Assessment
Safety and Health Subteam
Savannah River Site

APPENDIX A-3-1

Biographical Sketches of
Waste Management Facilities Team Members
Tiger Team Compliance Assessment
Safety and Health Subteam
Savannah River Site

NAME: Braj K. Singh

AREA OF RESP: Waste Management Team Leader

ASSOCIATION: U.S. Department of Energy Headquarters
Office of Safety Appraisals

EXPERIENCE: 24 years

- DOE, Germantown, Maryland
  - Team Leader for Technical Safety Appraisals of DOE facilities
- U.S. Nuclear Regulatory Commission, Rockville, Maryland
  - Project Manager for Beaver Valley Unit 2, Washington Public Power Supply System, WNP Unit 3, and TVA Employee Concerns Program
  - Mechanical Engineer, Auxiliary Systems Branch, Nuclear Reactor Regulation (NRR)
  - Reactor Systems Engineer, Reactor Systems Branch, NRR
- Combustion Engineering, Inc., Chattanooga, Tennessee
  - Senior Design Engineer responsible for analyses, design, and testing of nuclear power supply systems components
- Sperry Rand Corporation, Huntsville, Alabama
  - Engineer responsible for analyses of solar panels used in Skylab
- Teledyne Wah Chang, Huntsville, Alabama
  - Mechanical Engineer responsible for supervision of manufacturing activities related to Tungsten and Molybdenum products
- Bihar Institute of Technology, Sindri, India
  - Assistant Professor of Mechanical Engineering

EDUCATION: M.S., Engineering, University of Alabama in Huntsville
B.S., Mechanical Engineering, Bihar Institute of Technology, Sindri, India

OTHER: Awarded a patent from U.S. Patent Office and several foreign countries for a steam generator dryer design
Coauthored a book on engineering thermodynamics

NAME: Ronald E. Alexander

AREA OF RESP: Personnel Protection

ASSOCIATION: Environmental Management Associates

EXPERIENCE: 20 years

- Environmental Management Associates
  - Prepare applications for air, RCRA, NPDES, waste water, and solid waste permits for private companies and government agencies
  - Prepare environmental liability assessments
  - Perform evaluations for OSHA compliance
  - Conduct radon surveys
  - Prepare safety analysis documents and safety analysis reviews
  - Prepare radiation protection program manuals
  - Establish employee hazard communication programs
  - Conduct underground storage tank investigations
  - Perform hazardous waste determinations
- Mason & Hanger - Silas Mason Co., Inc.
  - Managed DOE Environmental Restoration (ER) Program for CERCLA investigations and remedial actions at a major DOE site
  - Conducted research and development of solid state radiation dosimeter and supervised its manufacture and deployment
  - Managed a health protection program for approximately 3,000 employees
  - Established and managed an environmental protection and compliance program for a major manufacturing facility
  - Supervised eight RCRA hazardous waste storage and treatment units

EDUCATION: B.S., Physics, Texas Tech University
Graduate course work in Industrial Technology, West Texas State University
Course work at Texas Junior College

NAME: Mark I. Good

AREA OF RESP: Emergency Preparedness and Security/Safety Interface

ASSOCIATION: COMEX Corporation

EXPERIENCE: 28 years

- NRC evaluator for 35 nuclear plant emergency exercises
- NRC inspector for 15 emergency preparedness appraisals
- Taught emergency preparedness scenario development during Battelle-sponsored courses
- Participated in scenario development, evaluation, and control of one Federal field exercise involving all government agencies
- NRC evaluator for 10 Detailed Control Room Design Reviews (DCRDRs) and Safety Parameter Display System (SPDS) reviews
- NRC contract inspector for safety system quality evaluations (SSQE), safety system outage modification inspections (SSOMI), and in-process construction audits at 12 nuclear power stations
- Monitored restart testing, power ascension, and operations during restart of two nuclear plants
- Performed reviews for NRC of exercise scenarios and emergency action level (EAL) procedures
- Performed operator walk-throughs and reviews of Savannah River K Reactor abnormal condition control (ACC) procedures
- Completed 20-year navy nuclear career, including qualification as Reactor Operator, Electrical Operator, Engineering Officer of the Watch (Shift Supervisor), and Submarine Chief Engineer Officer

EDUCATION:	B.S., Chemical Engineering, University of Idaho Navy Nuclear Program (enlisted and officer)
OTHER:	Qualified Chief Engineer, Nuclear Submarines Qualified Navy Reactor Operator Reactor Operator, TRIGA research reactors General Contractor

NAME: Roger W. Griebe

AREA OF RESP: Organization and Administration and Facility Safety Review

ASSOCIATION: Organizational Analysis Corporation

EXPERIENCE: 26 years

- Performance of management consulting activities, including organizational diagnostics, strategic planning, management assessments, and corporate structural development
- Development of organizational, functional, and technical assessment methodologies, including projects for DOE and the commercial nuclear industry
- Development and management of a consulting organization that offered services in reactor safety, operations, nuclear licensing, quality assurance, design, and engineering to the nuclear industry
- Project engineering and management for DOE/NRC in reactor safety development and experimental verification areas

EDUCATION: Senior Executive Program, Stanford University
Ph.D., Purdue University
M.S., Mechanical Engineering, Purdue University
B.S., Mechanical Engineering, Purdue University

OTHER: Licensed Professional Engineer, Idaho #4123
Member, American Society of Mechanical Engineers
Member, Sigma Xi
Member, American Nuclear Society
Who's Who in the World
Who's Who in the West
Adjunct Professor, University of Idaho (retired)

NAME: Denise K. Grimsman

AREA OF RESP: Technical Editor

ASSOCIATION: SCIENTECH, Inc.

EXPERIENCE: 8 years

- SCIENTECH, Inc.: Technical Editor and Writer
  - Edit DOE Technical Safety Appraisals
  - Edit technical reports, proposals, and correspondence
  - Write and edit company newsletter
  - Edit and update company marketing brochure
  - Develop and update graphics and visual aids for reports and presentations
- American College Testing: Test Specialist
  - Coordinated ongoing editing projects for a variety of national standardized medical tests
  - Managed the Certification Examination in Hand Therapy contract
  - Conducted workshops and designed instructional materials for writers of medical test questions
- West Branch Times: Co-owner/Associate Editor
  - Wrote and edited news stories, features, columns, and advertising copy
  - Reported on local government issues
  - Supervised the production staff
  - Monitored quality control
- University of Iowa: Teaching Assistant
  - Taught graduate and undergraduate courses in German, English as a second language, and linguistics
  - Directed the phonetics lab
  - Designed course curricula and testing materials

EDUCATION: M.A., Linguistics/Teaching English as a Second Language, University of Iowa
B.A., German, University of Iowa

NAME: Scott E. Harlow

AREA OF RESP: Assistant Team Leader

ASSOCIATION: U.S. Department of Energy Headquarters
Office of Safety Compliance

EXPERIENCE: 3 years

- DOE, Germantown, Maryland: Nuclear Engineer
  - Participated in Technical Safety Appraisals of Fast Flux Test Facility and Hanford Tank Farms
  - Coauthored Facility Safety Surveillance Manual for West Valley Project Office
  - Developed computer tracking systems for asbestos inventories and facility safety surveillances
  - Conducted study of Savannah River Reactor incident reports
  - Assisted with the establishment of the Suspect Equipment Notification System
- Toledo Edison, Davis-Besse Nuclear Power Station, Toledo, Ohio: Co-op Nuclear Engineer
  - Lead Engineer with the Technical Specification Verification Program, Borated Water Systems
  - Developed computer input decks for nuclear cross-section parameterization program
  - Compiled station power history
  - Conducted physical inventory of special nuclear material; completed NRC material balance sheet
  - Performed daily functional tests and backups of plant computer systems

EDUCATION: B.S., Nuclear Engineering, University of Cincinnati

OTHER: Member, American Nuclear Society
NRC Babcock and Wilcox Reactor Technology training
Management Oversight Risk Tree Analysis, Accident Investigation training
Probabilistic Risk Assessment training
Crosscut Management Program training

NAME: Harry W. Heiselmann

AREA OF RESP: Maintenance

ASSOCIATION: SCIENTECH, Inc.

EXPERIENCE: 30 years

- U.S. Department of Energy Programs
  - Participation in more than 10 Technical Safety Appraisals and recent Tiger Teams at the Hanford, Nevada, Idaho, Oak Ridge, Brookhaven, Mound, and Savannah River sites
  - Participation in the development, implementation, and utilization of maintenance programs and in the application of reliability and fault tree analyses
  - Development and testing of electric vehicles
- Nuclear Safety Programs
  - Participation in the LOFT and Semiscale nuclear safety testing programs
  - Manufacturing, testing, and maintenance of equipment
  - Quality assurance, control, and verification programs
- Industrial and Commercial Projects
  - Design, analysis, testing, maintenance, quality assurance, and research for developmental and prototype equipment and facilities
  - Expertise in instrumentation and measurement systems, field support and test equipment, and test data acquisition and analysis
  - Development of radiation protection and monitoring systems

EDUCATION: B.S., Mechanical Engineering, Illinois Institute of Technology
Graduate course work, University of Idaho
Jet Propulsion Lab/U.S. Army Guided Missiles

OTHER:

Member, American Society of Mechanical Engineers/Idaho Section Officer
Member, American Nuclear Society/Symposium Finance Chair
Registered Professional Engineer, Idaho and Illinois

NAME: Hugo R. Hofmann

AREA OF RESP: Fire Protection

ASSOCIATION: Allied Signal, Inc.
Kansas City Division

EXPERIENCE: 15 years

- Allied Signal, Inc.
  - Staff Fire Protection Engineer: Beneficial occupancy inspections, design reviews, operational surety assessments, fire hazard risk analyses
- Industrial Risk Insurers
  - District Supervisor: Engineering risk analysis, account relations
  - Fire Protection Engineer: Field risk assessment and reporting

EDUCATION: B.S., Ceramic Engineering, Iowa State University

NAME: Nels C. Jensen

AREA OF RESP: Training and Certification

ASSOCIATION: EG&G Idaho, Inc.

EXPERIENCE: 24 years

- Member of Radiological Protection Program appraisal team at Martin Marietta Energy Systems (Oak Ridge Complex), September 1989
- Team member of Plutonium Finishing Plant TSA, October 1987; and Hot Fuel Examination Facility TSA, September 1988
- Consultant to DOE-HQ in resolution of restart issues and concerns for the N Reactor and the Plutonium Finishing Plant RMC Line (January 1988, July 1989)
- Consultant to the NRC for prelicensing actions at South Texas Project
- Certification as NRC Operator Licensing Examiner, Westinghouse and Babcock and Wilcox pressurized water reactor designs (4 years)
- Training Coordinator, Shift Supervisor, Reactor Operator, and Procedure Writer LOFT Facility, Idaho National Engineering Laboratory (11 years)
- Reactor Operator and Technician, USS Enterprise; Staff Instructor, AlW; U.S. Navy Nuclear Power Program (9 years)

EDUCATION: I&E PWR Course Series (Westinghouse and Babcock and Wilcox), NRC
Management Specialty Courses, EG&G Idaho, Inc.
U.S. Navy Nuclear Power and Prototype Schools and Electronics Technician School

NAME: Rex N. Lutz

AREA OF RESP: Quality Verification

ASSOCIATION: ARINC Research Corporation

EXPERIENCE: 14 years

- ARINC Research Corporation
  - Nuclear Quality Assurance Consultant
- The Pennsylvania State University
  - Research and Faculty Assistant
- U.S. Department of Energy
  - Savannah River Operations, Nuclear QA Auditor
- Baltimore Gas and Electric Company
  - Nuclear Engineer
- U.S. Navy
  - Submarine Service

EDUCATION: B.S., Nuclear Engineering, Penn State University
M.S., Nuclear Engineering, Penn State University

OTHER: American Society for Quality Control (ASQC) - Certified Quality Engineer
Member, ASQC Quality Auditing Technical Committee

NAME: Robert W. Powell

AREA OF RESP: Operations

ASSOCIATION: Retired, Private Consultant

EXPERIENCE: 44 years

- Participated in DOE Technical Safety Appraisals of the N Reactor, Savannah River Reactors, Advanced Test Reactor, and Lawrence Berkeley Laboratory
  - Participated in Graphite and Confinement Review of the N Reactor
  - Conducted annual safety audits of the Bureau of Standards Reactor, Oak Ridge National Laboratory Reactor, and the Brookhaven National Laboratory Reactors
- Brookhaven National Laboratory (BNL)
  - Manager of Reactor Division
  - Project Engineer for design, construction, and startup of Brookhaven Medical Research Reactor
  - Member of design committee for High Flux Beam Reactor with startup responsibility
  - Design and startup responsibility for Brookhaven Graphite Research Reactor
  - Chair, BNL Safety Committee (6 years)
  - Member, Reactor and Critical Experiments, Safety Committee (20 years)
  - Status - Senior Engineer (with tenure)
- DuPont Company
  - Supervisor, Cellophane Production
  - Military Explosive Division
    Senior Supervisor, TNT
    Senior Supervisor, DNT
    Senior Supervisor, X-10 Reactor

EDUCATION: B.S., Chemical Engineering, Auburn University

OTHER: Fellow, American Nuclear Society
Chair, Reactor Operations Division of American Nuclear Society
Member, U.S. Team to Investigate Windscale Accident

NAME: Thomas L. Van Witbeck

AREA OF RESP: Auxiliary Systems

ASSOCIATION: TOMA Enterprises

EXPERIENCE: 30 Years

- Served on five DOE Technical Safety Appraisals as a technical expert in the areas of auxiliary systems, technical support, operations, and maintenance

- TOMA Enterprises

  - General Manager: Provide services to government and commercial nuclear industry in the areas of operations, maintenance, and safety

- SCIENTECH, Inc.

  - Provided project management and technical consulting services to government agencies and the utility industry

- Energy Incorporated

  - Vice President: Provided maintenance management systems, plant operations, and quality assurance services
  - Director: Management and quality assurance audits and technical support of nuclear utilities
  - Group Manager: Onsite team to assess the Three Mile Island accident
  - Principal Consultant: Technical support of commercial reactors and DOE facilities and programs

- Westinghouse Electric Corporation

  - Shift Supervisor/Supervisory Engineer: Commercial nuclear plant startup and testing

- Oregon State University

  - Reactor operator and health physicist

- U. S. Navy
  - Petty Officer in charge of water chemistry and radiological programs aboard USS Bainbridge DLGN25
  - Instructor, U.S. Navy Nuclear Power School

EDUCATION: Management Development Program, Northeastern University
B.S., Nuclear Engineering, Oregon State University
U.S. Navy Engineering Laboratory Technician School
U.S. Navy Nuclear Power School

OTHER: Registered Professional Engineer
Licensed Reactor Operator (OP-2315)

NAME: Steve R. Velen

AREA OF RESP: Radiological Protection

ASSOCIATION: M.H. Chew & Associates, Inc.

EXPERIENCE: 18 years

- M.H. Chew & Associates, Inc.: Principal Associate
  - Provide services in health physics, operational safety, and environmental and safety analysis report preparation and review to DOE and government contractors
  - Provide technical health physics support to DOE site representative program
  - Responsible for upgrading and preparing technical specifications for the Advanced Test Reactor at the INEL site
  - Responsible for appraising radiological protection for Technical Safety Appraisals at Oak Ridge National Laboratory and Brookhaven National Laboratory
  - Member of the Oak Ridge Y-12 Tiger Team
- Lawrence Livermore National Laboratory: Safety Team Leader
  - Managed technicians and safety professionals in all aspects of safety in plutonium and tritium handling and processing facilities, as well as all facilities in the Laser Research Program
  - Served as an Emergency Action Coordinator
- Fermi National Accelerator Laboratory: Radiation Safety Officer
  - Operational health physicist for experimental areas that included implementation of all aspects of the radiation safety program

EDUCATION: B.S., Chemistry and Math, Roosevelt University
Completed M.S. course work in Health Physics, Northwestern University

OTHER: Certified Health Physicist

NAME: Glenn A. Whan

AREA OF RESP: Technical Support

ASSOCIATION: Emeritus Professor, Chemical and Nuclear Engineering, University of New Mexico

EXPERIENCE: 33 years

- Participated in DOE Technical Safety Appraisals for Oak Ridge Y-12 Plant, Portsmouth and Paducah Gaseous Diffusion Plants, Idaho Chemical Processing Plant, Hanford Plutonium Finishing Plant and PUREX Plant, Rocky Flats Plants, West Valley Facility, and Nevada Test Site, 1986-1989.

- Professor and Department Chair, Chemical and Nuclear Engineering Department, University of New Mexico, 1957-1985

- International Atomic Energy Agency Technical Expert, Reactor Experimentation, 1966-1967

- Los Alamos National Laboratory

  - High Temperature Gas-Cooled Reactor Safety Analysis, 1974-1975; Nondestructive Assay Measurements for SNM, International Safeguards, 1983 to present

- Other Nuclear Safety Reviews

  - Doe Independent Review Committee for Transuranic Waste, 1980-1984, Chair 1 year
  - NRC Nuclear Criticality Safety Appraisal Team, Nuclear Fuel Services Corporation, Erwin, Tennessee, 1986
  - DOE Readiness Review Team, PUREX and PFP, Hanford, Washington, 1986-1988
  - Nuclear criticality safety analysis, Oak Ridge K-25 Decommissioning Project, 1987-1989
  - EDS SAR Review, criticality safety, Lawrence Livermore National Laboratory, 1988

EDUCATION: Ph.D., Chemical Engineering, Carnegie-Mellon University
M.S., Chemical Engineering, Montana State University
B.S., Chemical Engineering, Indiana Institute of Technology

OTHER: Fellow, American Nuclear Society
Professional Engineer, Nuclear Engineering, New Mexico

APPENDIX A-3-2

Biographical Sketches of
Tritium Facilities Team Members
Tiger Team Compliance Assessment
Safety and Health Subteam
Savannah River Site

NAME: Owen O. Thompson

AREA OF RESP: Tritium Facilities Team Leader

ASSOCIATION: DOE Headquarters, Office of Safety Appraisals

EXPERIENCE: 25 years

- DOE Headquarters
  - Office of Safety Appraisals, Team Leader
  - Office of Compliance Programs, Project Manager for Idaho Operations
  - Office of Civilian Radiological Waste Management, Licensing Project Manager for proposed Basalt Waste Isolation Project
- Nuclear Regulatory Commission
  - Licensing Project Manager, TMI-1 restart
  - Technical Assistant to Director, Div. of Engineering
  - Staff reviewer on Geosciences for power plants, low level waste sites, mill tailings dams
  - NRC Deputy Dam Safety Officer
  - ANSI subcommittee on NQA-2
- ATEC Associates of Maryland, Inc.
  - Chief Engineer: Consulting services for foundations, highways, dams, hazardous waste sites; expert witness
- U.S. Waterways Experiment Station
  - Research Engineer on heavy duty pavement studies
- University of Illinois
  - Lecturer for Illinois Highway Dept. training program
  - Research on dynamic response of highway pavements

EDUCATION: B.S., Royal Melbourne Inst. of Technology (Australia)
Ph.D., Civil Engineering, University of Illinois (Urbana)
NRC, Chattanooga Training Center, BWR & PWR series

OTHER: American Society of Civil Engineers
Registered Professional Engineer

NAME: Steve K. Singal

AREA OF RESP: Tritium Facilities Assistant Team Leader

ASSOCIATION: DOE Headquarters, Office of Safety Appraisals

EXPERIENCE: 19 years

- DOE, Germantown, Maryland: Nuclear Engineer
  - Assistant Team Leader for Technical Safety Appraisals of DOE Facilities
- DOE, Germantown, Maryland: General Engineer
  - HQ Study Plan Coordinator for the characterization of the Yucca Mountain Deep Geologic Repository
- Federal Engineering Regulatory Commission: Project Manager
  - Responsible for review of license applications for hydroelectric power projects
- DOE, Washington, D.C.: Environmental Engineer
  - Responsible for preparation of EIS for coal-conversion of NYC's Arthur Kill and Ravenswood Powerplants (DOE's Office of Fuels and Conversion)
- State of Maryland: Environmental Engineer
  - Responsible for enforcement of air, water, solid waste, and noise pollution control laws

EDUCATION: M.S., Civil Engineering, Brigham Young University
B.S., Civil Engineering, Roorkee University, India

OTHER: Registered Professional Engineer (Maryland)

NAME: Carl D. Corbit

AREA OF RESP: Emergency Preparedness
Safety/Security Interface

ASSOCIATION: Battelle Pacific Northwest Laboratories, Richland, WA

EXPERIENCE: 27 years

- Battelle Pacific Northwest Laboratories, Richland, WA
  - Staff Scientist: N Reactor and Fuels Fabrication radiological/environmental assistance, emergency preparedness for the NRC and DOE, and environmental peer reviews of environmental impact statements
- UNC Nuclear Industries, Richland, WA
  - Manager Radiological/Environmental & Safety: Establish, maintain and administer safety and waste management programs
  - Chairman of the Isotopes Committee for the radioactive materials license
- Atomic Energy Commission, Richland, WA
  - Health Physicist: Develop and implement radiation protection and environmental control inspection/appraisal programs
  - Coordinate and respond to waste management experts and the National Academy of Sciences

EDUCATION: B.S. in Zoology, University of Idaho
M.S. in Biology, University of Oregon

OTHER: Sustained Superior Performance Award with the Atomic Energy Commission
Appointed Commissioner of the National Occupational Health and Safety Program Accreditation Commission
President of the Columbia Chapter of the Health Physics Society
Member of the Training Committee, National Health Physics Society
Chairman, Washington State Radiation Advisory Commission

NAME: Roland A. Jalbert

AREA OF RESP: Technical Support

EXPERIENCE: 32 years

- Los Alamos National Laboratory
  - Field health physics involving accelerators, x-ray machines, portable radiation sources, in addition to instrument development, neutron shielding, radiological engineering, tritium handling safety
  - Member of "Tritium Systems Test Assembly" staff responsible for safety systems and for tritium contamination studies and tritium monitor R&D
- University of Alaska, College, AK
  - Assistant Professor of Physics
- General Electric Company, Richland, WA
  - Member, Health Physics Group
- Private Consultant
  - American Atomics Corporation (Tucson, AZ) on tritium handling, safety, monitoring, dosimetry
  - Quadrex Corporation (Richland, WA) on decommissioning radiochemistry laboratory
  - Skyway Consulting, Inc. (Tucson, AZ) on tritium accident analysis

EDUCATION: B.S., Physics, Massachusetts Institute of Technology
M.S., Biophysics, Massachusetts Institute of Technology

OTHER: Certified by American Board of Health Physics
Member of Panel of Examiners, American Board of Health Physics
Member of ANSI committee that drafted Tritium Bioassay Standard
Member, DOE/OFE panel that reviewed ORNL generic fusion safety technical basis document

NAME: Paul H. Lamberger

AREA OF RESP: Operations

ASSOCIATION: EG&G Mound Applied Technologies Inc. (Mound)

EXPERIENCE: 30 years

- Senior Specialist, Tritium Technology
- Senior Development Specialist
- Group Leader, Tritium Process Technology
- Group Leader, Tritium Recovery
- Senior Development Chemist, Tritium Control Technology
- Senior Development Chemist, Weapons Process Development
- Supervisor, Polonium Concentration
- Chemist, Polonium Processing
- Participated in DOE/OMA Safety Survey for LLNL and SNL
- Participated in TSA of LLNL Tritium Facility

EDUCATION: B.A., in Chemistry, College of Wooster
B.S., in Chemical Engineering, University of Dayton

OTHER: Registered Professional Engineer in California
Co-editor of "Tritium Control Technology," WAS-1269

NAME: Leonard M. Lojek

AREA OF RESP: Quality Verification

ASSOCIATION: Headquarters, DOE, Quality Assurance Manager, Office of Environment, Safety and Health

EXPERIENCE: 30 Years

- Quality Assurance Manager, Assistant Secretary for Environment, Safety and Health, DOE
- Quality Assurance Program Manager, Assistant Secretary for Fossil Energy, DOE
- Program Manager of R&D efforts in Solvent Refined Coal Conversion Programs (SRC-I and SRC-II), Assistant Secretary for Fossil Energy, DOE
- Project Manager and Project Engineer for disposal of obsolete toxic chemical munitions, Chemical Systems Laboratory, DOD
- Product Engineer for smoke and pyrotechnic chemicals, and for riot control chemicals; Process Engineer for plasticized white phosphorus munitions, Chemical Systems Laboratory, DOD
- Technical Service Engineer for industrial and utility water treatment systems, Calgon Corporation

EDUCATION: B.S., Chemical Engineering, Carnegie-Mellon University
M.S.A., Management Engineering, George Washington University

OTHER: Member of AICHE, ASQC, ADPA

NAME: Jerome B. Martin

AREA OF RESP: Radiological Protection

ASSOCIATION: Battelle, Pacific Northwest Laboratory (PNL)
Technical Leader, Operational Health Physics Group

EXPERIENCE: 23 years in health physics

- Participated in DOE Technical Safety Appraisals of: LLNL Bldg. 332, Brookhaven High Flux Beam Reactor, Idaho Chemical Processing Plant, and the Mound Plant T-Building
- Acting Section Manager, Health Physics Technology Section, PNL
- Technical Leader, Emergency Preparedness Group, PNL
- Manager, Radiation Monitoring Section, PNL
- Associate Section Manager, Radiation Standards and Engineering Section, PNL
- Radiation Safety Officer, University of Colorado, Boulder
- Radiation Safety Officer, San Diego State University

EDUCATION: B.S., Nuclear Physics, San Diego State University
M.S., Radiation Physics, Colorado State University

OTHER: Certified by American Board of Health Physics, 1972
Director, Radiation Protection Appraisals Division, ASTM E-10.04

NAME: George A. Morris

AREA OF RESP: Maintenance

ASSOCIATION: Lawrence Livermore National Laboratory (LLNL)
University of California, Tritium Facility Manager

EXPERIENCE: 26 years - LLNL

- Tritium Facility Staff
- Tritium Facility Manager
- Tritium Facility Safety Officer
- Laboratory handling of tritium gas and compounds for Nevada Test Site support
- Field work for radiochemical diagnostics at Nevada Test Site

EDUCATION: B.S., Metallurgical Engineering, Univ. of Illinois
M.S., Nuclear Engineering, Univ. of Illinois

NAME: Bobby A. Picker

AREA OF RESP: Training and Certification

ASSOCIATION: EG&G Idaho, Inc.

EXPERIENCE: 21 Years

- Special assignment to DOE-ID for project management and oversite for the Reactor Facilities and Operations Branch. Responsible for construction and reactor modifications associated with the Advanced Test Reactor at the INEL.
- NRC certified examiner for Westinghouse and B&W PWR Reactor and consultant for prelicensing actions at South Texas Project
- Assistant Shift Supervisor, ETR, INEL, included audit and review of reactor and experiment programs and reactor crew training
- Engineering Officer of the Watch, Engineering Watch Supervisor, and Electrical Operator, U.S. Navy Nuclear Power Program

EDUCATION: 100 credit hours in Math, Nuclear Technology, and Computer Science (University of Idaho)
NRC - I & E Training Center PWR Course Series
Navy - Nuclear Power and Prototype Training Schools

NAME: David Schweller

AREA OF RESP: Organization and Administration
Facility Safety Review

ASSOCIATION: DBS Associates, Inc.

EXPERIENCE: 35 years

- President, DBS Associates, Inc.; Private Consulting in organization, management, safety and security
  - Participated in 10 TSAs
  - Member of the Assistant Secretary's Environment, Health and Safety working group to review the TSA program
  - Participated in the Secretary of Energy's first Tiger Team, Management Subteam, and 2 subsequent Management Subteams
  - Safety Advisor to DOE Security Inspection and Evaluation Team
  - Evaluator for FEMA Nuclear Utility Emergency Drills
- U.S. Department of Energy
  - Manager and Contracting Officer, Brookhaven Area Office, Upton, NY
  - Regional Coordinator for Region I (11 NE States) Radiological Assistance Program
  - Director, Safety Division, Brookhaven Area Office, Upton, NY
- Reactor Safety Specialist, U.S. AEC, Washington, DC
- Chief, Experimental Physics, Martin Nuclear Division, Middle River, MD
  - Designed, built, and operated three zero-power-reactors - experimental facilities
- Reactor Physicist, Combustion Engineering Nuclear Division, Windsor, CT
  - Designed, built, and operated three zero-power-reactors - experimental facilities

EDUCATION: B.S., Engineering Physics, N.Y.U. College of Engineering

OTHER: Numerous Government Awards for Performance Listed in:

- Who's Who in Atoms
- Who's Who in Engineering
- Who's Who in the East
- The U.S. Senior Executive Directory

NAME: Douglas P. Serpa

AREA OF RESP: Personnel Protection

ASSOCIATION: Chemrad Corporation

EXPERIENCE: 18 years

- Stone and Webster Engineering Corporation
  - Senior Principal Scientist
  - Responsible for the development of the Radiation Protection and ALARA programs for the Atomic Vapor Laser Isotope Separation Production Plant being developed by LLNL and MMES
  - Lead Engineer For LLNL Tritium Facility SAR Rewrite
- Chemrad Corporation
  - Marketing Representative and Senior Health Physics Engineer
  - Responsible for providing health physics engineering services on company matters and most recently has been involved in the asbestos removal program at the General Electric Nuclear Center at Vallecitos
- Airplanes, Inc.
  - President and CEO: Responsible for all aspects of the operation of Airplanes, Inc., as well as a DOE and FAA approved hazardous material transport program for the transport of various classified radiological materials and for emergency transport of radiation accident response teams and victims
- Pacific Gas & Electric Company
  - Senior Nuclear Generation Engineer: Directed a special projects section which was responsible for in-plant radiochemistry, health physics computational, and general health physics support
  - Developed and directed the redesign of the personnel radiation dosimetry program
  - Provided expert testimony on the behalf of PG&E for NRC licensing of Diablo Canyon Nuclear Power Plant

- Health Physicist: Served as a Staff Health Physicist in PG&E's Department of Engineering Research and directed PG&E's environmental radiation monitoring programs at Humboldt Bay and Diablo Canyon Nuclear Power Plant

EDUCATION:

A.S., Chemistry, Modesto Junior College
B.S., Zoology and Chemistry, University of California
M.S., Biophysics and Radiation Protection, Texas A&M University

OTHER:

Member, Health Physics Society
Member, ANS/ANSI Committee on Standardization of In-Plant Radiation
Member, IEEE Society

NAME: James A. Shurick

AREA OF RESP: Fire Protection

ASSOCIATION: Private Expert

EXPERIENCE: 40 years

- Private Expert, Tijeras, NM
- U.S. Department of Energy, Albuquerque, NM
  - Fire Protection Engineer: Responsible for all protection/prevention design efforts for remodification on upgrading existing facilities and new construction
- Factory Insurance Association, Chicago, IL
  - Assistant Chief Engineer: Supervised 200 field inspector, Also assisted the Underwriting Section in reviewing existing insured businesses for renewals, review of prospective risks for insurance coverage, and in settling loss estimates
  - Accounts Engineer: Responsibilities included the handling of large accounts and required complete engineering review of existing an prospective assureds' facilities by use of plans, consultation and physical visits to property

EDUCATION: B.S., Fire Safety, Illinois Institute of Technology

OTHER: Member, Fire Protection and Safety
Member, Certified Safety Professional
Licensed Professional Engineer, Fire Protection

NAME: William R. Wall

AREA OF RESP: Auxiliary Systems

ASSOCIATION: Sandia National Laboratories - Livermore

EXPERIENCE: 31 years - Sandia

- Participated in DOE/ONS PSAR review SRP RTF
- Tritium Research Laboratory staff, 18 years
- Tritium Research Laboratory, Gas Purification System, Vacuum Effluent Recovery System, systems design
- Computer based, TRL, tritium monitoring system design
- Hardware/software, design/development, test data processing systems
- Underground nuclear tests telemetry system design
- Flight telemetry systems design

EDUCATION: B.S. Electrical Engineering, University of Idaho

NAME: Larry D. Warren

AREA OF RESP: Report Quality

ASSOCIATION: Private Consultant

EXPERIENCE: 26 years

- Private Consultant
  - Technical safety consulting to the Department of Energy and its contractors
  - Represented the Assistant Secretary for Defense Programs, Program Office Representative, on two Technical Safety Appraisals (TSAs) and five TSA follow-ups
- U.S. Department of Energy, Germantown, MD
  - Safety Programs Manager, Office of Weapons Safety and Operations, Deputy Assistant Secretary for Military Applications (DASMA), Defense Programs: Formulated safety and health policy and long-range plans for three major national laboratories and five primary manufacturing facilities in the nuclear weapons complex
  - TSA coordinator and contact for DASMA
  - Headquarters Program Office Representative on 11 TSAs
- Wilmington District, U.S. Army Corps of Engineers
  - Deputy District Commander: Managed and directed annual planning and execution of $60-70 million in civil works projects, and $9-15 million in military construction projects
  - Contracting officer for construction and service contracts
- Los Alamos National Laboratory
  - Program Manager, Insertable Nuclear Component Technology Program; Project Manager, Corps Support Weapon System Concept Study; Design Engineer: Nuclear weapon components and subsystems

- U.S. Army (Lieutenant Colonel, Retired)
  - Various command, operations, and training assignments; and nuclear weapons research and development staff assignments

EDUCATION: B.S., Nuclear Engineering, North Carolina State University
M.S., Nuclear Engineering, North Carolina State University
United States Army Command and General Staff College

OTHER: Member, Society of American Military Engineers

APPENDIX A-3-3

Biographical Sketches of
Savannah River Laboratory and Aviation Safety,
Medical Services, Packing and Transportation,
and Emergency Preparedness
Tiger Team Compliance Assessment
Safety and Health Subteam
Savannah River Site

NAME: Blake P. Brown

AREA OF RESP: Team Leader

ASSOCIATION: DOE/Headquarters - Office of Safety Appraisals

EXPERIENCE: 31 Years

- Team Leader of 16 previous Technical Safety Appraisals and follow-up reviews.
- Department of Energy
  - Team Leader, Technical Safety Appraisals
  - Program Manager, Nuclear Criticality Safety
  - Nuclear Safety Engineer, Appraisals and Safety Reviews
- Atomic Power Development Associates, Detroit, Michigan
  - Systems Engineer
- Phillips Petroleum Company, Idaho National Engineering Laboratory
  - Chemical Research Engineer

EDUCATION: B.S., Chemical Engineering, University of Idaho

OTHER: DOE Representative on ANSI N-16 Committee on Nuclear Criticality Safety
Past Secretary-Treasurer and member of Board of Directors of Nuclear Engineering Division, American Institute of Chemical Engineers.

NAME: Robert A. Babione

AREA OF RESP: Quality Verification and Technical Support

ASSOCIATION: ARINC Research Corporation

EXPERIENCE: 17 Years

- Energy Facility Appraisal Support and Reliability Analysis (ARINC Research Corporation, Annapolis, MD)
  - Participated in numerous on-site appraisals at DOE facilities including TSAs, QA appraisals, and special technical evaluations.
  - Managed and supported numerous reliability evaluations and technology assessments of energy systems.
- Nuclear Facility Support Engineering
  (Westinghouse - Bettis Atomic Power Laboratory and Naval Reactor Facilities)
  (EG&G Idaho - Idaho National Engineering Laboratory)
  - Facility support engineering at various government nuclear facilities.
- Energy Technology Engineering
  (Stearns-Roger Inc., Denver, Colorado)
  (Coury and Associates, Denver, Colorado)
  (Benham-Holway, Tulsa, Oklahoma)
  - R&D project management, detailed engineering design, and construction support engineering for fossil fuel, geothermal, and nuclear energy technologies.

EDUCATION: B.S., Mechanical Engineering, Oklahoma State University

OTHER: Registered Professional Engineer

NAME: Timothy Bardell

AREA OF RESP: Training

ASSOCIATION: Pacific Northwest Laboratory

EXPERIENCE: 12 Years

- PNL

  - NRC Operator Licensing Examiner
  - DOE/NRC Technical Support

  N-Reactor

  - Lead engineer for updating N-Reactor Technical Specifications
  - Level II certification (operating staff management level)
  - Process standards engineer, implementation and compliance monitoring of technical specification and safety standards
  - Nuclear safety representative for security projects, including development of insider protection plan
  - PRA technical liaison for N-Reactor Level I PRA

- U.S. Navy

  - Junior watch officer, submarine
  - Underway engineering watch officer, nuclear
  - In-Port engineering duty officer, nuclear

EDUCATION: B.S., Ceramic Engineering, University of Washington

OTHER: Naval Reserve Intelligence

NAME: James A. Buckham

AREA OF RESP: Operations

ASSOCIATION: Private Consultant

EXPERIENCE: 37 Years

- Member of DOE TSA teams at Fernald, Rocky Flats, Y-12, West Valley, and Portsmouth
- Oversight Team Leader to assure safe, effective restart of Sequoyah Facility
- Allied-General Nuclear Services - Executive VP and President with overall responsibilities for the Barnwell Nuclear Fuels Plant
- Idaho National Engineering Laboratory - Research and Development, Operations, and Management at the Idaho Chemical Processing Plant

EDUCATION: B.S. Chemical Engineering, University of Washington
M.S. Chemical Engineering, University of Washington
Ph.D. Chemical Engineering, University of Washington

OTHER: Member, Sigma Xi, Tau Beta Pi
Fellow, American Institute of Chemical Engineers
Member, American Nuclear Society
Member, American Chemical Society
Instructor, University of Washington
Adjunct Professor, University of Idaho

NAME: John M. Cece

AREA OF RESP: Packaging and Transportation

ASSOCIATION: Menehune Marine Services

EXPERIENCE: 31 years

- Served on Technical Safety Appraisals of Plutonium Finishing Plant, Feed Materials Production Center, PUREX, H-B Canyon, Rocky Flats, Hanford Tank Farms, Brookhaven National Laboratory, Pinellas Plant, Y-12 Plant
- Completed peer review of Rocky Flats Safety Analysis Report (SAR)
- Safety Consultant, Hazardous Materials Packaging and Transportation: Participated in safety reviews of 36" pipeline (Texas); chemical manufacturing plant (Connecticut); private clients
- Marine Surveyor (safety and compliance)
- U.S. Department of Energy
  - Manager, Hazardous Materials Packaging and Transportation, Office of Operational Safety
- U.S. Department of Transportation (Coast Guard)
  - Manager, Transportation Safety R&D

EDUCATION: Ph.D., Physical Chemistry, University of Rhode Island
B.S., Engineering, U.S. Coast Guard Academy

NAME: Jerome E. Dummer, Jr.

AREA OF RESP: Personnel Protection

ASSOCIATION: M.H. Chew & Associates, Inc.

EXPERIENCE: 32 Years

- Los Alamos National Laboratory
  - Associate division leader for Health Safety, and Environment Division providing radiation protection, and safety services and development work
  - Group leader for Health Physics
  - Alternate group leader for dosimetry and hazard prediction for nuclear rocket engine tests
  - Health Physics advisor to test director for nuclear rocket engine tests
- U.S. Army Chemical Corps
  - Health Physicist

EDUCATION: B.S., Physics, The Colorado College
M.S., Physics, Vanderbilt University

OTHER: Certified by American Board of Health Physic
Accident Investigation (DOE)

NAME: Leo G. Faust

AREA OF RESP: Radiological Protection

ASSOCIATION: Chief Scientist, Health Physics Department Battelle-Pacific Northwest Laboratory

EXPERIENCE: 32 Years

- Battelle-Pacific Northwest Laboratory
  - Various management positions covering all phases of health physics
  - Broad range of health physics and dosimetry research and development activities, including various dosimetry upgrade programs
  - Serves on several national and international standards committees, both as a participating member and as chairman of working groups
  - DOE representative to the Interagency Intrinsic Radiation (INRAD) Committee and Joint Radiation Protection Group
  - Served on 12 TSAs and 3 Tiger Teams
- General Electric Company at the Hanford Atomic Energy Project
  - Managed the radiation monitoring program of the Hanford Laboratories
  - Responsible for establishing improved routine surveillance programs resulting in better contamination control and reduced exposures
  - Developed and applied radiological engineering criteria for new and old facilities; performed dose rate determinations and shielding calculations

EDUCATION: B.S., Physics, Humboldt State College
Graduate studies in Physics and Nuclear Engineering
University of Washington Center for Graduate Study

OTHER: Health Physics Society Fellow and American Nuclear Society Member (active committee member in both organizations)
Authored and co-authored numerous technical publications and presentations.

NAME: Scott E. Harlow

AREA OF RESP: Assistant Team Leader (Part-Time)

ASSOCIATION: U.S. Department of Energy Headquarters
Office of Safety Compliance

EXPERIENCE: 3 years

- DOE, Germantown, Maryland
  - Assistant Team Leader for Savannah River Waste Management Facilities Subteam
  - Participated in Technical Safety Appraisals of Fast Flux Test Facility and Hanford Tank Farms
  - Coauthored Facility Safety Surveillance Manual for West Valley Project Office
  - Developed computer tracking systems for asbestos inventories and facility safetysurveillances
  - Conducted study of Savannah River Reactor incident reports
  - Assisted with the establishment of the Suspect Equipment Notification System
- Toledo Edison, Davis-Besse Nuclear Power Station Toledo, Ohio--Co-op Nuclear Engineer
  - Lead Engineer with the Technical Specification Verification Program, Borated Water Systems
  - Developed computer input decks for nuclear cross-section parameterization program
  - Compiled station power history
  - Conducted physical inventory of special nuclear material; completed NRC material balance sheet
  - Performed daily functional tests and backups of plant computer systems

EDUCATION: B.S., Nuclear Engineering, University of Cincinnati

OTHER: Member American Nuclear Society
NRC Babcock and Wilcox Reactor Technology training
Management Oversight Risk Tree Analysis,
Accident Investigation training,
Probabilistic Risk Assessment training
Crosscut Management Program training

NAME Harry W. Heiselmann

AREA OF RESP: Maintenance (Part-Time)

ASSOCIATION: SCIENTECH, Inc.

EXPERIENCE: 30 Years

- U.S. Department of Energy Programs
  - Participation in more than 10 Technical SafetyAppraisals and recent Tiger Teams at the Hanford, Nevada, Idaho, Oak Ridge, Brookhaven, Mound, and Savannah River sites
    - Participation in the development, implementation, and utilization of maintenance programs and in the application of reliability and fault tree analyses
    - Development and testing of electric vehicles

- Nuclear Safety Programs
  - Participation in the LOFT and Semiscale nuclear safety testing programs
  - Manufacturing, testing, and maintenance of equipment
  - Quality assurance, control and verification programs per NQA-1 and MIL Q-9858

- Industrial and Commercial Projects
  - Design, analysis, and testing, maintenance, quality assurance, and research for developmental and prototype equipment and facilities
  - Expertise in instrumentation and measurement systems, field support and test equipment, and test data acquisition and analysis
  - Development of radiation protection and monitoring systems

EDUCATION: B.S., Mechanical Engineering, Illinois Institute of Technology
Graduate course work, University of Idaho
Jet Propulsion Lab/U.S. Army Guided Missiles

OTHER: Member, American Society of Mechanical Engineers/IdahoSection Officer
Member, American Nuclear Society/Symposium Finance Chair
Registered Professional Engineer: Idaho and Illinois

NAME: Hugo R. Hofmann

AREA OF RESP: Aviation Safety

ASSOCIATION: HRH Aero Consulting, Inc.

EXPERIENCE: 40 years

- DOE Programs
  - Participation in Technical Safety Appraisals of the security helicopter services at Savannah River Site, Brookhaven National Laboratory, Hanford, Plutonium Finishing Plant, Idaho Chemical Processing Plan, Livermore National Laboratory, and Nevada Test Site
- Employment with major air carrier and Federal Aviation Administration

EDUCATION: B.S., Industrial Education, University of Miami
National Aircraft Accident Investigation, Oklahoma City, Oklahoma

NAME: William G. Jacobs

AREA OF RESP: Maintenance

ASSOCIATION: Reynold's Electrical & Engineering Co., Inc. (REECo)
Site Maintenance Department
Manager

EXPERIENCE: 30 years

- REECo, Nevada Test Site (NTS)
  - Various administrative, line and management positions covering all phases of maintenance.
  - Formulated procedures and established policies for efficient and economical maintenance controls.
  - Personally responsible for the development of the Real Property Maintenance Management Program at the NTS (DOE Order 4330.4).
  - Chairman of committee for the 1989 DOE Maintenance Management Conference, Las Vegas, Nevada.
  - Presentations at previous DOE Maintenance Management Conferences.
- Hughes Aircraft Corporation, Inglewood, California
  - Electrical/Mechanical inspections of Fire Control Systems.

EDUCATION: Sierra High School, Gardena, California
El Camino Junior College
Harbor Junior college
Major: Business Administration and Accounting
Numerous Plant Engineering and Maintenance Workshops

OTHER: American Water Well Association

NAME: Bernard R. Kokenge

AREA OF RESP: Organization and Administration and Site/Facility Safety Review

ASSOCIATION: EG&G/Consultant

EXPERIENCE: 25 Years

- Kentucky Christian College
  - Vice President, Strategic Planning and Program Development
- TSA/Tiger Team Member on 6 DOE Headquarters Appraisals
- DOE-Price-Anderson Amendment Act Visiting Team
- Monsanto Research Corporation, Mound Plant
  - Associate Director of Mound Plant - Responsible for all of Mound's component development and production activities associated with primary detonators, timers, actuators and pyrotechnic devices
  - Nuclear Operations Director - Responsible for all radiological development and production technology as applied to the isotopes of hydrogen, analytical chemistry support for Mound and production/testing of radioisotopic thermoelectric generators for the Galileo and Ulysses space missions
  - Nuclear Technology Manager - Covering diverse technical radiological functions including Plutonium-238 processing technology, plutonium waste management development, tritium process development in support of DOE's weapons programs and processing/engineering technology for Mound's tritium operations.
  - Plutonium Processing Manager - Responsible for Plutonium Processing Building operation, wherein Plutonium-238 fuel forms were produced and Plutonium-238 scrap recovered and recycled
  - Plutonium Fuels Group Leader - Investigating the behavior and physical properties of Plutonium-238 as a fuel for space applications

EDUCATION: Ph.D., Inorganic Chemistry, Ohio University
B.S., Chemistry, University of Dayton

OTHER: Patent on Plutonium-238 isotopic fuels
Achievement awards for DOE for significant overall program contributions
DOE Management Team Chairman for the Galileo and Ulysses RTG space mission program

NAME: O. Clinton Kolar

AREA OF RESP: Nuclear Criticality Safety

ASSOCIATION: Lawrence Livermore National Laboratory, Livermore, CA

EXPERIENCE: 38 Years.

- Lawrence Livermore National Laboratory, Livermore, CA
  - Nuclear criticality safety: Responsible for nuclear criticality safety studies at LLNL.
  - Group leader of Livermore Plutonium Array Program with responsibility for providing technical and administrative direction on design, performance, and analysis of a series of experiments to determine critical spacings of arrays of plutonium parts.
  - Assistant Head of R Division with responsibilities for administrative and technical supervision of physics personnel. Technical responsibilities were in reactor neutronic analysis, and radiation effects and shielding.
- Lawrence Berkeley National Laboratory, Berkeley, CA
  - Conducted investigations of nuclear reaction mechanisms, magnetic field measurements, beam shielding, particle energy determination, accelerator field mapping.

EDUCATION: B.A. in Physics, UCLA.
Ph.D. in Physics, University of California at Berkeley

OTHER: Registered Professional Nuclear Engineer, State of California
Certified U.S. DOE Accident/Incident Investigator
Member of American Physical Society, American Nuclear Society, Sigma Xi, American Association of Physics Teachers, American Association for the Advancement of Science, National Science Teachers Association

NAME: Joseph A. Leary

AREA OF RESP: Auxiliary Systems

ASSOCIATION: TRU Engineering Company, Inc.

EXPERIENCE: 46 Years in Nuclear Materials

- Served on Technical Safety Appraisals for Fernald, (WMCO), Savannah River Plant (221-H Canyon), Y-12 Plant (Bldgs. 9206 and 9212), Oak Ridge, LLNL (Bldg.332), PUREX, and the Plutonium Finishing Plant at Hanford.
- President, TRU Engineering Company, Inc., Santa Fe, NM
- AEC/ERDA/DOE Headquarters Manager, National Advanced Fuels Program; Director, International Programs; and Director, Fuels Management and Safeguards
- Scientist, Engineer and Manager of Nuclear Materials Programs, Los Alamos National Laboratory

EDUCATION: Ph.D.,Chemistry, University of New Mexico, B.S., Chemical Engineering, Newark College of Engineering

OTHER: Fellow, American Nuclear Society
Member, N.Y. Academy of Science
Member, Cosmos Club of Washington, DC
Member, Sigma XI and Tau Beta Pi

NAME: Paul B. Mossman

AREA OF RESP: Medical Services

ASSOCIATION: Private Expert

EXPERIENCE: 40 Years

- Private Expert
  - Consulting with government and private agencies offering expertise in the Medical Services field with respect to organization and administration; procedures and documentation; and medical treatment

- Sandia National Laboratories
  - Medical Director, responsible for the overall management of the Medical Services Department
  - Associate Medical Director of Sandia National Laboratories

- Arabian American Oil Company (ARAMCO) Dhahran, Saudia Arabia
  - Occupational Health Physician

- Northern California State
  - General Practitioner

- U.S. Army
  - Captain in Medical Corps

EDUCATION: M.D., George Washington University, Washington, D.C.
M.P.H., and Occupational Health, University of California, Berkeley

OTHER: American Board of Family Practice
American Board of Preventive Medicine in Occupational Medicine

NAME: Linda Munson

AREA OF RESP: Emergency Readiness and Security/Safety Interface

ASSOCIATION: Evergreen Innovations, Inc.

EXPERIENCE: 16 Years

- Evergreen Innovations
  - Project Manager for EPRI Radwaste Desk Reference
  - Consultant to Battelle-Northwest on TMI cleanup
  - TSA participant: Industrial Hygiene, Emergency Readiness, Radiation Protection and Safety Security Interface
- Battelle, Pacific Northwest Laboratories
  - Associate Section Manager, Dosimetry Technology Section
  - Project Manager for various technical assistance programs including cleanup of TMI and upgrade of the RMI Health Physics program
  - Participated in the team appraisal of six uranium mills for and with the NRC
  - Appraised, with DOE-HQ, Emergency Preparedness of Rocky Flats
  - Participated in six Emergency Preparedness exercises for NRC
- UNC Nuclear Industries
  - Manager, Industrial safety responsible for industrial hygiene, industrial safety and fire protection at N Reactor and the associated fuel fabrication facilities
  - Managed the preparation of Environmental Information Reports and license applications for various nuclear facilities, primarily uranium mills, and fuel fabrication plants
  - Evaluated decontamination alternatives for the West Valley Reprocessing Plant

EDUCATION: M.S., Analytical Chemistry, Iowa State University
B.A., Chemistry U.S. International University
Short courses in Radiation Protection, Industrial Hygiene, Industrial Safety, MORT, Respiratory Protection, Management, and Communications

NAME: Kirk Russell

AREA OF RESP: Fire Protection

ASSOCIATION: Rockwell, INEL

EXPERIENCE: 10 Years

- Rockwell, INEL
  - Sr. Fire Protection Engineer - responsible for fire protection standards, training emergency response teams
  - Pertain audits and inspections of plant facilities and operation for adherence to codes and standards
- WINCO
  - Sr. Fire Protection Engineer - providing engineering and technical direction for projects
  - Provided inspections and audits of plant facilities and operations
- Factory Mutual Engineering Assoc.
  - Fire Protection Consulting Engineer, responsible for inspections of industrial facilities, identifying plant hazards and providing recommendations

EDUCATION: B.S. in Geological Engineering, University of Idaho

OTHER: Member, SFPE since 1982
Member, NFPA since 1984

NAME: James C. Snell

AREA OF RESP: Assistant Team Leader (Part-Time)

ASSOCIATION: DOE Headquarters, Office of Safety Appraisals

EXPERIENCE: 27 Years

- U.S. Department of Energy, Germantown, Maryland
  - Team Leader for Technical Safety Appraisals of DOE facilities
  - Policy review and revision to DOE Environmental Health and Safety Policies

- U.S. Department of Transportation, Washington, DC
  - Safety engineer for regulatory review of MotorVehicle Codes and Standards

- U.S. Department of Defense (Army), Alexandria, VA
  - Inspector General, responsible for technical engineering inspections and reviews of Defense Weapons Systems

- General Physics Corporation, Columbia, Maryland
  - Manager of Licensing, responsible for nuclear power plant licensing concerns.

- NUS Corporation, Gaithersburg, Maryland
  - Manager of Licensing, responsible for review and compliance of licensing activity for power plant clients.

- U.S. Nuclear Regulatory/Atomic Energy Commission, Bethesda, Maryland
  - Regulatory Project Manager to variety PWR's and BWR's responsible for Government acceptance and review of applications to construct and operate facilities.

- U.S. Navy
  - Communication Division Officer responsible for both fleet and ship communication

EDUCATION: B.S., Math and Physics, Lebanon Valley College, Annville, PA
Graduate studies in Nuclear Engineering and Mechanical Desig

NAME: William H. Wallace

AREA OF RESP: Aviation Safety

ASSOCIATION: U. S. Department of Energy Headquarters
Office of Quality Programs

EXPERIENCE: 23 Years

- DOE, Germantown, Maryland
  - Aviation Safety Manager: manage and provide oversight of the DOE aviation safety program, and manage and direct aviation safety appraisals of DOE facilities
- Department of the Army
  - Aviation Safety Manager: managed a nationwide aviation safety program, and managed and directed numerous aviation safety appraisals of Army facilities

EDUCATION: B.S., Aeronautical Science, Embry Riddle Aeronautical University
Graduate work at the Safety Center, University of Southern California
Graduate work in the School of Engineering, Arizona State University

OTHER: Member, International Society of Aviation Accident Investigators
Member, Interagency Committee on Aviation Policy
FAA Airline Transport Pilot, Airplane and Helicopter
FAA Flight Instructor, Airplane and Helicopter
U.S. Army Master Aviator
U.S. Army Standardization Instructor Pilot and Instrument Flight Examiner
Who's Who in Aviation, 1983

NAME: Larry D. Warren

AREA OF RESP: Report Quality

ASSOCIATION: Private Consultant

EXPERIENCE: 26 Years

- Private Consultant
  - Technical safety consulting to the DOE and its contractors
  - Represented the Assistant Secretary for Defense Programs, Program Office Representative, on two Technical Safety Appraisals (TSAs) and five TSA follow-ups.
- U.S. Department of Energy, Germantown, MD
  - Safety Programs Manager, Office of Weapons Safety and Operations, Military Applications (DASMA), Defense Programs: Formulated safety and health policy and long-range plans for national laboratories and primary manufacturing facilities in the nuclear weapons complex
  - TSA coordinator and contact for DASMA
  - Program Office Representative on 11 TSAs
- Wilmington District, U.S. Army Corps of Engineers
  - Deputy District Commander: Managed and directed annual planning and execution of $60-70 million in civil works projects, and $9-15 million in military construction projects
  - Contracting officer for construction and service contracts
- Los Alamos National Laboratory
  - Program Manager, Insertable Nuclear Component Technology Program; Project Manager, Corps Support Weapon System Concept Study; Design Engineer: Nuclear weapon components and subsystems
- U.S. Army (Lieutenant Colonel, Retired)
  - Various command, operations, and training assignments; and nuclear weapon research and development staff assignments

EDUCATION: B.S., Nuclear Engineering, N.C. State University
M.S., Nuclear Engineering, N.C. State University
U.S. Army Command and General Staff College

OTHER: Member, Society of American Military Engineers

NAME: Glenn A. Whan

AREA OF RESP: Packaging and Transportation (Part Time)

ASSOCIATION: Emeritus Professor, Chemical and Nuclear Engineering, University of New Mexico

EXPERIENCE: 33 years

- Participated in DOE Technical Safety Appraisals for Oak Ridge Y-12 Plant, Portsmouth and Paducah Gaseous Diffusion Plants, Idaho Chemical Processing Plant, Hanford Plutonium Finishing Plant and PUREX Plant, Rocky Flats Plants, West Valley Facility, and Nevada Test Site, from 1986-1989.
- Professor and Department Chairman, Chemical and Nuclear Engineering Department, University of New Mexico, 1957-1985
- International Atomic Energy Agency Technical Expert, Reactor Experimentation, 1966-1967
- Los Alamos National Laboratory
  - High Temperature Gas-Cooled Reactor Safety Analysis, 1974-1975; Nondestructive Assay Measurements for SNM, International Safeguards, 1983 to present
- Other Nuclear Safety Reviews
  - DOE Independent Review Committee for Transuranic Waste, 1980-1984, Chairman 1 year.
  - NRC Nuclear Criticality Safety Appraisal Team Nuclear Fuel Services Corporation, Erwin, Tennessee, 1986
  - DOE Readiness Review Team, PUREX and PFP, Hanford, Washington, 1986-1988
  - Nuclear criticality safety analysis, Oak Ridge K-25 Decommissioning Project, 1987-1989
  - EDS SAR Review, criticality safety, Lawrence Livermore National Laboratory, 1988

EDUCATION: Ph.D., Chemical Engineering, Carnegie-Mellon University
M.S., Chemical Engineering, Montana State University
B.S., Chemical Engineering, Indiana Institute of Technology

OTHER: Fellow, American Nuclear Society
Professional Engineer, Nuclear Engineering, New Mexico

NAME: Wilbert G. Zurliene

AREA OF RESP: Radiological Protection

ASSOCIATION: General Dynamics Services Company

EXPERIENCE: 26 years

Reactor Plant Services, Engineering Supervisor

- Participated in Technical Safety Appraisal (TSA) at Hanford Tank Farm, Pre TSA for ORNL, ATR, and Tiger Team at Pinellas Plant.
- Evaluation of radiation protection programs at power reactors and DOE facilities
- Establishment of radiological engineering organization at power reactors and DOE facilities, including interim management
- Respiratory protection

General Dynamics/Electric Boat Division, Radiological Controls Staff

- Radiological engineering, including design review and operations support
- Management of operational radiological controls

U.S. Navy

- Naval Nuclear Power Program

EDUCATION: B.S. Business Administration, University of Rhode Island

OTHER: Member, American Nuclear Society and ANS 6/5.6.2, Radiation Protection Design Criteria for Post Accident Health Physics Facilities and Access Control.

APPENDIX A-4

Biographical Sketches of Team Members
Tiger Team Complaince Assessment
Management Subteam
Savannah River Site

NAME: Gerald W. Johnson

AREA OF RESP: Management and Organization Sub-team Leader

ASSOCIATION: U. S. Department of Energy, Amarillo Area Office (AAO)

EXPERIENCE: 22 years

- Management Experience
  - 3 months as Acting Area Manager of the DOE Mound Plant
  - 3 months as Acting Program Manager for DOE-AL Operational Surety Program
  - 3 years as Deputy Area Manager, AAO
  - 1 year as AAO Special Task Force Leader for security upgrades
  - 10 years as Branch Chief (ES&H, Security and Operations)
  - 1 year as initial Program Manager for DOE-AL TRU Waste Program
  - 5 years as USAF Nuclear Weapons Officer
- Special Projects
  - Directed initial development of DOE-AL Operational Surety Program for Conduct of Operations
  - Directed "Modernization Review" of the DOE Mound Plant
  - Developed AAO reorganization to separate line and oversight responsibilities
  - Directed special Task Force to implement cultural change in Pantex safeguards and security programs
  - Participated in development of DOE-AL Award Fee Handbook
  - Participated in special DOE-AL review of indirect cost growth in DOE Weapons Complex
- ES&H Experience
  - 7 years as DOE ES&H Branch Chief
  - 3 years as DOE industrial, high explosive, and nuclear explosive safety specialist
  - 5 years as USAF Nuclear Weapons Officer
  - Participated in preparations and remedial actions associated with a Tiger Team, Environmental Survey, and 3 Technical Safety Appraisals of the Pantex and Mound Plants.
  - Participated in negotiations with the EPA relating to a RCRA Corrective Action Order
  - Participated in negotiations with the State of Texas relating to an "Agreement-in-Principle".

EDUCATION: M.S., Physical Chemistry, Purdue University
B.A., Chemistry, William Jewell College

NAME: Robert M. Compton

AREA OF RESP: Management and Organization Sub-team

ASSOCIATION: United Energy Services Corporation

EXPERIENCE: 21 years

- USNRC Senior Engineer, Regional Inspector
- NRC contract inspector for two Safety System Quality Evaluations (SSQE), six Safety System Outage and Modification Inspections (SSOMI), and 16 Construction Appraisal Team (CAT) inspections.
- NRC contract inspector evaluating inservice testing of pumps and valves at six commercial nuclear plants.
- Consultant to utility in performing Safety System Functional Inspection.
- NRC contract inspector for special instrumentation inspection in support of reactor restart at commercial nuclear plant.
- Long term NRC contract assistance in restart of "problem" nuclear plant including corrective actions to events and regulatory issues; testing activities; operational readiness reviews; and compensatory measures special inspections.
- Consultant to various utilities for special construction appraisals and responses to NRC bulletin for environmental qualification of electrical equipment.
- Consultant for assessment of Savannah River Plant reactor maintenance procedures.
- Nuclear Fluid Systems Engineer and Supervisory Nuclear Engineer for civilian shipyard during construction, repair and refueling of navy nuclear vessels.

EDUCATION: B.S., Civil Engineering, California State University at Chico

OTHER: Member, American Nuclear Society
Member, American Society for Quality Control
Member, American Society of Civil Engineers
Member, American Consulting Engineers Council

NAME: Patrick D. Edgerton

AREA OF RESP: Management and Organization Sub-team (Part-Time)

ASSOCIATION: U. S. Department of Energy, MIDP Intern

EXPERIENCE:

- 1989 Management Intern Development Program. Currently assigned to Richland Operations Office, Safety and Environment Division, Environmental Oversite Branch
- Developed and generated database of Anchorage, Alaska housing market for Federal National Mortgage Association

EDUCATION: BA, Political Philosophy, University of Dallas
MA, Public Policy Analysis, University of Chicago

NAME: Ralph W. Gray

AREA OF RESP: Management and Organization Sub-team

ASSOCIATION: Nevada Operations Office (NV), DOE, Information Management Division (IMD)

EXPERIENCE: 33 years

- Director, IMD - NV
- Director, Management Evaluation Division, NV
- Director, Office of Audit, NV
- Deputy Director of Finance Division, NV
- Chief, Contract Finance and Analysis Branch, NV
- Auditor, NV and Idaho Operations Office

EDUCATION: BS, Accounting, Brigham Young University

OTHER: Certified Public Accountant (CPA)
Licensed Member, American Institute of CPAs
Licensed Member, Idaho Chapter of CPAs

NAME: David F. Humenansky

AREA OF RESP: Management and Organization Sub-team (Part-Time)

ASSOCIATION: United Energy Services Corporation

EXPERIENCE:

- U. S. Department of Energy Programs
  - Team member of Readiness to Restart Management Assessment at ORNL High Flux Isotope Reactor
- U.S. NRC
  - Technical Assistant to Chairman Zech
  - Participated in NRC SALPs, PATs, and SSFIs
  - Member of NRC Performance Indicator Task Force
  - Oversight responsibilities for all commercial nuclear reactors
- INPO
  - Senior Evaluator
  - Conducted 167 operations evaluations and 6 Technical Support evaluations
  - Team Leader for Assistant visit
- Commercial Nuclear Utilities
  - Managed over 30 SSFIs
  - Utility Executive Consultation
  - Regulatory Interface programs

EDUCATION: M.S., Systems Simulation and Analysis, Michigan State University
B.S., Systems Engineering, U.S.N.A.

NAME: E. L. Kelly

AREA OF RESP.: Management and Organization Sub-team

ASSOCIATION: Battele, Pacific Northwest Laboratories (PNL)
Manager of Operations and Administration, Earth and Environmental Sciences Center (EESC)

EXPERIENCE: 26 Years

- Currently, and for the past five years, provide operational management and oversight to the EESC and support groups that will: ensure availability of systems, resources, and staff training; and develop, monitor, and implement uniform plans and activities that are in compliance with PNL policy and procedures and with Federal, State, and local ES&H requirements.

- Facilities Coordinator and Building Manager for two major research departments and eight research facilities. Responsibilities included facility acquisition and utilization oversight, space planning and allocation, and hands-on facilities management providing interface between owners, occupant groups and support organizations.

- Computer Programmer responsible for writing programs for mock reactor test runs, converting off-site codes for PNL software systems and converting research data bases from large main frame computers to small user friendly computers.

EDUCATION: Abilene Christian University, B.S.,
Mathematics/Physics, 1959
UCLA, Management Courses, 1988

NAME: Donald E. Knowlton

AREA OF RESP: Management and Organization Sub-team

ASSOCIATION: Batelle NW

EXPERIENCE: 28 years

- Nuclear Fuel Reprocessing Supervision
  - Supervisor at Idaho ICPP in reactor fuel reprocessing and nuclear waste calcine operations
  - Supervisor of process support group at the West Valley Nuclear Reprocessing Facility
  - Planner and Scheduler for coordinating all plant activities at the Midwest Nuclear Reprocessing Plant operated at the General Electric Co.
- Technical Management
  - Assisted Bechtel Corporation in evaluating the Barnwell nuclear reprocessing plant as to its operability
  - Operations Manager at the Midwest Nuclear Reprocessing Plant
  - Operations Manager of Nuclear Waste Vitrification Project at Battelle N W
  - Waste Technology Center Operations Manager at Battelle NW. Responsibilities included being focal point for center staff in areas of Safety, Quality Assurance, Security and Safeguards. Conducts safety reviews, event investigations, operational readiness reviews, audits project management systems
  - Alternate Director of Battelle 300 area Emergency Control Center

EDUCATION: B.S., Chemical Engineering, University of Washington
Graduate course work, University of Idaho

NAME: Roger A. Pressentin

AREA OF RESP: Management and Organization Sub-team (Part-Time)

ASSOCIATION: U. S. Department of Energy, MIDP Intern

EXPERIENCE:

- Current assignment - Richland Operations Office, Environmental Restoration Division RPDP
- Hazardous Materials Handling
- Spill Response, Containment, & Mitigation
- NASA Sponsored Research - Space Power
- Emergency Services
- Industrial Systems Maintenance, cleaning, hydroblasing
- Systems Engineering - mechanical, power, fluid
- Computer Staff, Wind Tunnel Testing
- Fuel Efficient Vehicle Research
- Reinforced Plastics & Composites construction

EDUCATION: University of Washington - Astronautics Engineering
Western Washington University - Physics

OTHER: Member: AAAS, AIAA, AAS, NSS

NAME: Ronald D. Schaffer

AREA OF RESP: Management and Organization Sub-team

ASSOCIATION: United Energy Services Corporation

EXPERIENCE: 20 years

- United Energy Services Corporation (UESC)
  - Manager of Management Services Section (UESC)
  - Program Manager for Reactor Restart Issue Evaluation
- Tetramark Inc.
  - Subject matter expert for Task Analysis Review
  - Operations Staff Advisor
  - Preventive Maintenance Manager
  - Maintenance Training Coordinator responsible for Job Analysis and Training Objective Development towards INPO Accreditation
- Quadrex Corporation - Perry Nuclear Power Plant
  - Nuclear Test Section Maintenance Engineer
  - Systems Test Engineer
- Detroit Edison Company - Enrico Fermi Nuclear Power Plant
  - Nuclear Maintenance Supervisor
  - Nuclear Supervising Operator
- U. S. Navy
  - Instructor to SIC Nuclear Power Training Unit
  - Engineering Officer of the Watch Qualified

EDUCATION: Monroe Community College
Mechanical Engineering, Ohio State University

OTHER: Certified Senior Reactor Operator, Enrico Fermi Power Plant
Instructor Certification Training, Detroit Edison
Certified Level III, ANSI 45.2.6

NAME: David Schweller

AREA OF RESP: Management and Organization Sub-team

ASSOCIATION: DBS Associates, Inc.

EXPERIENCE: 35 years

- President, DBS Associates, Inc.; Private Consulting in organization, management, safety and security
  - Participated in 11 TSAs
  - Member of the Assistant Secretary's Environment, Health and Safety working group to review the TSA program
  - Participated in their Secretary of Energy's first Tiger Team, Management Subteam, and 2 subsequent Management Subteams
  - Safety Advisor for DOE Security Inspection and Evaluation Team
  - Evaluator for FEMA Nuclear Utility Emergency Drills
- U.S. Department of Energy
  - Manager and Contracting Officer, Brookhaven Area Office, Upton, NY
  - Regional Coordinator for Region I (11 N.E. States) Radiological Assistance Program
  - Director, Safety Division, Brookhaven Area Office, Upton, NY
- Reactor Safety Specialist, U.S. AEC, Washington, DC
- Chief, Experimental Physics, Martin Nuclear Division, Middle River, MD
  - Designed, built, and operated three zero-power-reactors-experimental facilities
- Reactor Physicist, Combustion Engineering Nuclear Division, Windsor, Ct.
  - Designed, built, and operated three zero-power-reactors-experimental facilities

EDUCATION: B.S., Engineering Physics, N.Y.U. College of Engineering

OTHER: Numerous Government Awards for Performance

Listed in:
- -Who's Who in Atoms
- -Who's Who in Engineering
- -Who's Who in the East
- -The U.S. Senior Executive Directory

NAME: Donald E. Shadley

AREA OF RESP: Management and Organization Sub-team

ASSOCIATION: U. S. DOE Idaho

EXPERIENCE:

- 25 years nuclear reactor and processing experience.
- Branch Chief, Reactor Operations and Facilities
- Certified Accident Investigator and Trained Auditor and Operational Readiness Review
- Certified Naval Reactors Instructor and Naval Reactors Site Representative
- U. S. DOE
  - ICPP Site Representative
  - Chaired or performed several significant ORR reviews including restart of the ICPP and several Major Project Facility startups
  - Program/Projects Manager for the ICPP Nuclear Facilities
  - Served on several Class A and B DOE Investigations
- U. S. Navy
  - 15 years nuclear navy electronics technician and certified reactor operator/instructor experience
  - Served as instructor at three nuclear propulsion Prototypes
  - Naval Reactors Site Representative at a three reactor prototype facility

NAME: David G. Smith

AREA OF RESP: Management and Organization Sub-team

ASSOCIATION: United Energy Services Corp.

EXPERIENCE: 32 years

- NUS - Senior Executive Consulting Associate for the NUS Plant Management Services Department, providing management consulting services to nuclear facility and corporate staff. Provided specialized consulting services in analysis, planning, and development of management techniques and administrative controls.

- Georgia Power Company - reported to Senior Vice-President - Nuclear Operations. Responsible for providing independent assessment of nuclear safety, operations and maintenance at two nuclear power plants, radiological controls, chemistry and environmental monitoring, as well as effective implementation of an Industry Operating Experience Program.

- Institute of Nuclear Power Operations - Director, Construction Project Evaluation Division, reporting to President. Responsible for directing technical team that independently assessed the status of nuclear construction projects for safety, design, and standards, and presented recommendations for enhancements. Evaluation Team Leader and Exit Representative.

- U.S. NAVY - Held various positions in the submarine force including command of nuclear submarine. Select to two major commands - command of a submarine repair ship and command of a squadron of Poseidon nuclear submarines. Twice promoted ahead of contemporaries, including to the rank of Captain.

EDUCATION: B.S. Degree-Electrical Engineering, U.S. Naval Academy

APPENDIX B

ENVIRONMENTAL ASSESSMENT PLAN

FOR THE

DOE TIGER TEAM ASSESSMENT

AT THE

SAVANNAH RIVER SITE

MARCH 1990

1.0 INTRODUCTION

On June 27, 1989, Secretary of Energy Watkins announced a 10-point Initiative to strengthen environmental protection and waste management activities in the Department of Energy (DOE). One of the initiatives involves conducting Tiger Team Assessments at DOE's operating facilities.

The purpose of the environmental assessment portion of the Tiger Team Assessment of the Savannah River Site is to provide the Secretary with information on the current environmental regulatory compliance status and associated vulnerabilities of the facility, root causes for noncompliance, adequacy of DOE and site contractor environmental management programs, and response actions to address the identified problem areas.

The scope of the Savannah River Site environmental assessment is comprehensive, covering all environmental media and applicable Federal, State, and local regulations, requirements, and best management practices. The environmental disciplines to be addressed in this assessment include air, soil, surface water hydrogeology, waste management, toxic and chemical materials, radiation, quality assurance, and inactive waste sites. The assessment will also address National Environmental Policy Act (NEPA) requirements and other environmental regulations as appropriate.

2.0 ENVIRONMENTAL ASSESSMENT IMPLEMENTATION

The Savannah River Site environmental assessment will be conducted by a team of technical specialist, managed by a Team Leader from the Office of Environmental Audit (OEV), an Assistant Team Leader from the Brookhaven Area Office. The technical specialists are from other DOE offices, Argonne National Laboratory, Oak Ridge National Laboratory, Tetra Technology, Inc., Environmental Resources Management, Inc., Civil and Environmental Consultants, Inc. and are listed below:

Fayne, Vincent	Subteam Leader-Environment
Searing, John M.	Asst. Subteam Leader-Environment
Heintzelman, Andrea	Special Asst.-Environment
Harris, Lyle	NEPA
Barisas, Susan	Technical Coordinator
Sticksel, Phil	Air
Cuscino, Tom	Air
Tschanz, John	Air
DePadro, James	Surface Water
Orr, James R.	Surface Water
Dirkes, Roger	Surface Water
Jennings, Ted V.	Hydrogeology
Diodato, David	Hydrogeology
Davol, Phoebe	Hydrogeology
Martino, Lou	Waste Management
Frostenson, J. Carl	Waste Management
Wallace, James D.	Waste Management
Poston, Ted	Waste Management
Wentz, Al	Waste Management
Lindahl, Peter	Quality Assurance
Berger, James	Radiation
Peel, John	Radiation
Vogel, Herbert	Radiation
Browne, Robert	TSCA/FIFRA
Gheesling, Frank	TSCA/FIFRA
Flowers, David A.	CERCLA/Surface Water
McCann, John P.	CERCLA
Hughey, Lisa A.	CERCLA
Barringer, Richard	NEPA
Cada, Glenn	NEPA
Eddlemon, Gerald	NEPA
Heckman, Cynthia	NEPA
Webb, Warren	NEPA

2.1 Pre-Assessment Activities

Pre-Assessment activities for the Savannah River Site environmental assessment included the issuance of an introduction and information request memorandum (Fayne, January 3, 1990), a Pre-Assessment Site visit, and initial review of documentation which

Assessment Site visit, and initial review of documentation which was sent to the environmental team by the Savannah River Site as a result of the information request memorandum.

A Pre-Assessment Site visit was conducted on January 10 and 11, 1990, by the Tiger Team Leader, the Sub-team Leaders for Environment, Safety and Health, Management, and support contractors. The purpose of the Pre-Assessment visit was to brief site personnel on the purpose and scope of the Tiger Team Assessment effort, to become familiar with the site, to review information being supplied and request additional information, and to coordinate plans for the upcoming Assessment with the Savannah River Operations Office and the site operating contractor - Westinghouse Savannah River Company (WSRC). Representatives from the U.S. Environmental Protection Agency (EPA)-Region IV, the South Carolina Department of Health and Environmental Control (SCDHEC) and the State of Georgia were invited to participate and present their concerns with respect to ES&H activities at the Savannah River Site.

This Environmental Assessment Plan is based upon the information received by the Environmental Team as of the middle of January 1990, and on-site orientations held during the first two weeks of assessment.

2.2 On-Site Activities and Reports

The on-site activities for the environmental assessment will take place beginning on January 29, 1990 through closeout on March 23, 1990. On-site activities include field inspections, file/record reviews, and interviews with site personnel. The agenda for the assessment is shown in Table 2-1. Any and all modifications to the agenda will be coordinated with the Savannah River Operations Office and the principle contacts from WSRC.

A close-out briefing will be conducted at the conclusion of the on-site activities. Findings from the Environmental Assessment, as well as findings from the Safety and Health, and Management Assessments will be presented. A draft report containing the findings will be provided for review and comment to the Office of Defense Programs, the Office of Environmental Restoration and Waste Management, the Savannah River Operations Office, and the site contractors.

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		AIR		
		STICKSEL	CUSCINO	TSCHANZ
Monday 29-Jan	AM	Tiger Team Overview and Agenda, SRO Overview and WSRC Self-Assessment	Not Available	Not Available
	PM	WSRC Self Assessment	Not Available	Not Available
Tuesday 30-Jan	AM	Safety, Health Protection and Security Briefing Environmental Team Functional Briefings	Not Available	Not Available
	PM	Environmental Team Functional Briefings	Not Available	Not Available
Wednesday 31-Jan	AM	Facilities Tour	Not Available	Not Available
	PM	Facilities Tour	Not Available	Not Available
Thursday 1-Feb	AM	F-Area (air permits) Boilers & generators (non-radioactive source) Power, Separations	Not Available	Not Available
	PM	F-Area, other permitted sources (non-rad)	Not Available	Not Available
Friday 2-Feb	AM	H-Area (air permits) Boilers & generators (non-radioactive source) Power, Radiation, Waste Management	Not Available	Not Available
	PM	H-Area, other permitted sources (non-rad)	Not Available	Not Available

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		AIR		
		STICKSEL	CUSCINO	TSCHANZ
Saturday 3-Feb	AM	Review Air Permits; Training for Conduct of Operations/Maintenance	Not Available	Not Available
	PM	Training for Conduct of Operations/Maintenance	Not Available	Not Available
Monday 5-Feb	AM	Areas K, L, and P permitted sources (non-rad) Power, D. Bignell	Not Available	Not Available
	PM	Areas K, L, P and A all permitted (non-rad) Power, D. Bignell	Not Available	Not Available
Tuesday 6-Feb	AM	M-Area; permitted sources (non-rad) Reactor	Not Available	Not Available
	PM	C-Area permitted sources/Bignell Areas C, K, L and P; permitted sources (non-rad) Reactor, Jewell	Not Available	Not Available
Wednesday 7-Feb	AM	K Reactor release	Not Available	Not Available
	PM	Diesel generator test K-Area 12:30-Tim Schatzer; Meeting regarding Emergency Procedure (EP)	Not Available	Not Available
Thursday 8-Feb	AM	S&S (EP) presentation	Not Available	Not Available
	PM	EPS Air Emissions inventory and permits	Not Available	Not Available
Friday 9-Feb	AM	S and Z-Areas permitted sources-DWPF (non-rad) Humberto Teran	Not Available	Not Available
	PM	Wackenhut	Not Available	Not Available

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		AIR		
		STICKSEL	CUSCINO	TSCHANZ
Saturday 10-Feb	AM	Travel	Not Available	Not Available
	PM	Travel	Not Available	Not Available
Monday 12-Feb	AM	Travel	Not Available	Not Available
	PM	Travel	Not Available	Not Available
Tuesday 13-Feb	AM	Review Documents	Not Available	Not Available
	PM	T-Area permitted sources (non-rad) SRL	Not Available	Not Available
Wednesday 14-Feb	AM	Meterological Monitoring - SRL R. P. Addis	Not Available	Not Available
	PM	Meterological Dispersion Modeling-SRL R. P. Addis	Not Available	Not Available
Thursday 15-Feb	AM	D-Area; permitted sources - Power, Tim Schatzer	Not Available	Not Available
	PM	Construction -- J. Travis	Not Available	Not Available
Friday 16-Feb	AM	Visit with EPA Region IV	Not Available	Not Available
	PM	Visit with EPA Region IV	Not Available	Not Available

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		AIR		
		STICKSEL	CUSCINO	TSCHANZ
Saturday 17-Feb	AM	Prepare drafts of findings on non-rad sources	Not Available	Not Available
	PM	Team Meetings	Not Available	Not Available
Monday 19-Feb	AM	Review progress and plans with Team Leaders rad team	Review progress and plans with Team Leaders rad team	Review progress and plans with Team Leaders - rad
	PM	Review progress and plans with Team Leaders air team	Review progress and plans with Team Leaders air team	Review progress and plans with Team Leaders - non-rad
Tuesday 20-Feb	AM	Review documents	In processing and orientation	In processing and orientation P-Area asbestos removal - S. Smith
	PM	EMS-ambient monitoring -- L. Geary	EMS-ambient monitoring -- L. Geary	Review documents
Wednesday 21-Feb	AM	Document Review	EMS-ambient monitoring	Asbestos Removal (Power) - Tim Schatzer
	PM	Env. Dosimetry - ETS L. Bauer	Env. Dosimetry -- Dispersion Monitoring L. Bauer	Asbestos Removal (EPS) - Tim Faugl
Thursday 22-Feb	AM	View Compliance Test - Power - Tim Schatzer, Tim Faugl	SCDHEC	SCDHEC
	PM	View Compliance test - Power Tim Faugl, Tim Schatzer	Ambient Monitoring - ETS. Env. Transport Rob Addis	Review documents
Friday 23-Feb	AM	Fugitive emissions--A Area power plant -- D Area power plant--opacity records, T Schatzer	Calculate doses with AIRDOS	DWPF NESHAP - Kathy Wolf
	PM	Write findings	Write reports	TNX NESHAP - Jill Glasscock

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		AIR		
		STICKSEL	CUSCINO	TSCHANZ
Saturday 24-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Monday 26-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Tuesday 27-Feb	AM	Bechtel, John Travis CS-Sandblasting	Tim Schatzer - Coal & ash handling	Not Scheduled
	PM	Forest Service, Pat O'Bannon Prescribed Burns	Emission Inventory Review EPS - T. Faugl	Not Scheduled
Wednesday 28-Feb	AM	Visit Burial Area; K. Wierzbicki Write Findings	Revisit Environmental Transport Group	H-Area cooling towers - G. Steed CS sandblasting/painting - J. Travis
	PM	Meet with contractor, Zedek Ambient Monitoring	Meet with contractor, Zedek Ambient Monitoring	
Thursday 1-Mar	AM	SCDHEC Meeting; 707-F	SCDHEC Meeting	SCDHEC Meeting
	PM	Write Findings	Review degreaser solvent replacement project	F Area NO-x absorption column W. Wierzbicki
Friday 2-Mar	AM	Environmental Transport; wind tunnel & tower	Revisit - Environmental Transport Group	ETF - D. Brown
	PM	Environmental Dosimetry; routine release modeling	Revisit - Environmental Dosimetry Group	Write Reports & Findings
Saturday 3-Mar	AM	Prepare Findings	Write Reports & Findings	Write Reports & Findings Team Meeting
	PM	Findings Critique with Team Leaders	Findings Critique	Findings Critique

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		AIR		
		STICKSEL	CUSCINO	TSCHANZ
Monday 5-Mar	AM	Write Reports & Findings	D-Area -- Calibration of Opacity Meters	Write Reports & Findings
	PM	Write Reports & Findings	Write Reports & Findings	Write Reports & Findings
Tuesday 6-Mar	AM	Air emissions from Fire Training; K. Keaton	Write Reports & Findings	F & H Waste tanks/evaporator - P. d'Entremont; ITP - N. Davis
	PM	Write Reports & Findings	Write Reports & Findings	Naval Fuel Materials Facility
Wednesday 7-Mar	AM	Write Reports & Findings	Write Reports & Findings	Write Reports & Findings
	PM	Write Reports & Findings	Write Reports & Findings	Write Reports & Findings
Thursday 8-Mar	AM	Write Reports & Findings	Write Reports & Findings	Write Reports & Findings
	PM	Write Reports & Findings	Write Reports & Findings	Write Reports & Findings
Friday 9-Mar	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Saturday 10-Mar	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Monday 12-Mar	AM	Travel	Travel	Not Available - Completed
	PM	Travel	Travel	

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		AIR		
		STICKSEL	CUSCINO	TSCHANZ
Tuesday 13-Mar	AM	Not Scheduled	Not Scheduled	
	PM	Not Scheduled	Not Scheduled	
Wednesday 14-Mar	AM	Not Scheduled	Not Scheduled	
	PM	Not Scheduled	Not Scheduled	
Thursday 15-Mar	AM	Not Scheduled	Not Scheduled	
	PM	Not Scheduled	Not Scheduled	
Friday 16-Mar	AM	Not Scheduled	Not Scheduled	
	PM	Not Scheduled	Not Scheduled	
Saturday 17-Mar	AM	Not Scheduled	Not Scheduled	
	PM	Not Scheduled	Not Scheduled	
Monday 19-Mar	AM	Not Scheduled	Not Scheduled	
	PM	Not Scheduled	Not Scheduled	
Tuesday 20-Mar	AM	Not Scheduled	Not Scheduled	
	PM	Not Available - Completed	Not Available - Completed	

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Monday 29-Jan	AM	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview and Agenda; SRO Overview and WSRC Self-Assessment
	PM	WSRC Self-Assessment	WSRC Self-Assessment	WSRC Self-Assessment
Tuesday 30-Jan	AM	Safety, Health Protection and Security Briefings Environmental Team Functional Briefings	Safety, Health Protection and Security Briefings Environmental Team Functional Briefings	Safety, Health Protection and Security Briefings, Environmental Team Function Briefings
	PM	Environmental Team Functional Briefings	Environmental Team Functional Briefings	Environmental Team Functional Briefings
Wednesday 31-Jan	AM	Facilities Tour	Facilities Tour	Facilities Tour
		Facilities Tour	Facilities Tour	Facilities Tour
Thursday 1-Feb	AM	Obtain Regulations Documents Requested	Interview M. Dukes, Non-Compliances Organizational Structure, in Order to Obtain Regulations, WSAC 2 Volume Implementation Orders, Agreement, Documents Requested	Interview M. Dukes, Non-Compliances Organizational Structure, in Order to Obtain Regulations, WSAC 2 Volume Implementation Orders, Agreement, Documents Requested
	PM	Review Documents	Review Documents, Attended SRS Monthly Central Environmental Committee	Review Documents, Attended SRS Monthly Central Environmental Comm.
Friday 2-Feb	AM		Interview P. C. Carroll, Drinking Water and SPCC	Interview P. C. Carroll, Drinking Water and SPCC
	PM	Additional Document Review (and Previous Data)	Additional Document Review (and Previous Data)	Additional Document Review

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Saturday 3-Feb	AM	INPO Conduct of Operations and Maintenance Training	INPO Conduct of Operations and Maintenance Training	INPO Conduct of Operations and Maintenance Training
	PM	Conduct of Operations and Maintenance Training	Conduct of Operations and Maintenance Training	Conduct of Operations and Maintenance Training
Monday 5-Feb	AM	Interview Stan Smith, Power NPDES Outfalls Overview Alt - D. T. Bignell	Interview Stan Smith, Sanitary Waste Water Treatment Plants Overview Alt. - D. T. Bignell	Interview Stan Smith, Drinking Water Systems Overview Alt - D. T. Bignell
	PM	Begin Interview of Power NPDES Custodians and Begin Visits to Outfall, F and H Area Stan Smith	Review of utility drawings sanitary, industrialized, storm sewer and drinking water.	Begin Interviews of Drinking Water System Operators Stan Smith
Tuesday 6-Feb	AM	Interview with Dyer, John Pickett, observe M-Area LETF Outfall M-004	Interview Craig Johnson and Fred Harter, Inspect M-Area LETF Plan and operations	Follow up with Power Operations, GW monitoring, Env. monitoring, Industrial Hygiene and State of SC
	PM	Document review. NPDES, DMR's and non-compliance issues	Interview Al Parrott. Continue review of M-Area LETF operations, training and maintenance	Document Review

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Wednesday 7-Feb	AM	NPDES/outfalls. Observe stream monitoring, M-004 and A-014. Interview Jim Heffner and Bobby Reece	Initiate drinking water system inspection. Coordinate with Stan Smith. A-Area Systems and selected facilities. Document review and scheduling	Initiate drinking water sys. inspection. Coordinate with Stan Smith,. Systems and selected facilities A-Area Systems and selected facilities. Investigate K-Area Spill & response.
	PM	NPDES/outfalls. Observe stream monitoring, M-004 and A-014. Interview Jim Heffner and Bobby Reece	Initiate drinking water system inspection. Coordinate with Stan Smith. A-Area Systems and selected facilities. Document review and scheduling	Initiate drinking water sys. inspection. Coordinate with Stan Smith. Systems and selected facilities A-Area Systems and selected facilities. Investigate K-Area Spill & response.
Thursday 8-Feb	AM	Schedule and Document Review Meeting with Rick Green	Schedule and Document Review	Revise and Transfer responsibilities Summarize issues to date
	PM	Schedule and Document Review	Document Reviews and Report Preparation	NPDES Permit application and documentation review
Friday 9-Feb	AM	Travel	Document Reviews and Report Preparation	NPDES Permit application and documentation review
	PM	Travel	Travel	Travel

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Saturday 10-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Monday 12-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Tuesday 13-Feb	AM	Document Review	Drinking water system inspection - F Area Coordinate with Stan Smith	NPDES Permit applications Interview Dyer and Keyes
	PM	Interview with John Keyes applications	Drinking water system inspection - CS & B Area Coordinate with Stan Smith	NPDES Permit applications Interview Dyer and Keyes
Wednesday 14-Feb	AM	Interview w/John Gladden	Inspect F/H Effluent Treatment Facility Kim Wierzbicki	Power Sanitary NPDES Outfalls Contact: Stan Smith
	PM	Interview J. Keyes	Interview with F/H Area Maintenance Bill Wierzbicki	Follow up and Document Review
Thursday 15-Feb	AM	Document Review Follow up on Fish Kill & Trend Mitigation	Drinking water system inspections, D Area; Coordinate with Rob Turner	Reactor NPDES Outfalls Contact: C. Jewell
	PM	SRL - John Gladden	Drinking water system inspections, D Area; Coordinate with Rob Turner	HP NPDES Sampling Contact: Heffner
Friday 16-Feb	AM	Document Review	Meeting with EPA in Atlanta, Ga.	Separations NPDES Outfalls Contact: B. Wierzbicki
	PM	Jim Bowers (L-Lake)	Meeting with EPA in Atlanta, Ga.	Document Review

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Saturday 17-Feb	AM	Regulation/Issue/Document Review	Regulation/Issue/Document Review	Regulation/Issue/Document Review
	PM	Regulation/Issue/Document Review	Regulation/Issue/Document Review	Regulation/Issue/Document Review
Monday 19-Feb	AM	Regulation/Issue/Document Review Preliminary Issues.	Regulation/Issue/Document Review & Follow-up	Regulation/Issue/Document Review
	PM	Regulation/Issue/Document Review	Regulation/Issue/Document Review	Regulation/Issue/Document Review
Tuesday 20-Feb	AM	Interview w/Jim Heffner	Inspect DWPF and Z Area Effluent Treatment Facility	SREL NPDES Outfalls Contacts: R. Nestor
	PM	Review Soil/Sediment Biota Data and Issues Start Erosion Control	Follow up on issues with S. Smith	CSWE NPDES Outfalls Contacts: T. Bittler
Wednesday 21-Feb	AM	Interview w/EMS Personnel	Interview Dale Bignell, Eng. and Constructions	Construction NPDES Outfalls Contact: J. Travis
	PM	Review Soil/Sediment Biota Data and Issues (Field Day)	Follow up on issues	Review river monitoring program Env. Mon. Section. K-Area Cooling Tower Construction
Thursday 22-Feb	AM	DHEC	DHEC	DHEC
	PM	M-Area Soil/Sediment Biota & Wetlands Studies	WM, Kim Wierabicki	Document Review and Follow up
Friday 23-Feb	AM	Travel	Preliminary findings/format and followup on issues	WM NPDES Outfalls, Kim Wierzbicki, S. Roberts
	PM	Travel	Travel	Travel

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Saturday 24-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Monday 26-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Tuesday 27-Feb	AM	SREL Sediment Transport Dave Hayes/CS Personnel	Inspect K Area Neutralization Waste Water Treatment and Drinking Water Treatment Facilities. Coordinate w/Stan Smith	Liquid Radiological Effluent Control Programs Review/Overview
	PM	SRL, Kevin Moorehead John Keyes	Interview M, F/H & Power Sewer Personnel	Liquid Rad Effluent Control SRL/SREL D. Tipton, N. Halverson
Wednesday 28-Feb	AM	Cathy Lewis, Seep Data	M Area sewer lines & SE area backflow preventors	Liquid Rad Effluent Control Separations M. Tyrell Sand Blasting Area J. Travis
	PM	M-Area Soil Sediment, Jay Horvath Keith Dyer, Dunaway, Gould	Report PreparationReview Documentation	Liquid Rad Effluent Control Waste Mgmt S. Roberts, J. Brantley
Thursday 1-Mar	AM	Review information on Erosion Control USFS, Bob Austin	Report Preparation	Naval Fuels Materials Facility D. Murdoch
	PM	Wildlife, Bob Austin Follow up on issues	Report Preparation/Review Documentation	Initiate Report Preparation
Friday 2-Mar	AM	Write up Findings	Interview with SE Area Maintenance	Report Preparation
	PM	Wetlands Review	Report Preparation/Review Documentation	Wetlands Review and Tour

Table 2-1.4

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Saturday 3-Mar	AM	Report Preparation and Docment Review	Report Preparation and Document Review	Report Preparation/Review/Revision
	PM	Report Preparation and Docment Review	Report Preparation and Document Review	Report Preparation/Review/Revision
Monday 5-Mar	AM	Observe Rad. River Sampling	Review Documentation	Report Preparation/Review Revision
	PM	Observe Rad. River Sampling	Review Documentation	Report Preparation/Review Revision
Tuesday 6-Mar	AM	Report Preparation/Review/Revision	Report Preparation/Review Revision	River Sampling Field Activities
	PM	Report Preparation/Review/Revision	Report Preparation/Review Revision	River Sampling Field Activities
Wednesday 7-Mar	AM	Report Preparation/Review/Revision	Report Preparation/Review Revision	Report Preparation/Review Revision
	PM	Report Preparation/Review/Revision	Report Preparation/Review Revision	Report Preparation/Review Revision
Thursday 8-Mar	AM	Report Preparation/Review/Revision	Report Preparation/Review Revision	Report Preparation/Review Revision
	PM	Report Preparation/Review/Revision	Report Preparation/Review Revision	Report Preparation/Review Revision
Friday 9-Mar	AM	Report Preparation/Review/Revision	Report Preparation/Review Revision	Travel
	PM	Travel	Travel	Travel

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Saturday 10-Mar	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Monday 12-Mar	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Tuesday 13-Mar	AM	Travel	Follow-up and report preparation	Follow-up and report preparation
	PM	Travel	Follow-up and report preparation	Follow-up and report preparation
Wednesday 14-Mar	AM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
	PM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
Thursday 15-Mar	AM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
	PM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
Friday 16-Mar	AM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
	PM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation

Table 2-1.4

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		SURFACE WATER		
		ORR	DEPADRO	DIRKES
Saturday 17-Mar	AM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
	PM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
Monday 19-Mar	AM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
	PM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
Tuesday 20-Mar	AM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
	PM	Follow-up and report preparation	Follow-up and report preparation	Follow-up and report preparation
Wednesday 21-Mar	AM	Not Available - Completed	Not Available - Completed	Not Available - Completed
	PM			
Thursday 22-Mar	AM			
	PM			
Friday 23-Mar	AM			
	PM			

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Monday 29-Jan	AM	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment	Not available
	PM	WSRC Self-Assessment	WSRC Self-Assessment	Not available
Tuesday 30-Jan	AM	Safety, Health Protection and Security Briefings;Environmental Team Functionalal Briefings	Safety, Health Protection and Security Briefings;Environmental Team Functional Briefings	Not available
	PM	Environmental Team Functional Briefings	Environmental Team Functional Briefings	Not available
Wednesday 31-Jan	AM	Facility Tour	Facility Tour	Not available
	PM	Facility Tour	Facility Tour	Not available
Thursday 1-Feb	AM	Meeting at WSRC Offices with compliance contracts (Charlie Sherman and representatives of ER&GW protection, Jim Heffner or representative of HP. Acquire list of permitted and unpermitted sites, acquire copies of consent orders, agreements, orders, etc. Discuss current and ongoing problems, identify additional contacts, identify drilling and sampling contractors	Meeting at WSRC Offices with compliance contracts (Charlie Sherman and representatives of ER&GW protection, Jim Heffner or representative of HP. Acquire list of permitted and unpermitted sites, acquire copies of consent orders, agreements, orders, etc. Discuss current and ongoing problems, identify additional contacts, identify drilling and sampling contractors	Not available
	PM	Check into status of previous action items from Action Plan dated July 31, 1989	Check into status of previous action items from Action Plan dated July 31, 1989	Not available

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Friday 2-Feb	AM	Inspect M Area, F&H seepage basins and wells and seeps and Four Mile Creek drainage.	Inspect M Area, F&H seepage basins and wells and seeps and Four Mile Creek drainage.	Not available
	PM	ES&H Self-Appraisal Trend analysis	Document review and text compilation	Not available
Saturday 3-Feb	AM	Document review and text compilation	Document review and text compilation	Not available
	PM	Training for Conduct of Operations/ Maintenance	Training for Conduct of Operations/ Maintenance	Not available
Monday 5-Feb	AM	Meeting with drilling contractors J. Janser; M. Flora	Meeting with drilling contractors J. Janser; M. Flora	Not available
	PM	Meeting with drilling contractors J. Janser; M. Flora	Meeting with drilling contractors J. Janser; M. Flora	Not available
Tuesday 6-Feb	AM	Document Review	Document Review	Inactive waste site field trip. WSRC contacts: Ed Campbell and Mike Wilson
	PM	Document Review	Document Review	Inactive waste site field trip. WSRC contacts: Ed Campbell and Mike Wilson

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Wednesday 7-Feb	AM	Field visits to observe ongoing groundwater monitoring; well sampling	Field visits to observe ongoing groundwater monitoring; well sampling	Field visits to observe ongoing groundwater monitoring; well sampling
	PM	Meet with John Haselow (SRL) re: Analytical techniques used in well capture zone analysis - M-Area	Meet with John Haselow (SRL) re: Analytical techniques used in well capture zone analysis - M-Area	Meet with John Haselow (SRL) re: Analytical techniques used in well capture zone analysis - M-Area
Thursday 8-Feb	AM	Document Review	Document Review	Document Review
	PM	Meeting with Tom Hicks (DOE-Op) re: DOE-SRS action on 7/31/89 Action Plan	Meeting with Tom Hicks (DOE-Op) re: DOE-SRS action on 7/31/89 Action Plan	Meeting with Tom Hicks (DOE-Op) re: DOE-SRS action on 7/31/89 Action Plan
Friday 9-Feb	AM	Preliminary report compilation	Wrap up of ongoing discussions with specific site personnel and generation of weekly summary of activities	Wrap up of ongoing discussions with specific site personnel and generation of weekly summary of activities
	PM	Preliminary report compilation	Wrap up of ongoing discussions with specific site personnel and generation of weekly summary of activities	Wrap up of ongoing discussions with specific site personnel and generation of weekly summary of activities
Saturday 10-Feb	AM	Travel	Not Available - Completed	Travel
	PM	Travel		Travel

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Monday 12-Feb	AM	Not Available		Travel
	PM	Not Available		Travel
Tuesday 13-Feb	AM	Not Available		SRL - Terry Hozen
	PM	Not Available		SRL - Terry Hozen
Wednesday 14-Feb	AM	Not Available		Discuss & Review SR levels, reverse groundwater flow gradients Chris Bennett-EPS
	PM	Not Available		Mixed Waste MF site visit/site personnel interviews (including PMT and EMS/EPS reps).
Thursday 15-Feb	AM	Not Available		Mary Flora, Dewatering Procedures, K-Area
	PM	Not Available		DWPF
Friday 16-Feb	AM	Not Available		F/H-area Separations basins chemical water analysis and review, K. Wierzbicki
	PM	Not Available		F/H-area Separations basins chemical water analysis and review, K. Wierzbicki

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Saturday 17-Feb	AM	Not Available		First draft of findings review
	PM	Not Available		First draft of findings review (dependent on receipt of document)
Monday 19-Feb	AM	Not Available		Purge Water Program Review
	PM	Not Available		Discharge volume verification and review
Tuesday 20-Feb	AM	Not Available		Well Casing Installation/Abandonment
	PM	Not Available		Virgil Rogers - Soils
Wednesday 21-Feb	AM	Not Available		Well Monitor Well Setting
	PM	Not Available		F-Area Tank Farm Well Monitoring - Tracy Killian
Thursday 22-Feb	AM	Not Available		SRL Water Level Determination/Hydro Punch, Horace Bledsoe
	PM	Not Available		R-Area physical/chemical water data analysis and investigation of compliance
Friday 23-Feb	AM	Not Available		Mary Flora, P-Area Portable Water Well Oversight/Larry Snyner
	PM	Not Available		Travel

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Saturday 24-Feb	AM	Travel		Travel
	PM	Travel		Travel
Monday 26-Feb	AM	Travel		Travel
	PM	Travel		Travel
Tuesday 27-Feb	AM	Debriefing		Debriefing
	PM	Program Review		Program Review
Wednesday 28-Feb	AM	Debriefing, cont'd		Debriefing, cont'd
	PM	Program Guidance		Program Guidance
Thursday 1-Mar	AM	Travel		Report preparation
	PM	Travel		Report preparation
Friday 2-Mar	AM	Travel		Report preparation
	PM	Travel		Report preparation

Table 2-1.5

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Saturday 3-Mar	AM	Travel		Report preparation
	PM	Travel		Report preparation
Monday 5-Mar	AM	Report preparation		Report preparation
	PM	Report preparation		Report preparation
Tuesday 6-Mar	AM	Report preparation		Report preparation
	PM	Report preparation		Report preparation
Wednesday 7-Mar	AM	Report preparation		Report Preparation
	PM	Report preparation		Report Preparation
Thursday 8-Mar	AM	Final Draft Submittal		Final Draft Submittal
	PM	Final Draft Submittal		Travel
Friday 9-Mar	AM	Travel		Travel
	PM	Travel		Travel

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Saturday 10-Mar	AM	Travel		Travel
	PM	Travel		Travel
Monday 12-Mar	AM	Travel		Travel
	PM	Travel		Travel
Tuesday 13-Mar	AM	Travel		Travel
	PM	Report Finalization		Report Finalization
Wednesday 14-Mar	AM	Report Finalization		Report Finalization
	PM	Report Finalization		Report Finalization
Thursday 15-Mar	AM	Report Finalization		Report Finalization
	PM	Report Finalization		Report Finalization
Friday 16-Mar	AM	Report Finalization		Report Finalization
	PM	Report Finalization		Report Finalization

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		GROUNDWATER		
		JENNINGS	DIODATO	DAVOL
Saturday 17-Mar	AM	Report Finalization		Report Finalization
	PM	Report Finalization		Report Finalization
Monday 19-Mar	AM	Report Finalization		Report Finalization
	PM	Report Finalization		Report Finalization
Tuesday 20-Mar	AM	Not Available - Completed		Not Available - Completed
	PM			
Wednesday 21-Mar	AM			
	PM			
Thursday 22-Mar	AM			
	PM			
Friday 23-Mar	AM			
	PM			

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Monday 29-Jan	AM	Tiger Team Overview & Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview & Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview & Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview & Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview & Agenda SRO Overview and WSRC Self-Assessment
	PM	WSRC Self-Assessment	WSRC Self-Assessment	WSRC Self-Assessment	WSRC Self-Assessment	WSRC Self-Assessment
Tuesday 30-Jan	AM	Safety,Health Protection & Security Briefings, Environmental Team Functional Briefings	Safety,Health Protection & Security Briefings, Environmental Team Functional Briefings	Safety,Health Protection & Security Briefings, Environmental Team Functional Briefings	Safety,Health Protection & Security Briefings, Environmental Team Functional Briefings	Safety,Health Protection & Security Briefings, Environmental Team Functional Briefings
	PM	Environmental Team Functional Briefings	Environmental Team Functional Briefings	Environmental Team Functional Briefings	Environmental Team Functional Briefings	Environmental Team Functional Briefings
Wednesday 31-Jan	AM	Facilities Tour	Facilities Tour	Facilities Tour	Facilities Tour	Facilities Tour
	PM	Facilities Tour	Facilities Tour	Facilities Tour	Facilities Tour	Facilities Tour
Thursday 1-Feb	AM	Gen Pts, Accum Pts, storage 709G, 2G, 4G & 710-U & UST Mgmt	General Pts, Accum Pts, storage 709G, 2G, 4G & 710-U & UST Mgmt	General Pts, Accum Pts, storage 709G, 2G, 4G & 710-U & UST Mgmt	CIF Waste Management Minimization Plan Document Review	Not Available
	PM	SRL Waste Storage Tank, Accum Pts, Gen Pts	Part B Permit Review for 709-G, 2G, 4G & 710U	SRL Waste Storage Tank, Accum Pts	Waste Min/CIF Document Review	Not Available
Friday 2-Feb	AM	SRL Waste Storage Tanks Satellite Pts	TRU Pads, 643-29G, WMO Training Records	SRL Staging Areas	Waste Min/CIF Document Review	Not Available
	PM	High Level Waste Storage Tanks; Federal Facility Agreement	Manifest Review Waste Analysis, Procedures	High Level Waste Storage Tanks; Federal Facility Agreement	Interview CIF and Waste Minimization Coordinators	Not Available

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Saturday 3-Feb	AM	Document Review - Part Bs Proposed Part B; Detailed Schedule Preparation	Document Review - Part Bs Proposed Part B; Detailed Schedule Preparation	Document Review - Part Bs Proposed Part B; Detailed Schedule Preparation	Document Review - Part Bs Proposed Part B; Detailed Schedule Preparation	Not Available
	PM	INPO TRAINING	INPO TRAINING	INPO TRAINING	Not Available	Not Available
Monday 5-Feb	AM	300 Area, Gen Pts, Accum. Points, Satellite Pts J. Horvath	300 Area, Gen Pts, Accum. Points, Satellite Pts, VSTs Training, Part B Applications	Settlement Agreements J. Horvath	Not Available	Not Available
	PM	300 Area, Gen Pts, Accum. Points, Satellite Pts, DETF J. Horvath	300 Area, Gen Pts, Accum. Points, Satellite Pts, Contingency Plans, Part B Application	300 Area, Gen Pts, Accum. Points, Satellite Pts, VSTs J. Horvath	Not Available	Not Available
Tuesday 6-Feb	AM	Met Hal Morris - Witness pressure test of CSWE tank	Record Review Compliance Agreements	SRL Contingency Plan Review	Not Available	Not Available
	PM	300 Area (Con't) Jay Horvath M-Area Closure Plan	300 Area Training Records; Inspection Records	300 Area Training Records; Inspection Records	Not Available	Not Available

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Wednesday 7-Feb	AM	Review F&H Area Waste General/Mgmt. F Area Separations, Rad, Mixed Waste General/Mgmt Return to F Area	Attend Contractor Meeting	Review F&H Area Waste General/Mgmt.	Not Available	Not Available
	PM	H Area Separations Rad, Mixed Hazardous & Solid Waste Mgmt	Review Settlement Agreements-Consent Agreements	F Area Separations	Not Available	Not Available
Thursday 8-Feb	AM	Return to F Area	Continue to review agreement-attend contractor meeting	Return to F Area - Solvent Storage & Oil Storage	Not Available	Not Available
	PM	H Area Separations Rad, Mixed Hazardous and Solid Waste Mgmt H Area Tank Farm	Establish Site-Wide RCRA HWMF & Accum Pts. Inventory Forestry Service	H Area Separations Rad, Mixed Hazardous, Solid Waste Mgmt	Not Available	Not Available
Friday 9-Feb	AM	Travel	Travel	Environmental Monitoring Task	Not Available	Not Available
	PM	Travel	Travel	Travel	Not Available	Not Available

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Saturday 10-Feb	AM	Travel	Travel	Travel	Not Available	Not Available
	PM	Travel	Travel	Travel	Not Available	Not Available
Monday 12-Feb	AM	Travel	Travel	Travel	Travel	Travel
	PM	Travel	Travel	Travel	Travel	Travel
Tuesday 13-Feb	AM	F&H Tank Farm	EPS/RCRA Compliance (Alex Guanlo)	F&H Tank Farm	Site-Wide waste characterization Program - Contact: Jill Glascock - 9 am	M Area 321-M, Hazardous and mixed waste generation, accumulation staging points
	PM	F&H Tank Farm	EPS/RCRA Compliance	F&H Tank Farm	Document Review	Review documents on Naval Fuel Facility
Wednesday 14-Feb	AM	F&H Tank Farm	Meet with EPS to discuss overall Waste Mgt Prog. Bruce Lawrence	F&H Tank Farm. Same as 2/13	Meet with EPS to discuss overall Waste Management Program	Naval Fuel Materials Facility, Rad Hazardous, Solid and mixed waste mgmt. and documents
	PM	Review of agreements prepared by Wallace	EPS (Hal Morris) Solid Waste Management UST Management Program - Tenant	Review of BVJW Agreements prepared	Contact John Harvey 9 am	Naval Fuel Materials Facility
Thursday 15-Feb	AM	Hal Morris, UST Program	Bechtel - Hazardous and Solid Waste	Establish revisits needed to evaluate compliance with agreements	Waste minimization plan and program	M Area 321-M documentation of proced. and acct. mater.
	PM	Hal Morris, UST Program	Bechtel - hazardous/solid waste Mgt & UST Mgt Program	Environmental monitoring	Steve Crook 1 pm	Waste Mgmt meeting
Friday 16-Feb	AM	Meet with EPA Region IV on LOR, FFCA, F&H Tank Farms, DWPF	Wackenhut UST, Hazardous Solid Waste Mgt Program	Environmental monitoring	Review SEN-7 reports	Inspect 232-H&234-H for LRAD, hazardous,solid & mixed waste management
	PM	Meet with EPA Region IV on LOR, FFCA, F&H Tank Farms, DWPF	Wackenhut UST, Hazardous Solid Waste Mgt Program	Environmental monitoring	Review SEN-7 reports	232-H and 234-H

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Saturday 17-Feb	AM	Review SRL Waste Characterization	Review week's activities, Rescheduling	Draft Conduct of Operations & maintenance	Review documentation on DWPF and TNX Areas pertaining to RAD	Review waste management procedures for L,K,P,C, and R Reactors
	PM	Report. Review sent info.	Document Review	Section of reports	hazardous, solid, and mixed waste management	Review waste management procedures for L,K,P,C, and R Reactors
Monday 19-Feb	AM	Review F&H Tank Farm Waste	SREL, Hazardous	Review product/spent materials/ waste issue using document review	Review documentation on DWPF & TNX Areas pertaining to RAD,	Review waste management procedures for L,K,P,C, and R Reactors
	PM	Characterization Data	Waste Mgmt Program	Review product/spent materials/ waste issue using document review	hazardous, solid and mixed waste management	Review waste management procedures for L,K,P,C, and R Reactors
Tuesday 20-Feb	AM	Meet w/H. Morris & R. Runnels to discuss "Smarts" Program and tank certifications for SRL	Wackenhut, waste JP-4 issue	Meet w/H. Morris & R. Runnels to discuss "Smarts" Program and tank certifications for SRL	Dick Reynolds 9 am	Visit L,K&P Reactors and inspect RAD, hazardous, solid & mixed waste
	PM	M-Area	Bechtel, UST	M-Area	Steve Crook 1 pm	Visit L,K&P Reactors and inspect RAD, hazardous, solid & mixed waste
Wednesday 21-Feb	AM	Document Review	Inspect U of SC solid and hazardous waste program	Environmental monitoring	Prepare report	Complete L,K&P Reactor visit Visit Reactor Operations
	PM	SRL-Treatability Studies, F006 Waste, Ed Stevens, Chris Langdon, Waste Character., Jane Bibler	Inspect Southern Bell solid and hazardous waste program	Review SRL Tank Inspection procedures	Prepare report	Complete L,K&P Reactor visit
Thursday 22-Feb	AM	SCDHEC Meeting	WMO - Conduct of Operations - Offsite Shipment	ManagementReview SRL training &contingency plans-solid waste and RAD Waste	SCDHEC Meeting	Document Review 232-H & 234-H acct. mat. review SCDHEC meeting
	PM	Document Review	EPS Sanitary Waste, John Cook and Steve Mentrup	Management	Document Review	Document Review

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Friday 23-Feb	AM	772-F Mike Holland, Paul Deason	Weekly Review	772-F Mike Holland, Paul Deason	TNX Area-RAD,hazardous,solid, and prepare rpeort	Travel
	PM	772-F Mike Holland, Paul Deason		772-F Mike Holland, Paul Deason	TNX Area-RAD,hazardous,solid, and prepare rpeort	Travel
Saturday 24-Feb	AM	Travel	Travel	Travel	Travel	NA
	PM	Travel	Travel	Travel	Travel	NA
Monday 26-Feb	AM	Travel	Travel	Travel	Travel	Travel
	PM	Travel	Travel	Travel	Travel	Travel
Tuesday 27-Feb	AM	Not Available	TNX, review solid and hazardous waste mgmt program	Visit R & C Reactors with Frostenson	Not Available - Completed	Visit R & C Reactors requiring follow-up activities Reactor Oper. records review
	PM	Not Available	TNX	Visit R & C Reactors with Frostenson		Visit R & C Reactors requiring follow-up activities L Reactor storage pads

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Wednesday 28-Feb	AM	Meet with DOE HDQS Rep	Wackenhut JP-4 issue	Environmental Monitoring Bill Wierzbicki		Meet with DOE HDQ Rep
	PM	CSWE, Traci Bittler	Corps of Engineers, Snyder	Environmental Monitoring Bill Wierzbicki		Report Preparation
Thursday 1-Mar	AM	Inspect USTS for Power OPS and inspect used oil storage	Excell Chemical Committee	Inspect soil erosion control station with Wallace		Meeting with Waste Management
	PM	D-Area	Prepare Report	Inspect soil erosion control station with Wallace		Meeting with Waste Management and report preparation
Friday 2-Mar	AM	DWPF, Kathy Wolf Salt Stone	Prepare Report	Environmental monitoring		Prepare report
	PM	DWPF, Kathy Wolf	Tru Pads LDR issues	Environmental monitoring		Prepare report
Saturday 3-Mar	AM	Prepare report	Prepare report	Prepare report		Prepare report
	PM	Prepare report	Prepare report	Prepare report		Prepare report
Monday 5-Mar	AM	Prepare report	Prepare Report	Prepare Report		Prepare Report
	PM	Prepare Report	Prepare Report	Prepare Report		Prepare Report

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Tuesday 6-Mar	AM	Meet with DOE HDQS Rep	Prepare Report	Prepare Report		SRL SED visit
	PM	Prepare Report	Prepare Report	Prepare Report		Prepare Report
Wednesday 7-Mar	AM	Prepare Report	Prepare Report	Prepare Report		Prepare Report
	PM	Meet with DOE SRS Office	Prepare Report	Prepare Report		Prepare Report
Thursday 8-Mar	AM	Prepare Report	Prepare Report	Prepare Report		Prepare Report
	PM	Prepare Report	Not Available - Completed	Prepare Report		Prepare Report
Friday 9-Mar	AM	Prepare Report		Travel		Prepare Report
	PM	Prepare Report		Travel		Prepare Report
Saturday 10-Mar	AM	Not Available - Completed		Travel		Prepare Report
	PM			Travel		Prepare Report
Monday 12-Mar	AM			Travel		Prepare Report
	PM			Travel		Prepare Report

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Tuesday 13-Mar	AM			Prepare Report		Prepare Report
	PM			Prepare Report		Prepare Report
Wednesday 14-Mar	AM			Prepare Report		Prepare Report
	PM			Prepare Report		Prepare Report
Thursday 15-Mar	AM			Prepare Report		Prepare Report
	PM			Prepare Report		Prepare Report
Friday 16-Mar	AM			Prepare Report		Prepare Report
	PM			Prepare Report		Prepare Report
Saturday 17-Mar	AM			Prepare Report		Prepare Report
	PM			Prepare Report		Prepare Report
Monday 19-Mar	AM			Prepare Report		Prepare Report
	PM			Prepare Report		Prepare Report

Table 2-1.6

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		WASTE MANAGEMENT				
		MARTINO	WALLACE	POSTON	WENTZ	FROSTENSON
Tuesday 20-Mar	AM			Prepare Report		Prepare Report
	PM			Prepare Report		Prepare Report
Wednesday 21-Mar	AM			Not Available - Completed		Not Available - Completed
	PM					
Thursday 22-Mar	AM					
	PM					

Table 2-1.6

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		TSCA/FIFRA	
		GHEESLING	BROWNE
Monday 29-Jan	AM	Tiger Team overview and agenda. SRO overview and WSRC Self-Assessment.	Tiger Team overview and agenda. SRO overview and WSRC Self-Assessment.
	PM	WSRC Self-Assessment.	WSRC Self-Assessment.
Tuesday 30-Jan	AM	Safety, health protection and security briefings. Environmental team function briefings.	Safety, health protection and security briefings. Environmental team function briefings.
	PM	Environmental team functional briefings.	Environmental team functional briefings.
Wednesday 31-Jan	AM	Facilities tour.	Facilities tour.
	PM	Facilities tour.	Facilities tour.
Thursday 1-Feb	AM	Review of documents. Identification and contact with SRS personnel to be visited.	Review of docuemnts. Identification and contact with SRS personnel to be visited.
	PM	Industrial Hygiene, Ed Kvartek.	Industrial Hygiene, Ed Kvartek.
Friday 2-Feb	AM	Meet with Tiger Team personnel: NEPA, RCRA, and Air	Meet with Tiger Team personnel: NEPA, RCRA, and Air
	PM	Technical Stores, John Gantt.	Technical Stores, John Gantt.
Saturday 3-Feb	AM	Continue document review; Continue SRS/TT personnel contacts; Set site visits for next week; Training for Conduct of Operations/ Maintenance.	Continue document review; Continue SRS/TT personnel contacts; Set site visits for next week; Training for Conduct of Operations Maintenance.
	PM	Tiger Team report preparation training; Training for Conduct of Operations/Maintenance	Tiger Team report preparation training; Training for Conduct of Operations/Maintenance
Monday 5-Feb	AM	Document review and schedule.	Document review and schedule.
	PM	TSCA & FIFRA Programs, John Harris	TSCA & FIFRA Programs, John Harris

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		TSCA/FIFRA	
		GHEESLING	BROWNE
Tuesday 6-Feb	AM	Document review, schedule and revised Assessemnt Plan.	Document review, schedule and revised Assessemnt Plan
	PM	Central Services and Works Engineering,. Traci Butler.	Central Services and Works Engineering, 722-A Traci Butler
Wednesday 7-Feb	AM	Engineering and Projects Division, D. Bignell. Operations Division, M. Sujka. Central Stores, Dennis Houston.	Engineering and Projects Division, D. Bignell, Operations Division M. Sujka, Central Stores, Dennis Houston
	PM	Brian Ellig, Chemical Buying.	Brian Ellig, Chemical Buying
Thursday 8-Feb	AM	Savannah River Laboratory - Bill Fowler.	SRL - Bill Fowler.
	PM	Savannah River Ecology Laboratory, Tony Towns.	SREL
Friday 9-Feb	AM	H-Area ETF Lab, Lorie Chandler; Powerhouse, Gregg Steed.	Follow-up in M-Area H-Area ETF Lab, powerhouse
	PM	Observation of asbestos survey at P-Area powerhouse, Tim Shatzer.	Travel
Saturday 10-Feb	AM	Travel	Travel
	PM	Travel	Travel
Monday 12-Feb	AM	Travel	Travel
	PM	Travel	Travel

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		TSCA/FIFRA	
		GHEESLING	BROWNE
Tuesday 13-Feb	AM	Wackenhut (B-Area), Yvonne Gentry.	Wackenhut (B-Area), Yvonne Gentry.
	PM	PCB Committee; Bingell, Griffin, Kozemko, Maloney, Nodal and Smith.	B-Area: test reactor (closed)
Wednesday 14-Feb	AM	PCB's, Bill Maloney and Ted Smith.	PCB's, Bill Maloney and Ted Smith.
	PM	C-Reactor chemical usage, Brent Blunt and Sara Mundy.	C-Reactor chemical usage, Brent Blunt and Sara Mundy.
Thursday 15-Feb	AM	F-Area Separations: lab, Paul Deason and Mike Holland.	F-Area Separations: lab, Paul Deason and Mike Holland.
	PM	F and H Area Separations chemical usage (outside), Myran Tyrrel.	F and H Area Separations chemical usage (outside), Myran Tyrrel.
Friday 16-Feb	AM	Central Shops and Construction, John Traves and Max Hammon.	Central Shops and Construction, John Traves and Max Hammon.
	PM	Same.	Same.
Saturday 17-Feb	AM	Document review, and preliminary draft report preparation.	Document review, and preliminary draft report preparation.
	PM	Document review, Tiger Team Meeting and preliminary draft report preparation.	Document review, Tiger Team Meeting and preliminary draft report preparation.
Monday 19-Feb	AM	Document review, and preliminary draft report preparation.	Document review, and preliminary draft report preparation.
	PM	Document review, findings briefing and preliminary draft report preparation.	Document review, findings briefing and preliminary draft report preparation.
Tuesday 20-Feb	AM	P-Reactor steam plant, Stan Smith.	P-Reactor and steam plant, Stan Smith.
	PM	P-Reactor chemical usage, Brent Blunt.	P-Reactor chemical usage, Brent Blunt.
Wednesday 21-Feb	AM	Forestry Service, John Irwin. Chemical usage and pesticides.	Forestry Service, John Irwin. Chemical usage and pesticides.
	PM	WSRC, Tim Fagul. TSCA and FIFRA.	WSRC, Tim Fagul. TSCA and FIFRA.
Thursday 22-Feb	AM	M-AREA Fuel & Target Fabrication Chemical Usage	M-AREA Fuel & Target Fabrication Chemical Usage
	PM	M-AREA Fuel & Target Fabrication Chemical Usage	M-AREA Fuel & Target Fabrication Chemical Usage

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		TSCA/FIFRA	
		GHEESLING	BROWNE
Friday 23-Feb	AM	DWPF Construction at DWPF, Humerto Teran.	DWPF Construction at DWPF, Humerto Teran.
	PM	R.R. Classification, Locomotive Shop, Ted Pennington	Travel
Saturday 24-Feb	AM	Travel	Travel
	PM	Travel	Travel
Monday 26-Feb	AM	Travel	Travel
	PM	Travel	Travel
Tuesday 27-Feb	AM	H Area Separations	H Area Separations & Tritium
	PM	CSWE at G-Area	CSWE at G-Area
Wednesday 28-Feb	AM	Followup on issues or findings and draft report.	Followup on issues or findings and draft report.
	PM	Followup on issues or findings and draft report.	Followup on issues or findings and draft report.
Thursday 1-Mar	AM	Followup on issues or findings and draft report.	Followup on issues or findings and draft report.
	PM	Followup on issues or findings and draft report.	Followup on issues or findings and draft report.
Friday 2-Mar	AM	Followup on issues or findings and draft report.	Followup on issues or findings and draft report.
	PM	Followup on issues or findings and draft report.	Followup on issues or findings and draft report.

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		TSCA/FIFRA	
		GHEESLING	BROWNE
Saturday 3-Mar	AM	Draft Report	Draft Report
	PM	Draft Report	Draft Report
Monday 5-Mar	AM	Draft Report, followup on issues/findings	Draft Report, followup on issues/findings
	PM	Draft Report, followup on issues/findings	Draft Report, followup on issues/findings
Tuesday 6-Mar	AM	Critique of Draft Findings	Critique of Draft Findings
	PM	Draft Report, followup on issues/findings, and Conduct of Operations.	Draft Report, followup on issues/findings, and Conduct of Operations.
Wednesday 7-Mar	AM	PCB storage inspection and sampling, PCB Conduct of Operations.	PCB storage inspection and sampling, PCB Conduct of Operations.
	PM	PCB Committee Meeting	PCB Committee Meeting
Thursday 8-Mar	AM	Draft Report, followup on issues/findings, and Conduct of Operations.	Not available - Completed
	PM	Draft Report, followup on issues/findings, and Conduct of Operations.	Not available - Completed
Friday 9-Mar	AM	Draft Report, followup on issues/findings, and Conduct of Operations, for chemical distrib.	Not available - Completed
	PM	Travel	Not available - Completed
Saturday 10-Mar	AM	Travel	Not available - Completed
	PM	Travel	
Monday 12-Mar	AM	Travel	
	PM	Travel	

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		TSCA/FIFRA	
		GHEESLING	BROWNE
Tuesday 13-Mar	AM	Draft Report	
	PM	Draft/Final Report	
Wednesday 14-Mar	AM	Conduct of operations, P-Powerhouse asbestos removed	
	PM	Draft/Final Report	
Thursday 15-Mar	AM	Final Report	
	PM	Final Report	
Friday 16-Mar	AM	Final Report	
	PM	Not Available - Completed	
Saturday 17-Mar			
	PM		
Monday 19-Mar	AM		
	PM		
Tuesday 20-Mar	AM		
	PM		
Wednesday 21-Mar	AM		
	PM		

Table 2-1.7

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		TSCA/FIFRA	
		GHEESLING	BROWNE
Thursday 22-Mar	AM		
	PM		
Friday 23-Mar	AM		
	PM		

Table 2-1.7

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Monday 29-Jan	AM	Tiger Team Overview and Agenda. SRO Overview and WSRC self-assessment	Tiger Team Overview and Agenda. SRO Overview and WSRC self-assessment	Not Available
	PM	WSRC Self-Assessment	WSRC Self-Assessment	Not Available
Tuesday 30-Jan	AM	Safety, Health Protection and Security Briefings, Environmental Team Functional Briefings	Safety, Health Protection and Security Briefings, Environmental Team Functional Briefings	Not Available
	PM	Environmental Team Functional Briefings	Environmental Team Functional Briefings	Not Available
Wednesday 31-Jan	AM	Facilities Tour	Facilities Tour	Not Available
	PM	Facilities Tour	Facilities Tour	Not Available
Thursday 1-Feb	AM	L-Area, ES&H Milestones, Environmental Program, Documentation, Effluent Information for radioactive emissions source terms, past experience in meeting DOE Orders, Applicable Federal/State Standards. Ability to meet 40 CFR 61	L-Area, L Reactor	Not Available
	PM	K-Area, ES&H Milestones, Line Management ES&H responsibilities vs. ES&H organization	K-Area, K Reactor	Not Available
Friday 2-Feb	AM	F-Area, ES&H, Milestone compliance, Regulatory compliance, Notice of violations	F-Area	Not Available
	PM	ES&H Self-Appraisal Trend analysis	F-Area	Not Available

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Saturday 3-Feb	AM	Program Milestone Schedules, Performance Objective, Award Fee, ES&H Milestones, Audit/ Performance (ES&H) Evaluations	DOE ES&H Program Manager, Re: Milestones, Schedules, Performance Objectives	Not Available
	PM	ES&H Oversite of SRS Program-Objectives (DOE-SR) Milestones/Schedules	Document Review	Not Available
Monday 5-Feb	AM	F-Area Separations, Radioactive Air Effluent Guidelines and Standards and Source Terms, Compliance Experience, DOE Orders, Applicable Federal/State Regulations; W. Wierzbicki	Review the documents, compile questions and schedule interviews with the above area staffs	Not Available
	PM	F-Area, Liquid Effluent Guidelines; Radioactivity Releases, Compliance Experience, Notices of Violation Audit (ES&H) 5 yr. Reports, 1990 ES&H Goals, Trend Audits; Radiological Effluent Calibration; W. Wierzbicki, Dan Ratchford	Document Review	Not Available
Tuesday 6-Feb	AM	3H, Radioactive Effluent Guidelines and Standards Source Terms, Compliance Experience, DOE Orders/Applicable Standards; Paul Rowan	Review the documents, compile questions and schedule interviews with the above area staffs	Not Available
	PM	Plant Maintenance/Field ES&H Personnel/ Laboratory Duties/Responsibilities Relevent to ES&H Sampling/Program Audit	Document Review	Not Available
Wednesday 7-Feb	AM	K Reactor IWCIDE-T Investigation Health Protection Interviews, DWPF, Humberto Teran, Tank Farm, K. Wierzbicki, Bechtel/W, ES&H Critical Path Milestones Program, Personnel Responsible/Accountable for ES&H Milestones, Progress Report Estimate to Complete-404 Status ES&H Interfaces Bechtel/W	Review the documents, compile questions and schedule interviews with the above area staffs	Not Available
	PM	DWPF, ES&H QA Audit	Document Review	Not Available

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Thursday 8-Feb	AM	Observed Westinghouse Critique Y Emergency Response to K Reactor Moderator Release Impacts on Current Program Line and ES&H	LLW, Site DOE Order Compliance, 10DFRG1	Not Available
	PM	Incinerator, ES&H Critical Path Milestones *Criteria/Standards Progress Report, Handoffs* Between Line Management and ES&H, Compliance Audit Program Plan	Review the documents, compile questions and schedule interviews with the above area staffs	Not Available
Friday 9-Feb	AM	Environmental Measurements Program, Stack Emission Monitoring vs. Environmental Measurements, 1989 Performance, 1988 Performance	Review the documents, compile questions and schedule interviews with the above area staffs	Not Available
	PM	1) Review of Wackenhut Rad. Monitoring Pgm Rqts 2) Corps of Eng Rad Effluent Program Review Notices of Violation, Environmental/Plant Operation, Air Monitoring Compliance, Audits - Duties/Responsibilities	Document Review	Not Available
Saturday 10-Feb	AM	Travel	Travel	Not Available
	PM	Travel	Travel	Not Available
Monday 12-Feb	AM	Travel	Travel	Not Available
	PM	Travel	Travel	Not Available
Tuesday 13-Feb	AM	TF, RTF Tour. Review RTF Env. Monitoring and Health Physics Programs	TF, RTF Tour. Review RTF Env. Monitoring and Health Physics Programs	Orientation; meet with 3H Faculty Reps. to discuss later
	PM	Heffner-Review 3H program standards, frequency of monitoring, QA, interfaces-who installs, who calibrates - Frequency calibration	Heffner-Review 3H program standards, frequency of monitoring, QA, interfaces-who installs, who calibrates - Frequency calibration	Orientation; meet with environmental monitoring (HP) to discuss general operations

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Wednesday 14-Feb	AM	Review TR/RTF ES&H documents. Liquid effluents F primary calibration to correlate to readout	Review Tritium Facility and Replacement Tritium Facility	Review Tritium Facility Effluent Control and Monitoring (D. Hayes)
	PM	H Liquid effluents - clean waste; FTF Rad Eff Pgm Review; Meet with Line Mgmt/ES&H Personnel 2F Area Cooling H2O monitor calibration	Review TNX Env. Monitoring/HP Programs Meet with Line Management/ES&H Personnel Jill Glascok	Review Tritium Facility Effluent Control and Monitoring (D. Hayes)
Thursday 15-Feb	AM	ETF Program review for Env. monitoring and HP Programs, and facility inspection	ETF Program review for Env. monitoring and HP Programs, and facility inspection	ETF Program review for Env. monitoring and HP Programs, and facility inspection - observed calibration of 281-4F Effluent Monitor
	PM	DWPF ES&H Area 2 Saltstone ES&H ETF Env. Lab Analysis	Self-assessment of management programs and practices, followed by HP hands-on field review	DWPF ES&H Area 2 Saltstone ES&H ETF Env. Lab Analysis
Friday 16-Feb	AM	Mixed waste site inspection, policies implementation review. LLW Sanitary Landfill Rx ES&H Criteria, Rx Eng Div System Engine	Mixed waste site inspection, policies implementation review	Meeting H-3 facility, re: waste issue
	PM	Review 300 Area. Airborne emission. Liquid effluents - 300 M Area Target Fab.	Review possible issues	Review possible issues. Airborne emission. Liquid effluents - 300 M Area Target Fab, J.Horvath
Saturday 17-Feb	AM	EPS ES&H Commitment Tracking	Airborne emission-Liquid effluent. K-Reactor effluents	Document review and report preparation
	PM	DWPF Airborne/Liquid Effluents - Site walkthrough with DOE-SR HP	Vogel - write up findings. Debrief Rad specialist Turnover to Peel/Burger	DWPF Tour (D. Zwerfel)
Monday 19-Feb	AM	Maintenance shops: Policies, procedures for Environmental monitoring and HP Programs	Maintenance shops: Policies, procedures for Environmental monitoring and HP Programs	Review Issues
	PM	Maintenance shops site inspection. Bechtel Const. Management HP training and supervision. Policies and practices review	Maintenance shops site inspection. Bechtel Const. Management HP training and supervision Policies and practices review	Document review - report prep.

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Tuesday 20-Feb	AM	Configuration Management change/control	Meet with site-wide manager of HP programs, re: Practices, Config. Management change/control	Review Issues
	PM	Excess material - WM conduit release accessing and handling procedures. Bechtel Constr Env Pgm Overview-Rail Car Grit Blast Facility Inspection NUS RAFTS System Review	Meet with site-wide manager of HP programs, re: Practices, Config. Management change/control	Review Documents and Issues
Wednesday 21-Feb	AM	Bill Murphy, Syst. Engr., 703-14A, Office 269-54989	Not Available - Completed	Reactor Effluent Monitoring - at C-Area (C. Jewell)
	PM	Tech. Specs for Env. Monitoring Applicability - Reactors - L Reactor Visit		L-Area HP Office - Reactor Effluent Monitoring (J. Stafford)
Thursday 22-Feb	AM	Follow-up on NESHAP (ETF Tim Pfeffercorn, T. Faugl). Implementation of DOE Orders, Luce		EPS - Responsibilities (T. Pfefferkorn, R. Duke)
	PM	EPS follow-up of DOE appraisal findings. Mtg. Mgr. Integraded Scheduling Review. CIF/ETF Schedule impacts.		SCDHEC Meeting
Friday 23-Feb	AM	Report Preparation		Criteria and procedures for determining disposal/ release of radioactive material or contaminated material (K.Wierzbicki)
	PM	Report Preparation		Inactive contaminated sites-oversight,criteria remediation (C. Sherman)
Saturday 24-Feb	AM	Travel		Travel
	PM	Travel		Travel

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Monday 26-Feb	AM	Travel		Travel
	PM	Travel		Travel
Tuesday 27-Feb	AM	Not Available		Meet with EPS (R. Duke, T. Faugl) Administration and Compliance (W. Luce)
	PM	Not Available		Meet with EPS Management (R. Duke, T. Faugl)
Wednesday 28-Feb	AM	Not Available		Emergency Drill
	PM	Not Available		Emergency Drill
Thursday 1-Mar	AM	Not Available		Accompany Environmental Monitoring field sampling team to observe procedures (W. Littrell)
	PM	Not Available		Meet w/Environmental Monitoring personnel to discuss brota monitoring program (J. Heffner)
Friday 2-Mar	AM	Not Available		Tour of F & H Separations Areas (except canyons) to observe effluent release and monitoring locations (D. Ratchford)
	PM	Not Available		Tour of F & H Waste Management Areas to observe effluent release & monitoring locations R. Wilson
Saturday 3-Mar	AM	Not Available		Discussion of assumptions, cenarios, procedure for estimating radiation doses to the public (W. Marter)
	PM	Not Available		Visit 400 Area-Rework Facility-to discuss and observe radiological effluent control & monitoring systems

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Monday 5-Mar	AM	Report Preparation and Follow-up		Meet with DOE/SR-ED to discuss operation office/ contractor interface, appraisal program, and compliance status (S. Wright)
	PM	Report Preparation and Follow-up Bechtel Constr HP. Inspection/Airborne Emission Monitoring Rail Car Grit Blast Facility		Clean release criteria (D. Stevenson, W. Lorng) observe and discuss radiological effluent monitoring and radioactive waste disposal
Tuesday 6-Mar	AM	Report Preparation and Follow-up		Tour or SRL and Administrative (700) Area to observe and discuss radiological effluent monitoring systems - Finding Preparation and Document Reviw
	PM	Report Preparation and Follow-up Tritium Program Review SIZL Env Rad Monitoring Program Review		Attend 3H TSA Closeout: SREL Biota Contamination
Wednesday 7-Mar	AM	Report Preparation and Follow-up; L Area Pad SRL Rad Effluent Monitoring Program Review		Document review, report preparation, followup of issues.
	PM	Report Preparation and Follow-up; 300 M Area - Rad Effluent Monitorg Stack Monitorg Calibration		Document review, report preparation, followup of issues.
Thursday 8-Mar	AM	Report Preparation and Follow-up		Document review, report preparation, followup of issues.
	PM	Report Preparation and Follow-up		Document review, report preparation, followup of issues.
Friday 9-Mar	AM	Report Preparation and Follow-up		Document review, report preparation, followup of issues.
	PM	Report Preparation and Follow-up		Document review, report preparation, followup of issues.

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Saturday 10-Mar	AM	Report Preparation and Follow-up		Document review, report preparation, followup of issues.
	PM	Report Preparation and Follow-up		Document review, report preparation, followup of issues.
Monday 12-Mar	AM	Not Available - Completed		Document review, report preparation, followup of issues.
	PM			Document review, report preparation, followup of issues.
Tuesday 13-Mar	AM			Document review, report preparation, followup of issues.
	PM			Document review, report preparation, followup of issues.
Wednesday 14-Mar	AM			Document review, report preparation, followup of issues.
	PM			Document review, report preparation, followup of issues.
Thursday 15-Mar	AM			Document review, report preparation, followup of issues.
	PM			Document review, report preparation, followup of issues.
Friday 16-Mar	AM			Document review, report preparation, followup of issues.
	PM			Document review, report preparation, followup of issues.
Saturday 17-Mar	AM			Document review, report preparation, followup of issues.
	PM			Document review, report preparation, followup of issues.

Table 2-1.8

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		RADIATION		
		PEEL	VOGEL	BERGER
Monday 19-Mar	AM			Not Available - Completed
	PM			
Tuesday 20-Mar	AM			
	PM			
Wednesday 21-Mar	AM			
	PM			
Thursday 22-Mar	AM			
	PM			
Friday 23-Mar	AM			
	PM			

Table 2-1.8

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		QUALITY ASSURANCE
		LINDAHL
Monday	AM	Tiger Team Overview and Agenda
29-Jan		SRO Overview and WSRC Self-Assessment
	PM	WSRC Self Assessment
Tuesday	AM	Safety, Health Protection and Security Briefings
30-Jan		Environmental Team Function Briefings
	PM	Environmental Team Function Briefings
Wednesday	AM	Facilities Tour
31-Jan		
	PM	Facilities Tour
Thursday	AM	Meet with Jim Heffner, Environment Monitoring Section
1-Feb		to discuss QA for Environmental Protection Programs
	PM	Meet with Mary Dodgen, Environment Health &
		Safety to Discuss QA for Environmental Protection Programs
Friday	AM	Review Environmental Program Plans and
2-Feb		Documents
	PM	Review Environmental Program Plans and
		Documents
Saturday	AM	Training for Conduct of Operations/
3-Feb		Maintenance
	PM	Training for Conduct of Operations/
		Maintenance

Table 2-1.9

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		QUALITY ASSURANCE
		LINDAHL
Monday 5-Feb	AM	Accompany Environmental Monitoring Section Performance Review Team to Offsite Contractor Analytical Laboratory (General Engineering Laboratory, Charleston, SC), Jim Heffner
	PM	Offsite Contractor Laboratory (Cont)
Tuesday 6-Feb	AM	Offsite Contractor Laboratory (Cont)
	PM	Offsite Contractor Laboratory (Cont)
Wednesday 7-Feb	AM	Tour onsite Environmental Monitoring Section Laboratories - Jim Heffner
	PM	Meet with R. E. Reece to coordinate sample collection activities
Thursday 8-Feb	AM	Met with R. E. Reece to monitor QA/QC for onsite sample collection for environmental samples
	PM	Meet with Jim Bush to discuss status of DOE Order 5400.1 implementation and/or plan
Friday 9-Feb	AM	Document review
	PM	Document review

Table 2-1.9

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		QUALITY ASSURANCE
		LINDAHL
Saturday 10-Feb	AM	Travel
	PM	Travel
Monday 12-Feb	AM	Travel
	PM	Travel
Tuesday 13-Feb	AM	Audit Environmental Radiochemical Analysis Laboratories - R. H. Young/O. R. Daniel
	PM	Audit Environmental Radiochemical Analysis Laboratories - R. H. Young/O. R. Daniel
Wednesday 14-Feb	AM	Audit NPDES sample collection R. Reese
	PM	Review shipping procs. for Radioactive Environmental Samples. T. Killeen
Thursday 15-Feb	AM	Meet with L. A. Geary to discuss offsite NPDES Laboratory contract
	PM	Review Radiochem. Lab. SOP & QA/QC Procedures w/ J. Berger
Friday 16-Feb	AM	Meet with Jesse Donnan to discuss formation of Waste Analysis Group initiative
	PM	Meet with R. Henderson to review onsite radiochemistry laboratory QA/QC Program
Saturday 17-Feb	AM	Document Review
	PM	Document Review

Table 2-1.9

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		QUALITY ASSURANCE
		LINDAHL
Monday 19-Feb	AM	Document Review
	PM	Document Review
Tuesday 20-Feb	AM	Audit Environmental Counting Laboratory - Brian Crandall
	PM	Meet with Bob Dorsett to discuss onsite Environment Laboratory Audit activities
Wednesday 21-Feb	AM	Audit off-site NPDES Laboratory - Lynn Geary
	PM	Audit off-site NPDES Laboratory - Lynn Geary
Thursday 22-Feb	AM	Meet with Gary Hoover to discuss DOE perspective on QA for Environmental Programs at SRS
	PM	Visit Standards Lab to review procedures and operation - Chet Tuthill
Friday 23-Feb	AM	Meet with Bill Luce to discuss DOE Order compliance for Environmental Protection Programs
	PM	Travel
Saturday 24-Feb	AM	Not Available
	PM	Not Available
Monday 26-Feb	AM	Not Available
	PM	Not Available

Table 2-1.9

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		QUALITY ASSURANCE
		LINDAHL
Tuesday 27-Feb	AM	Not Available
	PM	Not Available
Wednesday 28-Feb	AM	Not Available
	PM	Not Available
Thursday 1-Mar	AM	Not Available
	PM	Not Available
Friday 2-Mar	AM	Not Available
	PM	Not Available
Saturday 3-Mar	AM	Not Available
	PM	Not Available
Monday 5-Mar	AM	Audit Environmental Water Quality Analysis Labs. S. Boynton
	PM	Audit Environmental Water Quality Analysis Labs. S. Boynton
Tuesday 6-Mar	AM	Audit D-Area Water Quality Laboratory, K. Johns
	PM	Report Writing & Followup

Table 2-1.9

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		QUALITY ASSURANCE
		LINDAHL
Wednesday 7-Mar	AM	Report Writing & Followup
	PM	Report Writing & Followup
Thursday 8-Mar	AM	Report Writing & Followup
	PM	Report Writing
Friday 9-Mar	AM	Travel
	PM	Travel
Saturday 10-Mar	AM	Travel
	PM	Travel
Monday 12-Mar	AM	Report Writing
	PM	Report Writing
Tuesday 13-Mar	AM	Report Writing
	PM	Report Writing
Wednesday 14-Mar	AM	Report Writing
	PM	Report Writing

Table 2-1.9

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		QUALITY ASSURANCE
		LINDAHL
Thursday 15-Mar	AM	Report Writing
	PM	Report Writing
Friday 16-Mar	AM	Depart site
	PM	Not Available - Completed
Saturday 17-Mar	AM	
	PM	
Monday 19-Mar	AM	
	PM	
Tuesday 20-Mar	AM	
	PM	
Wednesday 21-Mar	AM	
	PM	

Table 2-1.9

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		QUALITY ASSURANCE
		LINDAHL
Thursday 22-Mar	AM	
	PM	
Friday 23-Mar	AM	
	PM	

Table 2-1.9

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		INACTIVE WASTE SITES AND RELEASES		
		FLOWERS	HUGHEY	McCANN
Monday 29-Jan	AM	Tiger Team Overview and Agenda	Tiger Team Overview and Agenda	Tiger Team Overview and Agenda
	PM	SRO Overview & WSRC Self-Assessment	SRO Overview & WSRC Self-Assessment	SRO Overview & WSRC Self-Assessment
Tuesday 30-Jan	AM	Safety, Health Protection and Security Briefing, Environmental Team Functional Briefings	Safety, Health Protection and Security Briefing, Environmental Team Functional Briefings	Safety, Health Protection and Security Briefing, Environmental Team Functional Briefings
	PM	Environmental Team Functional Briefings	Environmental Team Functional Briefings	Environmental Team Functional Briefings
Wednesday 31-Jan	AM	Facilities Tour	Facilities Tour	Facilities Tour
	PM	Facilities Tour	Facilities Tour	Facilities Tour
Thursday 1-Feb	AM	Interview spill response personnel. Look at spill reporting procedure. Interview Al Parrott - Spill Coordinator	Interview CERCLA and FFA contacts. Establish list of documents. RCRA closure issues	Interview SARA Title III contact John Harris, WSRC
	PM	CERCLA spill reporting. Interviews and document review	Establish list of sites. Review site listing procedure and data base	SARA Title III document review
Friday 2-Feb	AM	CERCLA spill reporting. Document Reviews	Inactive waste site document review	SARA Title III document review
	PM	CERCLA spill reporting interviews & document review	Inactive waste site document review	SARA Title III interviews: Gary Hoover, DOE and Ed Kvartek, WSRC, HP

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		INACTIVE WASTE SITES AND RELEASES		
		FLOWERS	HUGHEY	McCANN
Saturday 3-Feb	AM	Schedule; Assessment/Plan preparation Document Review	Document Review	Document Review
	PM	Training for Conduct of Operations/ Maintenance	Training for Conduct of Operations/ Maintenance	Training for Conduct of Operations/ Maintenance
Monday 5-Feb	AM	Not Available	Document Review CERCLA Site Listing-additional inactive list review	Interview Ed Kvartek Title III contact
	PM	Not Available	Document Review CERCLA Site Listing-additional inactive list review	Title III Document Review Interview Gary Hoover DOE Title III contact
Tuesday 6-Feb	AM	Audit Tour of M-Area Effluent Treatment Plant	Inactive waste site field trip. WSRC contacts: Ed Campbell and Michele Wilson	Inactive waste site field trip. WSRC contacts: Ed Campbell and Michele Wilson
	PM	Continued R/Q review on CERCLA Spill Reporting	Inactive waste site field trip. WSRC contacts: Ed Campbell and Michele Wilson	Inactive waste site field trip. WSRC contacts: Ed Campbell and Michele Wilson
Wednesday 7-Feb	AM	Follow-up with report on M-Area review	CERCLA site document review	RCRA closures: M-Area Basin document review and interviews Jay Horvath
	PM	Detailed review of Superfund Spill - Tank #37	CERCLA site document review	RCRA closures: M-Area Basin document review and interviews

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		INACTIVE WASTE SITES AND RELEASES		
		FLOWERS	HUGHEY	McCANN
Thursday 8-Feb	AM	Interview DOE Real Property Transfer contact. Tour H Area Canyon	CERCLA site document review	Interview with Rick Green-Compliance SR Compliance Coordinator, DOE-HQ
	PM	Audit and detailed tour of H-Area HLW Tank #37 CTS loop leak	CERCLA site document review	Interview Wade Whitaker DOE-SR OPS on CERCLA Compliance Issues
Friday 9-Feb	AM	Follow-up on Superfund Spill- Interviewed Tom Tregar	Not Available	Review FFA, RFI Program Plan and Other CERCLA documents
	PM	Wackenhut Presentation	Not Available	CERCLA document review
Saturday 10-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Monday 12-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Tuesday 13-Feb	AM	Continue CERCLA Support	CERCLA site document review	RCRA closure document review and interviews as required
	PM	Document Review Interviewed M. G. O'Rear	CERCLA site document review	RCRA closure document review and interviews as required

Table 2-1.10

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		INACTIVE WASTE SITES AND RELEASES		
		FLOWERS	HUGHEY	McCANN
Wednesday 14-Feb	AM	Surface Water/Treatment Plant Review F & H Area LETF Audit	Interview with Rue Ann Thomas Michele Wilson and Gerri Stejskal	CERCLA interview with Rue Ann Thomas
	PM	Surface Water/Treatment Plant Review Continued LETF Audit O & M	Interview with Charlie Sherman	RCRA closure & Title III document review & interview as req'd
Thursday 15-Feb	AM	CERCLA Report Writing	Interview w/Richard Brooks	Tracy Bittler, RF1
	PM	Audited and Toured A-Area Sanitary WW Plant	SWMU/RFI Program Document Review and Field Activities	Wackenhut Chemical Coordinator SARA Title III
Friday 16-Feb	AM	Surface Water/Treatment Plant Review	Interview with Traci Bittler, CSWE	Mtg with EPA Region IV representatives/Atlanta, GA
	PM	Surface Water/Treatment Plant Review	SWMF/RFI Document Review and Interviews	Mtg with EPA Region IV representatives/Atlanta, GA
Saturday 17-Feb	AM	Document Review/Report preparation	SWMU/RFI Program Document Review	SWMU/RFI Program Document Review
	PM	CERCLA Summary meeting	SWMU/RFI Program Document Review	SWMU/RFI Program Document Review
Monday 19-Feb	AM	Not Available	SWMU/RFI Program Document Review	SWMU/RFI Program Document Review
	PM	Not Available	SWMU/RFI Program Document Review	SWMU/RFI Program Document Review and Interviews
Tuesday 20-Feb	AM	Not Available	SWMU/RFI Program Document Review and Interviews	Chemical Coordinators mtg 735-11A Conference Rm.
	PM	Not Available	Interview with Roger Pitts of the U. S. Forestry Service	SWMU/RFI Program Document Review and interview as required
Wednesday 21-Feb	AM	Not Available	Interview with John Travis	SWMU/RFI Program Document Review
	PM	Not Available	SWMU/RFI Program Document Review and Interviews	SWMU/RFI Program Document Review

Table 2-1.10

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		INACTIVE WASTE SITES AND RELEASES		
		FLOWERS	HUGHEY	McCANN
Thursday 2/22/90	AM	Not Available	Field activities with WSRC-EPS-contacts Ed Campbell and Don Morris, and U. S. Forestry Service Contact, Roger Pitts	DHEC
	PM	Not Available	SWMU/RFI Document Review	2:00 Tritium, SARA Title III, Paul Rowan
Friday 23-Feb	AM	Not Available	Not Available	Reactor, SARA Title III Inactive Waste Site Management, Pete Hanley, S. Mundy
	PM	Not Available	Not Available	RWE, SARA Title III Inactive Waste Site Management
Saturday 24-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Monday 26-Feb	AM	Travel	Travel	Travel
	PM	Travel	Travel	Travel
Tuesday 27-Feb	AM	Inspect S, D, and B Areas Sanitary Waste Water Treatment Facility, Stan Smith	CERCLA Document Review and Interviews	RWE,SARA Title III Inactive Waste Site Management, Mike Ridgeway
	PM	Inspect TNX Central Shops, H Area San. WWTF	Interview with Kim Wierzbicki, Paul d'Entremont and Robert Wilson	WM, SARA Title III Inactive Waste Site Mgt., Kim Wierzbicki,Tim Gaughn
Wednesday 28-Feb	AM	Interviewed Kim Cauther SCDHEC on OIC issue	Tritium Facility Emergency Response Exercise	CSWE, SARA Title III Traci Bittler
	PM	Report Preparation	Tritium Facility Emergency Response Exercise	CSWE, SARA Title III Traci Bittler
Thursday 1-Mar	AM	Audited/Toured TNX ET Plant	Follow-up interviews, Document Review and Report Preparation	SRL,SARA Title III Inactive Waste Site Mgt., Nancy Halverson, Bill Fowler
	PM	Report Preparation	Follow-up interviews, Document Review and Report Preparation	SRL, SARA Title III Inactive Waste Site Mgt., Nancy Halverson, Bill Fowler

Table 2-1.10

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		INACTIVE WASTE SITES AND RELEASES		
		FLOWERS	HUGHEY	McCANN
Friday 2-Mar	AM	Interviewed G. Hoover on OIC Issue	Follow-up Interviews, Document Review and Report Preparation	Interview with Ralph Nichols, SRL Inactive Waste Sites
	PM	Report Preparation	Interview with Bill Wierzbicki	Report Preparation
Saturday 3-Mar	AM	Report Writing	Report Preparation	Report Preparation
	PM	Report Writing	Report Preparation	Report Preparation
Monday 5-Mar	AM	Report Writing	Report Preparation	NRDC Site Tour
	PM	Report Writing	Report Preparation	NRDC Site Tour
Tuesday 6-Mar	AM	Report Writing	Report Preparation	Report Preparation
	PM	Report Writing	Report Preparation	Report Preparation
Wednesday 7-Mar	AM	Report Writing	Report Preparation	Report Preparation
	PM	Report Writing	Report Preparation	Report Preparation
Thursday 8-Mar	AM	Report Writing	Report Preparation	Report Preparation
	PM	Report Writing	Report Preparation	Report Preparation
Friday 9-Mar	AM	Travel		Report Preparation
	PM	Travel		Report Preparation

Table 2-1.10

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		INACTIVE WASTE SITES AND RELEASES		
		FLOWERS	HUGHEY	McCANN
Saturday 10-Mar	AM			
	PM			
Monday 12-Mar	AM			
	PM			
Tuesday 13-Mar	AM			
	PM			
Wednesday 14-Mar	AM			
	PM			
Thursday 15-Mar	AM			
	PM			
Friday 16-Mar	AM			
	PM			
Saturday 17-Mar	AM			
	PM			

Table 2-1.10

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		INACTIVE WASTE SITES AND RELEASES		
		FLOWERS	HUGHEY	McCANN
Monday 19-Mar	AM			
	PM			
Tuesday 20-Mar	AM			
	PM			
Wednesday 21-Mar	AM			
	PM			
Thursday 22-Mar	AM			
	PM			
Friday 23-Mar	AM			
	PM			

Table 2-1.10

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		NEPA				
		CADA	EDDLEMON	BARRINGER	HECKMAN	WEBB
Monday 29-Jan	AM	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment	Tiger Team Overview and Agenda SRO Overview and WSRC Self-Assessment
	PM	WSRC Self-Assessment	WSRC Self-Assessment	WSRC Self-Assessment	WSRC Self-Assessment	WSRC Self-Assessment
Tuesday 30-Jan	AM	Safety, Health Protection and Security Briefings	Safety, Health Protection and Security Briefings	Safety, Health Protection and Security Briefings	Safety, Health Protection and Security Briefings	Safety, Health Protection and Security Briefings
	PM	Environmental Team Function Briefings	Environmental Team Function Briefings	Environmental Team Function Briefings	Environmental Team Function Briefings	Environmental Team Function Briefings
Wednesday 31-Jan	AM	Facilities Tour	Facilities Tour	Facilities Tour	Facilities Tour	Facilities Tour
	PM	Facilities Tour	Facilities Tour	Facilities Tour	Facilities Tour	Facilities Tour
Thursday 1-Feb	AM	Review Responses to Pre-Audit Visit Questionnaire	Review Responses to Pre-Audit Visit Questionnaire	Review Responses to Pre-Audit Visit Questionnaire	Review Responses to Pre-Audit Visit Questionnaire	Review Responses to Pre-Audit Visit Questionnaire
	PM	Interview Westinghouse NEPA Staff (Gordon, Murdock)	Document Review	Document Review DOE/EA-0179	Document Reivew MTFS 1-5	Document Review
Friday 2-Feb	AM	Review WSRC NEPA Procedures	Document Review and Begin Additional Site Tours (Facilities covered by NEPA documents)	Budget Sheet Review	Document Review MTFS 6-19	Document Review and Interview ERDA 1537
	PM	Interview NEPA Staff, P. Stone, L. McClain, A. B. Gould	Document Review and Begin Additional Site Tours (Facilities covered by NEPA documents)	Document Review DOE/EA-0170	Document Review MFTS20-20	Document Review and Interview DOE/EIS-0023

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		NEPA				
		CADA	EDDLEMON	BARRINGER	HECKMAN	WEBB
Saturday 3-Feb	AM	Training Session	Training Session and Document Review EA-0240	Training Session: Tiger Team Strategy, Conduct of Operations, Conduct of Maintenance	Training Session: Tiger Team Strategy, Conduct of Operations, Conduct of Maintenance	Training Session and Document Review DOE/EIS-0046
	PM	Training Session	Document Review Other EAs	Training Session	Document Review MTFS 30-35	Document Review DOE/EIS-0062
Monday 5-Feb	AM	Review of WSRC NEPA Procedures Documents	L-Reactor and L-Lake Tour Interviews (C.E. Jewell)	Document Review. DOE/EA-0170 and related MTFs	Document Review MTFs 36-45	Document Review DOE/EIS-0082, DOE/EIS-0108
	PM	Draft finding on WSRC NEPA procedures	Separations (F-Canyon) Interviews (Wierzbicki, Geddes, Eubanks)	Interview NEPA Staff (Murdock, Gordon)	Interview NEPA Staff (Murdock, Gordon)	Document Review DOE/EIS-0120
Tuesday 6-Feb	AM	Review DOE-SR NEPA implementation procedures	Doc. Review: DWPF, MODS Env. Analysis, MTFs 47,52	Interview WSRC NEPA Staff (Murdock). Review NEPA files	Interview WSRC NEPA Staff (Murdock). Review NEPA files	Document Review DOE/EIS-0121
	PM	Interview Jim Jackson	DOE/EIS-0082	Document Review: Additional FMF NEPA memos (Murdock)	Document Review MTFs 46-56	Document Review. DOE-SR Implementation Plan for DOE 5440
Wednesday 7-Feb	AM	Review SEN-15-90. Draft finding on DOE-SR NEPA proc.	Begin prep. of findings. Document review (EA-0315)	Compilation of EA evaluations (NEPA Protocol)	Document Revie MTFs 57-65 and various supporting documentation	WSRC Site Implementation Plan for Environment
	PM	Draft NEPA overview section	Interview John Murdock	Development of potential EA findings	Development of Findings - MTFs	Finding: EISs
Thursday 8-Feb	AM	Finalize NEPA findings	John Gladden, SRL	Preparation of findings	Preparation of findings	Finding: SR implementation
	PM	Draft evaluations & conclusion sections of NEPA report	Kim Wierzbicki, Waste Management	Finding revision	Finding revision. Complete final protocol sheets	Finding revision

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		NEPA				
		CADA	EDDLEMON	BARRINGER	HECKMAN	WEBB
Friday 9-Feb	AM	Complete the draft NEPA report eg. bibliographies, biographies	Finding revision Complete exit procedures	Completion of exit procedures	Completion of exit procedures	Finding revisions. Complete exit procedures
	PM	Complete the draft NEPA report	Finalization of NEPA report input	Finalization of NEPA report sections	Finalization of NEPA report	Finalization of NEPA report
Saturday 10-Feb	AM	Not Available - Completed	Not Available - Completed	Not Available - Completed	Not Available - Completed	Not Available - Completed
	PM					
Monday 12-Feb	AM					
	PM					
Tuesday 13-Feb	AM					
	PM					
Wednesday 14-Feb	AM					
	PM					
Thursday 15-Feb	AM					
	PM					

Table 2-1.11

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		NEPA				
		CADA	EDDLEMON	BARRINGER	HECKMAN	WEBB
Friday 16-Feb	AM					
	PM					
Saturday 17-Feb	AM					
	PM					
Monday 19-Feb	AM					
	PM					
Tuesday 20-Feb	AM					
	PM					
Wednesday 21-Feb	AM					
	PM					
Thursday 22-Feb	AM					
	PM					
Friday 23-Feb	AM					
	PM					

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		NEPA				
		CADA	EDDLEMON	BARRINGER	HECKMAN	WEBB
Saturday 24-Feb	AM					
	PM					
Monday 26-Feb	AM					
	PM					
Tuesday 27-Feb	AM					
	PM					
Wednesday 28-Feb	AM					
	PM					
Thursday 1-Mar	AM					
	PM					
Friday 2-Mar	AM					
	PM					

Table 2-1.11

SAVANNAH RIVER SITE
ENVIRONMENT TEAM
SCHEDULE OF ON-SITE ACTIVITIES

		NEPA				
		CADA	EDDLEMON	BARRINGER	HECKMAN	WEBB
Saturday 3-Mar	AM					
	PM					
Monday 5-Mar	AM					
	PM					
Tuesday 6-Mar	AM					
	PM					
Wednesday 7-Mar	AM					
	PM					
Thursday 8-Mar	AM					
	PM					
Friday 9-Mar	AM					
	PM					

Table 2-1.11

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		NEPA				
		CADA	EDDLEMON	BARRINGER	HECKMAN	WEBB
Saturday 10-Mar	AM					
	PM					
Monday 12-Mar	AM					
	PM					
Tuesday 13-Mar	AM					
	PM					
Wednesday 14-Mar	AM					
	PM					
Thursday 15-Mar	AM					
	PM					
Friday 16-Mar	AM					
	PM					
Saturday 17-Mar	AM					
	PM					

SAVANNAH RIVER SITE

ENVIRONMENT TEAM

SCHEDULE OF ON-SITE ACTIVITIES

		NEPA				
		CADA	EDDLEMON	BARRINGER	HECKMAN	WEBB
Monday 19-Mar	AM					
	PM					
Tuesday 20-Mar	AM					
	PM					
Wednesday 21-Mar	AM					
	PM					
Thursday 22-Mar	AM					
	PM					
Friday 23-Mar	AM					
	PM					

3.0 AIR

Investigations of compliance with air regulations can be divided into the two categories of air pollutant emission--radioactive and nonradioactive. Emissions of both radioactive and nonradioactive air contaminants may occur simultaneously at some sources, but the regulations are generally different. The Clean Air Act and South Carolina Air Pollution regulations cover the nonradioactive pollutants while DOE orders and 40 CFR 61, Subpart H, National Emission Standard for Radionuclide Emissions from DOE Facilities, cover the radionuclides. The air portion of this environmental assessment plan is divided into two sections corresponding to the two categories of air contaminants.

The assessment for both categories of air emissions at the SRS will cover (1) the activities and equipment that emit or have the potential to emit one or more air contaminating materials, (2) the emission controls applied to these activities and equipment, (3) the administrative procedures applied to restrict the emissions, (4) the ambient-air monitoring equipment and procedures, and (5) WSRC's adherence to the INPO guidelines for the conduct of operations and maintenance.

Based on the principals of the INPO guidelines personnel who are responsible for effecting air pollution controls will be interviewed to determine if they have received adequate training to perform their duties and be able to follow prescribed standard operating procedures. Documentation of equipment operation, periodic maintenance, calibration of the control systems and the air monitoring equipment will be examined. The interviews with WSRC staff are conducted to determine whether the attitude and the procedures have been set forth to demonstrate the site is striving to reduce air pollutant emissions and related health risks than is required by regulations and permits.

3.1 Issue Identification

1) Nonradiological Category

The assessment will address those air contaminants for which quality standards (criteria pollutants) or emission standards (new source performance standards or emission standards for hazardous air pollutants) have been established by the United States Environmental Protection Agency (U.S. EPA) or by the South Carolina Department of Health and Environmental Control (SCDHEC). Also, under consideration, will be an assessment hazardous pollutants which have been identified by SCDHEC but which no emission standards have been set at this time. Previous measurements have specified that emissions of mercury, 1,1,1-trichloroethane, nitrogen oxides, and all other ozone precursors might require special control measures. In addition, any asbestos-removal activities will

be reviewed for compliance with regulating procedures and guidelines.

The general approach for the nonradiological portion of the assessment will include a review of existing air permits, pending applications, and pertinent documents, including standard operating and maintenance procedures for all contractors and subcontractors. Processes and emission-control equipment will be inspected and normal run-time operations observed. Of special interest will be the nitric acid scrubber in area 313-M and the TNX pilot operations. Fugitive emissions from construction activities and rubble pits will be evaluated as potential sources of airborne contaminants. Records of operating hours, production rates, emission tests, and visible emissions from permitted sources will be reviewed. Air contaminant sources that do not have air permits will be checked to determine if permits should be required. The use and storage of solvents will be evaluated as potential sources of air contaminants.

In addition, the assessment will evaluate the air-monitoring devices and procedures used to monitor atmospheric contaminants, both on-site and off-site. Typical air-monitoring sites will be visited and the monitoring activities will be discussed with Westinghouse personnel. The equipment and procedures used to acquire meteorological data will be examined. The use of these data in models which predict downwind pollutant concentrations will be discussed with the Savannah River Laboratory staff.

Several sources of nonradiological emissions to the atmosphere have been identified:

-- Degreaser in M-Area
-- Etching tanks in M-Area
-- Air stripper in M-Area
-- Coal-fired boilers and coal handling
-- Metal cleaning processes
-- Diesel generators
-- Plutonium Waste Incinerator, Precipitate Hydrolysis Experimental Facility, and integrated DWPF melter system at the TNX
-- Metallurgical laboratory in 322-M
-- NO2 absorption column at F canyon
-- DWPF stacks (especially benzene emissions)
-- Ash disposal operations
-- Cooling towers (toxics & particulates)
-- Tank Farm Evaporators (F/H Areas)
-- TNX Pilot Plants
-- Tritium Facilities, H-Area & Waste Management Facilities mercury and other chemicals emissions

2) Radiological Category

The assessment will concentrate on the sources of which emit tritium and tritium oxide to the atmosphere; however, it will also investigate the atmospheric emissions radioactive particulates and gases (e.g., the Beta/Gamma Incinerator and the SHIRCO Incinerator). Visits to the tritium production facilities, the reactors, the separation facilities and the fuel fabrication facility will embrace identification of release points, examination of emission monitors, and emission control devices.

Investigations in greater depth will be directed toward
-- calculation of ambient dosages arising from routine or accidental releases to the atmosphere
-- placement, maintenance, and calibration of ambient-atmosphere monitors
-- laboratory procedures for analyzing the radioactive constituents of atmospheric samples
-- quality assurance practices in the sampling and analysis of atmospheric radionuclides

3.2 Records Required

Specific documents and files requested for review while on-site include, but will not be limited to, the following:

1) Non-radiological

- o Most recent annual reports to the State of South Carolina of information required by air operating permits, including production records, operating hours, visible opacity observations.
- o Ambient air monitoring reports for 1987 and 1988.
- o Monthly fuel-consumption data per boiler for recent year and annual fuel analysis data.
- o Annual throughput data for gasoline and fuel-oil tanks.
- o Annual data on organic solvent usage (including chlorofluorocarbons), and information on where and how these materials are used.
- o Any reports on NESHAPS impact modeling.
- o Asbestos removal permits.
- o Operation and maintenance procedures and checklists

- o Meteorological data reports for 1987 and 1988.
- o Information on methods for disposal of classified waste paper.
- o Most recent listing by EPS of the SRS air emissions inventory.
- o User's manuals for mathematical dispersion models

2) Radiological

- o Atmosphere radiological sampling procedures
- o Documents discussing the placement and design of atmospheric radiological monitors
- o Records of atmospheric monitor calibration and maintenance
- o Radioanalytical QA documentation
- o NESHAPS permitting documents

4.0 SURFACE WATER

The focus of the surface water portion of the environmental assessment will be to review issues related to wastewater discharges and drinking water. Conduct of operations and maintenance and compliance with regulations promulgated in response to the Clean Water Act (CWA) and the Safe Drinking Water Act (SDWA) will be reviewed.

4.1 Issue Identification

This portion of the Savannah River Site (SRS) Tiger Team environmental assessment will be concerned with the liquid discharges on site from industrial, process, and sanitary sources including wastewater treatment facilities and storm water runoff which may affect neighboring surface waters. The potable water systems at SRS will also be addressed in this portion of the assessment.

The Savannah River Site NPDES permitted outfalls and nonpermitted outfalls for the site will be surveyed and reviewed. Permits and applications for discharge to septic tank systems and leach fields will be reviewed. Measures taken to prevent back-flow of process wastewater or sanitary sewer flows into the drinking water piping systems will be reviewed. A walkthrough of the facilities will be made to observe the current operations and maintenance activities. Actual sampling procedures will also be observed. The adequacy of the monitoring programs and systems will be assessed. The wastewater collection, holding and treatment systems including retention tanks, basins, ponds, lakes, and streams will be examined and records of operations reviewed. The team will consider major contributors to wastewater generation, spill prevention and control, as well as thermal compliance problems and mitigation.

The surface water specialists will review SRS's Stream Management Program. This will be coordinated closely with the NPDES permits review and potential point and nonpoint source discharge impacts. Interaction with SRL and SREL stream management projects will be necessary to evaluate compliance of stream management policy and state requirements.

4.2 Records Required

DOE-HQ 1987 Environmental Survey Report

SRS 1988 Environmental Report

SRS 1989 Environmental Implementation Plan

SRS 1989 Action Plan for Resolution of DOE-HQ Environmental Survey Findings

DOE, WSRC and other SRS contractor self-appraisals and inspection reports

Regulatory inspection reports

NPDES permit applications

Well water usage reports and permits
Well site maps and status records

Water treatment plant licenses

Water treatment plant operations and maintenance records

Drinking water monitoring records including scope, chain of custody, procedures and quality

Drinking water backflow prevention program installation and maintenance records

Wastewater treatment plan permits and licenses

Wastewater treatment plan and equipment operations records

Septic system permits

Wastewater discharge monitoring records, both radiological and chemical including scope, chain of custody, procedures and measurements

Sediment and aquatic life monitoring records including scope, chain of custody, procedures and measurements

Erosion control program records
SRS environmental committee meeting records

Spill Prevention and Control and Countermeasures Plan

Best Management Practices Plan

EPA and State Agreements, orders and decrees

Environmental Information Document reports

EIS and 316a reports

Incident and spill reports related to surface waters

Site and area utility drawings including facility drains, sanitary and industrial sewers and lift stations, drinking water supplies lines and storms sewers.

Industrial, storm and sanitary cross connection prevention program

Utility system training, spare parts, and maintenance records related to systems handling wastewater and drinking water

Current and historic RCRA storage and treatment facilities and waste disposal sites to determine runoff or drainage risks to surface water

Discharge Monitoring Reports

4.3 Areas to be Investigated

NPDES outfalls

Controlled stormwater outfalls

Uncontrolled and unregulated identified outfalls

Savannah River swamp and Savannah River monitoring points upstream and downstream from SRS

SRS drainage creeks and wetlands

PAR Pond and L Lake
Sanitary waste treatment plants, septic systems and sludge disposal sites

Containment structures, stormwater, sanitary and industrial sewers in various areas
100 Area reactor buildings discharge sumps

100 Area disassembly buildings' basins and clarifiers

100 Area reactor retention basins

100 Area coal fired boilers' discharges, and ash and coal-pile run-off basins

100 Area cooling towers including construction at K reactor

F/H Area chemical separation process buildings' discharges, retention basins and seepage basins

F/H Area Canyon and Tritium building process and nonprocess discharges

F/H Area waste management treatment buildings and Tank Farm

F/H Area support buildings, especially the Chemical Feed, Manufacturing, Metallurgy, Refrigeration and Laundry facilities

F/H Area coal fired boilers' discharges, and ash and coal-pile run-off basins

M Area Liquid Effluent Treatment Facility including the Dilute Treatment Facility and Chemical Transfer Facility and storage tanks

D Area coal fired boiler's discharges, and ash and coal-pile run-off basins

D Area Water Treatment Plant

TNX Area Facilities including seepage basins and the Treatment Plants

3/700 Area facilities including Savannah River Laboratory and technical and support shops

Central Shops Area facilities

Y-Area Locomotive Shop

4.4 General Items of Concern

Variances between field assessment and SRS plans and procedures

Trends which might lead to future noncompliance or health risks

SRS plans to correct current violations

Conduct of operations and maintenance

Spill Prevention Control and Countermeasures

5.0 HYDROGEOLOGY

The goal of the groundwater subteam is to evaluate the current status of environmental compliance at the Savannah River Site with respect to groundwater issues. Environmental compliance is interpretted as reflecting both the literal requirements and the intent of the law. As such, adequacy of program management as well as identifying any noteworthy practices will be assessed. In addition to the investigation of regulatory compliance with State and Federal statutes and directives, these goals also require that evaluation of groundwater protection, monitoring, and remediation activities occur and root causes of the noted deficiencies are identified. The methodologies and plan of action follow immediately from these goals.

5.1 Issue Identification

Initially, the team will identify and interview with the principal groundwater compliance personnel from the Westinghouse Savannah River Company (WSRC). From this point of contact the team will identify permitted and unpermitted sites, as well as acquiring the relevant documentation of consent orders, settlement agreements, guidance documents, decrees, and other environmental contracts which the SRS has entered into. Query of the contacts as to the status of current and ongoing problems and evaluate the status of facility response to past appraisals, inspections, incidents, action plans, and alleged violations is expected. Discussion and assessment of potential future compliance issues that are likely to arise as a result of continuing, anticipated, or planned operational activities will occur.

The team will also identify additional regulatory and compliance contacts (EPA Region IV, South Carolina Department of Health and Environmental Control (SCDHEC), drilling contractors, groundwater sampling contractors, analytical laboratory services), and initiate future agencies. Regulators will be polled individually from a standard list of questions, while contacts with drilling contractors, groundwater sampling contractors, and laboratory services personnel will be focused on QA issues. In all cases, individuals will be prompted to identify concerns which they have regarding the current status of groundwater programs at the SRS.

Field inspections are planned for the current groundwater remediation activities at the A and M separation areas as well as the F and H area basins and adjacent reaches of Four Mile Creek.

In addition, the team will conduct spot inspections of yet-to-be-identified monitoring wells for regulatory compliance. Further field inspections will be conducted when appropriate areas are identified during the course of the investigation.

Data pertaining to groundwater sample quality and monitoring well construction, as well as field sampling and laboratory quality assurance, will be examined during the course of the investigation.

5.2 Records Required

- Groundwater quality assessment plan
- RFI report planned and completed
- Current maps of all monitoring well locations, any domestic well locations, potentiometric, isopleth, etc.
- Well installation and development reports, boring logs, etc.

6.0 WASTE MANAGEMENT

This assessment will evaluate waste management activities, underground hazardous substance and petroleum storage tanks (UST) at SRS and determine compliance with DOE orders, state, and federal regulations, as well as conformance with consent decrees and agreements, and settlement agreements between SRS and regulatory authorities.

6.1 Issue Identification

The approach to be followed in evaluating waste management activities involves seven elements: 1) identification of all waste generated at SRS (hazardous, radioactive, mixed, solid and sanitary wastes); 2) identification of all waste generation points; 3) identification of all USTS 4) identification of all treatment, storage, and disposal facilities; 5) review of relevant files and documents; 6) inspection of waste generation points and TSD facilities; 7) comparison of on-site observations with status of SRS as perceived by DOE, contractor and regulatory authorities, and 8) interviews with relevant SR, WSRC, subcontractor employees, Federal and state representatives concerning present and past waste management practices. Each of these activities will be conducted by several team members throughout the term of the audit.

Areas of interest that are associated with the SRS operations include the following:

- 300-M Area
- TNX Area
- Reactor Areas
- TC/U Area
- Savannah River Laboratory
- General Construction and Maintenance Activities
- Waste generation, treatment, storage, and disposal areas (classified and non-classified activities)
- F and H Separations Areas
- F and H Tank Farms
- Savannah River Laboratory facilities
- Tenant activities including Bechtel, South Carolina Power, Wackenhut Service, Inc., and S.C. Bell Telephone

- Savannah River Ecology Laboratory
- Central Shops
- U. S. Forest Service
- Army Corps of Engineers

The audit team will investigate both existing, proposed, and inactive treatment, storage and disposal facilities. Existing and proposed facilities will be evaluated against existing federal and state equivalent RCRA regulations. The RCRA Part A and Part B submittal, as well as, RCRA annual reports and manifests will also be relied on in the evaluation of existing and planned facilities. Overall compliance status of the site will be evaluated against the self-assessments conducted by WSRC. The status of findings reported in the August 1987 Environmental Survey Report will also be evaluated. The UST evaluation will focus on tank construction materials, corrosion protection, age, content, inventory control, and leak detection capabilities. UST management will be evaluated with respect to both state and federal UST regulations. Where relevant, DOE orders will be used to evaluate existing and proposed waste management facilities.

Waste management activities that could result in or avoid releases of contaminants to the environment will also be investigated. Such activities include: 1)waste minimization; 2)waste characterization; 3)waste containerization and labeling; 4)waste segregation and storage; 5)waste tracking and recordkeeping; 6)waste treatment and or disposal practices; 7)waste inspections and corrective actions; 8)training and contingency planning.

Discussions will be held with representatives of the Savannah River Operations Office, the various site contractors and regulatory authorities. These discussions will be held throughout the tenure of the audit and will focus on existing and proposed activities.

6.2 Conduct of Operations and Conduct of Maintenance

While evaluating the radioactive, hazardous, mixed and solid waste management activities at the site, the audit team will evaluate operations and maintenance activities against INPO Conduct of Operations and Maintenance guidelines. Actions to be considered will include, but will not be limited to:

- shift routines and control room activities
- communications
- training

- response actions in abnormal events
- logkeeping
- maintenance and operating procedures
- equipment labeling
- preventive maintenance schedules
- control and calibration of measuring and test equipment
- maintenance record keeping and analysis of maintenance problems.

Specific assessment activities shall include but not limited to:

- Observing tank and container inspection procedures
- Reviewing training and inspection documents
- Observing waste transfer operations from tanks and/or containers
- Interviewing SRS personnel at the operator level.

6.3 Records Required

Records on waste generation and waste management activities will be reviewed on-site to verify, expand, and update documented information prior to the assessment. Records that will be needed on-site include:

- Waste minimization plan
- Files on waste generation and analysis
- Identification of all waste generation and accumulation points.
- Files on all waste treatment, storage and disposal facilities
- Closure plans and environmental assessments
- Files on all off-site TSD facilities used
- Waste manifests and land disposal restriction notifications
- Files on monitoring programs around active and inactive sites

- RCRA Part B Permits both existing and proposed with associated NODs for Part Bs in draft
- Management Plans for compliance with RCRA 3004 (u)
- Files on the location of all USTs
- Files on UST testing and leak detection monitoring
- Waste management training records
- Waste management inspection records
- Files on consent decrees, orders, settlement agreements, proposed federal facility agreements and federal facility compliance agreements
- Files on internal appraisals of compliance status
- Files on state and federal inspection records

TABLE 6-1
WASTE MANAGEMENT AREAS TO BE INVESTIGATED

Building 320-M
Building 321-M
DETF Filter Press (341-M)
LETF Crystallizer (313-M)
TC/U Area Vehicle maintenance
TC/U Area Weapons Cleaning
Satellite and interim facilities at reactor areas
Waste oil storage at reactor areas
Buildings 773-A and 776-9A
Building 716-A Motor Vehicle Shop
Building 717-A Maintenance Shop
Paint Shops Buildings 725-A and 710-G
Buildings 710-U, 709-G, 709-2G
484-D Powerhouse
Tritium Facility Mixed Waste Storage Areas
F/H Mixed Waste Basin System
200-H Area Tank Farm
Canyon Mixed Waste Treatment Facilities
High Level Waste Tank Farms
Radioactive Waste Burial Ground (RWBG)
Greater Confinement Disposal (GCD)
Depleted U0 3 Storage Areas
Beta/Gamma Incinerator
Sanitary Landfill
Sewage Sludge Lagoons and Ash Disposal Basins

TABLE 6-2
WASTES TYPES TO BE INVESTIGATED

Reactive metals
Mercury contaminated materials
Sodium dichromate
Miscellaneous metals and laboratory chemicals
Pesticides
Coolants
Acids/bases
Paint solvents
Varnish and thinner
Toluene
Waste oils
Spent halogenated solvents
CMP pits soil and waste liquids
DWPF simulated waste sludge
Lead smelter waste and soil residues
Radioactive Waste
Non Hazardous Solid Waste

7.0 TOXIC AND CHEMICAL MATERIALS

The toxic and chemical materials portion of the environmental assessment will address the shipment, storage, distribution, use and disposal of raw materials and operations-related chemicals used at SRS. This includes, but is not limited to, specific chemicals regulated under the Toxic Substances Control Act and the Federal Insecticide, Fungicide and Rodenticide Act. Through interviews with key SRS personnel and tours of relevant facilities, the shipping, purchasing, inventorying, distribution program, use and disposal of toxic and chemical materials will be reviewed. This information will be evaluated to determine whether or not the facility, equipment, training and operations established by SRS for management of toxic and chemical materials comply with the federal, state and local regulations and corresponding DOE orders. The potential pathways for environmental contamination by toxic and chemical materials will be evaluated for current and immediate past SRS activities. The condition and environmental monitoring of underground and above ground storage tanks used for bulk materials, other than wastes, will also be evaluated.

7.1 Issue Identification

The procedures which have been implemented by SRS to manage equipment which contains PCB and PCB-contaminated fluids will be evaluated during the assessment. The condition of, and potential for environmental contamination from, any PCB-containing equipment will be determined by evaluating representative numbers of the equipment. Obsolete, stored, or used PCB equipment will be checked for proper labeling, containment, documentation, and protection. Plant records for PCBs will be reviewed and disposal methods and practices will also be addressed. Review of required PCB reports will be made. Records of off-site shipments and disposal of PCB-containing materials and any information pertaining to previous PCB spill or dump areas will also be reviewed.

The location, quantity, type and condition of any asbestos-containing materials at SRS will be reviewed. The procedures used by SRS to maintain, repair, renovate, or remove such materials will be evaluated to determine if potential pathways of environmental contamination exist.

Records relating to the handling and disposal of asbestos-containing materials will be reviewed. If possible, asbestos removal projects ongoing during the assessment and/or disposal of asbestos-containing materials by SRS will be observed directly. During the environmental assessment, the assessment team will evaluate the conduct of operations and maintenance activities against the INPO guidelines. The SRS documentation and procedures used to purchase, handle, mix, apply, and dispose of pesticides

will be reviewed. The required training programs and associated records for SRS employees and/or contractor personnel who work with pesticides will also be reviewed.

Areas where toxic and hazardous substances in both bulk and smaller quantities are stored, distributed and/or used at SRS or tenants of SRS will be visited during the assessment to determine the potential for environmental contamination. In addition, any locations where acutely toxic substances are handled will also be evaluated.

7.2 Documents Required

SRS documents and files will be reviewed as part of the assessment, including items not yet received or identified. Documents and files to be collected and reviewed during the environmental assessment may include the items listed below:

PCBs

- PCB transformer inspection records and forms.
- Storage and disposal records for PCB equipment and fluids.
- Documentation that SRS personnel have conducted site visits at off-site PCB disposal locations.
- Correspondence with the SRS Fire Department regarding PCB equipment, in particular any records of fires involving PCB equipment.
- Records which demonstrate that areas affected by PCB spills have been adequately decontaminated.

Asbestos

- Procedures established by SRS for asbestos removal work performed by SRS employees and/or contractor personnel.
- Records of NESHAPs notifications for recent asbestos removal projects.
- Asbestos disposal records and permits.

Pesticides

- Procedures covering the purchase, handling, mixing, application and disposal of pesticides at SRS or any of its tenants.
- Training records of personnel who handle pesticides.
- Pesticide annual reports.

Toxic/Hazardous Substances

- Toxic/hazardous substances inventory and chemical purchase records.
- Procedures for purchasing, labeling, handling, storing, using, tracking, and disposing of toxic/hazardous substances.
- Environmental monitoring reports and procedures for underground storage tanks that contain non-waste toxic/hazardous materials.
- Spill control and emergency preparedness plans for above ground storage tanks that contain non-waste materials.

Other

- Internal or external audits of any of the above programs,
- Records and procedures for the transportation of toxic/hazardous materials,
- Applicable DOE and Westinghouse orders, policies and procedures, and
- Other records as determined on-site.

Documents reviewed to date for the SRS Environmental Assessments are listed below. This is considered a working list and will be updated as the assessment progresses.

1. Camp, Dresser & McKee, Inc.
Savannah River Plant, E.I. Du Pont Environment and Energy Department, 1988 Annual Environmental Management Appraisal Summaries.
No date.

2. DOE Headquarters.
Action Plan. Attachment 1, for the Resolution of the DOE-HQ Environmental Survey Findings.
July 31, 1989.

3. DOE Office of Environment, Safety and Health
Environmental Survey Preliminary Report, Savannah River Plant, August 1987

4. NUS Corporation
Environmental Implementation Plan (U), Volume II
Protection Programs
August 1, 1989.

7.3 SRS Facilities to be Evaluated

Based on a preliminary review of the documents listed above, the SRS facilities and their toxic and chemical materials related programs listed below will be subject to evaluation during the site visit. This is considered a working list and will be updated as the assessment progresses.

1. 700 - A Area: Administration, Technical, and Shops
   - o S.R. Forest Service
   - o Powerhouse
   - o S.R. Laboratory
   - o S.R. Ecology Laboratory
   - o Medical Center
   - o Automotive Repair
   - o Warehouses
   - o Fire Station
   - o Gasoline Station
   - o Construction Materials

2. 600 - B Area: Components Test Area
   - o S.R. Laboratory Air Research
   - o Wackenhut Services Helicopter Support Facility

3. 100 - C Area: Reactor (shutdown)

4. 400 - D Area: Power Facility and Heavy Water Recovery Facility
   - o Laboratory
   - o Powerhouse
   - o Incinerator (PCBs)

5. 200 - F Area: Chemical Separation Facility
   - o Laboratory
   - o Powerhouse
   - o Naval Fuels Materials Facility

6. 600 - G Area: General Facilities and Services
   - o Health Protection, Industrial Hygiene Group
   - o Procurement
   - o Central Stores
   - o Par Pond Laboratory
   - o Site 51, Geologic Storage

7. 200 - H Area: Chemical Separations Facility
   - o Waste Management ETF Laboratory
   - o Powerhouse

8. 100 - K Area: Reactor
   - o Steam Plant

9. 100 - L Area: Reactor

10. 300 - M Area: Reactor Materials Area
    - o Raw Materials
    - o Laboratory
    - o Metals Shop
    - o Target Extrusion
    - o Alloy Extrusion
    - o Test Reactor
    - o Low-Power Test Reactor

11. 100 - P Area: Reactor
    - o Steam Plant

12. 100 - R Area: Reactor (Shutdown)

13. 200 - S Area: Defense Waste Processing Facility (under construction)
    - o Hazardous Waste Incinerator with Mercury Recovery
    - o S.R. Construction

14. 600 - T Area: TNX Facilities
    - o CMX Building, Hydraulic Systems
    - o Pilot Defense Waste Processing Facility

15. Y Area: Railroad Classification yard
    - o Track Maintenance Shop
    - o Locomotive Repair Shop

16. Z Area: New Defense Waste Processing (see 200-s)

17. Thermal Effects/Flowing Stream Laboratories

8.0 RADIATION

SRS's primary function is the production of plutonium, tritium, and other special nuclear materials for national defense, for other governmental uses, and for some civilian purposes. Major site facilities include five nuclear reactors, a fuel and target fabrication plant, a naval fuel materials facility, two chemical separations plants, three tritium production facilities, the Defense Waste Processing Facility, and the Savannah River Laboratory (SRL), a process development laboratory which supports production operations. Many other facilities necessary to support operations are located on the SRS. Examples are the Heavy-Water Production Plant (shutdown since 1981), several test reactors, and waste treatment and disposal facilities. Many of these facilities and operations routinely release small quantities of radioactive contaminants to the environment; occasional spills and accidental releases have also occurred. Operation of waste disposal facilities also may present potential environmental impacts. The environment assessment will examine the impact of past and present activities on the current environmental condition of the site.

8.1 Issue Identification

The radiological aspects of the environmental assessment will involve an evaluation of the facility-wide radioactive emissions, control and monitoring, the associated impact on the environment, and conformance with DOE Orders, Federal and state regulations, consent orders, decrees, and/or settlement agreements. The assessment will encompass four major areas: 1) airborne radionuclide releases; 2) liquid radionuclide releases; 3) radioactive waste management practices; and 4) soil contamination. On the basis of reviews of available documents, it may be concluded that airborne releases of radionuclides have historically been the most significant contributors to radiation exposure to members of the general public. However, the potential of risks to the environment from other sources must be assessed. The radiological assessment will be coordinated with the air, surface water, inactive wastes sites, and hydrogeology aspects of the assessment. Specific issues requiring investigation have been identified for each of the major areas.

1) Airborne Releases of Radionuclide

Tritium and tritium oxide are the predominant radionuclide releases to the atmosphere from SRS operations. These materials account for greater than 50% of the off-site dose from airborne releases. Releases are of both a routine and accidental nature. Smaller levels of gases, vapors, and particulates are released, primarily from the reactors and separations facilities. Specific issues to be investigated during the assessment include:

- o Airborne dose calculations, inputs, assumptions, and methodology.
- o Design, placement, maintenance, and calibration of on-site and off-site ambient air monitors.
- o Laboratory facilities for airborne environmental analyses.
- o Quality assurance program and records for airborne radiological sampling and analyses.

These issues will be evaluated against the following DOE orders and EPA regulations.

5400.1	General Environmental Protection Program
5400.5	Radiation Protection of the Public and the Environment
5400.xy	Radiological Effluent Monitoring and Environmental Surveillance (Draft)
5400.1	Environmental Protection, Safety and Health Information Reporting Requirements
5500.3	Emergency Planning and Response Program
40 CFR 61,	Subpart H National Emission Standard for Radionuclide Emissions from DOE Facilities

2) Liquid Radionuclide Release

Numerous surface-water streams, ponds, and lakes are located on or adjacent to the SRS. With few exceptions, these waters receive potentially contaminated effluents from SRS operations. Previous radionuclide releases have results in low-level contamination of some stream and lake sediments. Specific issues that will be investigated include:

- o Criteria for selection of surface water and groundwater sampling locations, and adequacy of sampling network.
- o Quality assurance program and records for liquid effluent sampling and analysis.
- o Adequacy of surface water and groundwater sampling and analysis procedures.
- o Sediment sampling and analysis programs.
- o Current status of stream and lake bed contamination.

These issues will be evaluated against the following DOE orders and EPA regulations:

5400.1	General Environmental Protection Program

5400.5	Radiation Protection of the Public and the Environment
5400.xy	Radiological Effluent Monitoring and Environmental Surveillance (Draft)
5484.1	Environmental Protection, Safety and Health Information Reporting Requirements
5500.3	Emergency Planning and Response Program
49 CFR 141	National Primary Drinking Water Regulations

3) Radioactive Waste Handling and Disposal

Site radiological wastes include solid wastes (low-level, intermediate level, and transuranic) and liquid wastes. The greatest volume of solid waste is low-level contaminated waste, most of which is disposed by shallow level burial at the Radioactive Waste Burial Ground (RWBG); small quantities of such waste are incinerated in the Beta-Gamma Incinerator. Some intermediate level wastes are buried and others are stored above ground.

Transuranic (TRU) wastes are packaged and stored for eventual disposal at the Waste Isolation Pilot Plant (WIPP) in New Mexico. Radioactive waste storage is also managed at the RWBG.

Liquid wastes, containing both low and high levels of radioactivity are generated by the separations process, the SRL, reactors, and several operations support activities. Although some low-level liquids were previously disposed of by discharge into seepage basins, that procedure has been discontinued and contaminated liquid wastes are now collected in tanks. The Effluent Treatment Facility collects and treats low-level wastes; treated liquids are released into Upper Three Runs Creek. Higher-level liquid wastes are stored in underground storage tanks and a portion is treated by evaporation, to reduce the waste volume.

Waste collection, treatment, storage, and disposal operations are potential sources for environmental release. Previous use of seepage basins have resulted in contamination of subsurface soil, groundwater and surface water. Specific issues that will be investigated in conjunction with the Waste Management specialists include:

- o Current site radioactive and mixed waste management practices.
- o Segregation of radioactive and mixed wastes.
- o Radioactive waste disposal practices.
- o Adequacy of disposal area monitoring.
- o Potential impacts of waste disposal on the environment.
- o Inactive contaminated waste disposal areas.
- o Leachfields.

These issues will be evaluated against the following regulations and DOE orders:

5820.2A	Radioactive Waste Management
40 CFR 191	Environmental Standards for Management and Disposal of Spent Nuclear Fuel, High-level, and Transuranic Radioactive Waste

4) Contaminated Soil and Sediment

Soils and sediments have become radiologically contaminated as a consequence of intermittent routine releases in effluents, waste disposal practices, and accidental spills. Levels of contamination, types radionuclides, and radionuclide inventories have been addressed in numerous SRS documents. Specific issues to be investigated include:

- o Extent of on-site and off-site surface soil contamination.
- o Migration of soil contamination.
- o Control of contaminated soil areas.

These issues will be evaluated against the following DOE orders:

5400.1	General Environmental Protection Program
5400.5	Radiation Protection of the Public and the Environment
5484.1	Environmental Protection, Safety and Health Information Reporting Requirements
5500.3	Emergency Planning and Response Program

5) Miscellaneous Issues

There remain other issues of interest that are not necessarily included in the above categories. Such issues include:

- Migration of radionuclides in the groundwater.
- Adequacy of the site's overall environmental monitoring program.
- Overall dose assessment methodology (all pathways).
- Control of contaminated buildings.
- Control of materials being released for use by the general public.
- Contamination or uptake of radionuclides by biota (vegetation, fish, and animals).

8.2 Records Required

Records that are requested for on-site review include the following:

- Radioanalytical QA documentation.
- Radiological sampling procedures.
- Environmental-equipment calibration and maintenance records.
- Radioactive waste management procedures.
- Identification of contaminated soil areas.
- Background documents for the placement and design of monitors.
- Raw data from environmental monitoring.

9.0 QUALITY ASSURANCE

The quality assurance phase of the environmental assessment will evaluate the sampling and analytical capabilities at the Savannah River Site. The objective will be to review and verify the quality assurance procedures for obtaining process effluent and environmental samples, performing the analyses to measure the concentration of pollutants, and the handling and reporting of the data. All aspects of the quality assurance program relating to environmental management of the Savannah River Site will be reviewed including: operator training; equipment and instrument calibration/maintenance; precision and accuracy evaluation; blank, split, and spike sample analyses; sample handling and chain-of-custody procedures; data reduction and validation; data reporting and documentation; as well as the review of calculations and logbooks.

9.1 Issue Identification

The procedures used for sampling and analysis will be monitored to ensure proper implementation and conformance to accept practices. The quality assurance program will be reviewed for the sampling and analytical activities, and also for any internal quality assurance audits that have been conducted. Furthermore, the inter-laboratory test programs participated in by the Savannah River Site laboratories, as administered by the DOE's Environmental Measurements Laboratory , the U.S. Environmental Protection Agency and the South Carolina Department of Health and Environmental Control will be evaluated. The quality assurance procedures of any off-site sampling and/or analytical laboratories utilized by the plant will also be review in this environmental assessment.

9.2 Records Required

Part of the assessment will consist of a review of pertinent documents and files. This will include documents not previously reviewed or received, such as classified documents (if any), individual files, and documents which have not been identified at this time. Some specific documents and files to be reviewed in this phase of the assessment include, but will not necessarily be limited to, the following:

- Environmental sampling and analysis quality assurance programs;
- Quality assurance audits of the analytical laboratories and sampling programs;
- Analytical and sampling procedures manuals;
- DOE, U.S. EPA, and SCDHEC quality assurance results of performance evaluation samples;

- Quality assurance reports for the Savannah River Site laboratories;
- Training policy and records for the sample collection and analytical laboratory personnel;
- Maintenance and calibration records for the analytical laboratory and sampling instruments/equipment;
- Laboratory notebooks, data reporting forms, and sampling logbooks; and
- Other records as determined on-site.

10.0 INACTIVE WASTE SITES

The objective of the inactive waste site portion of the environmental assessment is to determine whether current activities at the Savannah River Site (SRS) being performed under the Site's environmental restoration program fulfill the requirements of CERCLA and RCRA, as amended. Additional areas that will be addressed in this portion of the environmental assessment include the adequacy of reporting under the Superfund Amendments and Reauthorization Act (SARA) Title III, the methods used to quantify spills, and the spill reporting procedures required under CERCLA. Also, the SRS will be asked to identify whether federally-owned property associated with the plant has been transferred, the procedures used to assure its acceptability for release/transfer, and the procedure used for the notification of cognizant trustees of natural resources prior to environmental investigations or clean up activities.

The assessment will use the results of the Environmental Survey that was conducted in August 1987, and which characterized the inactive areas of the facility at which hazardous and radioactive wastes were released, stored, or disposed. The assessment will also use as starting points various documents describing the status of inactive waste sites including: the Final EIS - Waste Management Activities for Ground Water Protection, Response to Congressional Inquiry Regarding Seepage Basins, PA/SIs prepared for the sites, RFI Plans and RFIs prepared for the Site, closure reports, and any other Site-specific information that becomes available. Many aspects of the inactive waste sites assessment will be conducted in conjunction with the Ground Water, Waste Management, NEPA, and Radiation team members.

10.1 Issue Identification

The inactive waste site assessment at SRS will be unique as few CERCLA-based remedial activities have been initiated at the Site. To date, the environmental restoration program in place has been driven by RCRA regulation as the Site strives to close past waste disposal units. SRS is currently negotiating a Federal Facility Agreement (FFA) with EPA Region IV and the State of South Carolina. The purpose of this agreement is to establish a procedural framework and schedule for developing, implementing, and monitoring appropriate response actions at the Site in accordance with CERCLA, the NCP, RCRA, and in accordance with applicable State law.

As a result of the FFA, many of the inactive waste sites at SRS will be regulated under both RCRA and CERCLA. By entering into the FFA, the Parties intend to integrate DOE's CERCLA response obligations with the corrective measures required and conducted by DOE under its current RCRA permit. With the FFA negotiations having been carried out over the past year, the environmental

restoration program conducted at the Site is likely to have anticipated some of the CERCLA requirements specified in the FFA. Consequently, as part of this assessment, the remedial activities in progress at SRS will be reviewed in conjunction with the draft FFA to determine their conformance with CERCLA requirements.

SRS has divided all of the potential waste and release sites identified to date into CERCLA sites, SWMUs, and SWMUs not receiving any hazardous waste or hazardous constituents.

Remedial investigation and work is organized by distinct tasks carried out by SRS personnel from the various plant areas assigned as custodians for the sites. The inactive waste sites assessment will review the work completed and that which is planned for each site to determine consistency with CERCLA, the NCP, and RCRA Closure requirements. The integration of the NEPA process into the CERCLA activities will be addressed with the NEPA specialists of the Environmental Sub-team. This assessment will also be coordinated with the groundwater, waste management, and radiation specialists.

Another critical issue identified for the inactive waste site assessment is the proposed conflict-of-interest provision to be included in DOE Order 5400.4 which is intended to establish Department policy on compliance with CERCLA requirements. This provision would effectively remove the responsibility of Remedial Investigation/Feasibility Study (RI/FS) work under CERCLA and the NCP from WSRC and places those responsibilities on DOE. This assessment will address DOE's ability to perform RI/FS requirements at SRS and what impacts DOE Order 5400.4 will have on the environmental restoration program at the Site.

10.2 Records Required

In addition to those documents previously identified as important to the environmental assessment, the following records will be examined at SRS:

- Response to Congressional Inquiry Regarding Seepage Basins at the Savannah River Site, November 1989;
- Closure Plans for seepage basins and other waste site closures at the Site;
- Groundwater Monitoring Program at the Savannah River Site, December 1989;
- FY 1990 SRS Environmental Restoration Program Current Year Work Plan, December 1989;
- RCRA Facility Investigation Plans for inactive waste sites at the plant;

- Comments from DOE or regulatory agencies on closure plans or RFIs;

- Section 313 Documentation Package for CY 1988 Required by the Emergency Planning and Community Right-To-Know Act of 1986, January 1990;

- Notifications and internal records of spills/releases;

- Administrative Record associated with remedial activities;

- Other records as determined on-site.

11.0 NATIONAL ENVIRONMENTAL POLICY ACT

The overall goal of the NEPA assessment is to foster improved and environmentally sound decision making for those DOE actions having the potential for significant impacts on the environment.

11.1 Issue Identification

The objectives of the National Environmental Policy Act (NEPA) assessment are: (1) to evaluate the Savannah River Operations Office (SR) and the Westinghouse Savannah River Company (WSRC) management structure and NEPA review processes; (2) to identify problems that may lead to inappropriate procedures or inadequate NEPA documentation; and (3) to ensure consistency with the NEPA, Council of Environmental Quality (CEQ) regulations, and DOE NEPA Guidelines, Orders, and Memoranda.

Particular areas of inquiry include:

- overview of NEPA issues at the site;
- management structure (overall organization, training use of contractors, record keeping, etc.)
- NEPA compliance planning;
- NEPA/CERCLA and NEPA/RCRA integration;
- determination of level of NEPA review required;
- procedural aspects of NEPA documents;
- technical content of NEPA document.

The general approach to the assessment will include interviews with the SR and WSRC staff responsible for the NEPA procedures and review process, WSRC project and program managers, legal staff, and others, as the need arises. NEPA documents (environmental assessments [EAs] and environmental impact statements [EISs]) will be reviewed for adequacy in terms of their use as documents for continued operations of facilities and as documents from which subsequent NEPA determinations can be tiered. The use of categorical exclusions (CX), memoranda-to-file (MTFs), and actions description memoranda (ADMs) will be evaluated for consistency with DOE guidelines.

11.2 Records Required

Files to be reviewed as part of the NEPA assessment include, but may not be limited to, the following:

- Records that locate, identify, and describe occurrences of the following resources, which may be affected by facility activities: endangered and threatened species and their critical habitats, floodplains, wetlands, wild and scenic rivers, national recreational trails, wilderness and wilderness study areas, sacred Native American sites, prime/unique farmland, archeological and historical sites, historic and prehistoric ruins and monuments, and other Federal lands (e.g., National Forests).

- Documentation of consultation with agencies responsible for the administration of the natural resources listed above (e.g., Section 7 consultation with the Department of the Interior regarding endangered species).

- SR and WSRC NEPA guidance or policies.

- Correspondence or guidance which refers to delegation of authority to make NEPA determinations.

- Capital budget files, A-106 plans, and other appropriate records of proposed actions or initiated changes in operation.

- Lists of ongoing and proposed CERCLA response actions.

- Lists of ongoing and proposed RCRA closures and corrective actions.

- All NEPA-related documents prepared in support of remedial actions.

- Description of any litigation related to NEPA.

- All Memoranda-to-File pertaining to NEPA.

- All draft and final Environmental Assessment (EAs) and associated materials (i.e., consultation letters, FONSIs).

- All draft and final Environmental Impact Statements (EISs) and associated materials (e.g., ROD, Implementation Plan).

- All other types of documents used to make, support, or record NEPA determinations (e.g., Environmental Analyses, Environmental Evaluation Checklists, Action Description Memoranda).

- Documents and studies that are cited in support of major aspects of the Savannah River Site's EAs and EISs (e.g., biological assessments for endangered species, engineering details of projects).

- Monitoring or mitigation reports available for EAs and EISs.
- Printouts from databases that track the status of NEPA documents or proposed projects that require a NEPA determination.

APPENDIX C

LIST OF SITE DOCUMENTS

FOR THE

DOE TIGER TEAM ASSESSMENT

AT THE

SAVANNAH RIVER SITE

MARCH 1990

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

A = AIR

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
A-1	Savannah River QA Manual, Ch 20, Computer Software QA (DPW-83-111-3)	Du Pont			Last Update 2/1/89	3/6/90
A-2	Savannah River Laboratory QA Manual, Ch. 20, Computer Software QA, (DPSTM-87-800-1)	Du Pont	SRL		Last Update 1987	3/6/90
A-3	Atmospheric Science & Power Producton; DOE/TIC-27601, (DE 84005177)	U.S. DOE			1984	Not Received
A-4	Memo to R. W. Benjamin, SRL, entitled "Average Wind Statistics for SRP Area Meteorological Tower	J. E. Laurinat	SRL		6/29/87	2/23/90
A-5	Real Time Quality Control of Meteorological Data Used in SRP's Emergency Response System	M. M. Pendergast	SRL		May-80	2/23/90
A-6	A Puff-plume Atmospheric Deposition Model for Use at SRP in Emergency Response Situations	A. J. Garrett & C. E. Murphy, Jr.	SRL		May-81	2/23/90
A-7	User's Guide for the Wind System Emergency Response Functions	D. D. Hoel	SRL		1985	2/23/90
A-8	Draft Calibration Manual, Standard Calibration Procedure ETSP T100	T. Lockhart	Subcontractor		1990	2/23/90
A-9	Draft Installation Manual, Standard Installation Procedure ETSP T101	T. Lockhart	Subcontractor		1990	2/23/90
A-10	Draft Maintenance Manual, Standard Maintenance Procedure ETSP T102	T. Lockhart	Subcontractor		1990	2/23/90
A-11	Data Test Model 900-A Opacity Meter Calibration Procedure Manual Y4.1, Draft	WSRC	CSWE		Undated	3/3/90
A-12	Savannah River Site Environmental Report for 1988, Volumes I and II	H. A. Davis, D. K. Martin, J. L. Todd			1989	1/7/90
A-13	Printout of 1988 Dosimetry Run Using AIRDOS-EPA w/Humidity = 8 g/m3	Walt Marter			1988	2/21/90
A-14	Printout of 1988 Dosimetry Run Using AIRDOS-EPA w/Humidity = 11 g/m3	Walt Marter			1988	2/22/90
A-15	Printout of 1988 Maximum Individual Dose Using Maxigasp	Walt Marter			1988	2/21/90
A-16	Printout of 1988 Population Dose Using POPGASP	Walt Marter			1988	2/21/90
A-17	Technical Manual - Environmental Risk Assessment	Ju-Chrong Huang			Apr-86	2/21/90
A-18	Environmental Implementation Plan - Volume II, Protection Programs, WSRC-RP-89-453	WSRC			1989	1/17/90
A-19	Project S-1780 - SRP - 200 S-Area DWPF - Sludge Plant - Process Air Emissions Permit				4/13/88	2/27/90
A-20	Air Pollution Control Regulation 62.5, Standard No. 8: Toxic Air Pollutants (draft)	SCDHEC			Undated	2/27/90
A-21	Power Facility Asbestos Control	T. F. Thorne	Power Operations	L. E. Snyder DOE-SR	8/11/89	2/28/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

A = AIR

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
A-22	DPSOL 40-5-102, Asbestos Control Program and Plant Guidelines: Revision 1	SRS			1/6/87	2/28/90
A-23	Air Pollution Control Regulation 61-86.1, Standards of Performance for Asbestos Abatement Operation	SCDHEC			Undated	2/28/90
A-24	Air Pollution Control Regulation 62.6, Control of Fugitive Matter	SCDHEC			Undated	2/28/90
A-25	Evaluation of Waste Tank 16 Using a Field Mercury Analyzer - DPST-88-560	B. B. Looney & J. R. Cook	Technical Div. SRL	J. C. Corey & G. T. Wright	5/12/88	2/28/90
A-26	Modified Flowsheet for Catalyst Addition TA 2-1094; DPSOX 9844	J. A. Savage			5/8/85	2/28/90
A-27	Mercury Emissions Monitoring of 292-H Stack	M. G. Franklin		J. G. McKibbin	8/21/85	2/28/90
A-28	Final Results of Mercury Emissions Monitoring	M. G. Franklin		T. G. Campbell	3/30/88	2/28/90
A-29	MSDS for Betz 25K	Betz Industrial Trevose, PA			7/14/87	2/28/90
A-30	Updated Air Quality Control Operating Permit for F and H Area	T. A. Faugl			2/28/90	2/28/90
A-31	Inspection for a Permit to Operate/Naval Fuel Material Facility	Myra Reece	SCDHEC		4/14/89	3/6/90
A-32	NFMF, Air Quality Control Systems	J. E. Hoisington	Du Pont	L. C. Goidell DOE-SR	10/28/88	3/6/90
A-33	Air Permit Modifications - Naval Reactor FMF	M. B. Hughes	Du Pont	R. P. Whitfield DOE-SR	10/30/85	3/6/90
A-34	Const. Permit Application for Atmospheric Releases from Naval Reactor FMF - DPSP 82-1088	SRS		SCDHEC	5/29/86	3/6/90
A-35	Visible Emission Observation Form - Uranium Dissolution Stack 292-F	W. M. Wierzbicki	SRP		9/4/86	3/7/90
A-36	F-Area Stack Opacity	B. S. Christie		R. L. McQuinn	8/16/88	3/7/90
A-37	An Empirical Computer Model of the F-Area A-Line Nitrogen Oxides Absorp. Column (F-8 Column) WSRC-RP-89-786	K. L. Shanahan S. F. Peterson			Sep-89	3/7/90
A-38	F/H Effluent Treatment Facility	Doug Brown			12/4/89	3/7/90
A-39	Revised Air Quality Control Const. Permit - In-Tank Precipitation Process	R. M. Guidry		S. M. O'Conner & J. V. Odum	6/9/86	3/2/90
A-40	SCDHEC Air Quality Control Operating Permit for TNX Area	J. C. Huang		J. K. W. Dunaway & D. T. Bignell	10/13/88	3/2/90
A-41	Permit Application Form, Parts I and II B, PHEF (T-Area)	R. W. Cox, III			9/11/85	3/2/90
A-42	Permit Application Form, Parts I and II B, PWI (T-Area)	D. J. Trapp			1/12/84	3/2/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

A = AIR

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
A-43	SCDHEC NOx Permit Modification Information for the Uranium Solidification Facility OPS-STH-890178	M. F. Tyrrell		M. Hawkins	12/18/89	3/2/90
A-44	Air Quality Control Operating Permit - for sources in F-Area - effective 2/28/89	M. Batavia	SCDHEC	S. R. Wright DOE-SR	10/4/89	3/1/89
A-45	Regulation of Fuels and Fuel Additives - Controls Applicable to Gasoline Retailers 40 CFR 80.22		EPA		7/1/88	10/1/89
A-46	Corrections to F-Area Air Permit	J. Alexander	Separations	T. Faugl	2/6/90	2/7/90
A-47	Ambient Air Quality Monitoring Program DPSOP 271-4	SRS	Health Protection		Jul-87	2/1/90
A-48	Environmental Implementation Plan WSRC-RP-89-453	WSRC		U.S. DOE	8/1/89	1/18/90
A-49	SCDHEC Air Permits by Area	T. Faugl	EPS	Distribution	6/16/89	2/8/90
A-50	Guidelines for Conduct of Maintenance at Nuclear Power Stations INPO 85-038		Operations	U.S.DOE	12/1/88	2/3/90
A-51	Guidelines for Conduct of Operations at Nuclear Power Stations INPO 85-017		Institute of Nuclear Power Operations		6/1/85	2/3/90
A-52	DWPF-Air Permit Application for submittal to SCDHEC	B. G. Kitchen	DWPF Works Engineering	J. S. Roberts	4/13/84	3/6/90
A-53	Memo providing Guidelines for Entering Diesel Generator Information into Logbooks	T. Faugl	EPS	Distribution	6/5/89	3/9/90
A-54	A Climatological Description of the Savannah River Site	C. H. Hunter	ETS			2/1/90
A-55	Savannah River Plant Emergency Response: Environmental Transport and Assessment	R. P. Addis	ETS		8/1/88	2/1/90
A-56	SRS Meteorological Tower Instrument Calibration Records for 12/87 - 10/89		ETS		1/1/90	2/1/90
A-57	Quality Assurance Plan for Wind System Instrumentation	R. P. Addis	ETS	R. W. Benjamin	12/2/86	2/1/90
A-58	M.R.I. Vector Vane Calibration Procedure		ETS			2/1/90
A-59	Instruction Manual--Mark III Vectorvane Sensor		Meteorology Research Inc.		9/1/68	2/1/90
A-60	Instruction Manual for Radiation Shield		Climet Instruments		2/7/74	2/1/90
A-61	Draft Calibration Manual for a Cup Anemometer	T. Lockhart	T. Lockhart, Inc	ETS	9/1/89	2/1/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

SSB = Soil/Sediment/Biota

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
SSB-1	Savannah River Environmental Report - 1988 - Volume I	T. F. Heenan	Asst. Mgr for Hlth,Sfty,Env	DOE	1989	2/8/90
SSB-2	Savannah River Environmental Report - 1988 - Volume II	T. F. Heenan	Asst. Mgr for Hlth, Sfty, Env	DOE	1989	2/8/90
SSB-3	HP Environmental Monitoring	Du Pont			Dec-88	2/14/90
SSB-4	DPSOP 271-1	Du Pont	HP	DOE	Dec-88	2/14/90
SSB-5	Soil Survey of Aiken County Area South Carolina	USDA	SCS		May-85	2/22/90
SSB-6	Data Rpt Summarizing Water Quality & CS-137 Transport in Steel Creek During a P-Area Discharge in 11/80	D. W. Hayes	SRL	J. C. Corey	Aug-81	2/27/90
SSB-7	DOE Order 5400.1, General Envn. Protection Program	Office of Envn, Sfty & Health	DOE		NA	2/8/90
SSB-8	DOE Order 5400.5, Radiation Prot. of the Public & the Envn. (Draft)	Office of Envn, Sfty & Health	DOE		NA	2/8/90
SSB-9	DOE Order 5484.1, Envn. Prot., Sfty, & Health Prot Info Reporting Req.	Office of Envn, Sfty & Health	DOE		NA	2/8/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

SW = Surface Water

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
SW-1	DOE Order 5400.6 (Draft)		DOE		9/14/88	2/8/90
SW-2	DOE Order 5400.1		DOE		11/9/88	2/8/90
SW-3	DOE Order 5400.5		DOE		2/1/90	2/17/90
SW-4	DOE Order 5480.16		DOE		9/23/86	2/8/90
SW-5	DOE Order 5482.26		DOE		9/23/86	2/8/90
SW-6	DOE Order 5400.3		DOE		2/22/89	2/8/90
SW-7	Clean Water Act (as amended)		EPA		12/1/87	2/1/90
SW-8	Safe Drinking Water Act (as amended)		EPA		Jun-86	2/5/90
SW-9	South Carolina Pollution Control Act		SCDHEC (as amended)		1985	2/1/90
SW-10	South Carolina Hazardous Substances Control Act		SCDHEC		1985	2/1/90
SW-11	South Carolina Water Classification Standards		SCDHEC (as amended)		1984	2/1/90
SW-12	South Carolina NPDES Permit Regulations		SCDHEC		1979	2/1/90
SW-13	South Carolina Wastewater Treatment Regulation		SCDHEC		1978	2/8/90
SW-14	Environmental Implementation Plan		WSRC		Aug-89	1/24/90
SW-15	SRS Environmental Report for 1988 (Vol I, II)	H. Davis, D. Martin, J. Todd	Environmental Monitoring Section		1989	1/24/90
SW-16	Environmental Survey Preliminary Report - SRP		DOE, ES&H, Office of Env. Audit		Aug-89	1/24/90
SW-17	Operational Compliance Implementation VI, II, III		NUS for DOE-SR			1/25/90
SW-18	Guidelines for the Conduct of Operations at Nuclear Power Stations		INPO		Jun-85	2/3/90
SW-19	Guidelines for the Conduct of Maintenance at Nuclear Power Stations		INPO		Dec-88	2/3/90
SW-20	Tiger Team Guidance Manual		DOE, ES&H		1989	1/31/90
SW-21	Environmental Audit Program Manual	C. C. Johnson & P. C. Malhora	NUS	DOE		2/1/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

SW = Surface Water

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
SW-22	Environmental Appraisal Report - Water Pollution Control Programs: NPDES Functional Appraisal		DOE-SR		Aug-88	2/1/90
SW-23	Environmental Appraisal Report - Environmental Radiological Sampling Functional Appraisal		DOE-SR		Sep-88	2/1/90
SW-24	Environmental Compliance Site Manual - Table of Contents (Text under preparation)		Env. Prot. Section		Nov-89	2/1/90
SW-25	WSRC-RP-90-182-003-Description of Ash Basin		Power Operations		N/A	2/6/90
SW-26	WSRC-RP-90-182-002-Description of Ash Piles		Power Operations		N/A	2/6/90
SW-27	DPSOL-7042, Rev 3: Auxilary Equipment Logsheet - Drinking Water System Logs		Power Department		12/3/87	2/5/90
SW-28	Letter: Clarification of SCDHEC Bacteriological Monitoring and Reporting Requirements	S. R. Wright	DOE-Env. Div.	Dr. Porter (SRP) Du Pont	11/13/87	2/6/90
SW-29	Letter: Clarification of SCDHEC Bacteriological Monitoring and Reporting Requirements	C. F. Muska	SRP - Du Pont	L. C. Goidell (DOE-SR Env. Compl. Branch)	6/30/87	2/6/90
SW-30	Letter: Power Operations Department Environmental Self-Assessment	S. E. Smith	Power Operations	R. T. Duke (EPS)	1/31/90	2/6/90
SW-31	EPD-PED-892028 Possible Tiger Team Audit Findings for Site Domestic Water Systems	C. G. Hardin	Power Operations	J. S. Cote (DOE-SR) SRS Domestic Water		
SW-32	Letter: U.S. DOE/SRS NPDES Permit #SC0000175 - Annual 3560 Compliance Audit	J. E. Watson	SCDHEC	S. R. Wright (DOE-SR)	1/11/90	2/13/90
SW-33	Letter: SDCHEC's Nov. 6-17, 1989, NPDES Compliance Sampling Inspection Report	W. C. Reinig	WSRC/EPS	DOE-SR	1/25/90	2/13/90
SW-34	Letter: Performance Audit Inspection NPDES Permit Savannah River Site	A. G. Linton	USEPA/Region IV	S. R. Wright DOE-SR	1/5/90	2/13/90
SW-35	Letter: Proposed Settlement Agreement, P&L Reactor Fish Kills and Thermal Mitigation Matters	C. C. Montgomery	SCDHEC	S. R. Wright	1/22/90	2/13/90
SW-36	Field Procedure Change-DPSOP 212 Power Chair of Custody Procedure		Power Operations		2/22/90	2/22/90
SW-37	DPSOL 212, Rev 10, III, A.B.2 & 8.4 Wastewater Sampling		Power Operations		Jun-89	2/14/90
SW-38	DPSOL 212, Rev 5, III, A.6.3.2-6.3.5 NPDES pH Power		Power Operations		Apr-86	2/14/90
SW-39	DPSOL 607-2, Rev. 2, pH Meter Calibration Log		Power Operations		Jan-86	2/14/90
SW-40	DPSOL 607, Rev, Field Procedure Change Flow Meter Calibrations		Power Operations		2/14/90	2/14/90
SW-41	NPDES Program Documented Training Record (example)		EMS		10/6/89	2/14/90
SW-42	NPDES Document Training Test (example)		EMS		no date	2/14/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

SW = Surface Water

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
SW-43	NPDES Samples-Environmental Collections Chain of Custody Record (example)		EMS OSR 4-451 Rev. 8		Aug-88	2/14/90
SW-44	NPDES Sample Chain of Custody Reviewed (WSRC) Analytical Reports		EMS		no date	2/14/90
SW-45	WSRC-3Q1-3, Sec. 3340, Rev. 5 Compliance Sampling of NPDES Outfalls		EMS		11/1/89	2/14/90
SW-46	WSRC-3Q1-3, Sec 1100, Rev. 0 - Chain of Custody Procedure		EMS		11/1/89	2/14/90
SW-47	WSRC 3Q1-3. Sec. 4110, Rev. 0 - Conductivity and Temperature Determinations		EMS		N/A	2/14/90
SW-48	WSRC - 3Q1-3, Sec 3341, Rev. 0 -QC Compliance Sampling of NPDES Outfalls		EMS		11/1/89	2/14/90
SW-49	SRP Surveillance Report *895-07-065 NPDES Sampling	C. D. Brady	QA		9/18/89	2/15/90
SW-50	DPSOL 241-H-ETF-103B, Part C - Transferring from Treated Water Tanks to a Wastewater Collection Tank		ETF Operations		no date	2/16/90
SW-51	Summary Tables-F & H Areas Radioactive Releases from 1989 month by month by Radionuclide - Air Water		F&H Operations - Env. Group		Feb-90	2/28/90
SW-52	DPSOP 271-1 Environmental Monitoring Collections	HP Department	DOE	DOE	Dec-88	2/17/90
SW-53	Memo-K-Area Cooling Tower Construction - pH Limit for Deviating Water Discharge	K. Dyer	ESP	R. McCamant Bechtel Const. Proj. Management	2/8/90	2/21/90
SW-54	Letter-Surface Water Impact to Indian Grave Branch for Well Flushing to Permit Const. of K-Cooling Tower					
SW-55	Letter-Discharge Water Parameters at the K-Area Cooling Tower Dewatering Project	M. Flora	ESP	R. McCamant Bechtel Proj. Mgmt	2/14/90	2/21/90
SW-56	Letter - Monitoring of NPDES Waste - Samples for Radionuclides	M. Hughes	Du Pont Chehlp Energy & Env.	L. Goidell (DOE-SR)	10/14/86	2/21/90
SW-57	DPSOL 221-F-9406 Rev 10 Segregated Cooling Water System Increased Activity - Emergency Actions		Sep. Dept. F-Area		Jan-89	2/28/90
SW-58	DPSOL 221 - F - 9407 Rev 10 Circulated Cooling Water System Increased Activity - Emergency Action		Sep. Dept. F- Area		Jan-89	2/28/90
SW-59	Radiological Monitoring Program Report, Savannah River Plant - U.S. DOE	NUS	DOE-SR		10/1/88	2/28/90
SW-60	Certificate of Analysis: Analysis of Various Media (EP Tox) for Construction Dept. - Bechtel	Enwright Environmental			1/11/90	2/28/90
SW-61	DPSOL 247-W-020 Rev 6 Steam Condensate Collection Tanks Operations Ref. DPSOP 247		Naval Fuels		2/6/90	2/28/90
SW-62	Savannah River Plant - NPDES Permit Application-SC0000175	Du Pont	DOE-SR			2/9/90
SW-63	SCDHEC Permit #10,778 Naval Fuels WWT Permit		Naval Fuels	SCDHEC		2/28/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

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SW-64	Letter: NPDES DMR, November 1989 (Discharge Monitoring Report)	J. S. Roberts (Mgr)	EPS	H. Gibson (SCDHEC) (WSRC)	12/20/89	2/9/90
SW-65	Letter: NPDES Discharge Monitoring Report, 3/89	M. Dukes (Mgr)	EPS WSRC	S. R. Wright DOE-SR	4/20/89	2/9/90
SW-66	Letter: NPDES Discharge Monitoring Report, 2/89	C. F. Muska	E&E Dept. Du Pont	S. R. Wright (DOE-SR)	3/17/89	2/8/90
SW-67	Letter: NPDES Discharge Monitoring Report, 9/89	M. Dukes (Mgr)	EGS WSRC	S. R. Wright (DOE-SR)	9/20/89	2/9/90
SW-68	Letter: NPDES Discharge Monitoring Report 7/89	M. Dukes (Mgr)	EGS WSRC	S. R. Wright (DOE-SR)	8/21/89	2/9/90
SW-69	DPSOL 271-1-101 Personal Safety	EMS			12/15/86	3/6/90
SW-70	DPSOL 271-1-102 Life Preserves		EMS		10/24/86	3/6/90
SW-71	DPSOL 271-1-108 Boat Safety		EMS		10/23/86	3/6/90
SW-72	WSRC-3Q1-3, 4l00, Rev. 0 Dissolved Oxygen Measurement and Tank Collection		EMS		2/16/90	3/6/90
SW-73	General Specifications for K-Reactor Spill Site Stabilization		Offsite Contractor	Bob Austin USFS	11/3/89	3/14/90
SW-74	DPSOL 271-1-305, Rev. 2 Stream Water Paddle-Wheel Sampling		EMS		4/23/86	3/6/90
SW-75	DPSOL 271-1-260 Rev. 0 Installation and Maintenance of Diatom Trap					
SW-76	DPSOL 271-1-363 Rev. 0		EMS		12/1/89	3/6/90
SW-77	DPSOL 2BB-N-602 Rev. 3		Naval Fuels			2/28/90
SW-78	Alternative Cooling Water Systems - Savannah River Plant, Aiken, South Carolina Final EIS	US, DOE		SCDHEC	Oct-87	2/2/90
SW-79	Savannah River Plant NPDES Permit Application Volume 1	E. I. du Pont		US, DOE	NA	2/3/90
SW-80	Quality Criteria for Water EPA 1986	EPA			6/9/09	2/8/90
SW-81	Env. Compliance Tracking Volume II	NUS	Env. Div. SR Operations		11/3/89	2/13/90
SW-82	HP Environmental Monitoring	Du Pont			Dec-88	2/14/90
SW-83	Alternative Cooling Water ROD	DOE			2/14/88	2/13/90
SW-84	DOE Order 5400.XY	DOE			NA	2/17/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

SW = Surface Water

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
SW-85	Predictive 316(a) Demonstration for the K-Reactor Cooling System at the Savannah River Plant Following Mitigation with a Recirculating Cooling Tower	E. I. du Pont	SRL	DOE	NA	2/15/90
SW-86	Scope of Work, Proposed Biological Monitoring Program for L-Lake and Steel Creek	SRL			Mar-89	2/15/90
SW-87	Compliance of the Sav. River Plant P-Reactor Cooling System with Environmental Requirements	Du Pont	SRL	DOE	NA	2/15/90
SW-88	U.S. Fact Sheet, U.S. Forest Service Land Mgmt.	Savannah River Forest Station			Nov-89	2/20/90
SW-89	Sediment Control Ordinance	Aiken County Courthouse			Mar-75	2/20/90
SW-90	Closure Plan for the M-Area Settling Basin & Vicinity at the Savannah River Plant	Du Pont	DOE		Feb-89	2/18/90
SW-91	Section 404 Permit for Lost Lake	S. R. Wright	DOE	Charleston Corps of Engineers	Sep-86	2/18/90
SW-92	401 Certification for Lost Lake	C. E. Sansbury	SCDHEC	DOE	Jun-86	2/18/90
SW-93	An Aerial Radiological Survey of the Savannah River Plant and Surrounding Area - Aiken, SC	EG&G	DOE		Jun-79	2/27/90
SW-94	Data Rpt Summarizing Water Quality & CS-137 Transport in Steel Creek During P-Area Discharge in 11/80	D. W. Hayes	SRL	J. C. Corey	Aug-81	2/27/90
SW-95	DOE Order 5484.1	DOE			N/A	2/8/90
SW-96	Unusual Incident Report No. A-89-2		Power		7/29/89	2/7/90
SW-97	DPSOL 341-502 Rev. 2	WSRC	WSRC	WSRC		2/6/90
SW-98	DPSOP 16 Rev. 61		Power		7/0/89	2/8/90
SW-99	DPSOL 97-101 Rev. 0		Power			2/8/90
SW-100	DPSOL 210-102		Power			2/8/90
SW-101	EPD-PED-904014 Power Self Assessment		Power		1/31/90	2/6/90
SW-102	EPD-PED-900155 SRS Domestic Water Systems		Power		1/15/90	2/6/90
SW-103	List of all domestic water systems		Power			2/2/90
SW-104	Well Information Inter-office Memo	R. T. Turney	Power		9/14/87	2/2/90
SW-105	1988 Domestic Water Chemical Analysis	R. T. Turney	Power		2/2/89	2/5/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

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SW-106	SRS Best Management Plan		EPS		2/8/89	2/5/90
SW-107	DPSOP-87-1083 Rev. 0 SPCC Vol I		EPS		4/1/87	2/2/90
SW-108	Inter-office Memo Tiger Team Pre-Assessment M Area, LETF		EPS & RMET		2/2/90	2/6/90
SW-109	List of Waste Water Treatment Facilities		Power		11/21/89	2/15/90
SW-110	Outline of Envir. Compliance Sites		EPS		11/1/89	2/1/90
SW-111	List of NPDES Outfall Custodians		Power		10/2/89	2/5/90
SW-112	CTF-JOB Plan-104		RM		1/30/90	2/6/90
SW-113	ESH Westinghouse Self-Assessment		Westinghouse/SRC		1/31/90	2/2/90
SW-114	DPSPM-GEN-41 Spill Report		A. Parrott		12/30/88	2/9/90
SW-115	Attachment 1, Action Plan SRS Env Report 1989		DOE-HQ		7/31/89	
SW-116	DOE/EH/DEV-10-P		DOE-HQ		8/0/1987	1/16/90
SW-117	F-Area SE PM Performance		SE (WM)		1/11/89	2/15/90
SW-118	DPSOL 291-9016 Training		SE (WM)		N/A	2/15/90
SW-119	UOR SRS-99-WM-05		Facility Safety Division		7/31/89	2/15/90
SW-120	UOR SRS-89-WM-05, Draft Report WSRC-DOE		FSD		2/13/90	2/15/90
SW-121	DPSOL 138-8-H-440A Spill Plan		WM		N/A	2/14/90
SW-122	DPSOL 241-FH-9562 Waste Handling Facilities Spill Plan		WM		N/A	2/14/90
SW-123	DPSOL 200-H-9561, Spill Plan: Emergency Plan and Disaster				N/A	2/14/90
SW-124	DPSOL 14 Neutralization and Equalization System, Bldg. 483-D		Power		N/A	2/15/90
SW-125	OPS - WMWE - 900547, Maint. Work Schedule, Accomplishments	T. M. Osborne	WM	G. T. Wright	1/5/90	2/14/90
SW-126	Bldg. 241-H, Works Mgt. System				N/A	2/15/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

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SW-127	Inter-office Memo ETF Building OPS-ETF-900020		WM		1/24/90	2/15/90
SW-128	DPSOL 241-H ETF-103A ETF Transfer		WM		2/27/89	2/15/90
SW-129	WSRC-1-03 Management Requirements and Procedures				8/15/89	2/14/90
SW-130	EPD-PED-890228, Domestic Water Systems, 400 Area		Power		8/30/89	2/15/90
SW-131	PTR-159, SDWA, 1886 Amendments		Power		4/21/88	2/15/90
SW-132	EPD-PED-891725, New Bacteria Sampling		Power		11/21/89	2/15/90
SW-133	Drinking Water Systems Cross-Conn. Survey		Power		4/29/79	2/8/90
SW-134	Domestic Water Systems Cross-Conn. Survey		Power		10/22/81	
SW-135	Cross Connection Control Devices Req./Insp/Testing Reports 1989 and 1990		Power		6/15/89 & 2/5/90	2/20/90
SW-136	Letter: Well Abandonment PMT-485		Power		11/16/87	2/27/90
SW-137	Power Tech. Well Abandonment Specifications		Power		12/23/86	2/27/90
SW-138	Note to J. DePadro from P. C. Carroll List of Documents for Review/Domestic Water Outages	P. C. Carroll	WSRC	J. DePadro	3/6/90	3/7/90
SW-139	Memo entitled "S-Area Domestic Water Outage"	R. W. Heckrotte	WSRC	J. DePadro	2/23/89	3/7/90
SW-140	Memo, "DWPF TC Well Outage"	Alston E. Hodge	WSRC 7-1032	Carroll	5/12/89	3/7/90
SW-141	Backflow tester certificates for C. R. Stringer & R. C. Smith	SCDOH&EQ			7/13/89	3/7/90
SW-142	DPSOL 221-HB-4840, "Backflow Preventor Device; Annual Test and Inspection	Du Pont		Distribution	4/1/85	3/7/90
SW-143	Memorandum (1989) Primary Standards Drinking Water Analysis		Power		8/16/89	3/12/90
SW-144	Memorandum (1988) Primary Standards - Drinking Water Analysis		Power		12/20/88	3/12/90
SW-145	Letter, 100-K Area Water Outage	S. R. Wright	Power		11/18/88	3/12/90
SW-146	Letter, Domestic Water Piping Sampling	J. Juinnies	Power		12/12/89	3/7/90
SW-147	Initial Responses to T. T. Observations		WSRC		2/3/90	2/3/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

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SW-148	Drinking Water Cooler Lead Survey		EPS		1/9/89 to 3/9/90	3/3/90
SW-149	SE PM History Reports		SE		3/6/90	3/7/90
SW-150	Backflow Prevention Device DPSOL's		Separations Dept.		Apr-85	3/7/90
SW-151	SRS 2nd Qtr. 1989 Groundwater Monitoring Program (ESH-EMS-890049)		ESH&EMS		2nd Quarter 1989	3/7/90
SW-152	Operating Procedures (Power)		Power		5/1/89	3/7/90
SW-153	SPCC&BMP Update (Contract) Engineering Work Request		EPS		12/13/89	3/7/90
SW-154	Sanitary Treatment Plant Sludge Analysis		EPS		10/26/89	3/7/90
SW-155	F & H Area ETF Best Management Practice Plan	T. H. Hillian	EPS		9/21/89	3/7/90
SW-156	Operator Certification Plans		EPS		1986	3/7/90
SW-157	Waste Management SPCC Plan		WM		8/11/89	3/7/90
SW-158	BSF-DMP-890375		WSRC		11/30/89	3/7/90
SW-159	25 Gray Issues, WSRC-Self Assessment		WSRC			2/6/90
SW-160	DPSOP-86-1026 "How Manual"	Du Pont	Du Pont	Distribution	5/1/86	2/7/90
SW-161	Action Plan for the Resolution of Findings in DOE-HQ Environmental Survey		WSRC		2/12/90	3/7/90
SW-162	SEN-7 Report, Feb. 1990		WSRC		Feb-90	3/7/90
SW-163	M&TE, DPSOL WM 12-1		WM		10/26/88	3/12/90
SW-164	WMS Data Sheets/Examples OSR 19-118		WSRC		Oct-89	3/13/90
SW-165	WMWE PM Backlog and WMS Programmed Work Report WM-ETF		WM		Feb-90	3/13/90
SW-166	WM PM Program/Scope of Work		WM		12/7/89 & 2/3/90	3/13/90
SW-167	OPS-ETF-900020, Memo on status of the LETF Filters. Problem with biomass.	A. W. Higgens	WSRC	Distribution	1/24/90	2/2/90
SW-168	Circuit rider, and WWTP Trend Chart (example)	Power Group	WSRC	n/a	2/9/89	2/15/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

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SW-169	SCDHEC memo on OIC resposibilities. States daily.	J. Bart Ruiter	SCDHEC	R. P. Whitfield	3/13/85	2/27/90
SW-170	Memo to DePadro, subject: Visit to M-Area LETF WWT Plant	D. Flowers	Tiger Team	Jim DePadro	2/6/90	2/6/90
SW-171	"Supporting Doc. Sub. for Inclusion to SRS NPDES discharge monitoring...."	F.M. Harter	WSRC	K.W. Dyer	2/1/90	2/6/90
SW-172	Portions of NPDES permit request for outfall M-004.	unknown	WSRC	SCDHEC	6/30/88	2/1/90
SW-173	Du Pont memo "DOE appraisal of SRP WW Oper. Certification Program, draft report	Paul Carroll	Du Pont	Dist.	11/16/87	3/2/90
SW-174	Du Pont memo "DOE Appraisal of SRP WW Operator Certification Programs"	Paul Carroll	Du Pont	Dist.	8/24/87	3/2/90
SW-175	"Functional Env. Ap. of the WPC-Wastewater Treatment Operator Cert. Program"	C. F. Muska	Du Pont	Goidell	10/1/87	3/2/90
SW-176	"Draft WWT Operator Cert. Program Functioanl Appraisal Report"	C. F. Muska	Du Pont	Goidell	1/15/88	3/2/90
SW-177	"Operators Letter of Certification - Naval Fuels WWT Facility"	J. E. Hoisington	Du Pont	S. R. Wright	3/7/86	3/2/90
SW-178	"Requests for Dep. Programs for WWTP Certified Operators"	R. L. Rabon	Du Pont	Dist.	10/1/86	3/2/90
SW-179	SCPCA: WW Operator	J. E. Hoisington	Du Pont	Dist.	3/17/86	3/2/90
SW-180	"Centralized Wastewater Operator Training"	J. E. Hoisington		T. J. Sayers	4/1/86	3/2/90
SW-181	"Comments to the D Rules and Regs. for Wastewater Operator Certification"	J. E. Hoisington	Du Pont	T. J. Sayers	1/22/86	3/2/90
SW-182	Env. Appraisal R, WPC Prog.: NPDES Functional Appraisal, August, 1988	DOE NUS	DOE NUS	Du Pont	8/1/88	3/2/90
SW-183	Cover memo to final report of the Water Supply Treatment Operator Certification Functional Appraisal	Thomas Heenan	DOE	Thomas Anderson	7/14/90	3/5/90
SW-184	Cover letter to Functional Env. Ap. of the WPC- WW Toper. cert. prog, 7/87	R. P. Whitfield	DOE	J.T. Granaghan	3/21/88	3/5/90
SW-185	Settlement Agreement, 86-96-W Regarding M Area ETF Spill Situation	DOE SCDHEC	DOE SCDHEC	DOE	10/86	3/6/90
SW-186	FAX cover letter to Dave Flowers from Kim Cauthen	Kim Cauthen	SCDHEC	Dave Flowers Tiger Team	3/6/90	3/6/90
SW-187	Letter: "Operators for Wastewater Treatment Systems, Savannah River Plant (SRP)"	Bart Ruiter	SCDHEC	R. P. Whitfield	3/13/85	3/6/90
SW-188	Letter: "Certification of Wastewater Treatment Systems Operators, SRP"	Ken Hill	Jim Joy	SCDHEC	1/19/85	3/6/90
SW-189	Letter: "Certification of Wastewater Treatment Systems Operations"	R. P. Whitfield	DOE	SCDHEC J. Joy III	1/10/85	3/6/90

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SW = Surface Water

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
SW-190	Letter: "Proposed M Area Consent Orders Major Discussion Items"	S. R. Wright	DOE	SCDHEC R. W. Sharer	6/25/86	3/6/90
SW-191	M Area Orders Major Discussion Items with SDCHEC, WW Order, Haz. Waste Order"	DOE	DOE	SCDHEC	6/25/86	3/6/90
SW-121	Revised Certified Operator in Charge; Letter for M-Area Air Station, F&H LETF incl. Mercury Diffusion Sewers	S. R. Wright	DOE	SCDHEC R. K. Cauthen	11/21/89	3/6/90
SW-193	OIC Certification Sign-off for Building 323-M Air Stripper (P #10253)	S. R. Wright	DOE	SCDHEC	11/21/89	3/6/90
SW-194	OIC Certification Sign-Off for F/H Area ETF Permit #12870	S. R. Wright	DOE	SCDHEC	11/21/89	3/6/90
SW-195	OIC Cert. "Mercury & Organic Removal Process F/H ETF Permit #14020"	S. R. Wright	DOE	SCDHEC	11/21/89	3/6/90
SW-196	OIC Cert. "ETF F/H Diffuser Permit #14379"	S. R. Wright	DOE	SCDHEC	11/21/89	3/6/90
SW-197	OIC Cert. "Process Sewer, As-Built F/H ETF, Permit #14624"	S. R. Wright	DOE	SCDHEC	11/21/89	3/6/90
SW-198	Letter: "Savannah River Plant M Area NPDES Permit #SC0000175"	Cathy Montgomery	SCDHEC	DOE	10/8/86	3/6/90
SW-199	FAX cover sheet from H. L. Martin to Dave Flowers	H. L. Martin	WSRC	D. Flowers Tiger Team	3/6/90	3/6/90
SW-200	Inter-office Memo "Response to 3/2/90 Tiger Team Observations"	H. L. Martin	WSRC	J. R. Brookshire	3/6/90	3/6/90
SW-201	Interoffice Memo "Meeting Minutes, Cert. Operators Logbooks - Kim Cauthen"	A. M. Nowicki	Du Pont	Distribution	6/16/86	3/6/90
SW-202	Meeting Minutes "Operator-in-Charge Logs", CR-86-124	Du Pont	Du Pont	Distribution	6/11/86	3/7/90
SW-203	"WSRC Environmental Systems Certified Operator Policy Draft"	Bobby James	WSRC	Dave Flowers Tiger Team	2/7/90	3/7/90
SW-204	Memo "Followup on our meeting of this a.m.	Dave Flowers	Tiger Team	Bobby James	3/7/90	3/7/90
SW-205	Responses to Observations	Roger Duke	WSRC	Tiger Team	2/15/90	2/16/90
SW-206	Record of Show Cause Conference	B. Marcy	NUS	DOE/WSRC/SCDHEC	1/20/89	3/9/90
SW-207	33 CFR 320	Federal Register	EPA	Tiger Team	11/13/86	3/12/90
SW-208	K-Reactor & D-Area Drinking Water Maintenance Reports		Power		1/15/90	2/27/90
SW-209	Abandoned Well Program		Power		11/18/87	3/16/90
SW-210	ESH&QA Training Strategic Plan		EPS		No Date	3/15/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

SW = Surface Water

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
SW-211	WSRC Certified Operator Training Program		EPS		2/7/90	3/15/90
SW-212	State Certification Program		SCDHEC		Jun-88	3/15/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

HD = Hydrogeology

*Document Number	Title/Description	Author	Organization	Recipient	Document Document Date	Date Document Received
HD-1	A Comparison of Deterministic Geostatistical Modeling Methods as Applied to Numerical Simulation of Ground-Water Flow at the Savannah River Plant, South Carolina	R. W. Root, Jr.			8/1/87	Jan-90
HD-2	DPSOP 254 - Hydrogeologic Data Collection Methods, Procedures and Specifications		WSRC		1/1/90	2/5/90
HD-3	ESH-EMS-890070 - Environmental and Health Protection Well Inventory		WSRC		4/26/89	2/5/90
HD-4	ESH-EMS-890044 - The Savannah River Site's Groundwater Monitoring Program		WSRC		2nd Qtr '89	2/5/90
HD-5	EPS-FSG-89-0052 - U.S. EPA Compliance Inspection Report 5/4/89	John Lank	U. S. EPA	S. R. Wright	5/4/89	2/16/90
HD-6	Mixed Waste Management Facility Closure Plan		SRP/SCDHEC		5/11/87	2/14/90
HD-7	F and H Area Seepage Basins - Closure Feasibility Program	C. Woodward	E. I. du Pont		6/27/86	2/14/90
HD-8	Addition of Gravel Drainage Layer to MWMF Closure Cap	J. R. Cook	TIWT	Harold Sturm	10/24/88	2/14/90
HD-9	Drilling Plan for Domestic Well No. 3	P. Dickey E. C. Hunnicut	Corps of Engineers		1/16/90	2/14/90
HD-10	870-002172, Response to EPA RCRA- CEI conducted at SRP from May 20 - 29, 1987	S. W. Hickson	Env & Energy Du Pont	S. R. Wright	12/7/87	2/15/90
HD-11	ESH-FSG 890246 - 1989 EPA-RCRA Compliance Evaluation Inspection Warning Letter	Gail Jeter	SCDHEC	S. R. Wright	8/21/89	2/15/90
HD-12	870000835 - EPA-RCRA Compliance Evaluation Inspection of the SRP conducted by EPA May 20-29, 1987		EPA	R. M. Guidry	4/29/87	2/15/90
HD-13	Application for a Post-closure Permit MWMF Parts 1 & 2, Vol. VII		SRP/SCDHEC		7/29/88	2/16/90
HD-14	ESH-FSG-890318 - SCDHEC Follow-up Ins. of Violations during CEI EPA Comp. Eval. Insp. at SRS	A. V. Guanlao	SRC	C. W. Smith, et al EPS Personnel	10/23/89	2/20/90
HD-15	EPD-MWM-89-040 - Project S-3967, MWMF Closure Kaolin Placement	M. A. Phifer	WM Projects	J. N. Beatty	12/10/89	2/20/90
HD-16	ESH-FSG-900004 - Assessment Plan Amendment for SRS Central Shops	J. S. Roberts	EPS	James Hess UST-SCDHEC	1/4/90	2/20/90
HD-17	WSRC-RP-90-208 - Draft Purged Water Management Plan (U)	WSRC	SRC-EPS	DOE	2/1/90	2/20/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

HD = Hydrogeology

*Document Number	Title/Description	Author	Organization	Recipient	Document Document Date	Date Document Received
HD-18	DPSOL 271-1-325, Well-Water Bucket Sampling Procedure DPSOP Ref. 271-1	Health Protection	SRP	HP-Rad Sampling Team	9/17/88	2/23/90
HD-19	Settlement Agreement 87-27-SW Revised Part B Permit Application		SCDHEC Enforcement	S. R. Wright	5/1/87	3/1/90
HD-20	Amendment to Administrative Consent Order #85-70-SW Groundwater Quality Assessment Program	Gail Rawls Jeter	SCDHEC/DOE-SR		10/4/88	2/12/90
HD-21	Amendment to Settlement Agreement 87-27-SW		SCDHEC/Enforcement	S. R. Wright	6/15/89	5/5/90
HD-22	Memorandum - Traceski to Distrib. DOE - Environmental Guidance Div. (EH-231) (Found in Purged Water Plan [HD-17])				12/15/89	2/20/90
HD-23	RCRA Regulatory Status of Contaminated Ground Water	Marcia Williams	Office of Solid Waste	Patrick Toben	11/13/86	2/16/90
HD-24	Health Protection Department Environmental Monitoring Collection DPSOP 271-1		HPO		12/1/88	3/6/90
HD-25	EPA - Lead, RCRA Inspection of SRS 3/13 - 3/17/89	John Lank	U.S. EPA	S. R. Wright	5/4/89	2/16/90
HD-26	Inter-office Memorandum, Comments on Proposed Specifications for Process Well 905-121H	J. W. Furlow	WSRC	M. A. Flora J. M. Ormand	2/20/90	2/22/90
HD-27	EPA & DHEC Multimedia Inspection July 28 through August 26, 1986 and Responses to Deficiencies	Gail Jeter	SCDHEC	S. R. Wright	2/24/87	3/6/90
HD-28	Circumstances Related to Corps of Engineers Drilling at SRS	J. W. Furlow	WSRC and C. L. Bergren	D. E. Gordon & C. L. Bergren	1/30/89	3/1/90
HD-29	Inspection of Corps of Engineers Drill Site (488-D-Coal Ash Basin)	R. Benson	SCDHEC	S. R. Wright	2/1/89	3/1/90
HD-30	Environmental Appraisal Report, Groundwater Facilities and Services Functional Appraisal of the U.S. Army Corps of Engineers		U.S. DOE Env. Compliance Branch		11/1/88	3/1/90
HD-31	Environmental Appraisal Report, Groundwater Facilities and Services Functional Appraisal E.I. dupont de Nemours and Co.		U.S. DOE Env. Compliance Branch		11/1/88	3/1/90
HD-32	Action Plan for the Resolution of Findings	W. C. Reinig	WSRC	S. R. Wright	2/7/90	3/2/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

HD = Hydrogeology

*Document Number	Title/Description	Author	Organization	Recipient	Document Document Date	Date Document Received
HD-33	Final Environmental Impact Statement Waste Management Activities for Groundwater Protection Savannah River Plant Vols. 1 - 3 DOE/E1S-0120		U.S. DOE		12/1/87	2/4/90
HD-34	Environmental Audit Report: R-Area Waste Sites and Related Facilities; Seepage Basins, other Disposal Sites, and R-Canal		U.S. DOE Env. Division		12/1/86	2/23/90
HD-35	Summary of the M Area HWMF, Part B Permit Application, Rev. 3	WSRC	EPS	DHEC	Revised July, 1989	2/6/90
HD-36	WSRC-RP-90-88, Environment, Safety & Health Compliance at SRS		WSRC		1/31/90	2/2/90
HD-37	Compliance Assessment of the Nevada Test Site	U.S. DOE	Env. Safety & Health		1/1/90	2/2/90
HD-38	Environmental Implementation Plan Volume II Protection Programs		WSRC		8/1/89	Jan-90
HD-39	Groundwater Monitoring Program at the Savannah River Site (WSRC-RP-89-889)		WSRC		12/18/89	Jan-90
HD-40	Draft Compliance Assessment of the Pinellas Plant	U.S. DOE	Env. Safety & Health		2/1/90	2/22/90
HD-41	Draft Compliance Assessment of the Kansas City Plant	U.S. DOE	Env. Safety & Health		2/1/90	2/22/90
HD-42	Environmental Compliance Implementation Plan, Vol. II, Operational Com.	NUS Corp.	DOE		89(?)	2/22/90
HD-43	Environmental Survey Preliminary Implementation Report, SRS, DOE/EH/OEV-10-P	U.S. DOE	Env. Safety & Health		8/1/87	2/2/90
HD-44	DOE Order 5400.1		DOE-HQ		8/9/88	Jan-90
HD-45	Directive 9950.1 RCRA Technical Enforcement Guidance (TEGD)		OSWER		9/1/86	Jan-90
HD-46	Directive 9950.2 RCRA Comprehensive Ground-Water Monitoring Evaluation Document		OSWER		12/1/86	Jan-90
HD-47	Directive 9355.0-14 Compendium of Field Operation Methods		OWSER			Jan-90
HD-48	Directive 9502.00-6DRCRA Facility Investigation (ÅFI) Guidance		OSWER		5/1/89	Jan-90
HD-49	SRL-ESS-89-745 Program Plan for Research of Potential Groundwater Degradation from SRS, Coal Storage Piles, Phase1		WSRC	Inter-office Memo	11/2/89	3/2/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

HD = Hydrogeology

*Document Number	Title/Description	Author	Organization	Recipient	Document Document Date	Date Document Received
HD-50	ESH-AAC-890387 ESH&QA Division Procedure - Events Conditions, Concerns: Identification Notification and Issue Management		WSRC	Inter-office Memo	12/21/89	3/2/90
HD-51	ESH-GWG-900088 Installation of Domestic Deepwell 905-120P, P-Area (U)		WSRC	Inter-office Memo	3/5/89	3/6/90
HD-52	Transmittal of Final Well Abandonment Report of Monitoring Well MSB-23A at SRP		DOE	SCDHEC	12/28/88	3/3/90
HD-53	Circumstances Related to Corps of Engineers Drilling at SRP	Furlow	SRP	Gordon & Bergren	1/30/89	3/6/90
HD-54	RCRA Groundwater Monitoring Compliance Order Guidance-FINAL		OSWER		8/1/85	Jan-90
HD-55	Concern for use of ash basin water for drilling make-up water		SCDHEC	DOE-SR	2/1/89	3/3/90
HD-56	RAFTS Report No. 07-01-89-0051 Environmental Appraisal Report Groundwater Facilities and Services Functional Appraisal: U.S. Army Corps of Engineers		U.S. DOE		11/1/88	3/3/90
HD-57	DH-87-MM-01 Action Plan for the DOE-HQ Environmental Survey Findings		DOE-HQ Env. Survey		7/31/89	Jan-90
HD-58	Regulation 61-71 Well Standards		SCDHEC			3/2/90
HD-59	WSRC-RP-89-59-1, Volume 1, Text Savannah River Site Environmental Report for 1988		WSRC		6/12/09	Jan-90
HD-60	DPSOP 271-1, Revision 6 Health Protection Department Environmental Monitoring Collections		WSRC		12/1/88	3/6/90
HD-61	DPST-83-829, Volume 1, Site Geohydrology & Solid & Hazard Wastes Technical Summary of Groundwater Quality Protection Program at Savannah River Plant				12/1/83	3/7/90
HD-62	DPST-83-829, Volume II, Radioactive Waste Technical Summary of Groundwater Quality Protection at Savannah River Plant		E. I. du Pont		12/1/83	3/7/90
HD-63	Water Samples Collected from 488-D Ash Basin	J. W. Furlow C. Muska		Campbell & Gordon	2/10/89	3/5/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

HD = Hydrogeology

*Document Number	Title/Description	Author	Organization	Recipient	Document Document Date	Date Document Received
HD-64	WSRC-RP-89-67-3 M-Area Hazardous Waste Mgmt. Facility Post-Closure Care Permit Groundwater Monitoring & Corrective Action Program-3rd Qrt.1989 Report		WSRC		11/1/89	3/2/90
HD-65	DPSOP-86-1123 Savannah River Plant Groundwater Protection Program		WSRC		9/22/86	3/8/90
HD-66	A Numerical Model of the Hydrological System Underlying the Savannah River Plant	Geotrans, Inc.	WSRC		6/1/89	1/1/90
HD-67	Environmental Information Document Reactor Seepage Basins	E. I. du Pont	SRL	DOE	Mar-87	3/8/90
HD-68	S.C. Hazardous Waste Management Regulations		South Carolina		As Amended 6/23/89	2/8/90
HD-69	Public Law 96-510, Hazardous Substances Releases, Liability Compensation (CERCLA)	U.S. Government			12/11/80	3/8/90
HD-70	DOE Response to Predecisional Assessment Finding H/BMP-5	Larry Snyder	DOE	Tiger Team Env. Section	3/16/90	3/16/90
HD-71	Interagency Agreement between the U.S. DOE and the U.S. Corps of Engineers		U.S. DOE	U.S. Corps of Engineers	Jul-85	3/16/90
HD-72	Revised Final Protocol Document for the Corps of Engineers Support to the U.S. DOE, SRO	Larry Snyder	DOE	M. W. Walcher	1/30/90	3/16/90
HD-73	Propsed Safety Management Plan for Corps Projects at SRP	Larry Snyder	DOE	Harold Saucier	1/24/86	3/16/90
HD-74	Draft Summary Alleged Violation of SRP Well Installation Procedures D-Area Ash Removal Proj. & Assoc. Ref.	Unknown		Unknown	No Date	3/16/90
HD-75	Program Plans for COE Soil Boring Projects (Reference A to HD-74)	Ronnie Catoe	U.S. COE	Chris Bergren	1/10/89	3/16/90
HD-76	Work Clearance Permit for Corps 44-D-Area Soil Borings (Reference B to HD-74)	H. R. Main	Custodian (D-Area)		1/10/89	3/16/90
HD-77	Du Pont Inter-office Memo Drilling Safety and Performance Audit (Reference C to HD-74)	J. W. Furlow	Du Pont Contractor	Chris Bergren	1/13/90	3/16/90
HD-78	Memo Regarding Corps 44-D-Area Drill Site & Planned DHEC Inspection for 1/17/89 (Reference D to HD-74)	Elizabeth Phillips	DOE	Eugene Easterling	1/13/89	3/16/90
HD-79	Insp. Rpt. on Potential Violations of S.C. Regulations during DHEC Insp. of D-Area Ash Basin (Ref. E to HD-74)	Elizabeth Phillips	DOE	John Knox	1/19/89	3/16/90
HD-80	Installation of Soil Borings near D-Area Ash Basin (Reference F to HD-74)	S. R. Wright	DOE	W. C. Reinig	1/31/89	3/16/90
HD-81	Analyses of the water from the D-Area Ash Basin (Reference G to HD-74)	S. R. Wright	DOE	R. K. Cauthen SCDHEC	4/4/89	3/16/90
HD-82	Letter regarding status of potential SC Hazardous Waste violation by the Corps (Reference K to HD-74)	L. Lewis	DOE	Mark Silverman COE	2/14/89	3/16/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

HD = Hydrogeology

*Document Number	Title/Description	Author	Organization	Recipient	Document Document Date	Date Document Received
HD-83	Handwritten memo regarding inspections of the Corps by SRP (Reference L to HD-74)	W. M. Edwards	DOE	Eugene Easterling DOE	1/19/89	3/16/90
HD-84	Inter-office memo regarding oversight of the Corps by DOE and Du Pont (Reference M to HD-74)	W. J. Brumley	DOE	D. E. Gordon	2/10/89	3/16/90
HD-85	Revised protocol document for CORPS support to DOE-SRP (Reference N to HD-74)	L. Lewis	DOE	Col. Stewart Bornhoft (COE)	5/11/88	3/16/90
HD-86	Soil Borings Near D-Area Ash Basin (Reference O to HD-74)	S. R. Wright	DOE	R. K. Cauthen SCDHEC	3/2/89	3/16/90
HD-87	WSRC Response to Draft-Predecisional Hydrogeological Tiger Team Findings	WSRC		Tiger Team Environmental	3/16/90	3/16/90
HD-88	DOE Order 5820.2A Radioactive Waste Management	U.S. DOE	U.S. DOE	DOE Facilities	9/26/88	3/9/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

WM = Waste Management

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
WM-1	DOE Order 5820.2 Radioactive Waste Implementation Plan & Rad. Waste Management Plan	Dept. of Energy				2/5/90
WM-2	DOE Order 5480.2 Hazardous and Radioactive Mixed Waste Managment	Dept. of Energy			12/13/82	2/9/90
WM-3	Tiger Team Emergency Prepareness Training	WSRC			1/30/90	1/31/90
WM-4	Savannah River Site Environment Report 1988 V-I WSRC-RP-8959-1	WSRC			6/12/09	1/19,2/5/90
WM-5	EH&S Office of Environment Audit DOE-DOE/EH/OEV-10-P				6/10/09	1/19,2/20/90
WM-6	Building 341-M Interim Treatment/Storage Buildings Routine Patrol. DPSOL 341-498, Rev. 6	SRS			10/25/89	2/6/90
WM-7	Listed Waste in HL Tanks Bldg. Info ESH FS6900077 with 12 Attachments	WSRC			2/7/90	2/8/90
WM-8	221F & H Sep. Proc., Sum. Liq. Rad. Waste Radioactive OPS-STH-890177	WSRC			12/27/89	2/8/90
WM-9	Nonproduction Fuel Stage Information ROM OPS-SRB-890204	WSRC			12/1/89	2/16/90
WM-10	Spent Fuel Storage at RBOF OPS-STH-8900169	WSRC			2/1/90	2/16/90
WM-11	Proc. for Submitting Sam. Mir Rad. Hazard Waste DPSPM-GEN-52	WSRC			11/8/88	2/28/90
WM-12	RCRA Part B Permit F&H Area Book A&B 11/8/88 Never Submitted OPS-WMT-900119	Du Pont & Chas T. Main			11/8/88	2/28/90
WM-13	Guideline for Conduct of Operations 85-017	INPO			6/1/85	2/3/90
WM-14	Guideline for Conduct of Maintenance 85-038	INPO			12/1/88	2/3/90
WM-15	Waste Management Introduces RCRA WM-329-LP	WSRC			No date	2/27/90
WM-16	200 Area Environ. Group SOP 221-H-9440	WSRC			1/16/90	2/13/90
WM-17	Inventory of RTR Freon Storage Area at 211-H Slab Yard DPSOL 221-J-9588	WSRC			1/18/90	2/13/90
WM-18	Inspections of the Hazardous Waste Staging Area at 211-H Slab Yard DPSOL 200-H-9569 no approval date	WSRC			1/19/90	2/13/90
WM-19	Inspections of Radioactive and Hazardous Mixed Waste Staging Area at 211-H Slab Yard DPSOL 200-H-9570	WSRC			1/18/90	1/18/90
WM-20	Savannah River Site Waste Management Plan FY 89 DOE-SR WM-89-1	DOE/SR				2/6/90
WM-21	Savannah River Site Waste Management Plan FY 90 DOE-SR WM-90-1	DOE/SR				2/6/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

WM = Waste Management

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
WM-22	242H Waste Concentrate Transfer Piping Diagram DPSOL 138-8H-440A	WSRC			6/1/80	2/15/90
WM-23	Waste Management Response to Spills DPSOL 241-FH-9562 Rev. 5	WSRC			8/11/89	2/15/90
WM-24	South Carolina Hazardous Waste Management Regulations	SCDHEC			10/28/88	2/3/90
WM-25	Spill Reporting and Control DPSOL 105-ME-611-PLK Rev. 4				3/29/89	2/21/90
WM-26	Oil Spill Prevention and Control DPSOL 105-ME-2328A-PLK Rev. 5				3/15/89	2/21/90
WM-27	Response to DOE Env. Survey SRP Aug. 87 DPSP-87-1199					
WM-28	Initial Evaluation-Vault Inventory OPS-SPF-890169	R. L. Yourchak (235-F)		C. R. Goetzman	11/3/89	2/28/90
WP-29	Vault Inventory Eval. for Hazardous Materials OPS-SHB-890048	C. R. Goetzman (221-HBL)		J. G. McKibbin	11/9/89	2/28/90
WP-30	Oxide Storage Analysis OPS-SBT-890084	S. A. Trotter (703-F)		W. M. Wierzbichi	12/12/89	2/28/90
WM-31	EP Toxicity Testing of Uranium Oxide ESH-900001	J. M. Anderson	ESH&QA	T. F. Heenan	1/3/90	2/16/90
WM-32	Guidance Report on Management at RCRA Satellite Areas (A0441 9600)	S. R. Wright	Env. Div.	W. W. Culler	4/14/89	3/5/90
WM-33	DOE RCRA Compliance Issues Workgroup	K. Taimi		Distribution	2/15/90	2/16/90
WM-34	Memorandum-Savannah River Site (SRS) Issue Paper	Kaspar	DOE-SR	V. Stello	1/16/90	2/14/90
WM-35	Feasibility Study for FB-line Pu Oxide Sampling OPS-SBT-900023	S. A. Trotter	SRS	W. M. Wierzbichi	2/28/90	2/28/90
WM-36	Environment, Safety, and Health Compliance at Savannah River Site WSRC-RP-90-88				1/31/90	2/9/90
WM-37	Analytical Results from D-Area Drum	T. Bittler	CSWEEC	Lisa Hughey	2/16/90	3/5/90
WM-38	Application to Modify NPDES Permit No. SC0000175 - K-Area Reactor C Draft Tables I, 2 & 3 from Permit Appl.				2/1/90	2/21/90
WM-39	Mercury Recovery in Waste Evaporators & Active Management N Wash ESH-FG-890361	Hawkins/Jackson	WSRC	Wright/Suvlia	11/15/89	2/28/90
WM-40	100 Areas - Staging Area Contingency Plan	C. E. Jewell	SRS	Multiple Distribution	1/27/88	2/21/90
WM-41	SRL High and Low Level Waste Collection Tanks 770-A Waste Facility Contingency Plan Control Rm DO 776-A				3/7/89	
WM-42	H-Area Separations Staging Areas Contingency Plan Rev. 5	WSRC			1/29/90	

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

WM = Waste Management

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
WM-43	773-45A Staging Fac. Contingency Plan Rev. 1	SRL Copy			2/2/90	2/20/90
WM-44	Analysis of SRP Waste Streams for Waste Tank Certification - Summary DPST-89-281	C. Coleman	WSRC	K. Andringa	3/28/89	3/1/90
WM-45	Nonproduction Fuel Information (as of 11/30/89)	S. W. O'Rear	WMO/WSRC	W. A. Richardson	12/1/89	2/8/90
WM-46	Federal Facility Compliance and Settlement Agreement Draft #5	FFC			2/5/90	2/2/90
WM-47	Monthly Environmental Compliance Report Savannah River Site - February 1990 (Working Draft)				No date	3/7/90
WM-48	321-M Contingency Plan DPSOP 88-71-28		321-M		11/1/90	2/13/90
WM-49	321-M Spill Prevent Count. Plan DPSOL 288-N-602		321-M		3/1/87	2/13/90
WM-50	FMF Emergency Plan		NFMF		1/1/89	2/14/90
WM-51	NF Mixed and Haz. Conting. Plan DPSOL 247-54-068		NFMF		2/1/90	2/14/90
WM-52	Rad. Contam. and Control Procedure DPSOP 40		NFMF		3/1/88	2/14/90
WM-53	Reactor Materials PMT Records DPSOL 300-815		321-M		1/1/90	2/15/90
WM-54	DOE LDR Strategy Report for EMW EH-231		DOE		9/1/89	2/17/90
WM-55	Env., Safety, & Health Comp. Assess. EH-0106		DOE		9/1/89	2/17/90
WM-56	DOE ESH Compl. Assess., NTS EH-0115		DOE		1/1/90	2/17/90
WM-57	DOE ESH Compl. Assess., Pinellas EH-0126		DOE		2/1/90	2/19/90
WM-58	Tiger Team Assess. Mound EH-0117		DOE		12/1/89	2/19/90
WM-59	Char of 300-M Effluents	H. P. Holcomb			12/31/79	2/5/90
WM-60	Part B Permit-Vol XI	SAIC			7/26/88	2/5/90
WM-61	Env. Compliance Tracking VOL II	NUS			11/3/89	2/7/90
WM-62	RCRA Part A Application	S. R. Wright			7/5/89	2/17/90
WM-63	Final Report - RCRA Tank Assessment	Chas. T. Main Inc. & Ralph Parsons Co.			Not Dated	2/17/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

WM = Waste Management

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
WM-64	RCRA Part A Application	R. L. Morgan			4/30/87	2/17/90
WM-65	Memo to L Martino WMO-DPS-90018	Paul d'Entremont	WSRC		2/12/90	2/13/90
WM-66	A Program Self Assessment Report	WSRC			1/31/90	1/31/90
WM-67	Federal Register WS 54.No.224 Wed 11/22/89	EPA			11/22/89	1/29/90
WM-68	Smarts Program	SRP Underground Tank Committee			9/1/85	2/22/90
WM-69	Assessment Plan Amendment for SRS Shops	Correspondence HESS/ROBERTS			1/8/90	2/20/90
WM-70	Results of Bioreclamation FS for Central Shop	Bio Systems			6/1/89	2/20/90
WM-71	Char. of High & Low Level Activity Liquid Waste-SRL DPST-88-1038	Jane Bibler			12/19/88	2/1/90
WM-72	SRL LAB Procedures Manual DPSTP-2.9	SRL			4/1/87	2/21/90
WM-73	Handling of Hazardous Chemicals in Control Lab 1P-90014	Control Lab	WSRC		1/16/90	2/23/90
WM-74	Huber/Mooney Correspondence-SRL Tanks	Mooney CH2M Hill P. E.			1/12/89	2/15/90
WM-75	Draft List of H&F Tank Activity Managed	P. D. d'Entremont	WSRC		11/11/89	2/13/90
WM-76	Site Assessment Plan 715 USTs	Correspondence HESS/ROBERTS			1/26/90	2/28/90
WM-77	UST Soil Sampling Guidelines	Memo-MORAN/HUBER			5/5/89	2/28/90
WM-78	USTs	H. W. Morris			1/23/90	2/28/90
WM-79	Listed Waste in HL Tanks B & G Info FSG900077	WSRC			2/7/90	2/8/90
WM-80	Waste Oil Survey Package	TOT Sanders - Frim EICHIN			3/9/88	3/1/90
WM-81	Memo - Cioffi from Pickitt	Pickitt			1/18/90	2/5/90
WM-82	C Shop Tank Analytical Result	Normandeau Assoc.			1/31/90	1/31/90
WM-83	Dip Tank Level Measurement Procedure Bldg A-700	A. E. Channell	CSWE		Undated	2/28/90
WM-84	Reporting Spills or Leaks of Process Chemicals Petroleum Radionuclide DPSOL 3200-655	SRS			12/18/89	

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

WM = Waste Management

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
WM-85	Handling and Storage of Hazardous Waste at Tru-Pads DPSOL 643-G-2041	SRS			1/14/90	
WM-86	Letters of Guidance	Env Div SRS Oper Office, by NUS			3/22/89	2/16/90
WM-87	Letter, Response to Tiger Team Findings	Wackenhut			2/23/90	2/24/90
WM-88	Hazardous Waste Disposal Records R29-3, Rev. 6-88	WMO			various by transaction	2/15/90
WM-89	Procedures for Establishment and Control of Haz. Waste Satellite & Staging Area CP-S-2	SRS - Construction			1/12/90	2/15/90
WM-90	Procedure for Disposal of Inert Construction Waste CP-S-7	Same			1/1/90	2/15/90
WM-91	SREL Hazardous/Non Hazardous Waste Management Procedure	SREL			2/20/90	8/15/90
WM-92	Savannah River Archreological Research Program Safety Action Plan for the 1990's	SRS				2/21/89
WM-93	TNX Boneyard Drum Control Procedure 6745-40005	SRS/TNX			10/1/90	2/27/90
WM-94	TNX-Area Staging Area Contingency Plan	SRS/TNX			12/1/89	2/27/90
WM-95	Protocol for Corps of Engineers Execution of SRS Projects	U. S. Army Corps. of Engineers				2/28/90
WM-96	Application for a Hazardous Waste Permit Part A	SRS			12/14/88	2/1/90
WM-97	EEP-6011 DPSPM-GEN-41	SRS				
WM-98	Waste Management Technology Identification Analyses Packaging Labeling Shipping Requirement for Non-Radioactive Hazardous Waste DPSOP 138-16	SRS			10/1/85	2/1/90
WM-99	Monthly Inspections 709-G/709-46/710-U DPSOL 709-G-7	SRS			5/1/88	2/2/90
WM-100	Weekly Inspection Form for Non Radioactive Radioactive Hazardous Waste Storage DPSOL 709-G-2A	SRS			8/9/89	2/2/90
WM-101	Offsite Shipment of NRHW Drums DPSOL 709-13	SRS			9/1/88	
WM-102	Purchase Approval Program: Chemical and Physical Agents DPSOL 40-5-105	SRS			4/20/86	2/1/90
WM-103	Weekly Inspection of Hazardous Waste Satellite Areas DPSOL 300-127	SRS			4/27/88	

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

WM = Waste Management

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
WM-104	Weekly Inspection, Inventory, and Disposal Log for Drums Stored in Hazardous Waste Staging Areas DPSOL 300-125	SRS			2/8/90	
WM-105	Environmental Audit Program DE-AC01-88EH79066 MANUAL Vols. I, II, III	U.S. DOE Off. of Env Audit, Wash. D.C.			12/29/89	
WM-106	Environmental Compliance Implementation Plan Vols. I & II	U.S. DOE SRS/ED			12/16/86	
WM-107	Environmental Compliance Tracking Vols. II, III, IV	SRS Oper. Office			10/1/89	
WM-108	Waste Management Program/System Self Assessment Books I & II	SRS			1/1/90	
WM-109	Environmental Survey Preliminary Report	U.S. DOE Env, Saf & Health, Office of Env. Audi			8/1/87	
WM-110	Sen. Seven Report SRC 90 2016 SRC 89 1716	NUS Corporation			1/1/90 11/1/89	2/1/90
WM-111	Application for an RCRA Part B Permit - Tru Waste Facility Vol. XX	SRS	Du Pont		8/8/89	2/1/90
WM-112	Application for a Hazardous Waste Part B Permit, MWMF 643-29G Vol. VIII	SRS	Du Pont		2/22/87	
WM-113	Part B Permit Application for SRP M-Area PWITSF, Vol. XI	SRS	Du Pont		7/26/88	
WM-114	Application for a Hazardous Waste Part B Permit Hazardous Waste Storage Facilities Vol. II	SRS	Du Pont		4/1/87	
WM-115	Inter-Agency Agreement Between The US DOE SRS Operations Office & Corps.	U. S. Army Corps. of Engineers				
WM-116	Letter: Disposal of Solvent Contaminated Rags and Wipes	S. R. Wright	DOE	D. D. Culler SCDHEC	2/23/90	3/13/90
WM-117	Unusual Occurrence Report - UOR No. SRS-89-WM-05 (stamped "Rough Draft")		WSRC		No Date	3/14/90
WM-118	Guidance Request on Management of RCRA Satellite Areas	A. Coffey	SCDHEC	S. R. Wright	2/26/90	3/16/90
WM-119	SRP Strategy for Compliance with U.S. EPA LDR	S. R. Wright	DOE	J. A. Porter	11/3/88	3/16/90
WM-120	Management of ROOO Wastes Letter A034855	J. H. Scarborough	EPA	S. R. Wright	4/26/88	3/16/90
WM-121	Hazardous Waste Land Disposal Restrictions	S. R. Wright	DOE	J. A. Porter	6/27/88	3/16/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

TCM - Toxic & Chemical Materials

*Document Number	Title/Description	Author	Organization	Recipent	Document Date	Date Document Recieved
TCM-1	1988 Annual Environmental Appraisal Summaries	Camp Dresser & McKee, Inc.	Environmental & Energy Dept.	SRS	ND	1/18/90
TCM-2	Action Plan Attachment 1 for the DOE-HQ Resolution of Env. Survey Findings	DOE-Headquarters	DOE	SRS	7/31/89	1/18/90
TCM-3	Environmental Survey Preliminary Report	DOE	Office of ES&H	SRS	8/1/87	1/18/90
TCM-4	Environmental Comp. Imp. Plan Vol. II, Operational Comp. Imp.	NUS Corp	NUS Corp.	SRS	ND	1/18/90
TCM-5	Environmental Implement. Plan (V), Vol. II, Protection Prog.	NUS Corp.	NUS Corp.	SRS	ND	1/18/90
TCM-6	Tiger Team Assessment Manual	DOE	DOE	Distribution	2/1/90	2/1/90
TCM-7	Environmental Audit Program Manual	DOE Office of Env. Audit, HQ	NUS Corp.	C. C. Johnson & Malhorta, P.C.	ND	1/18/90
TCM-8	Stores Catalog 988	SRS Site Serv. Department	MLI	Distribution	2/27/88	2/2/90
TCM-9	Self-Assessment; Environment, Safety, & Health Comp. at SRS	WSRC	WSRC	N/A	1/31/90	2/2/90
TCM-10	40 CFR 700-799 (TSCA)	U.S. Office of Fed. Register	EPA	N/A	7/1/89	1/18/90
TCM-11	40 CFR 150-189 (FIFRA)	U.S. Office of Fed. Register	EPA	N/A	7/1/89	2/5/90
TCM-12	Manufacturer Listing of MSDS Sheets	John Harris	EPS	N/A	2/5/90	2/5/90
TCM-13	Premanufacture Notice for Monosodium Titanate	Tracy Killian & John Harris	EPS	N/A	6/20/88	2/5/90
TCM-14	Chemical Info. & Inventory System (CIIS) Req. Definition	John Harris	EPS	N/A	2/1/90	2/5/90
TCM-15	Savannah River Laboratory Procedures Manual DPSTP	SRL	SRL	N/A	1/1/89	2/8/90
TCM-16	Savannah River Laboratory Safety Manual	SRL	SRL	N/A	2/1/87	2/8/90
TCM-17	TSCA Pesticides Environmental Appraisal Report	J. Layden	DOE	Du Pont	5/1/86	2/27/90
TCM-18	Pesticide Control Manual DPSPM-GEN-78	CSWE - RR & Field Services	Du Pont	N/A	10/1/88	2/27/90
TCM-19	Safety Training for Forestry Herbicide Applicators FS 393	SRS Forest Service	USFS	N/A	2/1/86	2/21/90
TCM-20	Guidelines for Conduct Op. at Nuclear Power Stns INPO 85-017	Inst. Nuclear Power Ops.	INPO	DOE	6/1/85	2/7/90
TCM-21	1989 EPA Comp. Evaluation Insp. West.IOM(CEI) Rep(ESP-FSG-89-0052)	Alex Guanlao	WSRC	Distribution	5/11/89	2/6/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

TCM - Toxic & Chemical Materials

*Document Number	Title/Description	Author	Organization	Recipent	Document Date	Date Document Recieved
TCM-22	PCB Waste Storage and Disposal Files 1987-1990	J. Gantt J. Williams	MLI, Salvage	N/A	1987-1990	3/7/90
TCM-23	Env. Eval. Imapct Analysis Stab. Chem., Metals, Pest. (DMP) pits DPST-84-789	J. J. Amobi	WSRC	M. Anderson	10/1/84	2/6/90
TCM-24	Organics, Pesticides, & Metals in Streams & Savannah River	M. W. Lower	DPST-85-280	R. R. Fleming	3/15/85	2/6/90
TCM-25	SR/DOE Envir. App Rep. Toxic & Haz. Subs.-Pest. (860002602)	M. B. Hughes	CSWE	R. P. Whitfield	10/10/86	2/8/90
TCM-26	Toxic & Hazardous Substances Control; Pesticides	Du Pont	CSWE	DOE	5/1/86	2/27/90
TCM-27	Pesticides Management Program	USFS	USFS	N/A	11/1/86	2/21/90
TCM-28	Hazard Communication Program	USFS	USFS	N/A	12/8/89	2/21/90
TCM-29	Safety Action Plan - 1990	USFS	USFS	N/A	6/13/09	2/21/90
TCM-30	Guideline: Reporting Asbestos Spills or Damaged ACM	McCullough	WSRC-Eng. and Project Division	N/A	7/24/89	2/21/90
TCM-31	Fed. Reg, Dec. 21, 1989, EPA 40 CFR 761 PCBs Notification and Monitoring	U.S. Office of the Fed. Reg.	EPA	N/A	12/21/90	1/18/90
TCM-32	Guidelines: Conduct of Maint. at Nuclear Power Stations INPO 86-038, Rev. 1	Inst of Nuclear Power Operations	INPO	DOE	12/1/88	2/7/90
TCM-33	Env. Compliance Audit Program for: Power Op. Fac.-CSWE Fac.	SRS Power Technology	Eng. & Proj. Div.	Distribution	8/1/89	2/7/90
TCM-34	RRP SPCC Plan Vol. 1 & 2 DPSP-87-1086 Rev. 0	SRP, Du Pont		Distribution	7/1/87	2/8/90
TCM-36	North Brothers Working File: P-Powerhouse Asbestos Removal	K. Barrineau, North Bros.	Construction		1989-1990	2/20/90
TCM-37	Asbestos Management Program (Draft memo)	Auth: E. Kvartek Fm: T. Anderson	ESH&QA	Distribution	N/A	2/1/90
TCM-38	Env. Comm. Within E&PD	D. T. Bignell	E&PD	Distribution	12/4/89	2/20/90
TCM-39	Identifying Unpermitted Wastewater Discharges	D. T. Bignell	E&PD	Distribution	12/4/89	2/20/90
TCM-40	Evaluation of Containment Dike Integrity	D. T. Bignell	E&PD	Distribution	12/4/90	2/20/90
TCM-41	E&PD Environmental Self Assessment	D. T. Bignell	EP&D	Distribution	12/11/89	2/20/90
TCM-42	Onsite Training Program for RCRA	D. T. Bignell	EP&D	Distribution	12/18/89	2/20/90
TCM-43	Disposal of Fluorescent Light Ballasts & Small PCB Capacitors	D. T. Bignell	EP&D	Distribution	1/3/90	2/20/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

TCM - Toxic & Chemical Materials

*Document Number	Title/Description	Author	Organization	Recipent	Document Date	Date Document Recieved
TCM-44	SCDHEC Settlement, Agreement on RCRA 90-Day Violations	D. T. Bignell	EP&D	Distribution	1/30/90	2/20/90
TCM-46	DPSOL 40-5-116 Container Labeling	N/A	HP Department	N/A	9/3/87	3/1/90
TCM-47	DPSOL 40-5-117 OSHA Hazard Comm. Standard	N/A	HP Department	N/A	6/15/87	3/1/90
TCM-48	DOE Cover Letter - PCB Management	Asst. Mg.	ES&H	Distribution	12/21/87	3/1/90
TCM-49	DPSOL 10-450, Rev. 0-A Draft Draining Containment Dikes around Storage Tanks	N/A	Power Operations	N/A	N/D	2/20/90
TCM-50	WSRC File: Asbestos Removal P-Powerhosue	T. A. Faugl	EPS	N/A	1989-1990	2/21/90
TCM-51	SRS Asbestos Mngt. Plan Finding, TSA Tiger Team, SRS, Draft	DOE	DOE	N/A	ND	3/7/90
TCM-52	Du Pont SRP Letter SOP for Asbestos Removal Operations	C. F. Muska	N/A	S. R. Wright	10/20/87	3/1/90
TCM-53	Toxic & Haz. Substance Control-PCBs Envir. Appraisal Report	G. Hoover	DOE	Du Pont	8/1/87	3/1/90
TCM-54	IOM: E&PD Environ. Weekly Update	D. T. Bignell	EP&D	Distribtuion	1/2/90	2/7/90
TCM-55	IOM: Transformer PCB Labeling Insp. Report	D. R. Earnhart	EP&D	R. M. Hughes	1/17/90	2/7/90
TCM-56	IOM: E&PD Environ. Weekly Update	D. T. Bignell	EP&D	Distribution	12/8/89	2/20/90
TCM-57	IOM: E&PD Environmental Weekly UPdate	D. T. Bignell	E&PD	Distribution	1/9/90	2/20/90
TCM-58	IOM: E&PD Environmental Weekly UPdate	D. T. Bignell	E&PD	Distribution	1/17/90	2/20/90
TCM-59	IOM: E&PD Environmental Weekly Update	D. T. Bignell	E&PD	Distribution	1/30/90	2/20/90
TCM-60	IOM: E&PD Environmental Weekly UPdate	D. T. Bignell	E&PD	Distribution	2/15/90	2/20/90
TCM-61	Monthly Environmental Compliance Report SRS Jan. 1990	DOE	DOE	Distribution	2/1/90	2/23/90
TCM-62	SRS PCB Data Base Reports	B. Maloney	EPS	N/A	2/20/90	3/4/90
TCM-63	Tiger Team Assessment: Nevada Test Site (Draft)	DOE	DOE	N/A	12/1/89	1/18/90
TCM-64	Tiger Team Assessment: Mound Plant	DOE	DOE	N/A	12/1/89	2/20/90
TCM-65	Tiger Team Assessment: Pinellas Plant (Draft)	DOE	DOE	N/A	2/1/90	2/20/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

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TCM-66	Tiger Team Assessment: FMPC, Fernald	DOE	DOE	N/A	9/1/89	2/20/90
TCM-67	Tiger Team Assessment: 412 Oak Ridge	DOE	DOE	N/A	11/1/89	2/20/90
TCM-68	P-Powerhouse (184) Asbestos removal file	T. A. Faugl	EPS	N/A	N/A	2/21/90
TCM-69	DPSOP 158-2 with appendicies including DPSOLs on hazardous materials	N/A	Du Pont Pub.	N/A	2/19/87	3/2/90
TCM-70	1987 DOE Environmental Survey Report	DOE	DOE	Du Pont	,1987	3/1/90
TCM-71	1990 Westinghouse Response to 1987 DOE Survey	Westinghouse	EPS	DOE	Feb. 1990	
TCM-72	DPSOP 147-2WC: Canyon Processes, Cold Feed Preparation; DPSOL 221-H-687, Rev. 7, Disposing of Liquid Waste from Tank 181, 182 or 183.	N/A	Separations Technology	N/A	8/1/87	2/15/90
TCM-73	DPSOP 147-2: Canyon Processes, Pipe Feed & Tank Galleries DPSOL 221-H-937, Rev. 11, Checking & Flushing Acidic or Basic Drain Headers on 2nd Level	N/A	Separations Technology	N/A	8/28/89	2/15/90
TCM-74	DOE Letter: Standards of Performance for Asbestos Removal Operations	N/A	DOE	Du Pont	10/20/87	3/2/90
TCM-75	Final Engineering Report-PCB Decontamination Bldg 320-M Casting Area	J. Montgomery		Du Pont	7/1/86	3/2/90
TCM-76	Purchase Requisition B-03719	N/A	Purchasing	N/A	1/3/90	2/7/90
TCM-77	Requisition Form Instructions	N/A	Purchasing	N/A	ND	2/7/90
TCM-78	Wackenhut Procedure: Hazard Communication Program 1-2403	N/A	Wackenhut	N/A	6/28/89	2/13/90
TCM-79	Wackenhut Procedure: Waste Storage, Treatment, Disposal & Minimization	N/A	Wackenhut	N/A	1/9/90	2/13/90
TCM-80	Wackenhut Procedure: Flamable & Combustible Liquids, 1-2425	N/A	Wackenhut	N/A	6/28/89	2/13/90
TCM-81	Wackenhut Procedure: Weapons Cleaning, 1-2438	N/A	Wackenhut	N/A	5/19/86	2/13/90
TCM-82	Wackenhut Procedure: Environmental Protection Program, 1-2408	N/A	Wackenhut	N/A	ND	2/13/90
TCM-83	SREL Chemical Inventory	N/A	SREL	N/A	2/1/90	2/5/90
TCM-84	SREL Safety Manual	N/A	SREL	N/A	9/1/89	2/5/90
TCM-85	PCB Analysis Results, Transformer Oil	R. D. Downing	Normandeau Assoc.	L. McChesney	1/15/90	1/20/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

TCM - Toxic & Chemical Materials

*Document Number	Title/Description	Author	Organization	Recipent	Document Date	Date Document Recieved
TCM-86	PCB Analysis Results, Transformer Oil	R. D. Downing	Normandeau Assoc.	M. Hughes	12/11/89	2/20/90
TCM-87	PCB Analysis Results, Transformer Oil	R. D. Downing	Normandeau Assoc.	L. McChesney	1/3/90	2/20/90
TCM-88	EPA Test Method 600/4-81-045' PCBs in Transformer Fluid & Waste Oil	N/A	EPA	N/A	9/1/82	2/20/90
TCM-89	IOM: Transformer Consultants Trip Report	B. Nora	320-M Lab	J. E. Young	4/25/88	2/20/90
TCM-90	Waste Oil Disposal, 484-D Powerhouse, DPSOP 15-1, Rev. 66	N/A	WSRC	N/A	11/1/85	2/20/90
TCM-91	PCB Inventory Changes During Calander Year 1989 removal file	J. V. Odum	WSRC	S.R. Wright DOE	1/5/90	2/20/90
TCM-92	Notification of PCB Activities	S.R. Wright	DOE	EPA	11/17/88	2/20/90
TCM-93	Memo: TSCA Requirements-PCBs	W.J. Maloney R.M.Guidry	EPS	H.S.Willis	5/16/88	2/20/90
TCM-94	Reactor Dept. MSDS & List of Chemicals	N/A	Reactor Restart	N/A	10/12/89	2/14/90
TCM-95	DPSOP 81-1: Analy. Lab Std Practices; IP 90086, Rev. 0 Draft Page 51 or 79; Att. 9 Proc. Formats, pg. 11 of 11	N/A	Central Labs	N/A	10/12/89 N/D	2/14/90 2/26/90
TCM-96	DPSOP 81-4: Analy. lab Admin. Proc., IP 90014, Rev. 0; Pg. 1 of 6; Handling of Hazardous Chemicals ... 772-F/1F	N/A	Central Labs	N/A	1/16/90	2/26/90
TCM-97	Chemical Handling and Storage, Buildings 211-H and 221-H	N/A	Separatons Technology	N/A	ND	2/15/90
TCM-98	Separations Incident SI-87-2-16; Escape of NOx from 183 Sump	N/A	Separations Technology	N/A	2/4/87	2/15/90
TCM-99	Separations Incident SI-87-6-76; Generation of NOx Fumes from 183 Sump	N/A	Separations Technology	N/A	6/4/87	2/15/90
TCM-100	Separations Incident SI-87-5-55; NOx Gas Evolution in Old Cold Feed Prep.	N/A	Separations Technology	N/A	5/1/87	2/15/90
TCM-101	Pesticide Safety Training	R. G. Crais	USFS	File	5/5/89	2/21/90
TCM-102	Pesticide Inventory - 760-10G	R. G. Craig	USFS	N/A	1/30/90	2/21/90
TCM-103	Pesticide Use Report for National Forest Systems Lands	R. G. Craig	USFS	N/A	10/13/89	2/21/90
TCM-104	Compartment Perscription (Including pesticide activities)	Smith	USFS	J. Dent	12/13/85	2/21/90
TCM-105	Asbeston in Power Facilities	T. F. Thome	Power Operations	L. E. Snyder	9/12/89	2/9/90
TCM-106	Asbestos Removal File: P-Powerhouse	T. A. Faugl	EPS	N/A	6/12/09	2/21/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

TCM - Toxic & Chemical Materials

*Document Number	Title/Description	Author	Organization	Recipent	Document Date	Date Document Recieved
TCM-107	IOM: Storage & Control of Chemicals and Flammables - DWPF Facilities	J. B. Langford	DWPF	Distribution	1/3/90	2/23/90
TCM-108	Railroad Shipment File: LCPX-610232; NaOH UN 1824	T. Pennington	CSWE-T&T	N/A	9/20/89	2/23/90
TCM-109	Railroad Shipment File: UTLX-85974; NaOH UN 1824	T. Pennington	CSWE-T&T	N/A	2/22/90	2/23/90
TCM-110	DPSOP 302, Equip. Maint. and Gen Serv; DPSOL 302-EM&GS - 3007, Outgoing Railcar Insp. Cklist, CSWE-T&T	T. Pennington	CSWE-T&T	N/A	4/5/88	2/23/90
TCM-111	DPSOP 302, Equip Maint. and Gen Serv; DPSOL 302-EM&GS-3008, Outgoing Railcar Insp. Cklist, SRP Unloading	T. Pennington	CSWE-T&T	N/A	4/5/88	2/23/90
TCM-112	Guidelines: Notification of Substantial Risk Under Section 8(e) of TSCA	N/A	Du Pont	N/A	2/1/88	3/14/90
TCM-113	DPSOP 170: Interarea Shipments, Rev. 32	N/A	Du Pont	N/A	4/1/89	3/14/90
TCM-114	DPSOP 311, Rev. 9: Transportation of Drums	N/A	Du Pont	N/A	12/1/86	3/14/90
TCM-115	DOE Order 5400.1: General Environmental Protection Program	N/A	DOE	Distribution	11/9/88	3/13/90
TCM-116	DOE Order 5400.2A: Environmental Compliance Issue Coordination	N/A	DOE	Distribution	1/31/89	3/13/90
TCM-117	DOE Order 5482.1B: Environment, Safety and Health Appraisal Program	N/A	DOE	Distribution	9/23/86	3/13/90
TCM-118	DOE Order 5480.3: Safety Req. for the Packaging & Trans. of Haz. Materials, Substances and Wastes	N/A	DOE	Distribution	7/9//85	3/13/90
TCM-119	DOE Order 5480.4: Environmental, Safety and Health Protection Standards	N/A	DOE	Distribution	5/15/84	3/13/90
TCM-120	DOE Order 5484.1: Environmental, Safety and Health Protection Information Reporting Requirements	N/A	DOE	Distribution	2/24/81	3/13/90
TCM-121	DOE Order 5484.1, Change 3	N/A	DOE	Distribution	11/6/87	3/13/90
TCM-122	DOE Order 5484.1, Change 4	N/A	DOE	Distribution	10/17/89	3/13/90
TCM-123	Environmental Tiger Team WSRC Observation Nos. 20901, 20902, 21510, 22215, 22216, and 22217	N/A	WSRC	Distribution	No Date	2/27/90
TCM-124	F-Separations Chemical Cold Feed Layout & Inventory (DPSTS 4-200-9F)	N/A	Du Pont	N/A	No Date	2/15/90
TCM-125	Unused Materials Task Force Slide Presentation	N/A	WSRC	N/A	No Date	3/6/90
TCM-126	DPSOL 9-10505, Rev. 6 (DPSOP 220) Testing Insulating Oils	N/A	E&I	N/A	2/27/79	3/7/90
TCM-127	DPSOL S-9549, Rev. 5 (DPSOP 326) Control & Disposal PCBs	N/A	E&I	N/A	8/2/82	3/7/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

TCM - Toxic & Chemical Materials

*Document Number	Title/Description	Author	Organization	Recipent	Document Date	Date Document Recieved
TCM-128	SOP-6-10663: Sampling Insulating Oil	N/A	E&I	N/A	No Date	3/7/90
TCM-129	Sodium Hypochlorite Shipping File	N/A	713-A Receiving	N/A	3/9/90	3/9/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

QA = Quality Assurance

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
QA-1	DOE Order 5432.1B		DOE		9/23/86	
QA-2	DOE Order 5700.6B		DOE		9/23/86	
QA-3	DOE Order 5400.1		DOE		11/9/88	
QA-4	DOE Order 5400.XY (DRAFT)		DOE		9/14/88	
QA-5	ASTM D3856-80		ASTM		3/1/80	
QA-6	Environmental & Health Protection Dept. Managers Organization Chart	W. C. Reinig	Env and Health Protection Dept			2/1/90
QA-7	Charter Environmental Monitoring Section	W. C. Reinig	Env and Health Protection Dept		4/1/89	2/1/90
QA-8	Environmental Monitoring Section Organization Chart	J. Heffner	Env Monitoring Sect		1/8/90	2/1/90
QA-9	Environmental Monitoring Section-Laboratory Onsite Review Plate - Long Form	M. Khalil	EMS			2/2/90
QA-10	Environmental Monitoring Section-Laboratory Onsite Review Plate - Short Form	M. Khalil	EMS			2/2/90
QA-11	Detection Limits for Analysis of the Main Labs-General Engineering/Meta Trace	M. Khalil	EMS			2/2/90
QA-12	QA Assessment Results	M. Khalil	EMS		2/1/90	2/2/90
QA-13	General Engineering Laboratories Organization Chart	M. Green	Gen. Eng. Labs		1/1/90	2/5/90
QA-14	Agenda for Westinghouse SRS Audit		Gen. Eng. Labs			2/5/90
QA-15	Concerns about General Engineering Laboratories/Memo	M. Alfaro	EMS	C. Rogers	2/1/90	2/5/90
QA-16	Review of WP-22 Performance by Metals Section/ Inter-office Correspondence	B. Organ	Gen. Eng. Labs	T. O'Shields	8/23/83	2/6/90
QA-17	Valuation Report (WP023) for General Eng. Labs		U. S. EPA		12/21/89	2/6/90
QA-18	NPDES Documented Training Test	R. Reece	EMS			2/7/90
QA-19	NPDES Program Documented Training Record	R. Reece	EMS			2/7/90
QA-20	NPDES Samples Environmental Collections Chain of Custody OSR 4-451 (Rev. 8-88)				8/1/88	2/7/90
QA-21	NPDES Samples Chain of Custody Record Westinghouse SRS	R. Reece	EMS			2/7/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

QA = Quality Assurance

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
QA-22	Compliance Sampling of National Pollution Discharge Elimination System (NPDES) Outfalls	D. Stevens	EMS		11/1/89	2/8/90
QA-23	Quality Control Compliance Sampling of National Pollution Discharge Elimination System (NPDES) Outfalls	D. Stevens	EMS		11/1/89	2/8/90
QA-24	Chain of Custody Procedure	D. Stevens	EMS		11/1/89	2/8/90
QA-25	pH and Temperature Determinations	D. Stevens	EMS		11/1/89	2/8/90
QA-26	Radioactive Shipment Report	R. Reece	EMS		1/17/90	2/14/90
QA-27	Radioactive Shipment Receipt	J. Folk	WSRC		1/17/90	2/14/90
QA-28	Environmental Collections Chain of Custody Rec.	B. Bullard	GE-HY Env Sampling		12/4/89	2/14/90
QA-29	The Savannah River Site's Groundwater Monitoring Program-Second Quarter 1989/ESH-EMS 890044	J. Heffner	EHP-EMS		?	2/14/90
QA-30	Second Quarter Analysis Schedule/Letter	C. Cummins	HPD-DuPont	C. Byington	3/6/89	2/14/90
QA-31	Environmental Collections Chain of Custody Record	B. Bullard	GE-HY Env		12/6/89	2/14/90
QA-32	Environmental Collections Chain of Custody Record	B. Bullard	GE-HY Env		12/8/89	2/14/90
QA-33	Environmental Collections Chain of Custody Record	B. Bullard	GE-HY Env		2/12/90	2/14/90
QA-34	Savannah River Site Environmental Report for 1988/ WSRC-RP-89-59-1 Volume I Text	H. Davis, D. Martin J. Todd	EMS		?	2/8/90
QA-35	Environment, Safety, and Health Compliance at Savannah River Site/WSRC-RP-90-88		WSRC		1/31/90	2/15/90
QA-36	Water Pollution Control Programs: National Pollutant Discharge Elimination System(NPDES)Functional Appraisal		USDOE-SRO-ED-ECB		8/1/88	2/10/90
QA-37	Quality Control Analysis of Env. Monitoring Samples Sent to Subcontracting Laboratory	E. Rabon	HP-EM		2/26/86	2/15/90
QA-38	Savannah River Laboratory Surveillance Report/ Report No. 90-S-006	D. Collins, C. Braun	SRL-QS	C. Smith, Jr.	1/24/90	2/15/90
QA-39	Responses to Observations/Memo	R. Duke	EPS	Env. Tiger Team Media Leaders	2/15/90	2/15/90
QA-40	Count Master QC Samples & Trend Analysis Report Batch Nos: 1042-1043/Report	R. Henderson	EMS	Env. Monitoring	2/15/90	2/16/90
QA-41	Report on Quality Control for Envir. Monitoring Measure-ments-Control Charts of Inter-Laboratory Samples/Report	R. Henderson	EMS		2/2/90	2/16/90
QA-42	Results of QAP #31 are Reported/Report	R. Henderson	EMS	Env. Monitoring	12/18/89	2/16/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

QA = Quality Assurance

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
QA-43	EHP Quality Assurance Appraisal Schedule, 1990/ Inter-office Memorandum	N. Johnson	HP-QA	Various Managers	1/16/90	2/21/90
QA-44	Preparation and Control of EHP Procedures/ DPSOL 292-602		EHP Department		8/3/89	2/21/90
QA-45	Draft-Formatting Guidelines for HP Procedures/QE 1-2, 428, Rev. 0		EHP Department			2/21/90
QA-46	Savannah River Site Standards Laboratory Organization Chart		Standards Laboratory		1/12/90	2/22/90
QA-47	Standards Laboratory Brochure	R. Anderson	Stds Lab	Distribution	1/2/90	2/22/90
QA-48	DOE-SR Env.Div. Major Comprehensive Env.Prot. Evaluation Prog.(CEPEP) Evaluations FY1987, 1/10/90/Att 1&2		DOE-SR-ED		1/10/90	2/22/90
QA-49	Number of Groundwater Analyses Exceeding EPA Holding Times 2nd Quarter 1989/Table	T. Killeen	EMS	P. Lindahl	2/22/90	2/22/90
QA-50	Guidelines for the Conduct of Operations at Nuclear Power Stations/INPO 85-017		INPO		6/1/85	2/3/90
QA-51	Guidelines for the Conduct of Maintenance at Nuclear Power Stations/INPO 85-038		INPO		12/1/88	2/3/90
QA-52	Environmental Radiological Sampling Functional Appraisal		USDOE-SRO-ED-ECB		9/1/88	2/10/90
QA-53	Envir. Prot. Functional Appraisals of the Envir. Radiological Programs: Atmospheric Releases,Effluent Monitoring Functional Appraisal/Letter	L. Goidell	USDOE-SRO-ED-ECB	J. Roberts	4/29/88	3/6/90
QA-54	Envir. Prot. Functional Appraisals of the Envir. Radiological Programs: Atmospheric Releases,Effluent Monitoring Functional Appraisal/Letter		Du Pont	S. R. Wright	8/8/88	3/6/90
QA-55	The USDOE-SRO Envir.Prot. Functional Final Appraisal Rpt.-Envir.Radiological Programs: Atmospheric Releases Effluent Monitoring Functional Appraisal 12/87 Letter	R. Whitfield	USDOE-SRO	T. Lowe	10/28/88	3/6/90
QA-56	Envir. Prot. Functional Final Report-Appraisal of Envir. Radiological Programs: Atmospheric Releases,Effluent Monitoring Functional Appraisal/Letter		Du Pont	R. Whitfield	1/12/89	3/6/90
QA-57	Supplier Evaluation Report of General Engineering Laboratories/Report-Code No. 180	T. Bargeloh	Du Pont		7/29/88	2/8/90
QA-58	Hold Harmless Agreement Du Pont Supplied Tools & Equipment/Contract		Du Pont	M. Greene	11/1/88	2/8/90
QA-59	Agreement of Indemnification/Contract		Du Pont	M. Greene	11/2/88	2/8/90
QA-60	Bidder's Representation/Agreement		Du Pont	M. Greene	11/2/88	2/8/90
QA-61	Professional Services Terms and Conditions		Du Pont		8/24/88	2/8/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

QA = Quality Assurance

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
QA-62	Analytical Data Specifications/Letter	C. Rogers	WSRC-EMS	C. Cummins	9/29/89	2/8/90
QA-63	Purchase Requisition	C. Cummins	Du Pont	Teledyne Isotopes	10/9/87	2/16/90
QA-64	Update of Action Plan for Environmental Survey of the Savannah River Site (SRS)/Letter	T. Heenan	DOE-SR	R. Berube		3/5/90
QA-65	Comments on Action Plan for Resolution of Findings of DOE-HQ Environmental Survey/Letter	A. McClure	NUS Corp.	J. Layden	2/20/90	3/5/90
QA-66	Action Plan for the Resolution of Findings in the DOE-HQ Environmental Survey of SRS/Letter	W. Reinig	WSRC-EHP Dept	S. R. Wright	2/7/90	3/5/90
QA-67	DOE-HQ Environmental Survey Preliminary Report for Savannah River (SR)/Letter	J. Porter	Du Pont	S. R. Wright	11/3/87	3/5/90
QA-68	Discontinuation of Prior Custodian Notification by HP-EM for Sampling of SRS NPDES Outfalls/IOM ESH-ESG-900148	K. Dyer	EPS	Distribution	3/1/90	3/8/90
QA-69	Draft Envir. Appraisal Report-100 Areas Radiological Release Monitoring Functional Appraisal/Draft Report		DOE-SR		9/1/89	2/23/90
QA-70	Draft DQA Surveillance Program/Draft Procedure DQSP 18-2, Rev. 0		DQA		3/1/90	2/20/90
QA-71	Surveillances/SRP TQO Procedures DPSOP 260		SRP TQD		2/1/88	2/20/90
QA-72	Surveillances/QA Procedure QAP 18-3 Rev. 0		SRP QA		6/15/87	2/20/90
QA-73	Savannah River Plant Surveillance Report/ Report No. 89S-07-023	J. Hart	DQA	E. Megonigal	4/17/89	2/20/90
QA-74	Savannah River Plant Surveillance Report/ Report No. 89S-07-022	J. Hart	DQA	K. Johns	4/7/89	2/20/90
QA-75	Savannah River Plant Surveillance Report/ Report No. 89-07-029	J. Hart	DQA	S. Hightower		2/20/90
QA-76	Savannah River Plant Surveillance Report/ Report No. 89-07-063	D. Cohoon	DQA	D. Stevenson	9/15/89	2/20/90
QA-77	Savannah River Plant Surveillance Report/ Report No. 89-07-024	J. Hart	DQA	E. Megonigal	4/17/89	2/20/90
QA-78	Savannah River Plant Surveillance Report/ Report No. 89S-07-066	C. Brady	DQA	R. Reece	9/18/90	2/20/90
QA-79	Savannah River Plant Surveillance Report/ Report No. 89S-07-086	D. Cohoon	DQA	M. Mathery	11/13/89	2/20/90
QA-80	QA Audit of Analytical Laboratories (DPSP 89-72-23)/ Inter-office Memorandum ESH-QAA-890140	J. Denero	ESH-QA	W. Jacobson R. Dorsett	11/30/89	2/8/90
QA-81	1989 EPA Compliance Evaluation Inspection (CEI) Report/ Report		EPA		5/11/89	2/2/90
QA-82	1989 EPA Compliance Evaluation Inspection-Warning Letter/Letter		EPA		9/8/89	2/2/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

QA = Quality Assurance

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
QA-83	SCDHEC Followup Inspection of Violations Cited During CEI at SRS/Letter		SCDHEC		10/23/89	2/2/90
QA-84	Environmental Information Document QA Program for Environmental Assessment of SRP Waste Sites/Report		Du Pont		3/1/87	2/2/90
QA-85	Environmental Implementation Plan-Vol 2-Protection Programs/Report WSRC-RP-89		WSRC		8/1/89	2/8/90
QA-86	Gross Nonvolatile Alpha and Beta Determinations in Water/DPSOL 271-5-261		HPD		2/9/89	2/15/90
QA-87	Preparation and Radiochemical Analysis of Stack Air Samples/DPSOL-271-5-201		HPD		7/24/85	2/15/90
QA-88	Procurement Level Classification of Consultant Services/Inter-office Memorandum	W. Knopf	SQ	Distribution	6/23/89	3/6/90
QA-89	Procedure Review Reply/Memo	L. Clifton	PED	D. Bignell	8/8/89	3/7/90
QA-90	DOE-SR/ED Functional Appraisal Chronology (For Appraisals Conducted FY89 to Present)/FAX	G. Hoover	DOE-SR/ED	P. Lindahl	3/12/90	3/12/90
QA-91	Environmental Appraisal Report-Water Pollution Control Programs: National Pollutant Discharge Elimination System (NPDES)/Letter ESH 890229	T. Anderson	ESH&QA	T. Heenan	12/19/89	3/8/90
QA-92	Environmental Appraisal Report-Water Pollution Control Programs: National Pollutant Discharge Elimination System (NPDES)/Letter ESH 890150	T. Anderson	ESH&QA	T. Heenan	11/10/89	3/8/90
QA-93	Technical Review-NPDES Functional Appraisal Report/Inter-office Memorandum	K. Dyer	EPS	Managers	6/22/89	3/8/90
QA-94	DOE-SR/ED Functional Appraisal Chronology (for reports issued FY89 to present)/FAX	G. Hoover	DOE-SR/ED	P. Lindahl	3/9/90	3/12/90
QA-95	DOE-SR Envir.Div.Status Report for Major Comprehensive Envir. Protection Evaluation Prog.(CEPEP)Evaluations/FAX	G. Hoover	DOE-SR/ED	P. Lindahl	1/31/90	3/8/90
QA-96	Safe Drinking Water Act Amendments of 1986/ Report PTR-159	R. Turner	Power Dept	J. Juinnies	4/21/88	3/6/90
QA-97	Savannah River Plant Surveillance Report/ Report No. 89S-07-065	C. Brady	DQA	R. Reece	9/18/89	2/20/90
QA-98	Envir. Compliance Report for the Savannah River Site (SRS)/Letter	P. Kaspar	DOE-SR	J. Tuck, L. Duffy P. Brush	2/5/90	?
QA-99	Monthly Env. Compliance Report Savannah River Site January 1990/Report		DOE-SRO & SRSPO		2/1/90	?
QA-100	Proposed FY90 ED Appraisal Schedule/Memo	G. Hoover	DOE-SR/ED	ED Staff	8/15/89	3/6/90
QA-101	Fiscal Year 1990 Contractor Appraisal Schedule/Letter	E. Bowser DOE-SR	P&ME	DOE-SR Director	8/24/89	3/6/90
QA-102	Fiscal Year (FY) 1990 Contractor Appraisal Schedule (Memo) Bowser to Distribution, August 24, 1989/Memo	S. R. Wright	DOE-SR/ED	E. Bowser	10/10/89	3/6/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

QA = Quality Assurance

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
QA-103	Transmittal of Final FY90 Schedule for Environmental Functional Appraisals/Letter	G. DeCamp	NUS Corp	G. Hoover	9/15/89	3/6/90
QA-104	Fiscal Year (FY) 1990 Contractor Appraisal Schedule/ Memorandum	E. Bowser DOE-SR	P&ME	DOE-SR Directorsss	11/17/89	3/6/90
QA-105	FY 1990 Contractor Appraisal Schedule (Memorandum, Bowser to Distribution, 11/17/89/Memo	S. R. Wright	DOE-SR/ED	E. Bowser	12/13/89	3/6/90
QA-106	Savannah River Operations Office (SR) Schedule for Env., Safety, & Health Appraisals-Fiscal Year (FY)88/Letter	R. Morgan	DOE-SR	T. Wade	8/5/87	3/6/90
QA-107	Env., Safety, and Health(ES&H) Appraisal Schedule for Sav. Riv. Oper. Office (SR) Fiscal Year(FY)89/Letter	P. Kaspar	DOE-SR	T. Wade, E. Baynard	8/10/88	3/6/90
QA-108	Environmental Monitoring QA/QC Monthly Report/Report	M. Khalil	EMS	Distribution	2/10/89	2/23/90
QA-109	Environmental Monitoring QA/QC Status Report/Report	M. Khalil	EMS	Distribution	5/15/89	2/23/90
QA-110	Environmental Monitoring QA/QC Status Report/Report	M. Khalil	EMS	Distribution	11/10/89	2/23/90
QA-111	EMS Internal Audit/Form	M. Khalil	EMS		3/30/89	2/23/90
QA-112	EMS Internal Audit/Form	M. Khalil	EMS		6/23/89	2/23/90
QA-113	EMS Internal Audit/Form	M. Khalil	EMS		9/26/89	2/23/90
QA-114	EMS Internal Audit/Form	M. Khalil	EMS		12/5/89	2/23/90
QA-115	ISCO/Paddlewheel Sampler Comparison (U)/Inter-office Memorandum ESH-EMS-9000017	P. Fledderman	EMS	T. Dehart	1/30/90	3/14/90
QA-116	Normandeau Visit/Inter-office Memorandum	M. Khalil	EMS	J. Heffner	3/12/90	3/14/90
QA-117	Performance Review Summary of General Engineering Laboratories/Inter-office Memorandum ESH-EMS-900032	M. Khalil	EMS	J. Heffner, N. Johnson, R. Dorsett, M. Spletzer	3/2/90	3/14/90
QA-118	Performance Review Summary/Letter	C. Rogers	EMS	A. Artmeier	3/12/90	3/14/90
QA-119	Questions Concerning Savannah River Plant's Analysis of Radionuclides, as Reported in the Semi-Annual DOE Quality Assessment Program Report (EML-518)/Letter	D. Stevenson	EMS	L. Goidell	5/8/89	2/20/90
QA-120	Questions Concerning Savannah River Site's Analysis of Radionuclides, as Reported in the Semi-Annual DOE Quality Assessment Program Report (EML-518)/Letter	L. Goidell	DOE-SR	G. Hayes	2/22/89	2/20/90
QA-121	Questions Conderning Savannah River Plant's Analysis of Radionuclides, as Reported, as Reported in the Semi-Annual Department of Energy Quality Assessment Program Report (EML-518)/Letter			S. Wright	3/17/90	2/20/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

QA = Quality Assurance

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Received
QA-122	Results of National Discharge Monitoring Report (DMR) Quality Assurance (QA) Program for the SRS National Pollutant Discharge Elimination System Permit (NPDES) (Letter, Elder to Permit Holder, 8/1/89/Letter	S. Wright	DOE-SR	R. Davis	10/12/89	2/16/90
QA-123	EPA 1989 DMR QA Report Corrective Actions/Letter	R. Downing	Normandequ Assoc.	L. Geary	9/18/89	2/16/90
QA-124	State Environmental Laboratory Certification Regulations Brochure	SCDHEC			April, 1980	2/21/90
QA-125	Draft Chemistry Laboratory Quality Assurance Manual/ Manual	Normandeau Assoc.			March, 1989	2/21/90
QA-126	Normandeau Associates Data Management Policy/Policy Letter	Normandeau Assoc.				2/21/90
QA-127	NAI Methods and Detection Limits/Table	Normandeu Assoc.			8/1/89	2/21/90
QA-128	NAI Southeast Certifications/Table	Normandeau Assoc.			12/8/89	2/21/90
QA-129	TWM Normandeau Associates, Inc. Organization/ Organization Chart	Normandeau Assoc.			1/2/90	2/21/90
QA-130	NAI Southeast Organization/Organization Chart	Normandeu Assoc.				2/21/90
QA-131	Audit of Normandeau Associates, New Ellenton, SC, August 3, 1989/Memo	M. Khalil, L. Geary	EMS	N. Johnson	10/3/89	2/21/90
QA-132	U.S. EPA Water Pollution Studies Audit History/Report	Normandeau Assoc.				2/21/90
QA-133	Specification for Procurement of Analytical Services for NPDES Samples/specifications	Du Pont			1/5/89	2/21/90
QA-134	TWM Normandeau Associates/Brochure	Normandeau Assoc.				2/21/90
QA-135	NPDES Samples/Report	Normandeau Assoc.		L. Geary	12/11/89	2/21/90
QA-136	NPDES Samples Environmental Collections Chain of Custody Records/Form	T. Calliham	EMS	K. Rowe	11/28/89	2/21/90
QA-137	Sampling/Analytical Flow-Chart/Statement Letter	NAI-Southside Reg. Off.-Chemistry Div.				2/21/90
QA-138	Sample Results Investigation Report/Form	Normandeau Assoc.				2/21/90
QA-139	Purchase Order, Westinghouse Savannah River Company/ Form	M. Spletzer	WSRC	G. Eidson	4/13/89	2/21/90
QA-140	Reason for Purchase Requisition/Document		EMS			2/21/90
QA-141	SCDHEC Environmental Quality Control Laboratory Cert. Program/Certificate	W. Davis	SCDHEC	Normandeau Assoc.	2/2/90	2/21/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-1	Application for EPA Approval of Construction of the DWPF (NESHAP Permit Application)		DOE-SR	EPA	3/27/87	2/21/90
R-2	SCDHEC Permit Procedures "How" Manual DPSP-86-1026		Du Pont		5/1/86	2/27/90
R-3	Environmental Radiological Programs: Atmospheric Releases Effluent Monitoring Appraisal		NUS-DOE	Du Pont	12/1/87	2/20/90
R-4	Environmental Radiological Sampling Functional Appraisal		NUS-DOE	Du Pont	9/1/88	2/20/90
R-5	Monthly Environmental Compliance Report-Savannah River Site - January 1990		DOE-SR	DOE-HQ	2/1/90	2/28/90
R-6	Sample Identification-directions on labeling effluent samples for lab analyses	Larry Spradley	W- HP	Area HP Managers	2/1/90	3/1/90
R-7	A Critique of the Environmental Monitoring Program at the Savannah River Plant	John Till	Radiological Assess-ments Corp.	Du Pont	12/31/85	3/1/90
R-8	Savannah River Waste Management Program Plan FY1990 DOE/SR-WM-90-1		DOE-SR		12/1/89	3/2/90
R-9	Review of Radiological Effluent Monitoring, Analytical Techniques and Reporting HPR-86-270	C. Zeigler	Du Pont	R. Krump	11/14/86	3/1/90
R-10	DPSOP 271-1 Environmental Monitoring-Collections		Du Pont		12/1/88	2/19/90
R-11	DPSOP 271-2 Environmental Monitoring-Instrumental Analysis and Data Management		Du Pont		7/1/86	2/19/90
R-12	DPSOP 271-5 Environmental Monitoring-Radioactive Analyses		Du Pont		12/1/89	2/19/90
R-13	Environmental Appraisal Report of the Radiological Atmos. Effluent Monitoring Program at the Tritium Facilities		DOE-SR		10/1/85	2/22/90
R-14	Savannah River Plant Airborne Emissions and Controls DPST-82-1054	E. Dukes R. Bergramon	Du Pont		12/1/82	2/16/90
R-15	EHP Calibration Procedures - interoffice memo	R. Sullivan	WSRC	SR Distribution	1/11/90	2/14/90
R-16	DPSOL 193-4-301A HP Annual Calibration of Tritium Facilities Exhaust Stack Monitors		Du Pont		3/31/87	2/14/90
R-17	Design Specifications for Savannah River Site Atmos-pheric Effluent Sampling Systems	G. Earle	WSRC		7/5/89	2/20/90
R-18	DPSOP 193-3 Airborne Effluent Monitoring		Du Pont		8/1/89	2/16/90
R-19	Disassembly Ventilation System-105 P,L,&C	J. Croft	Du Pont	Plant Engineering	4/8/85	2/27/90
R-20	Liquid Effluents from the Tritium Facilities	P. Rowan	WSRC	J. Berger (TT)	2/20/90	2/22/90
R-21	Letter re: Effluent Monitoring Functional Appraisal of 12/87	M. Dukes	WSRC	L. Gordell DOE	10/4/89	2/21/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-22	Letter re: Effluent Monitoring Functional Appraisal of 12/87	T. Heenan	DOE-SR	T. Anderson	no date	2/21/90
R-23	Letter re: Effluent Monitoring Functional Appraisal of 12/87	T. Anderson	WSRC	T. Heenan	6/1/89	2/21/90
R-24	Letter re: Effluent Monitoring Functional Appraisal of 12/87	T. Anderson	WSRC	T. Heenan	5/5/89	2/21/90
R-25	Letter re: Effluent Monitoring Functional Appraisal of 12/87	G. DeCamp	NUS	G. Hoover	3/17/89	2/20/90
R-26	Letter re: Effluent Monitoring Functional Appraisal of 12/87	D. Dougherty	NUS	G. DeCamp	3/8/89	2/20/90
R-27	Letter re: Effluent Monitoring Functional Appraisal of 12/87	A. Peters	Du Pont	R. Whitfield	2/15/89	2/20/90
R-28	Letter re: Effluent Monitoring Functional Appraisal of 12/87	R. Whitfield	DOE-SR	J. Lowe	10/28/88	2/20/90
R-29	Health Protection Internal Audit - 100L Inter-office memo	J. McClam	Du Pont	G. Hayes	2/6/87	2/23/90
R-30	Letter re: Effluent Monitoring Functional Appraisal of 12/87	L. Goidell	DOE-SR	J. Roberts	4/29/88	2/27/90
R-31	Letter re: Effluent Monitoring Functional Appraisal of 12/87	C. Muska	Du Pont	S. Wright	8/8/88	2/27/90
R-32	Memo re: Effluent Monitoring Functional Appraisal of 12/87	J. Huang	Du Pont	Distribution	11/4/88	2/27/90
R-33	Letter re: Effluent Monitoring Functional Appraisal of 12/87	A. Peters	Du Pont	R. Whitfield	1/12/89	2/27/90
R-34	Report of Independent Review Group to Assess Radiological Environm. Mon. Prog. Conducted by Savannah Riv.Plant	M. Carter	Georgia Tech	S. Wright	10/20/85	3/1/90
R-35	Memo: Review of Second Draft of DOE 5400.XY	D. Ratchford	WSRC	J. Lettrell	9/27/89	2/15/90
R-36	DPSOP 193 Radiation Survey Procedures		Du Pont/WSRC		9/1/89	3/1/90
R-37	DPSOP 40 Radiation and Contamination Control		Du Pont/WSRC		9/1/89	3/1/90
R-38	Disposal of Segregated Clean Waste DPSOX-10068	V. Wheeler	Du Pont		3/30/87	2/27/90
R-39	DPSOL 221-F-8044 Handling Clean Waste and Compactable Waste at 221-F		Du Pont		9/1/88	2/15/90
R-40	Waste Acceptance Criteria	P. Redd	WSRC		1/12/90	2/27/90
R-41	Savannah River Site Environmental Report for 1988 Volumes I & II (WSRC-RP-89-59-1)	H. Davis, et al	WSRC		None	2/13-3/8/90
R-42	Westinghouse Savannah River Company ESH&QA - Related Order Compliance Plan Volumes I & II (WSRC-RP-89-738)		WSRC		9/30/89	3/5/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-43	Studies of Aquatic and Terrestrial Environments of the Savannah River Plant, South Carolina	J. Wiener & M. Smith	SREL		5/1/81	3/6/90
R-44	Avian Radioecology	I. Brisbin	SREL		None	3/6/90
R-45	DPSOP 292 Health Protection Procedures Manual		Du Pont		12/1/89	3/7/90
R-46	DPSOL 709-G-13 Offsite Shipment of NRHW Drums		Du Pont		9/1/88	3/7/90
R-47	Letter re: Acceptance of Waste for Treatment	B. Marti	SCA Chem Services	D. Zecha	11/16/87	3/7/90
R-48	Letter re: Acceptance of Waste for Treatment	R. Stiff	Ross Env. Services	D. Zecha	6/9/88	3/7/90
R-49	Letter re: Radiological Criteria for Releasing Materials from SRS	W. Reinig	WSRC	S. Wright	10/5/89	3/7/90
R-50	Letter re: ES&H Approval Schedule for Savannah River Operations Office FY 1990	G. Hoover	DOE-SR	ED Staff	8/15/89	3/7/90
R-51	DPSP 80-1033 Plant Decommissioning (for DWPF)		Du Pont		6/1/84	3/13/90
R-52	ESH-900013 Monthly	T. Anderson	WSRC	T. Heenan	3/5/90	3/13/90
R-53	WSRC-RP-89-1011 Savannah River Site Environmental Data Management Plan	C. Storey	WSRC		10/1/89	3/13/90
R-54	DPSOL 709-G-3 Paking and Receipt Requirements of Small Containers of Radioactive (Mixed) or Nonradioactive Hazardous Waste (NRWH)		Du Pont		1/18/89	3/13/90
R-55	DPSOL 709-G-5 Identification of Radioactive (Mixed) or Nonradioactive Hazardous Waste (NRWH)		Du Pont		7/1/88	3/13/90
R-56	DPSOP 138.3 Waste Handling Facilities		Du Pont		10/1/89	3/13/90
R-57	Study Report-DWPF-DOE Order Compliance Review (6430.1A)		United Engineers & Constructors		6/9/89	3/13/90
R-58	CH-4, WW-33, WISR-39, and TSA FR-21 Restart Issue Evaluation		Specs		2/2/90	2/2/90
R-59	Evaluation: Env. Release Limits Comments on Restart Criteria		DOE-SR-EO	T. M. Tram REO	1/31/90	2/290
R-60	Comments on WSRC Response to Surveillence Report 07-01-89-0004 (SRC File Cy 07-01-89-0009)		DOE-SR-EO			2/2/90
R-61	Response to Dept of Energy Env. Rad Surveillance Summary Rpt. 07-01-89-0003, 0004, 0007, 0009	W. Reinig	ESHPD	S. Wright	2/20/90	3/8/90
R-62	Assessment - Controls on Reactor Env. Releases	C. L. Peckinpaugh		R. E. Tiller	7/25/89	2/21/90
R-63	SR Site Admin. Control Tech Specs R. E. Tiller to J. L. Gallagher, VP/GM WSRC Rx Restart	R. E. Tiller		J. L. Gallagher WSRC VP/GM	1/12/90	3/8/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-64	Env. Radiological Surveillance - P Reactor Tritium Release of Dec 17, 1988	S. R. Wright	DOE-SR-EO	W. C. Reinig	1/3/90	2/20/90
R-65	Env. Radiological Surveillance - P Reactor Tritium Release of Dec 17, 1988	J. S. Roberts	E&E, Du Pont	S. R. Wright DOE-SR-EO	3/9/89	2/20/90
R-66	ERS of ISEP Safety Objectives	Sharon Parks	RAFTS	NUS	12/23/88	2/20/90
R-67	Surveillance Summary Report K Reactor NO-07-01-89-0004 Finding 2	D. N. Zweifel	NUS	S. M. Altman	12/12/88	2/20/90
R-68	Env Radiological Surveillance of ISEP Safety Objectives ISEP 11-3		106-K Area		12/23/88	2/2/90
R-69	Operational Compliance Implementation Plan Vol I & II		NUS Corp		9/29/89	2/20/90
R-70	Compliance Implementation Evaluation Report Vol III of Env. Compliance Implementation Plan	Sharon Parks	NUS		4/6/89	2/2/90
R-71	Comprehensive Env. Protection Evaluation Program	Sharon Parks	NUS		9/20/89	2/20/90
R-72	Radiological Environmental Program Report	Sharon Parks	NUS		9/8/88	2/20/90
R-73	Env. Compliance Tracking Vol. II Settlement Agreement Consent Orders	Sharon Parks	NUS		11/3/89	2/20/90
R-74	Env Compliance Tracking Memoranda of Agreements Status of Compliance Miscellaneous	Sharon Parks	NUS		10/27/89	2/20/90
R-75	Env Compliance Tracking Vol III Notices of Violation	Sharon Parks	NUS		10/27/89	2/20/90
R-76	Env. Appraisal 100M Areas Radiological Release Sept '89 RAFTS Report 07-01-89-0067				1/8/90	2/20/90
R-77	Wackenhut Services Presentation for Tiger Team Visitors	M. Cossgrove	Wackenhut		2/9/90	2/9/90
R-78	DPSOL 221-F-9406 Segregated Cooling Water System Increased Activity DPSOP Ref 130-8 Bldg 221-F					
R-79	Env. Rad Surveillance WCWI P Reactor Tritium Release 10/12/1988 (A041141 009.3.FB.4)				10/12/88	2/9/90
R-80	Structural Safety Review P Reactor Components A041141				5/13/88	2/9/90
R-81	NPDES Compliance Sampling by DHEC	M. D. Dukes		M. Tyrrell	1/25/89	2/14/90
R-82	Application for NPDES Permit SC000175 June 30, 1988 Outfall H-012	M. Tyrrell			6/30/88	2/14/90
R-83	Application for NPDES Permit SC000175 June 30, 1988 Outfall F-001	M. Tyrrell			6/30/88	2/14/90
R-84	Application for NPDES Permit SC000175 June 30, 1988 Outfall F-002	M. Tyrrell			6/30/88	2/14/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-85	Application for NPDES Permit SC000175 June 30, 1988 Outfall F-005	M. Tyrrell			6/30/88	2/14/90
R-86	Application for NPDES Permit SC000175 June 30, 1988 Outfall H-004	M. Tyrrell			6/30/88	2/14/90
R-87	Non Process Cooling H2O to Unnamed Tributary of Upper 3 Runs Creek which empties into the Savannah River	M. Tyrrell			6/30/88	2/14/90
R-88	US DOE SRP Consent Order Aiken/Allendale/Barnwell SC9999175	Dept. of Health & Env. Control NPDES			12/14/83	2/14/90
R-89	DPSOL 221-H-9407Q Emergency Actions Following Increased Activity in Circulation Cooling Water		Du Pont		11/13/89	2/14/90
R-90	Health Protection Organization DPSOL 292-202		Du Pont		7/13/87	2/5/90
R-91	Health Protection Requirements of Visitors DPSOL 193-220		Du Pont		9/7/89	2/5/90
R-92	Work Clearance Permit DPSOP 40		Du Pont		8/1/88	2/5/90
R-93	Radiation Survey Logsheet OSR 4-17		Du Pont		3/1/89	2/5/90
R-94	Response to the Areas for Concern in the DOE HP Review of SRS	Walt Loring			7/19/89	2/5/90
R-95	Commitment Status DOE Order 5480.11	Walt Loring			12/1/89	2/5/90
R-96	Health Physics Review Implementation	Walt Loring		J. Crawford	1/10/90	2/5/90
R-97	Implementation Plan for DOE Order 5480.11 Attachment 1	Kaspar		Troy Wade	12/21/88	2/5/90
R-98	Monitors Cooling Water; Maintenance and Service Test 281-4F/H 281-GFH DPSOL W-782002		Du Pont		9/15/82	2/5/90
R-99	Contamination Cases	D. D. Wise		W. C. Reinig	1/4/90	2/5/90
R-100	Root Cause of Contamination Bldg 704-S	Walt Loring			1/31/90	2/5/90
R-101	Radiological Posting Procedures	Walt Loring			2/5/90	2/5/90
R-102	Health Protection Survey Responsibilities	Walt Loring			2/25/85	2/5/90
R-103	Rad Protection Overview (Draft)	Steve Velen			2/28/90	2/28/90
R-104	Organization Chart Env. & Health Protection Dept	Walt Loring			12/10/89	2/5/90
R-105	F/H Atmospheric Release Data	Walt Loring	HP		2/5/90	2/5/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-106	Radiation 3 Contamination Control DPSOP 40				9/1/89	2/5/90
R-107	Discharge Monitoring Report '89 F01, H0017, F02, F05, H04, H12				1/2/89	2/14/90
R-108	Health Physics Review of SRC	R. Starosteci		P. Kaspar	1/23/89	2/5/90
R-109	Westinghouse Gvt. Ops. Safety & Env. Oversite Review Tritium Facility	Walt Loring			2/5/90	2/5/90
R-110	SRP Radiation Exposure Summary	Walt Loring			1988	2/5/90
R-111	Bldg 221-H Access Door Control DPSOL 221-H-9951					
R-112	Project S-1780 DWPF EPA Air Permit	J. B. Mellen			6/8/87	2/5/90
R-113	Safety Investigation P Reactor Tampering	R. Starosteci			10/30/87	3/9/90
R-114	Report of DOE P Reactor Shutdown Event Review DOE ID 10212 (UCNI)				8/1/88	3/9/90
R-115	Investigative Report of the Water Hammer In the Secondary Loop K Reactor				2/28/89	3/9/90
R-116	Tiger Team K Reactor Moderator Incident	Peel/Heintzelman			2/13/90	2/13/90
R-117	SR Site D&D Forecast DPSP-89-1055				3/1/89	3/8/90
R-118	ER Budget 91	K. S. Kotti	Long Range Planning		3/8/90	3/8/90
R-119	Savannah River Site Decontamination & Decommissioning Slides 10/5/89 (Hard copy of presentation)				10/5/89	3/8/90
R-120	Defense D&D Program (UCNI) PLD-LRP-890001				5/31/89	3/8/90
R-121	Savannah River Site Strategic Facilities Plan 1989-1995 WSRC-P-89-5-3				4/1/89	3/8/90
R-122	Long Range Plan for the Operation of the Savannah River Plant & Laboratory DPSP-LRP-88-4				12/1/88	3/8/90
R-123	Canyon Exhaust Upgrade Program	R. L. Geddes	R. L. Geddes		1/18/90	
R-124	Savannah River Site Emergency Mgmt Handbook	R. Zimmerman	WSRC		2/7/90	2/8/90
R-125	DOE-SR Self Assessment Clarifying Expectations	DOE-SR			2/7/90	2/8/90
R-126	Tech Safety Appraisal of SR Production Reactors	W. C. Reinig		G. F. Merz	1/20/87	2/5/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-127	SRP Reactor Dept Special Hazards Investigation No. 476 SHI No. 476 Tritium Exp 105K				9/14/88	2/5/90
R-128	SRP Reactor Lab Special Hazards Investigation No. 487 SHI No. 487 - 40 Side Pump Room 105K 3H Release				10/17/89	2/5/90
R-129	Response to Internal Appraisal #89-022 H. J. Stafford to B. D. Reed, 703-F 11/15/89 ESH-HPK-890010				11/15/89	2/5/90
R-130	Personnel Radiation Exposure - Dec 1989 1989 Whole Body Exposure				1/14/90	2/5/90
R-131	Start Program Modifications WS-07936	W. S. Loring			1/7/90	2/5/90
R-132	Energy Daily Vol 17 No. 238 Monday Dec 18, 1989	Danielle Weaver			12/18/89	2/5/90
R-133	SWE Special Procedures Log	M. Zeigler			1/15-2/5/90	2/5/90
R-134	U.S. DOE Tech Safety Appraisal of SR Production Reactors DOE/EH-0028				10/1/86	2/5/90
R-135	Circulated Cooling Water Emergency Actions DPSOL 221-F-9407				1/1/89	2/14/90
R-136	Disposal of Clean Segregated Waste Contamination or Garbage Truck (Outside)	V. B. Wheeler			3/30/87	3/8/90
R-137	Operations & Materials Div. Event Notification Form 84-39	Bill Chambers			6/22/89	3/8/90
R-138	Request for Flow Meters P, L, K Process Sewer	C. E. Jewell			6/1/89	3/8/90
R-139	Review of Stack Sampling & Analytical Protocol F/H Effluent Trt./DWPF	Winston Smith	AAPTAC EPA's		12/1/88	3/8/90
R-140	Env. Functional Appraisals	J. S. Roberts		S. R. Wright	1/5/90	2/5/90
R-141	Sampling 221-F Segregated Cooling Water Manholes DPSOL 193-2-302					2/14/90
R-142	200F Improved Segregated Water Delaying Basin Basic Data Report	J. P. Duane		R. Geddes	2/16/90	2/14/90
R-143	281-4F 281-G F/H Monitors, Cooling Water Monitor Source Test DPSOL W-782002				9/15/82	2/14/90
R-144	Segregated Cooling Water System Emergency Action DPSOL 221-F-9406					
R-145	Canyon Inventory Radionuclides	D. Ratchford			2/16/90	2/16/90
R-146	Calibration of Ionization Chambers Kanne Basis 890643 SRL-ELC-890076				8/2/89	2/14/90
R-147	Radiation Exposure Report DPSPU-89-11-1				1/1/89	2/14/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-148	Circulating Cooling H2O EA's DPSOL 221-F-9407				1/1/89	2/14/90
R-149	Conceptual Design Report Reactor Isotopic Monitor Systems (90-SR-024 Project)	W. F. Swift			2/1/88	2/14/90
R-150	Atmospheric/Liquid Releases ESH-EMS-890011				11/1/89	2/14/90
R-151	Guides for Environmental Releases DPSOL-292-401				3/4/88	2/14/90
R-152	HP Internal Appraisal #89-034 ESH-POS-89-0065				12/18/89	2/14/90
R-153	Reactor Isotopic Release Monitoring System 90-SR-024 Project				1115/89	2/14/90
R-154	Count Rate Meter Maintenance and Calibration DPSOL W-782011				11/10/88	2/14/90
R-155	Victoreen Gamma Guard Check Out DPSOL W-782019				9/18/89	2/14/90
R-156	SR EH Protection Internal Appraisal Contamination Control 105K, 105C Appraisal No. 89-022				10/17/89	2/14/90
R-157	SRS Monthly Exposure Rpt	W. H. Carlton			1/8/89	2/14/90
R-158	Calibration of Eberline PCM-1B SE-90-SP-8052				1/24/90	2/14/90
R-159	DOE-SR-EO Major Comprehensive Environmental Protection Evaluation Program (CEPEP FY87-1/10/90)	G. Hoover			1/10/90	2/22/90
R-160	Qualification of Hazards Associated with the Decay Storage Disp. of Tritium Crucibles WSRC-RP-89-1226TC				11/29/89	3/9/90
R-161	Radiological Performance Indicators ESH-HPT-890749				12/1/89	2/5/90
R-162	ANSI N13.1 - Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities		Americal National Standards Institute		1969	2/13/90
R-163	ANSI N42.18, Specifications & Performance of Onsite Instrumentation for Continuously Monitoring Radioactivity in Effluents		Americal National Standards Institute		1980	2/13/90
R-164	Title 40 CFR Environmental Protection (NESHAP) Part 61 (Revision)		Environmental Protection Agency		Dec-89	2/13/90
R-165	Title 49 CFR Transportation		Dept. of Transportation			2/13/90
R-166	DOE Order 5400.1, General Environmental Protection Programs		DOE		Nov-88	2/13/90
R-167	DOE Order 5400.3, Hazardous & Mixed Waste Program		DOE		Feb-89	2/13/90
R-168	DOE Order 5400.5, Radiation Protection of the Public and the Environment		DOE		Feb-90	2/13/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

R = Radiation

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
R-169	DOE Order 5400.XY, Radiological Effluent Monitoring & Environmental Surveillance		DOE		Sep-88	2/13/90
R-170	DOE Order 5480.4, Environmental Protection Safety, and Health Protection Standards		DOE		May-84	2/13/90
R-171	DOE Order 5482.9B, Environment, Safety and Health Appraisal Program		DOE		Sep-86	2/13/90
R-172	DOE Order 5484.1, Environmental Protection, Safety & Health Protection Information Reporting Requirements		DOE		Feb-81	2/13/90
R-173	DOE Order 5700.6B, Quality Assurance		DOE		Sep-86	2/13/90
R-174	DOE Order 6430.1A, General Design Criteria		DOE			2/13/90
R-175	Title 10 CFR Atomic Energy		Nuclear Regulatory Commission			2/13/90
R-176	INPO 85-038, Guidelines for the Conduct of Maintenance at Nuclear Power Stations		INPO		1985	2/13/90
R-177	INPO 85-017, Guidelines for the Conduct of Operations at Nuclear Power Stations		INPO		1985	2/13/90
R-178	DOE Order 5400.2A, Environmental Compliance Issue Coordination		DOE		Jan-89	3/14/90
R-179	DOE Order 5820.2A, Radioactive Waste Management		DOE		Sep-88	2/13/90
R-180	ASME NQA-1 Quality Assurance Program Requirements for Nuclear Facilities		American Society of Mechanical Engineers		Sep-89	2/13/90
R-181	Environmental Survey Preliminary Report-Savannah River Plant DOE/EH/OEV-10-P		DOE		8/1/87	2/13/90
R-182	Title 40 CFR Part 261		EPA		?	2/13/90
R-183	DOE Order 1540.2 Hazardous Material Packaging for Transport-Administrative Procedures				Sept.-1986	2/13/90
R-184	DOE Order 5480.6 Safety of Department of Energy-owned Nuclear Reactors		DOE		Sept.-1986	2/13/90
R-185	Letter re: Release Criteria Used at the Savannah River Site	S. Wright	DOE-SR	J. Tseng	12/13/89	2/13/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

N = NEPA

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
N-1	Engineering & Training Bldg, 730-M, Project S-2528	M. J. Sires	AMO	Memo to File	1/14/85	12/1/89
N-2	Support Services Building, 707-F	M. J. Sires	AMO	Memo to File	1/15/85	12/1/89
N-3	Geometrically Favorable Dissolver, TNX Area	M. J. Sirea	AMO	Memo to File	1/28/85	12/1/89
N-4	Disposal of the SREL 6000 Ci C-137 Source TA 2-998	J. S. Roberts	SRP	J. A. Porter	1/29/85	12/1/89
N-5	Engineered Low-Level Trench Demonstration, TA 2-1062	J. S. Roberts	SRP	J. A. Porter	2/1/85	12/1/89
N-6	Engineering & Training Bldg., 730-A, Project S-2530	C. H. Fox	AMPM	Memo to File	3/7/85	12/1/89
N-7	Computer & Communications Repair Bldg. 722-5A, Project S-3159, 700 Area	C. H. Fox	AMPM	Memo to File	4/1/85	12/1/89
N-8	Support Services Lower 700 Area, Bldg. 716-2A, Project S-2529	C. H. Fox	AMPM	Memo to File	4/3/85	12/1/89
N-9	Engineering Test Facility - Precipitate Hydrolysis Experimental Facility (PHEF), T-Area	C. H. Fox	AMPM	Memo to File	4/15/85	12/1/89
N-10	Facility Storage Modifications for Building 313-M, M-Area	M. J. Sires	AMO	Memo to File	4/26/85	12/890
N-11	Effluent Treatment Plant, T-Area	C. H. Fox	AMPM	Memo to File	5/6/85	Dec-89
N-12	FB-Line Restoration, Phase II, Building 221-F (F-Area), Project S-4116	M. J. Sires	AMO	Memo to File	5/31/85	Dec-89
N-13	Emergency Management Center (EMC), Building 703-A	M. J. Sires	AMO	Memo to File	6/14/85	Dec-89
N-14	Waste Compactor, Building 313-M	M. J. Sires	AMO	Memo to File	6/17/85	Dec-89
N-15	Low-Level Waste Compaction Test Facility, Building 253-H	M. J. Sires	AMO	Memo to File	6/27/85	Dec-89
N-16	Replace Domestic Deepwells: 905-39F, F-Area; 905-94K, K-Area, Project S-2612 and S-3178	C. H. Fox	AMPM	Memo to File	8/1/85	Dec-89
N-17	Savannah River Laboratory Boat Dock on the Savannah River	L. Lewis	AMPM	Memo to File	8/1/85	Dec-89
N-18	Above Grade Operation Demonstration, 643-7G	M. J. Sires	AMO	Memo to File	8/7/85	Dec-89
N-19	Ashcrete Facility Demonstration, H-Area, Project S-3772	M. J. Sires	AMO	Memo to File	8/29/85	Dec-89
N-20	Above Ground Operation Demonstration; 643-7G, New Info. for Approved Memo to File (MTF) Dated 8/7/85	M. J. Sires	AMO	Memo to File	9/9/85	Dec-89
N-21	Vogtle to SRP 230 Kilovolt (KV) Transmission Line	M. J. Sires	AMO	Memo to File	9/17/85	Dec-89
N-22	Power Supply to Radio Repeater, L-Lake	C. H. Fox	AMPM	Memo to File	10/8/85	Dec-89

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

N = NEPA

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
N-23	Personnel Building Facility, Building 225-H, H-Area	C. H. Fox	AMPM	Memo to File	10/29/85	Dec-89
N-24	Fuel Production Facility, Building 225-H, H-Area	C. H. Fox	AMPM	Memo to File	11/12/85	Dec-89
N-25	Replace Domestic Wells: 905-114G at the 681-3G Pumphouse & 905-115G at Aiken Barricade No. 2, Project S-9617 and Problem 6-1519	C. H. Fox	AMPM	Memo to File	12/5/85	Dec-89
N-26	Demonstration Integrated Defense Waste Processing Facility (DWPF) Melter System, T-Area	C. H. Fox	AMPM	Memo to File	12/17/85	Dec-89
N-27	TNX R&D Office Facility, Building 704-1T, Project S-2605, T-Area	C. H. Fox	AMPM	Memo to File	3/7/86	Dec-89
N-28	L-Lake Boat Dock & Launch Ramp on L-Lake	C. H. Fox	AMPM	Memo to File	3/7/86	Dec-89
N-29	Sanitary Landfill Expansion, 740-G	M. J. Sires	AMO	Memo to File	6/5/86	Dec-89
N-30	Replace Domestic Water Wells: 905-6G at the Allendale Barricade & 905-116G at the Patrol Pistol Range	C. H. Fox	AMPM	Memo to File	6/10/86	Dec-89
N-31	Computer Building, Building 703-44A	C. H. Fox	AMPM	Memo to File	6/11/86	Dec-89
N-32	Video Systems & Safeguards Equipment Repair Facility, Building 717-K	M. J. Sires	AMO	Memo to File	6/18/86	Dec-89
N-33	Replace Domestic Water Well: 905-66H, H-Area	C. H. Fox	AMPM	Memo to File	7/1/86	Dec-89
N-34	F/H Effluent Treatment Maintenance Facility, H-Area	C, H. Fox	AMPM	Memo to File	8/12/86	Dec-89
N-35	Regulated Equipment Maintenance Facility, 646-G	M. J. Sires	AMO	Memo to File	9/5/86	Dec-89
N-36	Additional Modifications to the Naval Reactor Fuel Mat. Fac. Env. Assessment (FMF EA; DOE/EA-0170)	C. H. Fox	AMPM	Memo to File	8/13/86	Dec-89
N-37	Central Records Facility, Building 773-52A	M. J. Sires	AMO	Memo to File	2/12/88	Dec-89
N-38	S&S Equipment Facility, 284-10F	M. J. Sires	AMO	Memo to File	2/16/88	Dec-89
N-39	Replace Augusta Barricade Well (905-10G) with new well (905-11G)	M. J. Sires	AMO	Memo to File	2/19/88	Dec-89
N-40	Savannah River Ecology Laboratory, Chemical Ecology Laboratory, Building 772-25G, TC-Area	S. P. Cowan	AMPM	Memo to File	3/20/87	Dec-89
N-41	Equipment Storage & Health Protection Facility, Building 221-25F	S. P. Cowan	AMPM	Memo to File	4/3/87	Dec-89
N-42	Landfill Monitor Building, 642-G	M. J. Sires	AMO	Memo to File	5/19/87	Dec-89
N-43	Administrative Control Building, Building 703-46-A	M. J. Sires	AMO	Memo to File	5/26/87	Dec-89

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

N = NEPA

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
N-44	Reactor Training Building, Building 705-C	M J. Sires	AMO	Memo to File	7/29/87	Dec-89
N-45	Administrative Services Building, Building 773-51A	S. P. Cowan	AMPM	Memo to File	8/22/87	Dec-89
N-46	Replace Domestic Water Wells: 905-6G at the Allendale Barricade	M. J. Sires	AMO	Memo to File	8/24/87	Dec-89
N-47	F/H Effluent Treatment Facility (ETF), H-Area (Supplement to MTF	M. J. Sires	AMO	Memo to File	8/27/87	Dec-89
N-48	Replace Domestic Water Well (905-93P) with new well (905-120P), P-Area	M. J. Sires	AMO	Memo to File	8/27/87	Dec-89
N-49	F to H Steam Line, F- and H-Areas	M. J. Sires	AMO	Memo to File	9/1/87	Dec-89
N-50	Low Level Beta-Gamma Waste Incinerator Demonstration, Building 230-H (Supplemental MTF)	M. J. Sires	AMO	Memo to File	9/4/87	Dec-89
N-51	Replace Central Shops Well (905-71G)	M. J. Sires	AMO	Memo to File	5/26/88	Dec-89
N-52	Modifications to the Defense Waste Processing Facility (DWPF) Environmental Impact Statement (EIS) (DOE/EIS-0082 & the Waste Form Selection Environmental Assessment (DOE/EA-0179)	L. Lewis	AMPM	Memo to File	6/3/88	Dec-89
N-53	Addt'l Modifications to the Defense Waste Processing Facility (DWPF) EIS (DOE-EIS-0082)	M. J. Sires	AMO	Memo to File	7/15/88	Dec-89
N-54	Mixed Waste Management Facility Closure (MWMF), 643-28G	R. L. Chandler	Acting Deputy Asst Mgr- Fac Operations	Memo to File	11/11/88	Dec-89
N-55	New Whole Body Counter (WBC) Facility, 700-Area	M. N. Silverman	Acting AMPM	Memo to File	12/13/88	Dec-89
N-56	Construct Process Well, 200-H	M. N. Silverman	Acting AMPM	Memo to File	12/13/88	Dec-89
N-57	Material Mgmt Receiving & Storage Facilities, Central Shops Area, Savannah River Site (SRS)	J. S. Cote and E. S. Chaput	Acting AMPM & AMA	Memo to File	10/16/89	2/6/90
N-58	Primary & Backup Domestic Waterwells, D-Area, Savannah River Site (SRS)	J. S. Cote	Acting AMPM	Memo to File	10/16/89	2/6/90
N-59	The 100-Area Fire Station, 709-G, Savannah River Site	M. N. Silverman and R. E. Tiller	AMPM SRSPL	Memo to File	10/16/89	2/6/90
N-60	Fire Alarm & Safeguard Support Bldg, 722-9A Savannah River Site	M. N. Silverman	AMPM	Memo to File	10/16/89	2/6/90
N-61	Engineering Center Bldg, B-Area, Savannah River Site	J. S. Cote	Acting AMPM	Memo to File	10/16/89	2/6/90
N-62	Domestic Water Well, B-Area, Savannah River Site	J. S. Cote	Acting AMPM	Memo to File	10/19/89	2/6/90
N-63	Reactor Charged/Discharge Trng Simulator Facility, Savannah River Site	R. E. Tiller and & M. N. Silverman	Acting Dir, SRSPO AMPM	Memo to File	10/31/89	2/6/90
N-64	Cold Run-In Test of the Equipment Retirement & Reclamation Fac. (Pu-238 Incinerator), TNX Area, SRP	M. J. Sires	AMO	Memo to File	1/18/85	2/6/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

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*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
N-65	New Info. for Approved Memo-to-File (MTF), Cold Run-In Test of the Pu-238 Waste Incinerator, TNX Area	M. J. Sires	AMO	Supplement to Memo to File	2/20/85	2/6/90
N-66	Engineering & Trng Bldg, 730-M, Project S-2528, Savannah River Plant	M. J. Sires	AMO	Memo to File	1/14/85	2/6/90
N-67	NEPA Recommendation, Natural Resources Management Plan - SRS	W. C. Reinig	E&HPD	S. R. Wright	11/21/89	2/5/90
N-68	NEPA Recommendation, Environmental Info, Uranium Solidification Facility, Bldg 221-H	W. C. Reinig, Manager	E&HPD	S. R. Wright	11/21/89	2/6/90
N-69	Conversion to Mark 15 Reactor Fuel, Mark 15 Reactor Fuel Fabrication, Savannah River Plant	E. S. Goldberg	AMO	Memo to File	4/4/83	2/5/90
N-70	Environmental Evaluation Impact Analysis, Geometrically Favorable Dissolver - TNX, DPSP-84-1081	L. M. Smolarek	Tech Div, SRL	J. S. Roberts	10/25/84	2/6/90
N-71	Low-Level Beta-Gamma Waste Incinerator Demonstration, Building 230-H, Savannah River Plant	E. S. Goldberg	AMO	Memo to File	9/28/82	2/6/90
N-72	Beta-Gamma Waste Incinerator Demonstration, Phase II - Building 230-H	J. S. Murdock	Tech Div, SRL	B. E. Long	3/13/84	2/6/90
N-73	NEPA Evaluation, Beta-Gamma Waste Incinerator Demonstration	J. S. Roberts	Envr & Energy Dept	R. P. Whitfield	10/24/84	2/6/90
N-74	Pilot Air Stripper Unit- M Area	E. S. Goldberg	AMO	Memo to File	2/23/83	2/6/90
N-75	Supplement to an Approved Memo-to-File, Pilot Air Stripper Unit - M-Area	M. J. Sires	AMHS&E	Memo to File	8/16/83	2/6/90
N-76	Production Air Stripper Unit No. 1 (PSAU-1) Demonstration, M-Area	E. S. Goldberg	AMO	Memo to File	1/4/84	2/6/90
N-77	Project Air Stripper	M. J. Sires	AMO	Memo to File	8/30/84	2/6/90
N-78	Pilot Air Stripper (M-Area)	M. J. Sires	AMO	Supplement to Memo to File	5/24/85	2/6/90
N-79	NEPA Environmental Evaluation, Horizontal Well Drilling & In-Situ Remediation	J. J. Amobi	Organization not Specified	D. S. Kaback	12/1/88	2/6/90
N-80	NEPA Environmental Evaluation, A/M Area Vadose Zone Remediation Program	J. J. Amobi	Organization not Specified	J. G. Horvath	1/3/89	2/6/90
N-81	NEPA Environmental Evaluation, SRL Groundwater Investigation and Remediation Program	J. J. Amobi	Organization not Specified	K. L. Sibley	1/6/89	2/6/90
N-82	FB-Line Test Facility, Building 246-F	M. J. Sires	AMO	Memo to File	10/25/84	2/6/90
N-83	NEPA Recommendation, Draft Memo-to-File, F & H Areas Hazardous Waste Management Facilities Closure	W. C. Reinig	E&HPD	S. R. Wright	1/16/90	2/6/90
N-84	NEPA Environmental Evaluation, Mixed Waste Pad Building 643-29G	J. J. Amobi	Organization not Specified	J. C. Collins	6/9/86	2/6/90
N-85	Project Problem 2-8698, Mixed Waste Pad, Building 643-29G	S. E. Lengel	Project Department	T. A. Drew	5/1/86	2/6/90
N-86	NEPA Environmental Evaluation Form, Sulfuric Acid Tank Replacement, Building 483-1D	J. S. Murdock	EAD	A. J. Byrne	7/27/83	2/6/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

N = NEPA

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
N-87	NEPA Review (Improved U03 Drum Loading Facilities, Building 221-1F)	M. S. Dodgen	Organization not Specified	J. S. Murdock	3/2/87	2/6/90
N-88	Basic Data Report #86-11, Improved U03 Drum Loading Facilities, 221-1F	A. S. Lamprey	Organization not Specified	Distribution	12/12/86	2/6/90
N-89	NEPA Review (Liquid Waste Collection & Drum Storage Facility, 100 Areas)	R. M. Guidry	Organization not Specified	J. S. Murdock	10/10/84	2/6/90
N-90	NEPA Safety Analysis & Permits Checklist (Liquid Waste Collection & Drum Storage Facility, 100 Areas)	R. O. Pekkala	Reactor Dept	No Recipient Identified	10/2/84	2/6/90
N-91	Authorization Request, Reactors Liquid Waste Collection & Drum Storage (Project Number S-2719)	No Author Specified	Reactor Dept	No Recipient Specified	9/1/87	2/6/90
N-92	NEPA Evaluation Form, Liquid Waste Collection & Drum Storage Facility, Buildings 105-PLK	R. C. Pattison	RT Project Mmgt	J. S. Murdock	2/4/87	2/6/90
N-93	Modifications to the Info Contained in the Environmental Assessment - Naval Reactor Fuel Materials Facility (DOE/EA-0170)	F. M. Allhoff	AMPM	Memo to File	Sep-82	2/6/90
N-94	Operation of the Naval Fuel Technology Transfer Lab	F. M. Allhoff	AMPM	Memo to File	4/22/83	2/6/90
N-95	NEPA Environmental Evaluation, FMF Drum Storage Facility, 247-F	J. S. Murdock	NAD	S. C. Nashatker	6/23/87	2/6/90
N-96	NEPA Environmental Evaluation, Receipt, Handling & Storage of Uranyl Nitrate Hexahydrate, 247-F, DPS Facility Startup Authorization 200F-11	J. S. Murdock	NEPA	A. J. Gartner	3/22/88	2/6/90
N-97	NEPA Environmental Evaluation, Naval Fuel Waste Solidification Project	R. A. Moyer	NEPA	S. Nashatker	4/15/88	2/6/90
N-98	NEPA Environmental Evaluation, Naval Fuel Lab HVAC Modifications, 247-F	J. S. Murdock	NEPA	A. Shah	7/7/89	2/6/90
N-100	NEPA Recommendation, Environmental Information, Fuel Materials Facility (FMF)	D. E. Gordon	NEPA Activities Grp	A. B. Gould	11/22/89	2/6/90
N-101	Naval Reactor Fuel Materials, DOE/EA-0170	US DOE			Mar-82	12/1/89
N-102	Waste Form Selection for SRP High-Level Waste, DOE/EA-0179	US DOE			Jul-82	Dec-89
N-103	L-Reactor Operation, Savannah River Plant, DOE/EA-0195	US DOE			Aug-82	Dec-89
N-104	Inter-Agency Agreement for Control of National Forest System Lands (adjacent to SRP), DOE/EA-0240	USFS/DOE			No Date	Dec-89
N-105	Tritium Loading Facility SRP, DOE/EA-0297, (Unclassified Summary Sheet)	US DOE			No Date	Dec-89
N-106	Mmgt Activities for Retrieved & Newly Generated Trans-uranic Waste Savannah River Plant, DOE/EA-0319	US DOE			Aug-88	Dec-89
N-107	Fuel Production Facility, Building 225-H SRP, DOE/EA-0319	US DOE			Nov-86	Dec-89

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

N = NEPA

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
N-108	Waste Mmgt Operations, Savannah River Plant, Aiken, South Carolina, Final Environmental Impact Statement, ERDA-1537	Energy Research & Development Admin, James L. Liverman, Asst Admin	Environment & Safety		Sep-77	
N-109	Long-Term Mmgt of Defense High-Level Radioactive Wastes, Savannah River Plant, Aiken, SC, DOE/EIS-0023	US DOE			Nov-79	Dec-89
N-110	Waste Mmgt Operations, SRP, Aiken, SC - Double Shell Tanks for Defense High Level Radioactive Waste Storage (Supplement to ERDA 1537), DOE/EIS-0062	US DOE			Apr-80	Dec-89
N-111	Mmgt of Commercially Generated Radioactive Waste Volumes 1-3, SRP, Aiken, SC, DOE/EIS-0046F	US DOE	Office of Nuclear Waste Mmgt		Oct-80	Dec-89
N-112	Defense Waste Processing Facility, SRP, Aiken, SC DOE/EIS-0082	US DOE			Feb-82	Dec-89
N-113	L-Reactor Operation, Volumes 1-3, SRP, Aiken, SC DOE/EIS-0108	US DOE			May-84	Dec-89
N-114	Alternative Cooling Water Systems, Savannah River Plant, Aiken, SC, DOE/EIS-121	US DOE			Oct-87	Dec-89
N-115	Waste Mmgt Activities for Groundwater Protection, Volumes 1-3, SRP, Aiken, SC, DOE/EIS-0120	US DOE			Dec-87	Dec-89
N-116	Environment, Safety, & Health Compliance at SRS. Self Assessment WSRC-RP-90-88	Anonymous	WSRC	DOE	1/31/90	2/2/90
N-117	WSRC Mmgt Guidance Letter Re: SRP Procedures Manual	J. S. Moore	WSRC		May-88	2/1/90
N-118	SRP Procedures Manual - Item 204		WSRC		May-88	2/1/90
N-119	WSRC Mmgt Guidance Letter Re: SRL Procedures Manual	J. S. Moore	WSRC		4/1/89	2/1/90
N-120	RL Procedures Manual - DPSTP - 4.39		WSRC		Mar-88	2/1/90
N-121	WSRC Environmental Compliance Site Manual. WSRC-3Q. Section ECSM 5.1 (Draft)		WSRC		Draft	2/1/90
N-122	WSRC Environmental Protection Section Procedures Manual. WSRC-Q-1-1-1		WSRC		Draft	2/1/90
N-123	Savannah River Operations Office Plan for Implementing Its Delegated Authorities		DOE-SR	P. K. Stone	Draft	2/5/90
N-124	1985 Appraisal Report - Du Pont Performance in Implementation of the NEPA	P. K. Stone	DOE-SR	File	?	2/6/90
N-125	1986 Appraisal Report - Du Pont Performance in Implementation of the NEPA	P. K. Stone	DOE-SR	File	?	2/6/90
N-126	Du Pont Performance in Implementation of the NEPA - Appraisal Period August 1986 to August 1987	P. K. Stone	DOE-SR	File	?	2/6/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

N = NEPA

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
N-127	Sec of Energy Notice (SEN-15-90 National Environmental Policy Act	D. Watkins	DOE	All DOE Elements	Feb-90	2/6/90
N-128	NEPA Activities - Program Implementation "How To"	J. S. Murdock	WSRC	File	Jan-88	2/6/90
N-129	Nat'l esource Council Fifth Report on the Biological Effects of Ionizing Radiation (BEIR V)	Nat'l Resource Council			Jan-90	?
N-130	Procedures Guide for the Preparation of an Environmental Impact Statement	US DOE	SRO	(DOE-SR)	Oct-88	2/5/90
N-131	Operating Reference Manual II and VI	DOE-SR	Environmental Div		12/11/89 and 1/25/90	2/5/90
N-132	Environmental Protection Program Guide	DOE-SR	Environmental Div		12/13/89	2/5/90
N-133	SR Site Environmental Implementation Plan I - III	WSRC-RP-89-453			8/1/89	2/5/90
N-134	Finding of No Significant Impact; Fuel Materials Facility, Savannah River Plant, Aiken, SC (47 FR 32473)	US DOE			7/27/82	2/6/90
N-135	Finding of No Significant Impact for Transuranic Waste Mmgt Activities at the Savannah River Plant, Aiken, SC	US DOE			8/24/88?	2/6/90
N-136	Proposed Finding of No Significant Impact, Selection of Borosilicate Glass as the Defense Waste Processing Fac. Waste Form for High-Level Radioactive Wastes, Savannah River Plant, Aiken, SC (47 FR 32778)	US DOE			7/29/82	2/6/90
N-137	Finding of No Significant Impact, L-Reactor Operation, SRP, Aiken, SC	US DOE			8/20/82	2/6/90
N-138	Finding of No Significant Impact, Fuel Production Facility, Bldg 225-H, SRP, Aiken, SC	US DOE			1/5/87?	2/6/90
N-139	Finding of No Significant Impact, Transfer of Control of Occupancy & Use of United States Forest Service Lands Adjacent to the Savannah River Plant, Aiken, SC	US DOE/USFS			11/15/84?	2/6/90
N-140	Finding of No Significant Impact for Tritium Loading Facility; SRP, Aiken, SC (51 FR 12727)	US DOE			4/15/86	2/6/90
N-141	Defense Waste Processing Facility SRP, Aiken, SC, Record of Decision (47 FR 23801)	US DOE			6/1/82	2/6/90
N-142	L-Reactor Operation; Savannah River Plant, Aiken, SC; Record of Decision (49 FR 28660)	US DOE			7/13/84	2/6/90
N-143	Alternative Cooling Water Systems, Savannah River Plant, Aiken, SC; Record of Decision (53 FR 4203)	US DOE			2/12/88	2/6/90
N-144	Waste Mmgt Activities for Groundwater Protection, SRP, Aiken, SC; Record of Decision (53 FR 7557)	US DOE			3/9/88	2/6/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

N = NEPA

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
N-145	Double Shell Tanks for Defense High-Level Radioactive Waste Storage, SRP, Aiken, SC; Record of Decision (45 FR 46154)	US DOE			7/9/80	2/6/90
N-146	Long-Term Mmgt of Defense High-Level Radioactive Wastes (Research & Development Program for Immobilization), SRP, Record of Decision (45 FR 9763)	US DOE			2/13/80	2/6/90
N-147	Program of Research & Development for Mmgt & Disposal of Commercially Generated Radioactive Wastes; Record of Decision (46 FR 26677)	US DOE			5/14/81	2/8/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

C* = CERCLA/Inactive Sites

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
C*-1	Environmental Survey Preliminary Report Savannah River Plant, August 1987	US DOE	EH	CEV-10	8/1/87	1/22/90
C*-2	DOE Order 5400.1 General Environmental Protection Program		DOE		11/9/88	2/1/90
C*-3	WSRC-1-03 Management Requirements... and Procurements		WSRC		8/15/89	2/1/90
C*-4	DOE 5500.2A Emergency Notification, Reporting and Response Levels		DOE		4/13/88	2/1/90
C*-5	DOE Order 5484.1 Environmental Protection Safety & Health Protection Reporting Requirements		DOE		2/24/81	2/1/90
C*6	WSRC Q-1-1-1 Rev. 0 Draft of "EPS Manual on EPS Spill Event Response and ..."		WSRC		3/1/89	2/1/90
C*-7	ESH-AAC-890380 "ESH & QA Division SIRIM Proc. - Final B84"		WSRC		12/18/89	2/1/90
C*-8	DPSOL 200-H-9561, Rev. 19, Area Emergency Coor. Response to Chem. Spills or Oil Spill		WSRC		1/1/89	2/1/90
C*-9	SOP 221-H-9440 200 Area Environmental Group		WSRC		1/16/90	Feb-90
C*-10	4/24/87 Letter "Prop. CERCLA Section 102 Rule Reg R/Q Adj..."	C. F. Muska	Du Pont	DOE-SR	4/27/87	Feb-90
C*-11	11/1384 Letter "DOE/EPA Draft Memo of Understanding on CERCLA Releases"	Hughes	Du Pont	DOE-SR	8/1/87	Feb-90
C*-12	Environment, Safety and Health Office of Environmental Audit		DOE		8/1/87	Feb-90
C*-13	DPSPU 81-302 Environmental Monitoring at the Savannah River Plant, 1980		Du Pont		11/1/83	Feb-90
C*-14	DPSOP 287SRP Emergency Operating Center Procedure for EOC Com. Personnel		Du Pont		No Date	Feb-90
C*-15	DPST-83-829 Technical Summary of Groundwater Quality Protection Program		Du Pont		Dec-83	2/1/90
C*-16	Section 313 Documentation Package for CY 1988 Required by SARA Title III-SRS		WSRC		1/1/90	2/1/90
C*-17	Spill Report to SCDHEC, 2/15/89, "F-Area Near 221-F", (Superfund R/Q)	Al Parrott	WSRC	DOE	2/15/89	2/1/90
C*-18	Spill Report to SCDHEC, 5/8/89 "200-H Area Tank #37 (Underground)"	Al Parrott	WSRC	DOE	5/8/89	2/1/90
C*-19	Spill Report to SCDHEC, 1/11/89, "SRP Hazardous Waste Storage Bldg. 709-4G Loading Area"	Al Parrott	WSRC	DOE	1/11/89	2/1/90
C*-20	Spill Report to SCDHEC, 3/6/89, "Transfer Line Between 320/321 M to..."	Al Parrott	WSRC	DOE	3/6/89	2/1/90
C*-21	Spill Report to SCDHEC, 3/9/89, "281-5-F Delaying Basin Div. BX and Outfall..."	Al Parrott	WSRC	DOE	3/9/89	2/1/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

C* = CERCLA/Inactive Sites

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
C*-22	Spill Report to SCDHEC, 4/11/89, "Construction Bulk Storage Plant in Central..."	Al Parrott	WSRC	DOE	4/13/89	2/1/90
C*-23	Spill Report to SCDHEC, 4/17/89 "Beuford Road Approx. Coord. N73,900 X..."	Al Parrott	WSRC	DOE	4/17/89	2/1/90
C*-24	Spill Report to SCDHEC, 4/18/89, "Building 672-T, X-011 Putfa;;"	Al Parrott	WSRC	DOE	4/18/89	2/1/90
C*-25	Spill Report to SCDHEC, 6/20/89, "607-17F"	Al Parrott	WSRC	DOE	6/20/89	2/1/90
C*-26	Spill Report to SCDHEC, 6/30/89, "483-D Water Purge Pl. from SR..."	Al Parrott	WSRC	DOE	6/30/89	2/1/90
C*-27	Spill Report to SCDHEC, 8/17/89, "Near 247-F Naval Fuels	Al Parrott	WSRC	DOE	8/17/89	2/1/90
C*-28	Spill Report to SCDHEC, 9/12/89, "Barricade No. 1 - Road 125"	Al Parrott	WSRC	DOE	9/17/89	2/1/90
C*-29	Spill Report to SCDHEC, 10/21/89, "242-F Area, Low Level Evap. Condens..."	Al Parrott	WSRC	DOE	10/21/89	2/1/90
C*-30	Spill Report to SCDHEC, 10/31/89, "Sewage Sludge Disposal Ste"	Al Parrott	WSRC	DOE	10/31/89	2/1/90
C*-31	Spill Report to SCDHEC, 11/17/89, "A-011 Outfall, One Gallon of Kerosene..."	Al Parrott	WSRC	DOE	11/17/89	2/1/90
C*-32	Spill Report to SCDHEC, 11/22/89, "H-Area Erosion Control..."	Al Parrott	WSRC	DOE	11/22/89	2/1/90
C*-33	Spill Report to SCDHEC, 12/08/89, "284-H Low pH Water From..."	Al Parrott	WSRC	DOE	12/8/89	2/1/90
C*-34	Spill Report to SCDHEC, 12/26/89, "Building 183-2K, Low pH Water..."	Al Parrott	WSRC	DOE	12/26/89	2/1/90
C*-35	FFA Operable Units List		WSRC-EPS		No Date	2/1/90
C*-36	Schedule for RFI Submitted to EPA		WSRC-EPS		Jan-90	2/1/90
C*-37	Spill Report to SCDHEC, 5/2/89, "Building 672-T, X-011 Outfall"	Al Parrott	WSRC	DOE	5/2/89	2/1/90
C*-38	SCSWD R61-61 List				No Date	2/1/90
C*-39	DOE/EIS-0120 Final, EIS, Waste Management Activities for Groundwater Protection		DOE		Dec-87	2/2/90
C*-40	WSRC-RP-89-898 Waste Management Units-SRS-Volume I		WSRC		Oct-89	2/2/90
C*-41	WSRC-RP-89-453 "Environmental Impact Plan (U), Volume II"		WSRC		6/15/89	2/2/90
C*-42	US EPA Form 2070-12 US EPA Preliminary Assessments		US EPA		No Date	2/5/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

C* = CERCLA/Inactive Sites

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
C*-43	WSRC-89-889 Groundwater Monitoring Program for the SRS		WSRC		12/18/89	2/5/90
C*-44	Proposed Federal Facilities Agreement-Savannah River Site	US EPA	US DOE	SCDHEC	9/1/89	2/5/90
C*-45	Surface Impoundment Clean Closure Guidance Manual	US EPA	CHZM Hill		10/1/87	2/5/90
C*-46	Response to Congressional Inquiry Regarding Seepage Basins of the SRS		DOE/WSRC		11/28/89	2/6/90
C*47	Reactor Materials Technology, DPSOL 300-22, Reporting Events, Conditions		WSRC		12/20/89	2/6/90
C*-48	Appendix C SRS Remediation Sites		WSRC-EPS		No Date	2/6/90
C*-49	EPA Proposal to Place the Savannah River Site on the NPL, and EPA Scoring Documents		DOE		7/26/89	2/7/90
C*-50	Environmental Compliance Report for SRS		DOE		Nov-89	2/7/90
C*-51	Notice of Intent ot Execute Federal Facilities Agreement		EPA		9/27/89	2/7/90
C*-52	RCRA Facility Investigation Plan for Metals Burning Pit/Misc. Chemical Basins		WSRC		6/1/89	2/13/90
C*-53	RCRA Facility Investigation Plan for Road A Chemical Basin		WSRC		6/1/89	2/13/90
C*-54	Request to Assess Areas for Inclusion on the SRP Current List of 66 Potential LA Sites 87-0002232		Du Pont		12/23/87	2/7/90
C*-55	Waste Site Closures for CERCLA Sites 87-0000153		Du Pont		1/22/87	2/7/90
C*-56	Contract Modificaton No. M012 to Contract Execution of Permits and Applications		DOE/SR		11/28/89	2/7/90
C*-57	Section 312 Tier Two Inventory for 1988		DOE		3/3/89	2/7/90
C*-58	Section 313 Toxic Chemical Release Inventory for 1989		DOE		7/11/89	2/7/90
C*-59	Section 313 Toxic Chemical Release Inventory for 1988		DOE		6/29/88	2/7/90
C*-60	Comprehensive Environmental Response, Compensation, & Liability Act Requirement SR 5400.4 Draft		DOE/SR Operations Office		DRAFT	2/7/90
C*-61	SRS Community Relations Program Scoping Document		DOE/SR Operations Office		DRAFT	2/8/90
C*-62	SCDHEC, NRDC vs DOE Consent Decree		US Dist. Court SC Aiken Division		5/31/89	2/8/90
C*-63	May 15, 1986 Letter from J. S. Robert (Du Pont) to W. E. Wisenbaker (DOE)		Du Pont		6/16/86	2/8/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

C* = CERCLA/Inactive Sites

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
C*-64	RCRA Facility Investigation Program Plan ESRC-RP-89-994		Sirrine Env. Consultants		6/30/89	2/8/90
C*-65	Superfund #2 (Spill) for 1989-High Level Waste, H Area Numerous Documents	Al Parrott	WSRC		5/8/89	2/8/90
C*-66	Waste Management Units-SRS Waste Management Unit Worksheets		WSRC		10/1/89	2/9/90
C*-67	Groundwater Monitoring Program of the SRS		WSRC		12/18/89	2/9/90
C*-68	Interim Status Closrue Plan for the F, H, K & P Area Acid/Caustic Basins	Camp, Dresser, & McKee	WSRC		6/1/89	2/9/90
C*-69	Chemical Information and Inventory System (C115)		WSRC		2/1/90	2/13/90
C*-70	F, H, P & K Acid/Caustic Basins ESH-ERG-890161	M. P. Wilson	WSRC	W. S. Whitaker DOE	11/17/87	2/14/90
C*-71	Notification of 3 Newly Discovered SWMUS	S. R. Wright	DOE-SR	P. M. Tobin EPA	No Date	2/14/90
C*-72	Database		WSRC-EPS		Feb-90	2/14/90
C*-73	Environmental Restoration and Waste Management 5 Year Plan DOE/S-0070		DOE			2/15/90
C*-74	Addition of Gravel Drainage Layer to MWMF Cap		Du Pont-SRL		10/24/88	2/15/90
C*-75	Closure Plan for Mixed Waste Management Facility		Du Pont/DOE		3/11/87	2/15/90
C*-76	Closure Plan for H-Area Hazardous Waste Management Facility		Du Pont/DOE		12/16/88	2/15/90
C*-77	Closure Plan for F-Area Hazardous Waste Management Facility		Du Pont/DOE		5/1/89	2/15/90
C*-78	Closure Feasibility Study F&H Area Seepage Basins		Du Pont/DOE		6/1/86	2/15/90
C*-79	Tank 16 RFI Plan		WSRC/DOE		10/3/89	2/15/90
C*-80	CS-Area Burning Rubble Pit RFI Plan		WSRC/DOE		9/14/89	2/15/90
C*-81	Old Radioactive Waste Burial Ground RFI Plan		WSRC/DOE		9/14/89	2/15/90
C*-82	Analytical Results from D-Area Drum	Sirrine Laboratory	WSRC-CWSE	Tiger Team	2/16/90	2/17/90
C*-83	Site Specific Plan WSRC-RP-89-978		WSRC/DOE		12/1/89	2/19/90
C*-84	Final EIS Waste Mangement Activities for GW Protection		DOE		12/1/87	2/19/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

C* = CERCLA/Inactive Sites

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
C*-85	Draft Purged Water Management Plan WSRC-RP-90-208		WSRC		Feb-90	2/20/90
C*-86	Certificate of Analysis		Enwright Env.		2/11/89	2/21/90
C*-87	Old F-Area Seepage Basin Draft RFI Work Plan	Sirrine Env.	WSRC		10/1/89	2/21/90
C*-88	Environmental Information Document SRL Seepage Basins		Du Pont/DOE		3/1/87	2/21/90
C*-89	Letter Describing SCDHEC's Intent to Reenter FFA Negotiations with Comments	Lewis Show	SCDHEC	Greer Tidwell	2/14/90	2/22/90
C*-90	Biweekly Report - Executive Summary Assurance of Full Compliance with Environmental Regulations ESH-900005		WSRC		Jan-90	2/2/90
C*-91	Sites of Radioactive Contamination on the Savannah River Plant DPSP-84-1054	Stevens & Ross	Du Pont		Jul-84	2/27/90
C*-92	Waste Sites on the Savannah River Plant DPSP-83-1008	Stevens & Ross	Du Pont		Jan-83	2/27/90
C*-93	H Area Spill Info (Information faxed by Rue Ann Thomas, WSRC-EPS)		Du Pont		2/28/90	2/28/90
C*-94	Savannah River Site Emergency Response Exercise, Tritium Facility EPE-004-ST		WSRC		2/28/90	2/28/90
C*-95	RFI/RI Plan-Old F Area Seepage Basin	Sirrine Env. Consultants	WSRC		2/1/90	3/1/90
C*-96	Final Report FRP 86-89 "Soil & Soil Gas Sampling in the Old Ellenton, the SRL Oil Test Site, the Fire Training Area, and the Miscellaneous Chenmical Basin		Microseeps, Ltd.		Dec-86	3/2/90
C*-97	Letter from C. F. Muska to Mr. S. R. Wright	C. F. Muska	Du Pont	S. R. Wright	5/21/87	3/2/90
C-98	Memo Regarding Environmental Impacts of 211-H Solvent Wash Spill	B. S. Christie	Du Pont	J. P. Ortaldo	3/19/87	3/2/90
C*-99	Letter Regarding Nitric Acid Spill From Building 211-H	C. F. Muska	Du Pont	S. R. Wright	1/30/87	3/2/90
C*-100	Separations Incident SI-87-1-7 Overflow of 903 Washer Solution from the Decant Sump DPSPU-87-272-9		Du Pont		1/23/87	3/2/90
C*-101	Radioactive Release in Excess of Annual Guide	J. P. Ortaldo	Du Pont	J. A. Kelly	4/3/87	3/2/90
C*-102	Separations Dept Operating Incident No. 221-H-87-1-1 Overflow of Segregated Solvent Decant Sump	T. R. George	Du Pont	M. F. Sujka	1/5/87	3/2/90
C*-103	EWR 863182 H-Area Drainage Ditch Decontamination VGA	B. S. Christie	Du Pont	J. F. Ortaldo	8/25/87	3/2/90

LIST OF SITE DOCUMENTS - ENVIRONMENTAL

C* = CERCLA/Inactive Sites

*Document Number	Title/Description	Author	Organization	Recipient	Document Date	Date Document Recieved
C*-104	DPSOL 200-H-9561 Emergency & Disaster Plan		Du Pont		1/1/87	3/2/90
C*-105	R Area Waste Sites & Related Facilities: Seepage Basins, Other Disposal Sites & R Canals		DOE		Dec-86	3/7/90
C*-106	DPSOL 292-417 Documentation of Radioactive Sites Within the SRP Environments		Du Pont		3/16/87	3/8/90
C*-107	NRDC Consent Decree	U.S. District Court SC Aiken Division			5/26/88	2/21/90

APPENDIX D

OCCUSAFE, Inc.
Report of Survey
for
Complaince with OSHA

OCCUSAFE INC. 1040 S. MILWAUKEE AVENUE, WHEELING, ILLINOIS 60090 6306 • 1 708 459-4800 • 1 800 323-7597
FAX 1-708 459 0471 • 24 HOUR EMERGENCY LINE 1-708 459-7894

March 7, 1990

Mr. Blake P. Brown
Team Leader
Inspection for OSHA Compliance
U.S. Department of Energy
Office of Safety Appraisal, EH-331
Washington, D.C. 20545

Mr. Lewis G. Hulman
Director of Quality Program, EH-32
U.S. Department of Energy
Washington, C.D. 20545

RE: Savannah River Site Tiger Team OSHA Inspection Report

Dear Mr. Brown and Mr. Hulman:

The report contains over 230 individual citations from approximately 30 buildings on the Savannah River site. The body of the report contains OSHA citations relevant to field inspections, where OCCUSAFE personnel spent almost all of their time on site.

There were significant findings in the areas of respiratory protection, hazard communication, and electrical safety. Recommendations include establishing a more thorough surveillance mechanism for respirators and instituting routine OSHA-type inspections by the Safety, Industrial Hygiene, and Health Physics groups.

The report and OSHA citations will be sent to Mr. Brown on diskette in WordPerfect format.

I will follow up with you to review the content of the report.

Sincerely,

FOR MJR

Michael J. Richen, CIH
Senior Project Consultant

MJR/sg

Enclosure: Report

20877/0621R/OS

Scope

The role of the OSHA-type assessment team was to identify occupational safety and health hazards (excluding radiological hazards) observed at the SRS. Due to the large size of the facility, a walk-through of all plant areas was not feasible in the two weeks allotted for the inspection. At the time of this assessment, the SRS was managed for DOE by Westinghouse SRS Company ("Westinghouse") with Bechtel SRS Company ("Bechtel") as the on-site construction contractor. The site included approximately 10,000 buildings built on 225 square miles, 20,000 employees, and six construction subcontractors. Walk-throughs were conducted in areas prioritized by DOE as representing various process streams, hazards and operations. A list of these areas is included in Tables 1 and 2.

OCCUSAFE, INC. conducted the OSHA-type inspection of the Savannah River site from February 5 through 15, 1990.

The criteria established for prioritized inspection involved the following:

1) Number of People
2) Construction Activities
3) Square Feet of the Building
4) Work Being Performed
5) Potential Hazard
6) Accident Rate
7) Professional Judgment

In addition to the physical inspection of the facilities, a limited review of the effectiveness of Westinghouse SRS Company's industrial safety and health program was performed based on the OSHA-type assessment team's inspection area observations. This is an element of OSHA's normal protocol as set forth in the agency's Field Operations Manual.

In January 1989, OSHA published voluntary guidelines in the Federal Register (54 FR 3904-3916) outlining the major elements of an effective safety and health program which OSHA compliance officers utilize in their evaluation of employers' programs. It should be noted that these guidelines are not mandatory, but the development and implementation of an effective safety and health program, containing systematic management policies and practices of the type identified, is fundamental to reduction of

work-related injuries and illnesses, along with their attendant economic costs.

Approach

OCCUSAFE utilized standard OSHA inspection procedures in the performance of this assessment. This included provision for an opening conference, employee representation, and walk-through inspections. The inspection team was composed of specialists with combined backgrounds in construction safety, general industry safety and industrial hygiene. Team members documented hazards by means of observations, exposure measurements, review of records and employee interviews.

Westinghouse representatives from the contractor's safety and industrial hygiene staff accompanied the OCCUSAFE inspectors on all inspections. Bechtel representatives attended when OCCUSAFE was present at construction sites or Bechtel facilities, such as the central shops. An inspection area management member was also present, whether it was an area controlled by Westinghouse or Bechtel.

An employee complaint hotline was open during the two-week OCCUSAFE inspection. The complaint line was set up on a phone recording system, which was locked up at night by the OCCUSAFE team. This phone line was checked daily for employee complaints. One complaint was received during the two-week inspection survey by OCCUSAFE. However, the complaint was not related to the Occupational Safety and Health Act, but to an environmental concern. This was passed on to the appropriate environmental group on the Tiger Team Appraisal.

Safety inspections were conducted for general industry and construction sites, following a general method. First, the OCCUSAFE inspector took a general walk-around through the building to identify areas for intense investigations. Next, the inspector went through the area and noted all violations of OSHA standards in that area, writing down the citations at the time of the survey. The OSHA Field Operations Manual was used to determine the appropriate severity to be applied to these findings. The citations were discussed at the time of the survey with the safety and management members who were present. If desired, OCCUSAFE employees also gave a general debriefing to the building manager at the time of the survey. The list of buildings receiving general industry inspections is included in Table 1. The list of

buildings receiving construction industry inspections is included in Table 2.

Industrial hygiene surveys were performed at the time of the safety surveys. Both OCCUSAFE inspectors are cross-trained in industrial hygiene and safety so this could be done effectively by either of the OCCUSAFE inspectors. Hazard communication program and respiratory protection findings were written at the same time as crane safety and electrical hazard findings.

Eleven full-shift breathing zone air samples were collected for coal dust, welding fumes, aluminum and Freon. All OCCUSAFE samples were duplicated by concurrent Westinghouse breathing zone air samples. Bechtel decided not to duplicate OCCUSAFE sampling efforts. All OCCUSAFE air samples were sent to an AIHA-accredited laboratory for analysis and were analyzed by OSHA-specified methods. All air sampling results collected by OCCUSAFE were less than the OSHA permissible exposure limits.

A 95% Upper Confidence Limit (UCL) ratio was calculated for each full-shift sample to compare with the OSHA (PEL) using the following formulae:

$$\text{Coefficient of Variation (CV)} = \frac{\text{Standard Deviation}}{\text{Mean}}$$

- Coefficient of Variation Total (CVT) =

$$\sqrt{(\text{CV Sampling Method})^2 + (\text{CV Analytical Method})^2}$$

- $$\text{UCL ratio} = \frac{\text{Measured}}{\text{OSHA PEL}} = 1.645 \times (\text{CVT})$$

The Coefficient of Variation Total (CVT) values for each sampling/analytical method are listed below:

Coal Dust	0.10 CVT
Total Welding Fume	0.10 CVT
Freon	0.06 CVT
Respirable Dust	0.10
Aluminum	0.06

Eleven noise dosimetry measurements were made on both Westinghouse and Bechtel employees. As before, Westinghouse collected

concurrent noise dosimetry measurements, while Bechtel decided not to duplicate OCCUSAFE's efforts. Eight noise dosimetry results were greater than the level that OSHA requires for hearing conservation program. None were above the OSHA limit of 90 dBA.

Tables 3 and 4 contain air sampling an noise dosimetry results. These air contaminants and noise dosimetry surveys were not considered a comprehensive overview, since almost all operations on the Savannah River Site were not in production at the time of the survey.

OSHA inspections are almost always given without advance notice. OCCUSAFE, therefore, notified Westinghouse of inspections only one day in advance. This notice was to help arrange the number of escorts necessary to work in the buildings being surveyed. Many findings were corrected at the time of the survey or soon after. However, citations were written up under the conditions that were present at the time of the survey.

Management's responsiveness in correcting deficiencies as soon as possible was commendable. In addition, the contractor's safety and industrial hygiene staff present during the time of the survey felt that the process was a good learning experience. This shows a management commitment to excellence and openness to criticism.

OCCUSAFE gave daily debriefings to Westinghouse, DOE and Bechtel management. At the end of the inspection, an overall debriefing was given to Westinghouse upper management.

OCCUSAFE Industrial Safety and Health Program Evaluation

The OCCUSAFE team's evaluation of Westinghouse's industrial safety and health program is based on the voluntary guidelines published in the Federal Register by OSHA in January of 1989. In that document, OSHA identified the major elements of an effective program to be:

1) Management Commitment and Employee Involvement
2) Worksite Analysis
3) Hazard Prevention and Control
4) Safety and Health Training

Each of the above-referenced areas will be addressed separately. Comparisons will then be drawn between the voluntary guidelines and Westinghouse's program. Specific examples will be used to highlight effective and ineffective areas, as determined by the



OCCUSAFE team's observations in the areas visited during the walk-throughs.

OCCUSAFE concentrated upon field observations, per DOE directions, and spent 100% of its time in the field inspecting working conditions during survey. As a result, many of the items identified above were not investigated. OCCUSAFE did comment in areas where there was adequate information. The majority of the findings are contained in the citations listing in the Appendix.

Management Commitment and Employee Involvement

An effective management program includes worker safety and health as a fundamental part of the organizational structure and utilizes employee involvement to help identify and correct hazardous conditions and practices. Areas that must be addressed include:

1) A clearly stated worksite safety and health policy.
2) Communication of safety and health program goals.
3) Involvement of top management.
4) Involvement of employees.
5) Assignment of program responsibilities.
6) Provision of adequate program resources.
7) Accountability of the responsible person.
8) Review of the program.

Worksite Analysis

Worksite analysis is needed not only to identify existing hazards, but also for conditions and operations in which changes might occur to create hazards. Lack of hazard awareness stemming from inadequate worksite examination is an indication that safety and health policies and/or practices may be ineffective. A proper worksite analysis includes:

1) Baseline worksite surveys.
2) Analysis of new and planned operations.
3) Analysis of routine job hazards.
4) Regular site safety and health inspections.
5) A system for reporting of hazards by employees.
6) Investigation of accidents and near-misses.
7) Analysis of injuries and illnesses.

Baseline Worksite Surveys

The evaluation was split into Westinghouse Safety and Westinghouse Industrial Hygiene.

Recent safety inspections by Westinghouse covered OSHA-type findings. These inspections appear to be an excellent overview of the areas inspected. However, the inspections program does not appear to cover all plant sites within the last year. Further analysis of Westinghouse resources may determine that the safety staff is unable to conduct the yearly OSHA-type inspection of every worksite with current resources.

Prior to 1984, there had not been extensive safety department program documentation, as stated by their safety director. Prior to 1989, many safety inspections were handled on an informal basis.

The Bechtel safety department had a number of new safety coordinators who appear to provide an extensive network of coverage. However, a large number of new safety individuals may take as long as two years before they are thoroughly trained in conducting complete and systematic safety inspections. In that period of time, Bechtel would benefit from comprehensive training programs for these individuals, and keeping them on-site.

Westinghouse industrial hygiene has a file with a number of air sampling results for many processes on site. Process evaluations which identify areas to be sampled also appear to be numerous. However, on investigation of evaluations and air sampling in the "H" canyon, it was noted that nitric acid is used extensively throughout the building. As a result, there are some chemical handling evaluations for processes contained in the building. There was no such evaluation or air samples available at the delivery site for nitric acid, despite the fact that a supplied-air garment was, and is, being used as a personal protective equipment for delivery of nitric acid at "H" canyon.

Stretching this evaluation to the entire plant site, OCCUSAFE did not find documentation on file to systematically evaluate all processes on the plant site.

Most breathing zone air sample evaluations in Westinghouse's industrial hygiene's air sampling file had occurred more than two years ago. OCCUSAFE had not determined the cause for this reduction in breathing zone air sampling frequency.

Bechtel does not have an industrial hygienist on staff. Instead, Bechtel depends upon Westinghouse and their industrial hygiene staff.

Analysis of Injuries and Illnesses

The DOE has not adopted OSHA's requirements for recording occupational injuries and illnesses contained in 29 CFR 1904. DOE Order No. 5484.1 outlines recordkeeping requirements for GOCO sites. This order requires preparation of an Individual Accident/Incident Report (DOE F 5484.X) for each recordable injury or illness. The criteria for recordability are outlined in the DOE F-75-45/7A. Comparison of this DOE order with the OSHA regulations revealed that the DOE form is functionally equivalent to the OSHA 101, First Report of Injury of Illness. Furthermore, the criteria for recordability used by DOE follow the same Bureau of Labor Statistics (BLS) guidelines as used by OSHA. DOE Order No. 5484.1 also requires that the OSHA 100 and/or OSHA 100F logs be maintained at DOE contractor sites.

The Westinghouse industrial safety department was maintaining the DOE form as well as OSHA 200 logs for all occupationally related injuries and illnesses. An extensive review of accidents and injuries on site was not performed, but a thorough review of the "F" area first aid log for December was used as a representation of the site. The "F" area was used as being representative because, historically, the "F" area reported the most injuries, illnesses, and radiological incidents. The "F" area medical clinic is the only clinic that is open 24 hours a day.

A number of potential problem areas were identified during this evaluation. These areas are as follows:

1) Repeated treatments are not automatically reported by medical to the safety department for follow-up to determine reportability.

2) Individuals restricted from working in their normal work area because of wounds, and potential alpha contamination of those wounds, are not accounted for in the restricted case rate.

3) Medical treatment with DPTA, a metal complexing agent given under the direction of a physician, is not reported under the OSHA reporting system.

In general, accidents and illnesses are well-documented and reported. One citation was recorded by the OCCUSAFE team for not reporting a single three-day restriction for a hand wound. The individual was restricted from working in an area with alpha contamination.

Hazard Prevention and Control

Hazard prevention and control is the ultimate goal of the safety and health program. An effective program includes provisions for the systematic identification, evaluation, and prevention or control of general workplace hazards, specific job hazards and potential hazards which may arise from foreseeable conditions. An effective program relies on means for prevention or control which provide the best feasible protection of employee safety and health. Although compliance with the law, including specific OSHA standards, is an important objective, an effective program looks beyond specific requirements of the law to address all hazards. It will seek to prevent injuries and illnesses whether or not compliance is at issue.

A program need not be written to be effectively implemented, but as the size of the worksite and/or complexity of the hazardous operation increases, so does the need for written guidance. A written program ensures clear communication of policies and priorities plus constant and fair application of rules. Areas that need to be addressed in this program include:

1) Engineering Controls
2) Work Practice Controls
3) Personal Protective Equipment
4) Administrative Controls
5) Preventive Maintenance
6) Emergency Planning and Preparedness
7) Medical and First Aid

Written safety policies and procedures were not evaluated. Similarly, items 4-7 were also not evaluated.

Engineering Controls

Portable showers were not being used in D-Area Powerhouse for an asbestos removal project which was not a small-scale or short-term activity. Although there is some basis for interpretation in the OSHA regulation as to when showers attached to a work area are mandatory, the project does not meet the criteria for a small-

scale, short-term project. A shower should be attached to the enclosure being used to encourage frequent changing and showering of workers. OSHA defines small-scale, short-term activities as:

- Removal of asbestos-containing insulation of pipes.
- Removal of small quantities of asbestos-containing insulation on beams or above ceilings.
- Replacement of an asbestos-containing gasket on a valve.
- Installation or removal of a small section of drywall.
- Installation of electrical conduits through or proximate to asbestos-containing materials.

One asbestos abatement project in the process of being set up was found with a large amount of suspect debris on the floor. Debris was contained in an incomplete enclosure being constructed by North Brothers Insulators. The bulk sample collected and analyzed by both Westinghouse and OCCUSAFE found chunks of the debris to be negative. See Table 5 for results of these samples. OCCUSAFE also collected a microvacuum sample of the debris on the floor. Analysis of this debris included materials that were not visible by analysis performed on the bulk sample. This sample identified asbestos debris contamination. The debris apparently had come from a steam valve cover from the immediate area of the enclosure. This steam valve was not being worked on at the time of the OCCUSAFE survey, but its valve cover was removed.

This indicates workers at the steam valve do not have adequate information about asbestos-containing materials on that valve, or they were not being supervised adequately. Westinghouse should consider a re-emphasis on enforcement of rules for working on asbestos-containing materials. In addition, they should be sure that health protection inspectors do a more thorough job in their oversight activities on asbestos abatement projects. Perhaps the use of a microvacuum sampling technique to evaluate floor debris would be helpful. The microvacuum techniques utilize transmission electron microscopy (TEM), which will identify asbestos-containing materials, especially if they are mostly less that 5 microns in length, as they were in this case. The microvacuum technique is explained in the Appendix.

Work Practice Controls

The lockout and tagout program developed by Westinghouse and Bechtel needs to be brought up to compliance with the OSHA regulation 29CFR 1910.147, Control of Hazardous Energy Sources. Specifically, the tagout tags need to be more substantial.

Personal Protective Equipment

Respiratory protection had a number of serious deficiencies that were citable under the OSHA respiratory protection regulation, 29CFR 1910. 134. A number of citations can be found in the Appendix.

Of greatest concern, OCCUSAFE found that no one group or individual was responsible for all aspects of the site-wide respiratory protection program. A respiratory protection program at the SRS must jointly address health physics and industrial hygiene. The respiratory protection program in OSHA covers the following areas:

- A written program
- Selection on the basis of hazard
- Training of employees
- Regular cleaning of respirators
- Proper respirator storage

Respirators cannot be selected on the basis of hazard unless appropriate routine surveillance is performed. OSHA interprets appropriate surveillance to mean frequent breathing zone air sampling, especially when respiratory protection is required. This process must be routine and representative of the process so that a respirator being used on a daily basis provides adequate and appropriate protection. OSHA does not explicitly include health physics considerations when it comes to alpha contamination as a reason not to use breathing zone air sampling as an evaluation method. This is especially true of maintenance activities that are evaluated routinely by stationary air sampler.

A number of jobs were found where the supplied air garment top was used as respiratory protection for welding operations. The supplied air garment requires that a top and bottom be used. It has not been communicated that this respirator is not approved.

Safety and Health Training

Education and training are needed for communicating practical understanding of the requirements of effective safety and health protection to all personnel. Without this understanding, managers, supervisors, and employees will fail to perform their responsibilities for effective safety and health protection. Hazard information that needs to be communicated to employees includes:

1) General hazard and safety rules of the worksite.
2) Specific hazards, safety rules and practices related to particular work assignments.
3) The employees' role in emergency situations.

Effective training of supervisors will address their safety and health management responsibilities and provide information on hazards, hazard prevention, and response to emergencies. Managers must understand both the manner and extent to which effective safety and health protection impacts on the overall effectiveness of the business.

However, training in and by itself is not sufficient to ensure practical comprehension. Some means of verification is also required. Formal testing, oral questioning, observation and other means are useful in determining whether required training is understood.

Employee Training

There are a number of formal employee training programs in effect at the SRS. Those which are required under OSHA standards are discussed below:

Hazard Communication

Employees have received training in the requirements of OSHA's Hazard Communication Standard. Interviews with employees in various areas of the site revealed that they knew where the written program, list of chemicals and Material Safety Data Sheets were kept.

Some employees, when questioned about the hazards associated with chemicals they were working with, could not identify some essential health effects. For example, an employee was using Freon TF as a cleaning agent for stainless steel pipe. When queried as to what he thought the potential hazards associated with the chemical were, he explained that it could dry the skin on your hands. This is correct. However, he did not mention the narcotic effect of the chemical, which was more significant in this circumstance. He used large quantities of the chemical daily. In addition, although the pipe cleaning operation was next door to a welding area, this worker was unaware that Freon vapors and welding torches were incompatible.

Material Safety Data Sheets (MSDS) should be readily available on a sitewide basis. However, OCCUSAFE inspectors repeatedly found that MSDSs for chemicals present could not be retrieved within 20 minutes. This was true for both Westinghouse and Bechtel sites. There appears to be a breakdown at the end user point for distributing MSDSs.

Multi- and Single-Piece Rims - not evaluated
Fire Bridgade - not evaluated
HAZMAT Training - not evaluated

Hearing Conservation

Westinghouse had a good baseline survey conducted approximately two years ago. Since that time, not much noise dosimetry has been conducted. This appears to be because the employee conducting the surveys left to take a new job. A new employee is on staff now and appears to be conducting more routine noise dosimetry surveys.

No serious problems with Westinghouse's hearing conservation program were noted.

Bechtel does not have an active hearing conservation program per the general industry standards, 29 CFR 1910.95. This was because, until OCCUSAFE did the inspection, their central shops were considered a construction site. OCCUSAFE does not consider the central shops that Bechtel operates a construction site. They are not immediately associated with a construction job, as are the construction shops at the Defense Waste Processing Facility (DWPF) and the Replacement Tritium Facility (RTF). They should be considered as workplaces under the general industry standard, since they have been standing in place for close to 30 years.

Fork Lift Truck Operations - not evaluated

Fire Extinguishers

Westinghouse had some areas in which fire extinguishers were not inspected on a yearly basis. In the "H" canyon, almost all of the fire extinguishers had not been inspected within a year.

At all Bechtel construction sites, all fire extinguishers had not been inspected in the last year.

The Westinghouse operated fire department, which has responsibilities for performing these inspections, may not be able

to keep up with the inspection frequency required by all fire extinguishers on site.

Emergency Evacuation Procedures - not evaluated
Mechanical Power Press - not evaluated
Supervisor Training - not evaluated
Management Training - not evaluated
Construction Safety and Health Evaluation
Control Over Construction Activities - not evaluated
Evaluation of Construction Safety and Health Program - not evaluated
Hazardous Waste Site Activities - not evaluated

Major Findings and Recommendations

The OCCUSAFE inspection team reached the following conclusions concerning the industrial and construction safety and health programs:

Major Findings

1) The number of types of OSHA violations found during the survey are significant.

2) The respiratory protection program should be looked at closely by Westinghouse Savannah River Company (WSRC) management.

Recommendations

Based on the inspection, the following recommendations are given:

1) Establish a systematic safety, industrial hygiene and health physics potential hazards/evaluation on the SRS.

2) Initiate a respiratory protection breathing zone air sampling program that conducts representative breathing zone air samples for every type of job that requires respiratory protection.

3) Conduct a systematic breathing zone air sampling survey of operations identified in the systematic survey listed in (1) above.

4) Upgrade the Health Protection Inspector training and qualification if these individuals are to monitor work requiring respirators.

5) Assure that all respiratory protection is specific by industrial hygienists or health physicists in writing.

6) Provide additional training for safety inspectors, industrial hygienists and health physicists so they may perform routine OSHA-type safety and hygiene inspections.

7) Require yearly safety and health physics and industrial hygiene inspections that cover OSHA-type criteria.

8) Provide showers for all asbestos abatement projects that do not meet OSHA criteria for small scale jobs.

9) Initiate random microvacuum sampling for asbestos abatement projects to verify clean-up efficiency.

10) Provide Bechtel with adequate industrial hygiene resources.

TABLE 1

GENERAL INDUSTRY INSPECTION

Building	Safety Inspection	Industrial Hygiene
711-K	X	
484-D	X	X
108-K	X	
6096	X	
618-6	X	
704-K	X	
714-A	X	
713	X	
8317	X	
8334	X	
105-K	X	
247-F	X	
8303	X	
8312	X	
716-A	X	
717-A	X	
707-F	X	
221-H	X	
Westinghouse Support Trailers RTF (5)	X	
Bechtel Support Trailers RTF (2)	X	X
222-H	X	
210	X	
980	X	
Naval Fuels Facility	X	
Total Buildings	24	2

TABLE 2

CONSTRUCTION INDUSTRY INSPECTION

Building	Safety Inspection	Industrial Hygiene
Central Shops	X	X
RTF	X	X
RT9, RTF	X	X
RT10, RTF	X	X
DWPF	X	

TABLE 3

BREATHING ZONE AIR SAMPLE RESULTS

Operator	Location	Sample Number	TWA	PEL	UCL Ratio
Total Welding Fumes					
Box Construction Wire Feed Welding	Boilermaker Shop Central Shops	83825	1.0 mg/m^3	5 mg/m^3	0.38
Box Construction Wire Feed Welding	Boilermaker Shop Central Shops	83827	1.7 mg/m^3	5 mg/m^3	0.50
Box Construction Wire Feed Welding	Boilermaker Shop Central Shops	83824	1.1 mg/m^3	5 mg/m^3	0.38
Box Construction Wire Feed Welding	Boilermaker Shop Central Shops	83826	1.8 mg/m^3	5 mg/m^3	0.52
Box Construction Wire Feed Welding	Boilermaker Shop Central Shops	83823	2.3 mg/m^3	5 mg/m^3	0.62
Burn Room Plasma Torch	Building RT10, Try Shop	83833	0.7 mg/m^3	5 mg/m^3	0.30
Freon					
Clean Room	Building RT9	83829	13.5 ppm	1000 ppm	0.11
Clean Room	Building RT9	83830	58.6 ppm	1000 ppm	0.16
Aluminum Fume					
Aluminum Welding	Building 233H RTF	83832	0.01 mg/m^3	5 mg/m^3	0.10
Total Welding Fumes					
Aluminum Welding	Building 233H RTF	83832	0.07 mg/m^3	10 mg/m^3	0.17
Coal Dust					
Bunker Room	Bldg. 484-D, D Area	83352	< 0.2 mg/m^3	2 mg/m^3	NA
Crusher Wash Down	Bldg. 484-D, D Area	83355	< 0.2 mg/m^3	2 mg/m^3	NA

TWA = 8 Hour Time Weighted Average

NA = Not Applicable

PEL = OSHA Permissible Exposure Limit

< = Less Than

UCL Ratio = 95% Upper Confidence Limit Ratio, See Calculation in Report

TABLE 4

NOISE SURVEY RESULTS

Operation	Factory Location	8 Hr. TWA Noise dBA	% Dose
Bunker Operator	Coal Bank	79.8	16.9
Carpenter Apprentice	Carpenter Shop 8312	86	63
Saw Operator	Carpenter Shop 8312	86	58
Saw Helper	Carpenter Shop 8312	89	91.4
Cleaner	Clean Room	83	37.8
Cleaner	Clean Room	84.5	46.2
Coal Handler	Crusher House 12	81.9	34
Grind Shim Plates	BWPF Try Shop	89.7	95.4
Mechanic	Machine Shop	84	45
Welder	8334 Boiler	84	43
Welder/Setup	8334 Boiler	86	59

NA = Not Applicable

dBA = Sound Pressure Level in Decibels, A Scale

TWA = Time Weighted Average, Projected From Sampling Period

% Dose = Based Upon OSHA 90 dBA w/5dB Exchange Rate

TABLE 5

ACM MATERIAL RESULTS

Location	Function	Sample Number	Result	Type
D Area Power House	Crumbs of Steam Pipe Insulation	44701	0% Asbestos	
D Area Power House 4th Level	Debris in 100 Square Centimeters	44702	280,000 s/cm^2	Amosite, Chrysotile

s/cm^2 = structures per centimeter squared

APPENDIX 1

OVERVIEW SURVEY FOR COMPLIANCE WITH OSHA

SURVEY FOR COMPLIANCE WITH OSHA

- 29 CFR 1910, GENERAL INDUSTRY

  29 CFR 1926, CONSTRUCTION

- WORKPLACE CONDITIONS & PRACTICES

OSHA STANDARDS

- WALKING - WORKING SURFACES
- EGRESS
- OCCUPATIONAL HEALTH
- HAZARDOUS MATERIALS
- PERSONAL PROTECTIVE EQUIPMENT
- GENERAL ENVIRONMENTAL CONTROLS
- MEDICAL AND FIRST AID

OSHA STANDARDS (CONT.)

- FIRE PROTECTION
- COMPRESSED GAS
- MATERIALS HANDLING AND STORAGE
- MACHINERY AND MACHINE GUARDING
- PORTABLE POWERED TOOLS
- WELDING, CUTTING
- ELECTRICAL
- TOXIC & HAZARDOUS SUBSTANCES

TABLE OF VIOLATIONS

• ELECTRICAL HAZARDS	37%
• PERSONAL PROTECTIVE EQUIPMENT	11%
• HAZARD COMMUNICATIONS	10%
• MACHINE GUARDING	8%
• WALKING/WORKING SURFACES	6%
• COMPRESSED GAS STORAGE	6%

ELECTRICAL

- TEMPORARY WIRING
- UNLABELED DISCONNECT
- CUT/FRAYED CORDS
- REVERSED POLARITY

PERSONAL PROTECTIVE EQUIPMENT

- EMERGENCY EYE/SHOWER
  - NOT AVAILABLE
    OR
  - BLOCKED

- IMPROPER RESPIRATOR STORAGE

- EYE/FACE PROTECTION

HAZARD COMMUNICATION

- MSDS ACCESSIBILITY
- MSDS AVAILABILITY
- UNLABELED CONTAINERS
  - CONTENTS
  - HAZARD RATING
- EMPLOYEE RECALL

MACHINE GUARDING

- UNSECURED GUARDS

- UNGUARDED HAZARDS

PROGRAMS

- RESPIRATORY PROTECTION
- HEARING CONSERVATION
- CRANE/HOIST INSPECTION FREQUENCY

RESPIRATORY PROTECTION

- COORDINATION/CONTROL
  - PRACTICE VS. PROGRAM
- SELECTION - HAZARD
- SURVEILLANCE WORK CONDITIONS
- QUALITY CONTROL

RESPIRATORY PROTECTION

BREATHING AIR

- CONFIGURATION CONTROL
  - AIR LINE COUPLINGS
  - WELDED VS. THREADED
  - ESCAPE PROVISION - IDLH CONDITIONS
  - MONITORING FOR IDLH

HEARING CONSERVATION

CONSTRUCTION CENTRAL SHOPS

- ID RISK GROUP >85 dB TWA
- ANNUAL AUDIOMETRIC TESTING
- ANNUAL TRAINING
- RECORD KEEPING
  - MONITORING
  - TESTING
  - TRAINING
  - CONTROLS IMPLEMENTED

CRANES/HOISTS

QUARTERLY INSPECTION CONDUCTED

MONTHLY INSPECTION REQUIRED

APPENDIX 2

MICROVACUUM TECHNIQUE FOR
ACM DEBRIS SAMPLING

APPENDIX A
STANDARD OPERATING PROCEDURE
Dust Sample Collection for TEM Analysis

1. Sampling nozzle construction:

1-1 Cut a 1 1/2 inch length of new (clean) flexible plastic tubing.

1-2 Cut 2 notches 1/8" deep across one end of the tubing, as shown in Figure 1

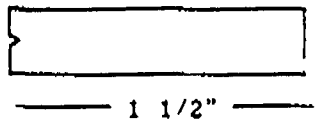


Figure 1. Flexible tubing 3/8" O.D.; 5/16" I.D.

2. Set up:

2-1 Attach an air monitoring cassette, 37mm or 25mm, to a personal air sampling pump with flexible plastic tubing. Use MCE filters in the cassettes.

2-2 Attach the tubing nozzle to the other end of the cassette with the notched end toward the surface area to be sampled.

2.3 Adjust air sampling pump to 2 liters per minute.

3. Collection:

3-1 Mark off and measure the area of the surface to be sampled. Use a 10 cm x 10 cm area (100 square centimeters) whenever possible. A pre-cut anti-static template is acceptable. When sampling above ceiling tiles, spread a plastic drop cloth on the floor to minimize the spreading of debris. Respirators should be worn as needed.

3-2 While drawing air through the cassette, pass the nozzle over the marked surface, covering the entire measured surface in two directions over the time span of one minute. Contact with the surface is necessary.

3-3 Turn off the pump with cassette facing up.

3-4 Cap tubing with 1/2" ID plastic cap and tape to the tubing. Replace outlet plug on cassette.

3-5 Document all pertinent information on air sampling cassette, dust sampling survey sheet and chain of custody sheet.

3-6 Ensure that cassettes remain intact by taping or appropriate packaging.

10/89

APPENDIX B

STANDARD OPERATING PROCEDURE

Dust Sample Preparation for TEM Analysis

1. Materials and Equipment:

Positive flow clean bench with HEPA filtered air
Negative air pressure box or hood
Squeeze bottle
Glass beaker (50 ml)
Pre-rinsed polyethylene sample container with wide mouth screwcap (125 ml) or equivalent sealable container
Water proof marker
Forceps
Low power ultrasonic bath
Disposable glass graduated pipettes (1, 5, 10 ml sizes)
Pipette, piston type, 10-100 ul range adjustable volume
Disposable pipette tips, for use with piston pipette
Whatman brand filter funnel assembly (47 mm filter diameter) or equivalent
Filtering flask
Cellulose ester membrane filters (47 mm diameter, 0.45 um pore size)
Cellulose ester membrane filters (47 mm diameter, 0.22 um pore size)
Storage container for 47 mm sample filters (Gelman-Analyslide or equivalent)
Desiccator
Water, deionized, particle free (<0.2um)
Low Temperature Asher
Hydrochloric acid 1.0%
High vacuum evaporator
Litmus paper

NOTE: All references to water in this procedure refer to deionized, particle-free water

10/89

2 Initial cassette handling:

2-1 Using a waterproof marker, label the filter cassette and the sample container with a McCrone sample number.

2-2 Make sure the filter cassette is capped on both ends with an inlet and outlet plug.

3 Wet transfer of dust from field sampling cassette:

NOTE: See Materials and Equipment for type of water. All uses of water in steps 3-2 through 3-12 are from the wash bottle in step 3-1.

3-1 Pre-measure 100 milliliters of water into a clean wash bottle.

3-2 In a hood, remove 1/2" ID plastic cap from the tubing and fill the cassette to 1/4 to 1/3 full with water. Rinse cap and tubing and dispose of properly.

3-3 Replace inlet plug on cassette and shake vigorously for 15 seconds.

3-4 Remove cassette cap and transfer suspension to the labeled sample container.

3-5 Rinse the inside of cap and filter cassette into the sample container three times, or until all loose particles have been transferred.

3-6 Replace cap and remove cassette cowl.

3-7 Remove top (sampling) filter and place in a disposable glass vial with sample side away from vial wall, and fill with water to cover the filter.

3-8 Ultrasonicate filter for 20 seconds.

3-9 Pour vial contents into the sample container and rinse the vial and filter 2-3 times, adding the rinse to the sample container.

3-10 Place rinsed filter on cassette base and set open filter cassette assembly in a negative air hood until dry. Discard the vial.

3-11 Add the remaining water from the wash bottle to the sample container to make a total of 100 ml. Adjust pH to 3.5 with 1.0% hydrochloric acid. Use Litmus paper for pH testing.

4 Assembly and preparation of the filter funnel:

NOTE: The following steps are performed on a clean bench, with a positive flow of HEPA filtered air.

4-1 Seat filter funnel base in opening of filtering flask.

10/89

4-2 Dribble water onto the glass frit to form a bead across the entire surface.

4-3 Place a 47 mm, 0.45 um filter on the water bead. This will serve as the backing filter.

4-4 While holding the filter in position with forceps, apply vacuum until filter is flat.

4-5 Release vacuum.

4-6 Dribble water onto the 0.45 um backing filter to form a bead across the entire filter surface.

4-7 Place a 47 mm, 0.22 um filter on the water bead. This will serve as the sample filter.

4-8 Repeat steps 4-4 and 4-5.

4-9 Place funnel on base and filters, then clamp.

4-10 Add 10 to 20 ml of water. Be sure vacuum is released completely.

5 Filtration of the dust/water suspension:

5-1 Cap sample container and briefly shake sample to make a uniform suspension; then ultrasonicate for 10 minutes.

5-2 Shake the sample vigorously for 30 seconds, then loosen cap and set it aside to allow the large particles to settle or rise.

5-3 After 2 minutes, extract a measured volume of suspension with a prerinsed disposable graduated pipette or disposable micropipette halfway below the water surface. Be sure to avoid large floating or settled particles.

5-4 Transfer extracted suspension to the assembled and prepared filter funnel.

NOTE: Experience has shown that sample volumes can vary from 60 ul to 100 ml depending on the turbidity of the suspension. Generally two or three extractions are taken, one 5 times greater volume than the next. Filtration of the greater volume typically results in a slight, noticeable discoloration of the sample filter.

5-5 Squirt 5-10 ml of deionized water into the funnel to agitate the suspension; then let it settle for about one minute, to produce a uniform particle distribution on the filter.

5-6 Apply a vacuum until entire sample is filtered. Do not rinse the funnel, as it will disturb the sample distribution.

10/89

5-7 With vacuum still being applied, remove the funnel from the base and carefully remove the top (sample) filter with forceps and place the filter (sample side-up) in an Analyslide container.

5-8 Place cap loosely on Analyslide and place it in a desiccator to dry for approximately 12 hours. If the desiccant is fresh, 2-3 samples can be dried in as little as 3 hours. Filters also have been dried on a hot plate at 100° F on a positive air flow clean bench for 30 minutes to 1 hour.

6 Direct transfer preparation of the sample filter:

For further preparation of the dry sample filters, follow the standard operating procedure based on the NIOSH Method No. 7402 for the preparation of air samples for asbestos analysis.[1] Pages 2-4 describe the reagents and procedure.

Reference

1. Carter, J.W., Baron, P.A. and Taylor, D.G., "NIOSH 7402", NIOSH Manual of Analytical Methods, p. 7402-1 through 7402-7 (1987).

APPENDIX C

STANDARD OPERATING PROCEDURE

TEM Analysis of Prepared Dust Samples and Calculation of Results

1. Counting rules for asbestos analysis can follow either the EPA provisional method, Level II analysis[1] (Yamate, et. al., 1984) or the Final Rule and Notice for asbestos containing materials in schools, "AHERA Method".[2]

2. The analysis is concluded when one of the following three conditions is met:

   a) Completion of ten grid openings or the grid square containing the 100th asbestos structure.

   b) Completion of the grid square that achieves a detection limit of less than 161 asbestos structures/square centimeter. Depending on the amount of particulate in the sample, this value can be achieved by filtering more of the sample or by increasing the number of grid openings analyzed. The detection limit is based on a minimum of 4 structures per analysis and is calculated using the equation in step 3, below.

   c) Completion of 20th grid opening for samples with heavy particulate which cannot be prepared to achieve a detection limit of 161 str/cm^2.

3. The amount of asbestos in a given sample is expressed as structures per square centimeter and is calculated, using the following equation:

$$\frac{\#str \times efa}{\#sq \times sqa \times spl \times fr}$$

#str = number of asbestos structures counted in the analysis
efa = effective filter area of the final sampling filter in square micrometers (see step 4-7)
#sq = number of grid openings analyzed
sqa = surface area of one TEM grid opening in square micrometers
spl = amount of surface area sampled in square centimeters (see Sampling Procedure, step 3-1)
fr = fraction of sample that was filtered in step 4-3

References

1. Yamate, M., Agarwal, S.C., Gibbons, R.D. 1984. Methodology for the Measurement of Airborne Asbestos Concentrations by Electron Microscopy. Draft Report. Washington, D.C.: Office Research and Development, U.S. Environmental Protection Agency. Contract No. 68-02-3266.

2. Federal Register, 40 CFR Part 763, 30 October 1987.

APPENDIX D

Notes on Interpreting Transmission Electron Microscopy (TEM) Results of Asbestos Analysis of Dust and Carpet Samples

Although the reader is strongly encouraged to contact McCrone Environmental Services, Inc., for help in answering any questions related to a specific asbestos analysis, the following notes provide some general information about asbestos analysis of dust and carpet samples by transmission electron microscopy (TEM).

1. The following abbreviations are used on the asbestos data sheets:

   Structure type: F = fiber, B = bundle, M = matrix, C = cluster
   Asbestos type: C = chrysotile, A = amphibole

2. Asbestos structure concentrations are reported in terms of asbestos structures per square centimeter. Concentrations are based on the number of asbestos structures counted and the area analyzed. Generally, if the number of fibers counted is 4 or less the sample cannot be considered statistically different from zero.

3. The detection limit for the dust analysis method depends primarily on the amount of area originally sampled. If the dust collected from a 100 square centimeter area is light, typically one-third to one-half of it is prepared for analysis. The detection limit for such a sample is in the range of 161 fibers per square centimeter.

4. In dust samples containing high levels of asbestos only a small portion of the original sample may be prepared so that the electron microscope specimens are not overloaded. In some cases several preparations may be necessary before the right dilution for counting is found.

5. Ambient levels of asbestos in dust or carpet samples have not been published. The highest level in dust we have found using our vacuuming technique in an occupied building not involved in an abatement project was 4.5E+06 fibers per square centimeter. The building was known to have asbestos- containing ceiling material.

6. The following ranges characterize the levels found in dust and carpet samples we have analyzed:

Level	Concentration (structures/sq.cm.)
Low	5.00 - 1,000
Moderate	1,000 - 100,000
High	over 100,000

Note: To convert structures/sq.cm. to structures/sq.ft. multiply by 929.03.

10/89

APPENDIX 3

AIR SAMPLE DATA SHEETS (13)

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 1

SRS | OSI-83825 | PW/PVC | Date 2/7/90 | Mgmt Syst Data Keys

Source Code | Sample Number | Type | Job No. 20977

Media Lot No. — | Flowmeter Serial No. 1196 | Materials: Total fume.

FIELD NOTES

Location of Sampler: Inside welders Helmet | Employee ID: 250-90-4847

Process Details: WIRE FEED | Location: Boiler Maker Shop

Operation Details: Box construction | Process: Box Construct

Conditions/Notes: Tack welding I beam to plate | Operations: wire feed weld.

Trade/Job: WELDER

Other: —

Engineering Controls: Dilution & local Exhaust

Sampling Equip. No. 8743 | Pre-Survey Calibration ✓ | Post Survey Calibration —

Analyze for (Materials): TOTAL PARTICULATE (Welding fume)

Interferences: NONE APPARENT

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading G Stroke	Flow Rate (lpm) ccpm	Aver. Flow (lpm) ccpm	Volume (L) cc
Start	910		36	1.51		
~~Check~~	—	—	—	—	—	—
Check	—	—	—	—	—	—
Stop	11:50	166	32	1:36	1.43	237.4

Total Time 166 min

Low Flow Vol. Calc. [___ Str.] x [___ cc/Str.] x [___ Str. Vol. Multi.] x 10^{-3} = Total Vol. (L) ___

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std, TLV, (OSHA), OTHER
TOTAL FUMES	0.6 mg	237.4 L	3.0 mg/m³	5 mg/m³
				1.0 mg/m³ 8 HR TWA.
				95% UCL RATIO = 0.38

Lab. Serial No. HL. SN46421IH

Collected By: DM Date: 2/7/90 Calculated By: DM Date: 2/14/90 Checked By: JC Date: 2/23/90

2046B/OS

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 2

SRS | OSI-83827 | PWPVC | Date 2/7/90 | Mgmt Syst Data Keys

Source Code | Sample Number | Type | Job No. 20877

Media Lot No. — | Flowmeter Serial No. 1196 | Materials: TOTAL FUME

FIELD NOTES

Employee ID: 280-90-4847

Location of Sampler: INSIDE WELDING HOOD | Location: BOILERMAKER SHOP

Process Details: BOX CONSTRUCTION | Process: BOX CONSTRUCTION

Operation Details: WIRE FEED | Operations: WIRE FEED WELD

Conditions/Notes: FINAL TACK, THEN 12" WELD OF I BEAM ON TO PLATE, DONE IN OPEN ON FLOOR, START OF NEW BOX | Trade/Job: WELDER

Other: —

Engineering Controls: DILUTION VENT

Sampling Equip. No. 5743 | Pre-Survey Calibration ✓ | Post Survey Calibration ____

Analyze for (Materials): WELDING FUME

Interferences: NONE OBSERVED

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading (G) Stroke	Flow Rate (lpm) ccpm	Aver. Flow (lpm) ccpm	Volume (L) cc
Start	12:45		35	1.47	1.43	
Check						
Check						
Stop	14:56		33	1.40		187.3

Total Time 131

Low Flow Vol. Calc. [___ Str.] x [___ cc/Str.] x [___ Multi.] x 10^{-3} = Total Vol. (L) ___ | Str. Vol.

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std, TLV, (OSHA), OTHER
Fume	1.2 mg	187.3L	6.4 mg/m³	5 mg/m³
				1.7 mg/m³ 8HR TWA
				95% UCL RATIO = 0.50

Lab. Serial No. HL SN46421 IH

Collected By: DM Date: 2/7/90 Calculated By: SM Date: 2/14/90 Checked By: TAC Date: 2/28/90

2046B/OS

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 3

SRS | OSI-83824 | PWPVC | Date 2/7/90 | Mgmt Syst Data Keys

Source Code | Sample Number | Type | Job No. 20877

Media Lot No. — | Flowmeter Serial No. 1196 | Materials: Welding fume

FIELD NOTES

Location of Sampler: INSIDE welders hood

Process Details: Box CONSTRUCTION

Operation Details: WIRE FEED

Conditions/Notes: INTERIOR BOX SEAM WELDING ON 18'x12'x7' Box

Employee ID: 249-45-5668

Location: Boilermaker Shop

Process: Box Construction

Operations: wire feed weld.

Trade/Job: Welder

Other: —

Engineering Controls: DILUTION & LOCAL

Sampling Equip. No. 1726 Pre-Survey Calibration ✓ Post Survey Calibration ✓

Analyze for (Materials): WELDING FUME

Interferences: NONE OBSERVED

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading G Stroke	Flow Rate (lpm) ccpm	Aver. Flow lpm ccpm	Volume L cc
Start	9:07		36	1.51		
Check						
Check						
Stop	17:58		21	0.96	1.2350	211.2

Total Time 171

Low Flow Vol. Calc. [___ Str.] x [___ cc/Str.] x [___ Str. Vol. Multi.] x 10^{-3} = Total Vol. (L) 211.2

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std. TLV, (OSHA) OTHER
Fume	0.6mg	211.2L	3 mg/m³	5 mg/m³
				1.1 mg/m³ 8hr TWA

Lab. Serial No. HL SN46421TH

95% UCL Ratio = 0.38

Collected By: [illegible] Date: 2/7/90 Calculated By: DM Date: 2/14/90 Checked By: [illegible] Date: 2/20/90

2046B/OS

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 4

SZS | OSI-83826 | PWPC | Date 2/7/90 | Mgmt Syst Data Keys

Source Code | Sample Number | Type | Job No. 20877

Media Lot No. — | Flowmeter Serial No. 1196 | Materials: TOTAL FUME

FIELD NOTES

Employee ID: 249-45-5668

Location of Sampler: INSIDE WELDERS HOOD | Location: BOILERMAKER SHOP

Process Details: BOX CONSTRUCTION | Process: BOX CONSTRUCTION

Operation Details: WIRE FEED | Operations: WIREFEED WELD

Conditions/Notes: INSIDE SEAM WELDING | Trade/Job: WELDER

BOX OPEN TOP ≈ 16'X12'X7', ELEPHANT | Other: —

TRUNK RUN INTO BOX UNUSED

Engineering Controls: DILUTION VENT

Sampling Equip. No. 1726 | Pre-Survey Calibration ✓ | Post Survey Calibration ✓

Analyze for (Materials): WELDING FUME

Interferences: NONE OBSERVED

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading (G) Stroke	Flow Rate (lpm) ccpm	Aver. Flow (lpm) ccpm	Volume (L) cc
Start	12:41		37	1.54		
Check					1.52	
Check						
Stop	14:51	—	36	1.51		198

Total Time 130 min

Low Flow Vol. Calc. [___Str.] x [___cc/Str.] x [___ Str. Vol. Multi.] x 10^{-3} = Total Vol. (L)___

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std. TLV, (OSHA) OTHER
Fume	1.3 mg	198 L	6.6 mg/m³	5 mg/m³

1.8 mg/m³ 8HR TWA

95% UCL RATIO = 0.52

Lab. Serial No. HL. SN46421H.

Collected By: DM Date: 2/7/90 Calculated By: DM Date: 2/14/90 Checked By: JAC Date: 2/28/90

2046B/OS

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 5

SRS | OSI-83823 | PWPK | Date 2/7/90 | Mgmt Syst Data Keys

Source Code | Sample Number | Type | Job No. 20877

Media Lot No. — | Flowmeter Serial No. 1196 | Materials: Total fume

FIELD NOTES

Location of Sampler: INSIDE WELDERS HOOD
Process Details: BOX CONSTRUCTION
Operation Details: WIRE FEED
Conditions/Notes: WELDING INSIDE SEAMS ON 25'x12'x15' OPEN TOP BOX

Employee ID: 247-02-3142
Location: Boilermaker Shop
Process: Box Const.
Operations: Wire feed weld
Trade/Job: Welder
Other: —

Engineering Controls: ELEPHANT TRUNK RUN TO BOTTOM OF BOX
Sampling Equip. No. 3590 Pre-Survey Calibration ✓ Post Survey Calibration ✓
Analyze for (Materials): WELDING FUME
Interferences: NONE OBSERVED

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading G Stroke	Flow Rate (lpm) ccpm	Aver. Flow (lpm) ccpm	Volume (L) cc
Start	9:04	177	36	1.51	1.59	282.3
~~Check~~	12:01		41	1.68		
ON ~~Check~~	—	177	—	—	1.68	297.4
Stop	1:45		41	1.68		

Total Time 354

Low Flow Vol. Calc. [___ Str.] x [___ cc/Str.] x [___ Str. Vol. Multi.] x 10^{-3} = Total Vol. (L) 579.7

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std. TLV, (OSHA), OTHER
Fume	1.8 mg	579.7	3.1 mg/m³	2.3 mg/m³ (5 mg/m³) 8 HR TWA

Lab. Serial No. HL SN464721H

95% UCL Ratio = 0.62

Collected By: DM Date: 2/7/90 Calculated By: DM Date: 2/14/90 Checked By: Joe Date: 2/28/90

2046B/OS

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 6

SRS | OSI-83833 | P

Source Code | Type | Date 2/9/90 | Job No. 20921

Media Lot No. DUC15673 | Flowmeter Serial No. 1196

Mgmt Syst Data Keys

Materials: welding fume

Employee ID: 871026 254-50-7107

Location: TRI SHOP

Process: Cutting SS

Operations: Plasma torch & Grinding

Trade/Job: welder

Other:

FIELD NOTES

Location of Sampler: Lt collar

Process Details: TRI SHOP - Burnroom, RT 10

Operation Details: Cut metal sheet pipe to shop

Conditions/Notes: Plasma torch cutting, grinding of stainless steel.

Engineering Controls: local Exh hoods

Sampling Equip. No. 781 Pre-Survey Calibration ✓ Post Survey Calibration ✓

Analyze for (Materials): mass

Interferences: other than welding mass

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading (G) Stroke	Flow Rate lpm ccpm	Aver. Flow lpm ccpm	Volume L cc
Start	0906		50	1.99		
Check					1.99	674.61
Check		339				
Stop	1435		50	1.99		

Total Time 339 ≤ 39

Low Flow Vol. Calc. [___ Str.] x [___ cc/Str.] x [___ Str. Vol. Multi.] x 10^{-3} = Total Vol. (L) 674.61

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std, TLV, (OSHA), OTHER
WELDING FUME	0.7 mg	674.6L	1.0 mg/m³	5 mg/m³ 0.7 mg/m³ 8HR TWA

95% UCL RATIO = 0.30

Lab. Serial No. HL SN4/64/21 IH

Collected By: JM Date: 2/9/90 Calculated By: JM Date: 2/9/90 Checked By: TK Date: 2/19/90

2046B/OS

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 7

SRS — Source Code | OSI-83829 | P — Type | Date 2/9/90 | Job No. 20877 | Mgmt Syst Data Keys

Media Lot No. 120 Charcoal Tube | Flowmeter Serial No. L3 SHORRATE | Materials: Freon TF

FIELD NOTES

Employee ID: 87195 (255-60-0416)

Location of Sampler: Lt level | Location: RT 9

Process Details: Clean Room | Process: Cleaning

Operation Details: Clean Bige w/ Freon TF | Operations: —

Conditions/Notes: Routine Ops | Trade/Job: Bgi fitter

Other: —

Engineering Controls: local exhaust ventilation

Sampling Equip. No. 734 | Pre-Survey Calibration ✓ | Post Survey Calibration ✓

Analyze for (Materials): Freon TF (113)

Interferences: —

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading G Stroke	Flow Rate lpm (ccpm)	Aver. Flow lpm (ccpm)	Volume (L) cc
Start	0905		60	149		
Check	—	340	—	—	135.5	46.07
Check	—		—	—		
Stop	1445	—	50	123	—	—

Total Time 340 5.40

Low Flow Vol. Calc. [___ Str.] x [___ cc/Str.] x [___ Str. Vol. Multi.] x 10^{-3} = Total Vol. (L) 46.07

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std, TLV, (OSHA), OTHER
FREON	6.85mg	46.07 L	19 ppm	1000 ppm 13.5 ppm 8 HR TWA. 95% UCL RATIO = 0.11

Lab. Serial No. PAL SW 46421 EH

Collected By: WL Date: 2/9/90 Calculated By: WL Date: 2/9/90 Checked By: ~~TNC~~ Date: 2/28/90

2046B/OS

Pages 51 thru 54
not available

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 12

SRS | OSI-83355 | D
Source Code | Type

Date 2/12/90 | Job No. 20827

Mgmt Syst Data Keys

Media Lot No. PWPUC-15355 | Flowmeter Serial No. 311916

Materials: Coal Dust

FIELD NOTES

Employee ID: 301267
258-ii-05000

Location of Sampler: Rt Lagel | Location: D AREA

Process Details: D area, Crusher house | Process: CRUSHER WASH DOWN

Operation Details: Wash down crusher | Operations: WASH DOWN

Conditions/Notes: Use water a spray to clean coal out of hopper if it clogs perform as needed. Simulated for 30 hours 1306 Start | Trade/Job: Coal H

Other: —

Engineering Controls: Water -

Sampling Equip. No. 712 | Pre-Survey Calibration ✓ | Post Survey Calibration

Analyze for (Materials): Coal dust

Interferences: Other dust

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading (G) Stroke	Flow Rate (lpm) ccpm	Aver. Flow (lpm) ccpm	Volume L cc
Start	1258		51	2.02		
Check		38			1.97	55.16
Check						
Stop	1337		48	1.92		

Total Time 38

Low Flow Vol. Calc. [___ Str.] x [___ cc/Str.] x [___ Str. Vol. Multi.] x 10^{-3} = Total Vol. (L) 55.16

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std, TLV, (OSHA), OTHER
Coal Dust	<0.1	55.20L	<0.2	2 mg/m3 / 2.4 mg/m3 / N/A

95% UCL RATIO = N/A

Lab. Serial No. IH SN 46421 LH

Collected By: WL Date: 2/12/90 | Calculated By: ML Date: 2/12/90 | Checked By: [illegible] Date: 2/28/90

2046B/OS

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 13

SRS — OSI-83353 — ____

Source Code — Type — Date 2/2/90 — Job No. ____ — Mgmt Syst Data Keys

Media Lot No. PWPVC-1SH20 — Flowmeter Serial No. ____ — Materials: Total Dust

FIELD NOTES — Employee ID: ____

Location of Sampler: Blank — Location: ____

Process Details: ____ — Process: ____

Operation Details: ____ — Operations: ____

Conditions/Notes: ____ — Trade/Job: ____

____ — Other: ____

Engineering Controls: ____

Sampling Equip. No. ____ Pre-Survey Calibration ____ Post Survey Calibration ____

Analyze for (Materials): ____

Interferences: ____

FOR INTEGRATED SAMPLES:

	Time	Duration (min.)	Meter Reading G Stroke	Flow Rate lpm ccpm	Aver. Flow lpm ccpm	Volume L cc
Start	____		____	____		
Check	____	____	____	____	____	____
Check	____	____	____	____	____	____
Stop	____	____	____	____	____	____

Total Time ____

Low Flow Vol. Calc. [____Str.] x [____cc/Str.] x [____ Str. Vol. Multi.] x 10^{-3} = Total Vol. (L)____

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std. TLV, (OSHA), OTHER
Total Dust	< 0.1 mg	0 L	< 0.2 mg/m^3	10 mg/m^3

Lab. Serial No. HL SW 46421 TH

Collected By: MA Date: 2/2/90 Calculated By: MA Date: 2/28/90 Checked By: JK Date: 2/28/90

2046B/OS

APPENDIX 4

NOISE DOSIMETRY SHEETS (11)

J

NOISE DOSIMETER DATA SHEET

Operation/location in plant 831.2 Date 2/6/90 Job No. 20877

Location on Person (2) SHOULDER % Dose Per Day Projected 8hr 91.4%

Monitor Serial No. 385 Sampling Time 169 min

Conditions/Notes: SAW HELPER, REMOVING SHEETS & STACKING, WORKED ON SAME CLEAN-UP THEN ASSISTED ON PLANNER

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

ACI - SN 02578

DATA

	Time	% Reading
Initial	15:20	0
Intermediate (not required)		
Final	16:09	
Totals	169 min	91.4% Dose
115 dBA exceeded (yes or no) NO		
Equivalent 8-hr time-weighted average sound level (dBA)		89 dBA

Calculations:

Collected By: DM Date: 2/6/90 Calculated By: DM Date: 2/6/90 Checked By: MRC Date: 2/20/90

2

NOISE DOSIMETER DATA SHEET

CARPENTRY SHOP

Operation/location in plant 831E

Date 2/6/90 Job No. 20877

Location on Person (A) SHOULDER

% Dose Per Day PROJECTED 8 Hr = 58%

Monitor Serial No. 125

Sampling Time 173 MIN

Conditions/Notes: SAW OPERATOR - CUTTING 3/4" PLY INTO 4'X4' VALUES ON 12" TABLESAW, TRIM EDGES, WORKED ON SET-UP FOR 1/4" PLY, THEN STARTED CUTTING

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

CALIBRATOR ACI - SN02578

DATA

	Time	% Reading
Initial	13:15	0%
Intermediate (not required)		
Final	16:08	
Totals	173 MIN	58
115 dBA exceeded (yes or no) NO (110)		
Equivalent 8-hr time-weighted average sound level (dBA)		86 dBA

Calculations:

L MAX = 110 dB

Collected By: DM Date: 2/6/90 Calculated By: DM Date: 2/6/90 Checked By: JMC Date: 2/13/90

3

NOISE DOSIMETER DATA SHEET

Operation/location in plant 8312 Date 2/6/90 Job No. 20877

Location on Person ② SHOULDER % Dose Per Day PROJECTED 8hr 63%

Monitor Serial No. 386 Sampling Time 160 MINUTES

Conditions/Notes: CARPENTER Apprentice IN ASSEMBLY AREA, GLUEING, DRILLING, CLAMPING, FACE FRAMES

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

CALIBRATOR ACI - SN 02578

DATA

	Time	% Reading
Initial	13:18	0
Intermediate (not required)		
Final	15:58	63%
Totals	160 min.	
115 dBA exceeded (yes or no) NO		
Equivalent 8-hr time-weighted average sound level (dBA)	634	86 dBA

Calculations:

L MAX = 111 dB

Collected By: DJM Date: 2/6 Calculated By: DJM Date: 2/6/90 Checked By: JAC Date: 2/23/90

4

NOISE DOSIMETER DATA SHEET

Operation/location in plant 6334 BOILER Date 2/7/90 Job No. 20877

Location on Person (L) Shoulder % Dose Per Day 59%

Monitor Serial No. 385 Sampling Time 375

Conditions/Notes: WELDING, SETUP, GRINDING, OPERATING MAGNETIC DRILL HOLE SAW

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

CALIBRATOR ACI - SN02578

DATA

	Time	% Reading
Initial	08.43	0
Intermediate (not required)		
Final		59%
Totals	375 min	
115 dBA exceeded (yes or no) NO		
Equivalent 8-hr time-weighted average sound level (dBA)	59%	86 dB

Calculations:

MAX 113 dB

Collected By: DM Date: 2/7/90 Calculated By: DM Date: 2/7/90 Checked By: JRC Date: 2/16/90

5

NOISE DOSIMETER DATA SHEET

Operation/location in plant 854 Boiler Date 2/7/90 Job No. 20877

Location on Person @ Shoulder % Dose Per Day 43%

Monitor Serial No. 396 Sampling Time 8:39 - 3:78

Conditions/Notes: Welder, working on outside bottom seam, welding, wire brushing knocking slag w/ hammer. Grinding taking place about 8' away

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

Calibrator ACI - SN 02578

DATA

	Time	% Reading
Initial	8:39	0
Intermediate (not required)		
Final		3.4%
Totals	378 min.	
115 dBA exceeded (yes or no) yes		
Equivalent 8-hr time-weighted average sound level (dBA)	43%	84 dB

Calculations:

MAX 115 dB

Collected By: DSM Date: 2/7/90 Calculated By: MR Date: 2/7/90 Checked By: Joe Date: 2/8/90

6

NOISE DOSIMETER DATA SHEET

Operation/location in plant Machine Shop — Date 2/7/90 Job No. 20877

Location on Person (L) Shoulder — % Dose Per Day 45%

Monitor Serial No. 125 — Sampling Time 377

Conditions/Notes: Mechanic, GRINDING, SHEER SET-up, RUNNING SHEER

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

ACI - SN 02578

DATA

	Time	% Reading
Initial	08:45	0
Intermediate (not required)		
Final	15:03	35%
Totals	377 min	
115 dBA exceeded (yes or no) NO		
Equivalent 8-hr time-weighted average sound level (dBA)	45%	84 dB

Calculations:

Collected By: DM Date: 2/7/90 Calculated By: DM Date: 2/7/90 Checked By: m Date: 2/12/90

7

J

NOISE DOSIMETER DATA SHEET

Operation/location in plant Clean Room / RTF Date 2/9/90 Job No. 20877

Location on Person lt lapel % Dose Per Day 37.8

Monitor Serial No. 17745 Sampling Time 276

Conditions/Notes: Clean dry gage w/ compressed air. Wearing MPD

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓ OK	Check Batteries	✓OK
2. Check Calibration	✓ OK	Take Reading	✓ OK
3. Reset	✓ OK	Check Calibration	✓ OK
4. Monitor On	✓	Monitor on "Hold"	✓

Calibrator AC1 - SN02578

DATA

	Time	% Reading
Initial	1010	0
Intermediate (not required)		
Final	1447	37.8
Totals	276 min	
115 dBA exceeded (yes or no) NO		
Equivalent 8-hr time-weighted average sound level (dBA)	83.0 dBA	37.8%

Calculations:

Collected By: MR Date: 2/9/90 Calculated By: MR Date: 2/9/90 Checked By: JJC Date: 2/26/90

8

NOISE DOSIMETER DATA SHEET

Operation/location in plant Clean Room/RTF Bldg Date 2/9/90 Job No. 20877

Location on Person Rt lapel % Dose Per Day 46.2

Monitor Serial No. 17748 Sampling Time 2 4hr 21min

Conditions/Notes: Cleaning / drying pipe. 120 psi compressed air.
Wearing HPD

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓ OLC	Check Batteries	✓
2. Check Calibration	✓ OLC	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

Calibrator AC1 — SN 02578

DATA

	Time	% Reading
Initial	1019	0
Intermediate (not required)		
Final	1440	46.2
Totals	261min	
115 dBA exceeded (yes or no)	YES	
Equivalent 8-hr time-weighted average sound level (dBA)	84.5	46.2%

Calculations:

Exceeded 115dBA

Collected By: MR Date: 2/9/90 Calculated By: MR Date: 2/9/90 Checked By: JRC Date: 2/28/90

9

NOISE DOSIMETER DATA SHEET

Operation/location in plant Dana PH/CoalBank 12m Date 2/12/90 Job No. 20877

Location on Person Rt Lapel % Dose Per Day 16.9% PROJECTED 8HR

Monitor Serial No. 17745 Sampling Time 334 MIN

Conditions/Notes: Bunker Operation *1040 left work area, lunch *1145 returned to get pump w/ in coal yard Wearing HPD

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

Calibrator AC-1 SN 102578

DATA

	Time	% Reading
Initial	0940	0
Intermediate (not required)		
Final	1314	16.9
Totals	334 min	
115 dBA exceeded (yes or no) NO		
Equivalent 8-hr time-weighted average sound level (dBA)	79.8 dBA	16.9%

Calculations:

Collected By: [illegible] Date: 2/12/90 Calculated By: [illegible] Date: 2/12/90 Checked By: JAC Date: 2/15/90

10

NOISE DOSIMETER DATA SHEET

Operation/location in plant Dave Power Coal Handling / Crush. House 2 Date 2/10/90 Job No. 20871

Location on Person Lt lapel % Dose Per Day 34%

Monitor Serial No. 18184 Sampling Time 84 min

Conditions/Notes: Simulated cleaning of crusher 1306 @ 1337 - Stopped cleaning. Wore mic during housekeeping. Not wearing HPD

Coal Handler

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓

Calibrator AC-1 SN 02578

DATA

	Time	% Reading
Initial	1358	0
Intermediate (not required)		
Final	1524	
Totals	86 min	34 projected
115 dBA exceeded (yes or no) NO		
Equivalent 8-hr time-weighted average sound level (dBA)	81.9 dBA	34%

Calculations:

Collected By: m Date: 2/10/90 Calculated By: m Date: 2/10/90 Checked By: [illegible] Date: 2/29/90

J

11

NOISE DOSIMETER DATA SHEET

Operation/location in plant BWFF/Toyshop Date 2/13/90 Job No. 858063

Location on Person Lt Collar % Dose Per Day 95.4%

Monitor Serial No. 18184 Sampling Time 296 min

Conditions/Notes: MK Ferguson. Grinding on metal ~~shim~~ shim plates. This period of time representative of the day. Wearing HPD

Check List

Before Sampling		End of Sampling	
1. Check Batteries	✓	Check Batteries	✓
2. Check Calibration	✓	Take Reading	✓
3. Reset	✓	Check Calibration	✓
4. Monitor On	✓	Monitor on "Hold"	✓ OFF

Calibrator ACI. SN02519

DATA

	Time	% Reading
Initial	1003	0
Intermediate (not required)		
Final	1459	
Totals	296 min	95.4
115 dBA exceeded (yes or no) NO	112	
Equivalent 8-hr time-weighted average sound level (dBA)	89.7 dBA	95.4%

Calculations:

Collected By: MM Date: 2/13/90 Calculated By: MM Date: 2/13/90 Checked By: JAC Date: 2/26/90

APPENDIX 5

ACM SAMPLE DATA SHEETS (2)

BULK SAMPLING FIELD DATA SHEET

Data Sheet No. 14

Sample No. OSI 44701 (YSY D900210-113) Job No. 20871

Source Code SRS Date 2/10/90

Facility D area Powerhouse Quantity 5 mg (Volume, Weight)

FIELD NOTES

Area (Floor, room, etc.,) ~~forth~~ fourth level

Location: # 2 DA

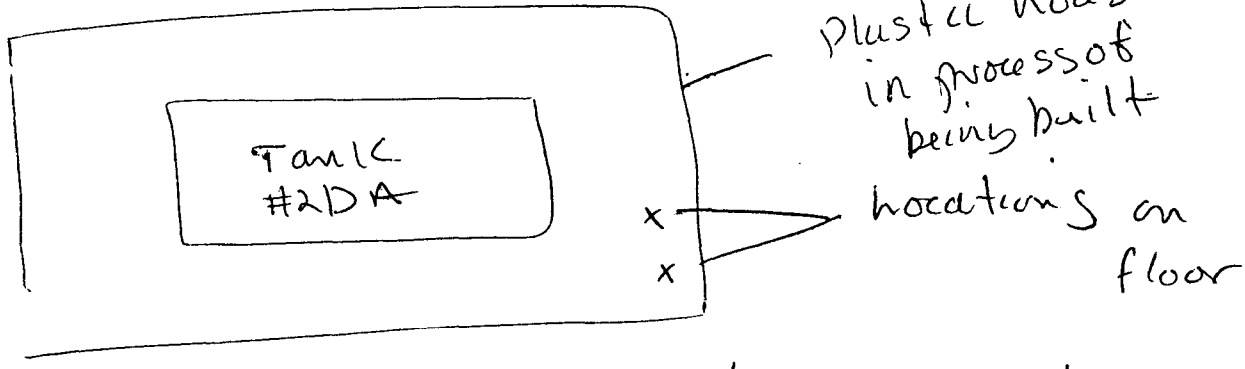
Material Use/Function: Insulation, steam pipe

Material/Sample Description/Appearance: Insulation debris on floor. White granular materials, moderately cohesive.

Collection Method: Picked up off of floor.

Analyze for (Materials): % Asbestos

Sample Location Sketch:



* Note: This sample was split w/ SRS Westinghouse

RESULTS:	Material	Quantity	Reference Level
2/13 - SRS	Bulk	~5-6 mg	0% asbestos
2/29 - Hagerlab 46588	Bulk		

Collected By: Michael J. Ryder Checked By: Jack Crawford Date: 3/2/90

ja/2046B/29
5/87

AIR SAMPLING FIELD DATA SHEET

Data Sheet No. 15

S12S (Source Code) | OSI-44702 (C484 D900210-2) (Sample Number) | Micro Vacuum (Type) | Date 2/10/90 | Job No. 20877

Media Lot No. NA | Flowmeter Serial No. NA

Mgmt Syst Data Keys
Materials: Asbestos
Employee ID: NA
Location: Dana Powerhouse
Process: Abatement Act.
Operations: Set up
Trade/Job: NA
Other: —

FIELD NOTES
Location of Sampler: Dana Powerhouse Fourth Level, #2 DA.
Process Details: Wall Crumbs on floor.
Operation Details: Insect
Conditions/Notes: Vacuumed crumbs off of floor at ~ 2 LPM

Engineering Controls: NA
Sampling Equip. No. ~~S212~~ Pre-Survey Calibration NA Post Survey Calibration NA
Analyze for (Materials): Asbestos
Interferences: —
FOR INTEGRATED SAMPLES: Vacuumed approximately 100 cm2.

	Time	Duration (min.)	Meter Reading G Stroke	Flow Rate lpm ccpm	Aver. Flow lpm ccpm	Volume L cc
Start	NA					
Check						
Check						
Stop						

Total Time
Low Flow Vol. Calc. [Str.] x [cc/Str.] x [Str. Vol. Multi.] x 10^{-3} = Total Vol. (L)

RESULTS: Material	Quantity	Sample Vol(L)	Conc(ppm) (mg/m3)	Std. TLV. OSHA. OTHER
ASBESTOS Structures	28,000,000	100 cm2	280,000 S/cm2.	No standard. Counts > 100,000 cm2 considered high.

cm2 = centimeter squared
S = Structures

Lab. Serial No. Res Em7374

Collected By: MR Date: 2/10/90 Calculated By: MR Date: 3/10/90 Checked By: JAC Date: 3/12/90

ge/2046B/85
2/87

APPENDIX 6

OSHA CITATIONS
SAVANNAH RIVER SITE

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(g)(1)(iii)(B)

(iii) Unless specifically permitted in paragraph (g)(1)(i) of this section, flexible cords and cables may not be used:
(A) As a substitute for the fixed wiring of a structure;
(B) Where run through holes in walls, ceilings, or floors;

Location: Building 105K, North side of Disassembly, HP monitoring equipment.

Hazard: Unprotected temporary wiring running through wall.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(b)(2)

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy.

Location: Building 105K, Crane Control Room, conduit coming out of alternate control box EN-K333-64-60.

Hazard: Conduit box (90 degree elbow) containing electrical wiring was uncovered.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(a)(2)

(2) Polarity of connections. No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.

Location: Building 105K, Crane Control Room, electrical outlet on wall behind crane control panel.

Hazard: Electrical receptacle had reversed polarity.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(a)(2)

(2) Polarity of connections. No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.

Location: Building 105K, E&I Shop Test Bench, closest to entrance.

Hazard: Test bench had two power receptacle columns which were all wired so that polarity was reversed.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 105K, E&I Shop, electrical box under panel "H".

Hazard: Electrical box was not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i) and 1200(f)(5)(ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 105K, E&I Shop, flammable storage cabinet.

Hazard: Chemical container was not labeled as to its contents, or its hazard rating.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 105K, Maintenance Shop, electrical panel from 13M.

Hazard: Disconnect means not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.212(a)(1)

(1) Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks.

Location: Building 108K, Room 1081, Emergency generator room platform near roll up doors.

Hazard: Rotating parts and pinch points from door roll-up opening mechanism were unguarded and easily accessible.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.27(c)(1)

(c) Clearance-
(1) Climbing side. On fixed ladders, the perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be 30 inches for a pitch of 90 degrees.

Location: Building 108K, Room 1081, Emergency generator room ladder to overhead platform.

Hazard: Overhead piping interferes with fixed ladder handhold so that there was not the required clearance.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(b)(2)

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy.

Location: Building 108K, minus 20 level, corridor 4, electrical outlet below periscope EP 234.

Hazard: Electrical box uncovered exposing electrical wiring.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.37(k)(2)

(2) Means of egress shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

Location: Building 108K, Room 1081, Emergency exit ladder from 1081 basement to Room 1081.

Hazard: Basement emergency egress ladder was blocked at landing by a large waste container.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(b)(2)

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy.

Location: Building 108K, Room 1081, Basement.

Hazard: Conduit "T" junction box was open exposing electrical wiring.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 108K, Room 1081, Basement GM continuous, FW pump.

Hazard: Machine guard was unsecured.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(b)(1)(ii)

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

Location: Building 108K, Room 1081.

Hazard: Electrical receptacle and conduit was not properly secured to wall.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.106(e)(9)(i)

(9) Housekeeping-
(i) General. Maintenance and operating practices shall be in accordance with established procedures which will tend to control leakage and prevent the accidental escape of flammable or combustible liquids. Spills shall be cleaned up promptly.

Location: Building 108K, Room 1081, Basement

Hazard: Ethyl ether was stored on top of combustible storage cabinet. Material is extremely flammable and based on the amount of dust on the can, appeared to have been outside the cabinet for some time.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 210, DWPF - New Clean Maintenance Shop.

Hazard: Equipment guarding absent on the following equipment:
1-Dake Press - needs shield.
1-Baldor Grinder - needs chip guard.
1-Shear - needs cut plate guard for passersby by at rear.

These findings must be taken care of when this new nonoperational shop becomes operations.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.305(a)(2)

(2) Temporary wiring. Temporary electrical power and lighting wiring methods may be of a class less than would be required for a permanent installation. Except as specifically modified in this paragraph, all other requirements of this subpart for permanent wiring shall apply to temporary wiring installations.

Location: Building 210, DWPF, E&I Shop.

Hazard: Temporary wiring permanently installed.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.1000(3); 107(b)(1); 107(d)(3)

(e) To achieve compliance with paragraphs (a) through (d) of this section, administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any equipment and/or technical measures used for this purpose must be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with 1910.134.

(1) Construction. Spray booths shall be substantially constructed of steel, securely and rigidly supported, or of concrete or masonry except that aluminum or other substantial noncombustible material may be used for intermittent or low volume spraying. Spray booths shall be designed to sweep air currents toward the exhaust outlet.

(3) Independent exhaust. Each spray booth shall have an independent exhaust duct system discharging to the exterior of the building, except that multiple cabinet spray booths in which identical spray finishing material is used with a combined frontal area of not more than 18 square feet may have a common exhaust. If more than one fan serves one booth, all fans shall be so interconnected that one fan cannot operate without all fans being operated.

Location: Building 210, DWPF.

Hazard: Improper paint spray booth consisting of a plastic house on an outdoor loading dock. This is a potential health and fire hazard.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 210, DWPF, Clean Maintenance Shop.

Hazard: Portable welding local exhaust hood labeled inspected 100 feet per minute (fpm) at X point from opening. This conflicts with the recommended flow rate of between 100 and 200 fpm published in the most recent Industrial Ventilation Manual by the American Conference of Governmental Industrial Hygienists.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.305(j)(2)(ii)

(ii) A receptacle installed in a wet or damp location shall be suitable for the location.

Location: Building 210, DWPF, E&I Shop

Hazard: Water cooler plugged into 100 VAC outlet that doesn't have GFI.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8), 134(c); 134(e)(2); 134(e)(4)

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

(c) Selection of respirators. Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.

(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.

(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

Location: Building 211-11, Outdoor Chemical Delivery.

Hazard: Savannah River Site (SRS) Supplied Air Garments (SAG) are used for delivery of nitric acid and sodium hydroxide. Currently, there are no breathing zone air samples collected to evaluate airborne levels of nitrogen dioxide or sodium hydroxide during delivery of these two chemicals.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8), 134(c); 134(e)(2); 134(e)(4)

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

(c) Selection of respirators. Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.

(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.

(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

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Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.1200(f)(5)(ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 211-H, Chemical Tanks East

Hazard: Hazard label for 50% nitric acid tank read 3,0,0, (National Fire Protection Association diamond label). It should read 3,0,1, OXI (for oxidizer).

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.1000(e) and General Duty Clause, Public Law 91-596, Section 5(a)(1)

(e) To achieve compliance with paragraphs (a) through (d) of this section, administrative or engineering controls must first be determined and implemented whenever feasible. When such controls are not feasible to achieve full compliance, protective equipment or any other protective measures shall be used to keep the exposure of employees to air contaminants within the limits prescribed in this section. Any equipment and/or technical measures used for this purpose must be approved for each particular use by a competent industrial hygienist or other technically qualified person. Whenever respirators are used, their use shall comply with 1910.134.

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 211-H-12 Segregated Solvent Area.

Hazard: Representative breathing zone air samples have not been collected in the outdoor segregated solvent area.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

Location: 221-H, Airlock to railroad tunnel.

Hazard: Bus panel found without cover.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1926.416(a)(1)

(a) Protection of employees--
(1) No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by deenergizing the circuit and grounding it or by guarding it effectively by insulation or other means.

Location: Building 221-H (H Canyon), first level cold feed prep area, above pool drain.

Hazard: Bare uninsulated electrical wiring found. This wire was not labeled disconnected. Only later this wire determined to be disconnected.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1926.416(a)(1)

(a) Protection of employees--
(1) No employer shall permit an employee to work in such proximity to any part of an electric power circuit that the employee could contact the electric power circuit in the course of work, unless the employee is protected against electric shock by deenergizing the circuit and grounding it or by guarding it effectively by insulation or other means.

Location: Building 221-H (H Canyon), first level cold feed prep area, above Tank 183.

Hazard: Uncovered disconnected wiring found extending from a conduit. This wire was not labeled as disconnected. Only later was this wire determined to be disconnected.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1926.405(j)(1)(iii)

Portable lamps shall be wired with flexible cord and an attachment plug of the polarized or grounding type. If the portable lamp uses an Edison-based lampholder, the grounded conductor shall be identifiled and attached to the screw shell and the identified blade of the attachment plug. In addition, portable handlamps shall comply with the following:

(A) Metal shell, paperlined lampholders shall not be used;
(B) Handlamps shall be equipped wilth a handle of molded composition or other insulating material;
(C) Handlamps shall be equipped with a substantial guard attached to the lampholder or handle;
(D) Metallic guards shall be grounded by the means of an equipment grounding conductor run within the power supply cord.

Location: Building 221-H, cold feed prep area, above Tank 183.

Hazard: A single light stringer was found strung with a 2 wire cord which was not durable nor flexible. This cord was temporarily strung in such a way as to be subject to abrasion. This stringer was energized.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.157(e)(3)

(3) The employer shall assure that portable fire extinguishers are subjected to an annual maintenance check. Stored pressure extinguishers do not require an internal examination. The employer shall record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less. The record shall be available to the Assistant Secretary upon request.

Location: Building 221-H.

Hazard: The following fire extinguishers were found without the required yearly maintenance inspection:

Location	Extinguisher Number
1st level, south steam stm	448225
1st level, MC Center 4	311559
1st level, MC Center 4	631156
1st level, Tool Crib	559997
SWG Cold Shop, Maintenance	366977
RM 175	453834
1st level, Sect. 12	366993
RM 107	444045
RM 107	631157
HP Corridor 1st level	366992
Warm gang valve corridor	951793
Warm gang valve corridor	951813
2nd level, Section 4	447550

It was determined that most fire extinguishers in H-Canyon had not had their required yearly inspection.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 221-H, Airlock to railroad tunnel.

Hazard: Lighting breaker panel did not have means of electrical disconnection clearly identified.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 221-H, Regulated Maintenance Shop

Hazard: Local exhaust hoods designated for welding exhaust were evaluated for 100 feet per minute (fpm) at x distance. Information was taken from inspection tags. The Industrial Ventilation Manual of the American Conference of Governmental Industrial Hygienists recommends between 100 and 200 (fpm). 150 fpm is a more appropriate recommended volume flow rate.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.134(b)(6)

(6) Respirators shall be stored in a convenient, clean, and sanitary location.

Location: Building 221-H, Men's Regulated Change Room.

Hazard: Two MSA full face respirators stored underneath dirty rubber overshoes.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
None Given	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8)

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

Location: Building 221-H, 3rd level, warm and hot sample isles.

Hazard: Sample collection in the warm and hot sample isles requires use of respiratory protection of some type, either a full face HEPA-filtered air-purifying respirator or the Savannah River Site Supplied Air Garment. Appropriate surveillance of the work area conditions and degree of employee breathing zone air contaminant levels are not available.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.1200(e)(1)(i)

(i) A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas);

Location: Building 221-H, 1st level, Process Area 18 Cold Shop.

Hazard: Three ring binder held by a maintenance supervisor does not have a list of the hazardous chemicals present in the maintenance shop.

The intent of this requirement is that a list is available for employees.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 221-H, SWE Cold Shop Maintenance.

Hazard: Local exhaust hoods designated for welding exhaust were evaluated for 100 feet per minute (fpm) at x distance. Information was taken from inspection tags. The Industrial Ventilation Manual of the American Conference of Governmental Industrial Hygienists recommends between 100 and 200 (fpm). 150 fpm is a more appropriate recommended volume flow rate.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.1001(d)(2)(i)

(2) Initial monitoring
(i) Each employer who has a workplace or work operation covered by this standard, except as provided for in paragraphs (d)(2)(ii) and (d)(2)(iii) of this section, shall perform initial monitoring of employees who are, or may reasonably be expected to be exposed to airborne concentrations at or above the action level and/or excursion limit.

Location: Building 221-H, SWE Cold Shop Maintenance, Tool Crib drawer for gaskets.

Hazard: Asbestos-containing gaskets found in drawers labeled "asbestos" have left debris which may be asbestos. Employees removing gaskets from these drawers may create a dust hazard. At minimum this should be evaluated by breathing zone asbestos air sampling.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.303(a)(2)(i)(A)

(2) Temporary wiring.
(i) Uses permitted, 600 volts, nominal, or less. Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:
(A) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

Location: Building 221-H, SWE Cold Shop, Tool Crib

Hazard: Two chargers for power tools found connected permanently to an extension cord.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

Location: Building 221-H, Gang Valve Corridor, Section 8

Hazard: Low pressure warning light bulb was broken but still in the socket on a supplied air manifold cart. The protective cover for the light was also missing so that accidental contact could result in electrical shock.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8); 134(c); 134(e)(2); 134(e)(4)

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

(c) Selection of respirators. Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.

(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.

(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

Location: Building 221-H, H Canyon, Level B Storage Area.

Hazard: Four workers were found rotating through a decontamination job using self-contained breathing apparatus (SCBA) and two pair of cloth overalls as personal protective equipment (PPE). Rotating in this case means one worker at a time. Deconning was being conducted with Ammoniated Wax Stripper. The Health Protection Inspector on the job stated that SCBA was used because of ammonia levels measured at 25 ppm with a Drager tube. Chlorine was also looked for with tubes but was not detectable. The area being deconned had surface contamination indicated by a beta gamma scan. Alpha contamination was not detected, but was assumed to be present. The decon agent and water interferes with direct alpha measurements.

No breathing zone air sampling was conducted during the deconning of this floor for alpha particles or for ammonia vapors. Therefore, this job was not being evaluated for breathing zone concentrations comparable to an 8-hour time-weighted average (TWA) or as a short term exposure limit (STEL) or as a ceiling limit (CTLV) to any demonstrable degree.

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

The Health Protection Inspector (HPI) was not aware that the current American Conference of Governmental Industrial Hygienist (ACGIH) threshold limit value (TLV) for ammonia was 25 ppm as an 8 hour TWA or that the STEL was 35 ppm. The HPI did not know why chlorine was being analyzed for in addition to ammonia. The floor stripper used would break down into ammonia, but not chlorine. This observation and the lack of knowledge on the HPI's part concerning the toxicity of ammonia supports the assertion that the HPI was not a competent person for the oversite of this job where respirators were being used.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8); 134(b)(11); 134(e)(2); 134(e)(4)

(b) Requirements for a minimal acceptable program.

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

(11) Approved or accepted respirators shall be used when they are available. The respirator furnished shall provide adequate respiratory protection against the particular hazard for which it is designed in accordance with standards established by competent authorities. The U.S. Department of Interior, Bureau of Mines, and the U.S. Department of Agriculture are recognized as such authorities. Although respirators listed by the U.S. Department of Agriculture continue to be acceptable for protection against specified pesticides, the U.S. Department of the Interior, Bureau of Mines, is the agency now responsible for testing and approving pesticide respirators.

(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.

(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

Location: Building 221-H Canyon, Second Level, Section 3.

Hazard: Welding on a carbon steel chilled water line was being performed with one-half of the SRS SAG. This is not an approved respirator. In addition, a breathing zone air sample was not collected which was representative of this job or a like job to qualify as surveillance.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8), 134(e)(2); 134(e)(4)

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.

(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

Location: Building 221-H, Canyon (1) Crane Maintenance Shop, (2) Warm and Hot Shop, (3) Warm Decon Cell, (4) Warm Canyon.

Hazard: In the above areas, respiratory protection is required, but representative breathing zone air samples have not been collected for radioactive contamination and chemical air contaminants.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.134(b)(6)

(6) Respirators shall be stored in a convenient, clean, and sanitary location.

Location: Building 221-H, truck well airlock.

Hazard: One MSA full face respirator was found stored within a sealed plastic bag on top of a flammable storage cabinet. This location was outside of the designated storage areas in H Canyon and subjected the respirator to possible damage from solvents used in the area.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8); 134(c); 134(e)(2); 134(e)(4)

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.
(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.
(c) Selection of respirators. Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.
(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.
(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

Location: Building 221-H, H Canyon, Mask Room, Level 2, Section 3.

Hazard: 10 MSA full face ultra twin respirators equipped with HEPA/charcoal filters were found stored in an open bin within the equipment room. Each respirator was stored correctly in a sealed plastic bag. Since the door to the room was not locked, it was assumed that those respirators were general issue.

This type of respirator dispensing system doesn't allow for proper respirator specification by a qualified person who is directly responsible to the qualified individual supervising the respiratory protection program.

This type of respirator issue also does not require that appropriate surveillance occurs for respirator use. Appropriate surveillance must include frequent breathing zone air sampling and frequent random inspections of jobs by a qualified individual where respirators are used.

Such a dispensing system might allow use of an air purifying respirator by untrained individuals in situations where hazardous air contaminants were immediately hazardous to life or health or where there is an oxygen deficient atmosphere.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8), 134(e)(2); 134(e)(4)

(b) Requirements for a minimal acceptable program.
(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.
(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.
(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.
(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

Location: Building 221-H, H Canyon, Second Level, Section 8.

Hazard: The SRS SAG was to be used on two jobs in Section 8. Locations were the hot side at nozzle 19 and at the warm side at nozzle 20. On the hot side, a plastic house was already built as an enclosure around a pipe, while on the warm side, it wasn't required. Breathing zone air sampling was not performed for either job or for maintenance work like this.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.101(b)

(b) Compressed gases. The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tank cars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965.

Location: Building 222H

Hazard: A single compressed argon gas bottle found stored in an unstable condition with a nylon rope across the lower 1/3 of the bottle.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

Location: Building 247F, east wall behind WW-WBT tank.

Hazard: Electrical receptacle in damp/wet location without GFIC.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(b)(2)

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy.

Location: Building 247F, west wall conduit about 12" above floor, parallel to floor under 480V Disconnect Switch F119-300-9-61.

Hazard: No cover plate on conduit, exposed wiring.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(a)(1)(i)

(a) Wiring methods. The provisions of this section do not apply to the conductors that are an integral part of factory-assembled equipment.
(1) General requirements-
(i) Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

Location: Building 247F, Cement Room controls immediately in front of tank WW-WBT Switch 4425HV.

Hazard: Conduit leading to switch box was pulled out of box, exposing wiring and not providing electrical continuity.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.133(a)(2)(vii)

(vii) Protectors should be kept clean and in good repair.

Location: Building 247F, Room 1512 Containment Room, Flammable Storage.

Hazard: Eye protection was not stored in a clean manner or kept in good repair.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.106(e)(6)(ii)

(ii) Grounding. Class I liquids shall not be dispensed into containers unless the nozzle and container are electrically interconnected. Where the metallic floorplate on which the container stands while filling is electrically connected to the fill stem or where the fill stem is bonded to the container during filling operations by means of a bond wire, the provisions of this section shall be deemed to have been complied with.

Location: Building 247F, Containment Room, flammable storage.

Hazard: 55 gallon drums containing flammable materials did not have grounding strap connected to drum.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(a)(2)

(2) Polarity of connections. No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.

Location: Building 247F, Clean Maintenance Shop, Room 1348, Receptacle PA-5 on North Wall.

Hazard: Reversed polarity in electrical box.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(a)(2)

(2) Polarity of connections. No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.

Location: Building 247F, electrical receptacle at water cooler in between Rooms 1333 and 1332.

Hazard: Reversed polarity of electrical receptacle.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(g)(8)

(8) The employer shall maintain copies of the required material safety data sheets for each hazardous chemical in the workplace, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s).

Location: Building 247F, flammable storage cabinet IMRON^{R} 2 component isocyanate paint.

Hazard: No MSDS available for the material available.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.132(a)

(a) Application. Protective equipment, including personal protective equipment for eyes, face, head, and extremities, protective clothing, respiratory devices, and protective shields and barriers, shall be provided, used, and maintained in a sanitary and reliable condition wherever it is necessary by reason of hazards of processes or environment, chemical hazards, radiological hazards, or mechanical irritants encountered in a manner capable of causing injury or impairment in the function of any part of the body through absorption, inhalation or physical contact.

Location: Building 247F, Dock outside of clean warehouse.

Hazard: No PPE readily available for battery charging station.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i) and (ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 247F, Containment Room, flammable storage

Hazard: Gallon paint-like can unlabeled as to contents or hazard.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1926.350(a)(7)

(7) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.

Location: Building 247F, Temporary Storage Area east of building.

Hazard: Clothesline-type cord used to secure welding cylinders to cylinder truck.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1926.350(a)(9)

(9) Compressed gas cylinders shall be secured in an upright position at times except, if necessary, for short periods of time while cylinder are actually being hoisted or carried.

Location: Building 247F, Temporary Construction Storage Area east of building.

Hazard: Cylinders not stored in vertical position. Cylinder trucks on 15-20 degree slope.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1926.350(a)(7)

(7) A suitable cylinder truck, chain, or other steadying device shall be used to keep cylinders from being knocked over while in use.

Location: Building 247F, East corridor, IW Construction cabinet.

Hazard: Improper compressed gas storage - chain was passed through cart handle yet was unsecured.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

Location: Building 247F, Compressor Room, Chemical Storage Area, receptacle "ECR-P41".

Hazard: Receptacle had chemical residual indicating splashing from water or inhibitor. Receptacle was inadequately protected for conditions.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(a)(2)

(2) Polarity of connections. No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.

Location: Building 247F, ECR Electrical receptacle, reversed polarity.

Hazard: Revised polarity of electrical receptacle.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.106(d)(4)(iv)

(iv) Ventilation. Every inside storage room shall be provided with either a gravity or a mechanical exhaust ventilation system. Such system shall be designed to provide for a complete change of air within the room at least six times per hour. If a mechanical exhaust system is used, it shall be controlled by a switch located outside of the door. The ventilating equipment and any lighting fixtures shall be operated by the same switch. A pilot light shall be installed adjacent to the switch if Class I flammable liquids are dispensed within the room. Where gravity ventilation is provided, the fresh air intake, as well as the exhaust outlet from the room, shall be on the exterior of the building in which the room is located.

Location: Building 247F, Containment Room, flammable storage.

Hazard: Room must be ventilated using a minimum of 6 air changes per hour and all electrical systems must be interlocked to the ventilation system.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.36(d)(1)

(d) Maintenance.
(1) Every required exit, way of approach thereto, and way of travel from the exit into the street or open space, shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

Location: Building 247F, ECR Room, east wall immediately south of emergency

Hazard: E&I cabinet restricting access to crash doors.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i) and (ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 247F, Regulated Maintenance Shop, flammable storage cabinet.

Hazard: Unlabeled chemical containers in storage cabinet.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.101(b)

(b) Compressed gases. The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tank cars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965.

Location: Building 247F, Cement Room

Hazard: Compressed gas cylinder roped to fixed ladder, improper storage.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 247F, regulated side of warehouse cleaning supply shelves.

Hazard: Chlorine bleach stored above and along side various soaps. In event of spill or mix Cl_2 gas can be generated.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 247F, Containment Room, flammable storage.

Hazard: Organic peroxide (MEKP) stored in oxalic acid, ACE tone, methyl alcohol, hydrous and oils.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

Location: Building 247F, Clean Maintenance Shop, Room 1348

Hazard: Insulation on welding stinger cable was cut through to wire.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.101(b)

(b) Compressed gases. The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tank cars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965.

Location: Building 247F, Unrestricted, clean side of warehouse, just outside lab cage.

Hazard: Compressed gas cylinders for Scott air packs improperly secured.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i) and 1200(f)(5)(ii)

5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: 6096 Oil Storage House, flammable storage cabinet.

Hazard: Solvent safety can was unlabeled so that contents were unknown and there was no indication of hazard warnings.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: 618-6 - Railroad Classification Yard, lighting panel "PNLC".

Hazard: Disconnect means not identified.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 484-D, Transfer House, second level, east side of conveyor belt.

Hazard: Machine guard was not secured to machine.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.307(b)

(b) Electrical installations. Equipment, wiring methods, and installations of equipment in hazardous (classified) locations shall be intrinsically safe, approved for the hazardous (classified) location, or safe or for the hazardous (classified) location.

Location: Building 484-D, Transfer House, third level, communications system, on north wall.

Hazard: Explosion proof communication box was not properly sealed.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 484-D, top level crusher house, Conveyor Belt No. 1.

Hazard: Machine guard was not secured.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(a)(1)(i)

(i) Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

Location: Building 484-D, Crusher House, second level at vibrator.

Hazard: Cable armor protecting electrical wiring to vibrator was broken and did not provide effective electrical continuity.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.27(c)(2)

(2) Ladders without cages or wells. A clear width of at least 15 inches shall be provided each way from the centerline of the ladder in the climbing space, except when cages or wells are necessary.

Location: Building 484-D, Crusher House, second level, ladder immediately west of vibrator.

Hazard: Insufficient hand clearance on sides of ladder.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.27(c)(4)

(4) Clearance in back of ladder. The distance from the centerline of rungs, cleats, or steps to the nearest permanent object in back of the ladder shall be not less than 7 inches, except that when unavoidable obstructions are encountered, minimum clearances as shown in figure D-3 shall be provided.

Location: Building 484-D, Crusher House, second level, ladder immediately west of vibrator.

Hazard: Insufficient toe room from ladder rail to obstruction.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.27(c)(1)

(c) Clearance-
(1) Climbing side. On fixed ladders, the perpendicular distance from the centerline of the rungs to the nearest permanent object on the climbing side of the ladder shall be 30 inches for a pitch of 90 degrees, (fig. D-2 of this section).

Location: Building 484-D, Crusher House, second level, ladder immediately west of vibrator.

Hazard: Insufficient head clearance between ladder and fixed object.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees.

Location: Building 484-D, Power House, turbine level, near column 8A.

Hazard: Two rotary floor sander/cleaner machines had damaged flexible power cords exposing conductors.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees.

Location: Building 484-D, Power House, Level 5, large transportable fan.

Hazard: Flexible power cord was damaged exposing conductors.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.23(b)(1)(i)

(b) Protection for wall openings and holes.
(1) Every wall opening from which there is a drop of more than 4 feet shall be guarded by one of the following:
(i) Rail, roller, picket fence, half door, or equivalent barrier. Where there is exposure below to falling materials, a removable toe board or the equivalent shall also be provided. When the opening is not in use for handling materials, the guard shall be kept in position regardless of a door on the opening. In addition, a grab handle shall be provided on each side of the opening with its center approximately 4 feet above floor level and of standard strength and mounting.

Location: Building 484-D, Bunker House level, east wall opening for hoist.

Hazard: Wall opening for hoist was not guarded by proper barrier.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.23(c)(1)

(c) Protection of open-sided floors, platforms, and runways.
(1) Every open-sided floor or platform 4 feet or more above adjacent floor or ground level shall be guarded by a standard railing on all open sides except where there is entrance to a ramp, stairway, or fixed ladder. The railing shall be provided with a toeboard.

Location: Building 484-D, Bunker House, north end conveyor motor platform.

Hazard: Motor platform was not guarded by a standard railing and toe board.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 484-D, Bunker House level, north end conveyor roller.

Hazard: Guard over conveyor assembly roller was not secured.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(2); 134(b)(8); 134(c); 134(e)(2); 134(e)(4)

(2) Respirators shall be selected on the basis of hazards to which the worker is exposed.
(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.
(c) Selection of respirators. Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.
(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.
(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

Location: Building 484-D Area Powerhouse, Safety Engineering Room, First Floor.

Hazard: 10 MSA full face ultra twin respirators equipped with HEPA/charcoal filters were found stored in an open bin within the equipment room. Each respirator was stored correctly in a sealed plastic bag. Since the door to the room was not locked, it was assumed that those respirators were general issue.

This type of respirator dispensing system doesn't allow for proper respirator specification by a qualified person who is directly responsible to the qualified individual supervising the respiratory protection program.

This type of respirator issue also does not require that appropriate surveillance occurs for respirator use. Appropriate surveillance must include frequent breathing zone air sampling and frequent random inspections of jobs by a qualified individual where respirators are used.

Such a dispensing system might allow use of an air purifying respirator by untrained individuals in situations where hazardous air contaminants were immediately hazardous to life or health or where there is an oxygen deficient atmosphere.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.1200(h); 95(k)(1) and (2)

(h) Employee information and training. Employers shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.

(k) Training program.
(1) The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and shall ensure employee participation in such program.
(2) The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.

Location: Building 484-D Area Powerhouse

Hazard: Crusher area worker found without hazards communication and hearing conservation training after working for more than nine months.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.147(d)(3)

(d) Application of Control. The established procedure for the application of energy control (implementation of lockout or tagout system procedures) shall cover the following elements and actions, and shall be done in the following sequence:
(3) Machine or Equipment Isolation. All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

Location: 484-D Area Powerhouse, 5th level, just outside bunker room.

Hazard: Crane maintenance was being performed without a physical lockout mechanism on the shutoff/fuse box. The fuse in the shutoff box was still in place. Observation on the crane itself revealed two exposed bare wires being worked on.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 484-D, D Area Powerhouse, E&I Shop, Mezzanine Level.

Hazard: Incompatible chemical storage, household bleach with oil.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 484-D, D Area Powerhouse, Bunker room.

Hazard: Coal bin topper safety shut off cable was blocked by scaffolding, thus not allowing ready access to a shut off system from all areas in the bunker room. This was remedied by 2/11/90.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 484-D, D Area Powerhouse, Bunker room.

Hazard: Multiple breaks in the bunker room fire wall were found, thus negating an important fire wall.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(g)(1)(iii)(A); 305(g)(1)(iii)(B)

(iii) Unless specifically permitted in paragraph (g)(1)(i) of this section, flexible cords and cables may not be used:
(A) As a substitute for the fixed wiring of a structure;
(B) Where run through holes in walls, ceilings, or floors;

Location: Building 484-D, D Area Powerhouse, 5th Level, just outside of the bunker room.

Hazard: Two extension cords were found extending through the wall just outside the bunker room to equipment in the bunker room. These cords were examples of temporary electrical power cords permanently installed.

Bechtel/North Brothers Insulators Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1926.58(j)(2); 58(e)(6)(iv)

(2) Requirements for removal, demolition, and renovation operations - (i) Decontamination area. Except for small scale, short duration operations, as described in paragraph (e)(6) of this section, the employer shall establish a decontamination area that is adjacent and connected to the regulated area for the decontamination of employees contaminated with asbestos, tremolite, anthophyllite, or actinolite. The decontamination area shall consist of an equipment room, shower area, and clean room in series. The employer shall ensure that employees enter and shall ensure that employees enter and exit the regulated area through the decontamination area.

(iv) Exception. For small-scale, short-duration operations, such as pipe repair, valve replacement, installing electrical conduits, installing or removing drywall, roofing, and other general building maintenance or renovation, the employer is not required to comply with the requirements of paragraph (e)(6) of this section.

Location: Building 484-D, D Area Powerhouse, 3rd Level, asbestos abatement project on No. 2 boiler blowdown tank.

Hazard: A non-small scale decontamination area was found connected to a plastic enclosure. This enclosure did not have an attached shower. Small scale short duration operations include pipe insulation, repair of minor degree, valve replacement, installing electrical conduits, installing or removing drywall, roofing, and other general building maintenance or renovation. Small scale does not include removing insulation from a boiler blowdown tank and related valves.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i); 1200(f)(5)(ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shal ensure that each container of hazardous chemicals in the workplace i labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 484-D, D Area Powerhouse, 2nd Level, Room 52, Flammable Storage Cabinet.

Hazard: Hydraulic pump containing an oil-like liquid was not labeled as to content, and did not have a hazard warning.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(g)(8); 1200(g)(10)

(8) The employer shall maintain copies of the required material safety data sheets for each hazardous chemical in the workplace, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s).

(10) Material safety data sheets may be kept in any form, including operating procedures, and may be designed to cover groups of hazardous chemicals in a work area where it may be more appropriate to address the hazards of a process rather than individual hazardous chemicals. However, the employer shall ensure that in all cases the required information is provided for each hazardous chemical, and is readily accessible during each work shift to employees when they are in in their work area(s).

Location: Building 484-D, D Area Powerhouse, 2nd Level, Room 52, Flammable Storage Cabinet.

Hazard: Material Safety Data Sheets for two chemicals picked at random that were stored in the above cabinet were not readily available. These chemicals were acetone and Hot Shot Flying Insect Killer.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(e)(1)(i)

(e) Written hazard communication program.
(1) Employers shall develop, implement, and maintain at the workplace, a written hazard communication program for their workplaces which at least describes how the criteria specified in paragraphs (f), (g), and (h) of this section for labels and other forms of warning, material safety data sheets, and employee information and training will be met, and which also includes the following:
(i) A list of the hazardous chemicals known to be present using an identity that is referenced on the appropriate material safety data sheet (the list may be compiled for the workplace as a whole or for individual work areas);

Location: Building 484-D, D Area Powerhouse, 2nd Level, Room 52, flammable safety cabinet.

Hazard: A list of the hazardous chemicals known to be present was not available for this workplace.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.134(b)(11)

(11) Approved or accepted respirators shall be used when they are available. The respirator furnished shall provide adequate respiratory protection against the particular hazard for which it is designed in accordance with standards established by competent authorities. The U.S. Department of Interior, Bureau of Mines, and the U.S. Department of Agriculture are recognized as such authorities. Although respirators listed by the U.S. Department of Agriculture continue to be acceptable for protection against specified pesticides, the U.S. Department of the Interior, Bureau of Mines, is the agency now responsible for testing and approving pesticide respirators.

Location: Building 484-D, D Area Powerhouse, Safety Equipment Room, 1st Floor.

Hazard: The top half of two Savannah River Site (SRS) Supplied Air Garment (SAG) welders respirators were found ready for use on a shelf. Nowhere in the equipment room were the bottom portion of the SAG found available. These respirators were stored intended for use as is. The SRS SAG is approved only as a two-piece unit, top and bottom. These respirators were unapproved for use.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.134(b)(6); 134(f)(5)(i)

(6) Respirators shall be stored in a convenient, clean, and sanitary location.

(i) After inspection, cleaning, and necessary repair, respirators shall be stored to protect against dust, sunlight, heat, extreme cold, excessive moisture, or damaging chemicals. Respirators placed at stations and work areas for emergency use should be quickly accessible at all times and should be stored in compartments built for the purpose. The compartments should be clearly marked. Routinely used respirators, such as dust respirators, may be placed in plastic bags. Respirators should not be stored in such places as lockers or tool boxes unless they are in carrying cases or cartons.

Location: Building 484-D, D Area Powerhouse, Safety equipment Room, 1st Floor.

Hazard: The following respirators were found stored improperly either on the floor or open to the atmosphere where they would become dirty or dusty:

1-MSA Comfo II half facepiece respirator with hose attachment, found without filters and opened to the air. 1-Scott Air Pack facepiece and hose found opened to the air. 2-MSA Comfo II half facepiece respirators with combination HEPA and charcoal filters found opened to the air and on the floor. 2-MSA full face ultra twin respirator found open to the air and on the floor.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 484-D, D Area Powerhouse, outdoors neutralization waste tank area.

Hazard: Loose guard on waste transfer pump.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.28(a)(1)

(a) General requirements for all scaffolds.
(1) Scaffolds shall be furnished and erected in accordance with this standard for persons engaged in work that cannot be done safely from the ground or from solid construction, except that ladders used for such work shall conform to 1910.25 and 1910.26.

Location: Building 484-D, D Area Powerhouse, outdoors neutralization waste tank area.

Hazard: Scaffold erected in area has a ladder leaning against it but is not tied off or permanently attached to the scaffold.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 484-D, D Area Powerhouse, Neutralization area.

Hazard: Mix pump motor guard was loose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 484-D, D Area Powerhouse, Gaseous chlorine piping area.

Hazard: Loose guard found on electric pump.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 484-D, D Area Powerhouse, Caustic (NaOH) Unloading Area.

Hazard: Caustic unloading pump does not have a guard for the rotating shaft.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.134(b)(8); 134(c); 134(e)(2); 134(e)(4)

(8) Appropriate surveillance of work area conditions and degree of employee exposure or stress shall be maintained.

(c) Selection of respirators. Proper selection of respirators shall be made according to the guidance of American National Standard Practices for Respiratory Protection Z88.2-1969.

(2) The correct respirator shall be specified for each job. The respirator type is usually specified in the work procedures by a qualified individual supervising the respiratory protective program. The individual issuing them shall be adequately instructed to insure that the correct respirator is issued.

(4) Respiratory protection is no better than the respirator in use, even though it is worn conscientiously. Frequent random inspections shall be conducted by a qualified individual to assure that respirators are properly selected, used, cleaned, and maintained.

Location: Building 484-D, D Area Powerhouse, the following two areas - (1) Gaseous Chlorine Cylinder Area and (2) Caustic (NaOH) Unloading Pipe and Tank System.

Hazard: Changing the gaseous chlorine tin cylinders requires use of an acid suit and a Self-Contained Breathing Apparatus (SCBA) as personal protective equipment (PPE). Receipt of caustic requires use of the Savannah River Site Supplied Air Garment. Neither operation has had a breathing zone air sample collected or an observation by a qualified individual recently. Infrequent operations of these kinds should be evaluated or observed on a yearly basis while the operation is performed.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.305(j)(2)(ii)

(ii) A receptacle installed in a wet or damp location shall be suitable for the location.

Location: Building 484-D, D Area Powerhouse, Filter Pipe Galley Building.

Hazard: Five 110 VAC outlets were not protected with ground fault interruption (GFI) although the area they serve was subjected to water on the floor routinely.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.134(b)(6)

Respiratory protection.

(6) Respirators shall be stored in a convenient, clean, and sanitary location.

Location: Building 704K, Maintenance, Welding Shop.

Hazard: Full face respirator was laying on top of parts cabinet and not stored in a clean, sanitary manner.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.305(a)(2)(i)(A)

(2) Temporary wiring.
(i) Uses permitted, 600 volts, nominal, or less. Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:
(A) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

Location: Building 704K, Maintenance, Welding Shop, blasting cabinet.

Hazard: Abrasive blasting cabinet was "permanently" wired to an outlet, across a hallway, with temporary wiring.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i) and 1200(f)(5)(ii)

5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 704K, Maintenance Shop, flammable storage cabinet.

Hazard: Safety can containing unknown chemical was unlabeled as to contents and health, fire, reactivity information.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 704K - Maintenance Shop, west wall, panel "A".

Hazard: Disconnect means not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.101(b)

(b) Compressed gases. The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tankcars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965.

Location: Building 704K, Maintenance, E&I Shop.

Hazard: Small compressed gas cylinders were not secured to prevent them from being knocked over.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.36(d)(1); 36(c)(2); 37(k)(2)

(d) Maintenance.

(1) Every required exit, way of approach thereto, and way of travel from the exit into the street or open space, shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

(2) No existing building shall be occupied during repairs or alterations unless all existing exits and any existing fire protection are continuously maintained, or in lieu thereof other measures are taken which provide equivalent safety.

(2) Means of egress shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

Location: Building 707F, South West (SW) exterior exit.

Hazard: The (SW) exterior exit for the building was blocked by a barrier set up by a construction crew putting in a culvert.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.37(k)(2)

(2) Means of egress shall be continuously maintained free of all obstructions or impediments to full instant use in the case of fire or other emergency.

Location: Building 711K, Guard House, DAC-1 near northwest exit door.

Hazard: Access to exit from behind control panel was blocked by typewriter stand.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 711K, southwest corner, high voltage disconnect box.

Hazard: Electrical box not marked to indicate its intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.147(d)(4)(iii)

Application of control, lockout or tagout device application. Tagout devices, where used, shall be affixed in such a manner as will clearly indicate that the operation or movement of energy isolation devices from the "safe" or "off" position is prohibited.

Location: Building 711K Guard House

Hazard: Electrical receptacle tagged out for reversed polarity was being used. Receptacle allegedly repaired yet tag not removed. Tagout should have been located at disconnect and disconnect put in "off" or "safe" position.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(b)(2)

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy.

Location: Building 711K, west wall, just north of air conditioner.

Hazard: Junction box carrying 110 voltage was uncovered.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 713, Central Stores - office area, lighting panel "A".

Hazard: Disconnecting means not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 713, Central Stores - shipping dock, electrical panel.

Hazard: Disconnecting means not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(e)(1)

(e) Enclosures for damp or wet locations.
(1) Cabinets, cutout boxes, fittings, boxes, and panelboard enclosures in damp or wet locations shall be installed so as to prevent moisture or water from entering and accumulating within the enclosures. In wet locations the enclosures shall be weatherproof.

Location: Building 713, Central Stores - safety shower near stripping.

Hazard: Electrical receptacle in potentially damp, wet location was not equipped with GFCI.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.22(b)(1)

(b) Aisles and passageways.
(1) Aisles and passageways shall be kept clear and in good repairs, with no obstruction across or in aisles that could create a hazard.

Location: Building 713, Central Stores - outside receiving offices overhead water collecting trough.

Hazard: Elevated drip trough, parallel with aisle, created a bumping hazard to people walking in aisle.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(b)

(b) Cabinets, boxes, and fittings-
(1) Conductors entering boxes, cabinets, or fittings. Conductors entering boxes, cabinets, or fittings shall also be protected from abrasion, and openings through which conductors enter shall be effectively closed. Unused openings in cabinets, boxes, and fittings shall be effectively closed.

Location: Building 713, Central Stores - carrousel workstations.

Hazard: 230V electrical boxes had open unplugged openings, which could allow an individual to contact live conductors.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(a)(1)(i)

(1) General requirements-
(i) Electrical continuity of metal raceways and enclosures. Metal raceways, cable armor, and other metal enclosures for conductors shall be metallically joined together into a continuous electric conductor and shall be so connected to all boxes, fittings, and cabinets as to provide effective electrical continuity.

Location: Building 713, Central Stores - carrousel workstation "A-B".

Hazard: Conduit cable leading into electrical box was broken so that it did not provide electrical continuity.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(h)(1), 1200(h)(2)

(h) Employee information and training. Employers shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.
(1) Information. Employees shall be informed of:
(i) The requirements of this section;
(ii) Any operations in their work area where hazardous chemicals are present; and,
(iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.
(2) Training. Employee training shall include at least:
(i) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
(ii) The physical and health hazards of the chemicals in the work area;
(iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,
(iv) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

Location: Building 713, Central Stores, moving shelve area.

Hazard: Employee was unsure of chemical handling/storage requirements.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.22(a)(1)

(1) All places of employment, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition.

Location: Building 713, Central Stores - fork truck battery charging station personal protection equipment cabinet.

Hazard: Personal protective equipment cabinet was not kept in a clean, orderly, and in a sanitary condtion.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.133(a)(2)(vii)

(vii) Protectors should be kept clean and in good repair.

Location: Building 713, Central Stores - fork truck battery charging station, personal protective equipment cabinet.

Hazard: Eye protection was stored on hygrometer used to test acid strength, so that acid could contact eye protection.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(b)(1)(ii)(D)(2)

(2) Each receptacle and attachment cap or plug shall be tested for correct attachment of the equipment grounding conductor. The equipment grounding conductor shall be connected to its proper terminal.

Location: Building 713, Central Stores - electrical receptical under lighting panel "E".

Hazard: Electrical receptical had open ground, thus it was not protected by any grounding.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees.

Location: Building 713, Central Stores - at newly installed safety shower.

Hazard: Safety shower installed on wall with unprotected electrical receptical creating electrical shock hazard.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(a)(2)

(2) Polarity of connections. No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.

Location: Building 713, Central Stores - Boiler Room, electrical receptical under air conditioner.

Hazard: Electrical receptical was wired so that the polarity of conductors was reversed.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(b)(2)

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy.

Location: Building 713, Central Stores - Loading Dock.

Hazard: Junction box was open with cover not secured.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.157(c)

(c) General requirements.
(1) The employer shall provide portable fire extinguishers and shall mount, locate and identify them so that they are readily accessible to employees without subjecting the employees to possible injury.

Location: Building 714A, Spare Parts, near moving rack storage area.

Hazard: Fire extinguisher was blocked making it neither readily accessible nor immediately available.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.179(j)(2)(i)

(2) Frequent inspection. The following items shall be inspected for defects at intervals as defined in paragraph (j)(1)(ii) of this section or as specifically indicated, including observation during operation for any defects which might appear between regular inspections. All deficiencies such as listed shall be carefully examined and determination made as to whether they constitute a safety hazard:
(i) All functional operating mechanisms for maladjustment interfering with proper operation. Daily.

Location: Building 714A, Spare Parts, hoist at overhead door.

Hazard: Required daily inspections failed to detect that safety latch was installed upside down on hoist hook. That condition made the safety latch ineffective.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.181(j)(2)(ii)

(ii) Safety latch type hooks shall be used wherever possible.

Location: Building 714A, Spare Parts, hoist at overhead door.

Hazard: Safety latch was installed upside down, so that the load could come free of the hook.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.37(q)5)

(5) A sign reading "Exit", or similar designation, with an arrow indicating the directions, shall be placed in every location where the direction of travel to reach the nearest exit is not immediately apparent.

Location: Building 714A, Spare Parts, exit doors.

Hazard: Exit directional signs were not installed at every location where the direction of travel to the exit was not immediately apparent.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.22(b)(2)

(2) Permanent aisles and passageways shall be appropriately marked.

Location: Building 714A, Spare Parts, all aisleways.

Hazard: Permanent aisles and passageways should be appropriately marked with yellow, yellow and black or black and white or combination stripping.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 714A, Spare Parts, lighting panel "LPC".

Hazard: Disconnecting means not marked as to its intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.178(g)(2)

(2) Facilities shall be provided for flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.

Location: Building 714A, Spare Parts, battery charger near lighting panel "LPC".

Hazard: Battery charger used in area with no provision for flushing and neutralizing spilled electrolyte or fire protection.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.179(g)(1)

(g) Changing and charging storage batteries.
(1) Battery charging installations shall be located in areas designated for that purpose.

Location: Building 714A, Spare Parts, battery charger near lighting panel "LPC".

Hazard: Battery charger used in area not designated for battery charging.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
None Given	20877	Savannah River Site

Description

1910.305(b)(2)

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy. Covers of outlet boxes having holes through which flexible cord pendants pass shall be provided with bushings designed for the purpose or shall have smooth, well-rounded surfaces on which the cords may bear.

Location: Building 714A, Spare Parts, north side of building.

Hazard: Cover to junction was not secured.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.37(q)(2)

(2) Any door, passage, or stairway which is neither an exit nor a way of exit access, and which is so located or arranged as to be likely to be mistaken for an exit, shall be identified by a sign reading "Not an Exit" or similar designation, or shall be identified by a sign indicating its actual character, such as "To Basement," "Storeroom," "Linen Closet," or the like.

Location: Building 714A, Spare Parts, north partition of building near new construction area.

Hazard: A sign stating "Not and Exit" must be on all doors which could be mistaken for an exit.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 716A, Central Automotive Shop, lighting panel "E".

Hazard: Disconnect not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 716A, Central Automotive Shop, lighting Panel "D".

Hazard: Disconnect not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 716A, Central Automotive Shop, lighting Panel "B".

Hazard: Disconnect not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.151(c)

(c) Where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area for immediate emergency use.

Location: Building 716A, Central Automotive Shop

Hazard: Access to emergency eye wash station was blocked.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(a)(2)(i)(A)

(2) Temporary wiring.
(i) Uses permitted, 600 volts, nominal, or less. Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:
(A) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

Location: Building 716A, Central Automotive Shop

Hazard: Temporary wiring, extension cord used in place of permanent installation.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.22(a)(1)

(1) All places of employment, passageways, storerooms, and service rooms shall be kept clean and orderly and in a sanitary condition.

Location: Building 716A, Central Automotive Shop, in corner near roll-up doors.

Hazard: Poor housekeeping practices.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees.

Location: Building 716A, Central Automotive Shop, 230 volt box EP-708

Hazard: Electrical equipment and conductors abandoned by locking out the box in place of removing the system.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(b)(2)

(2) Covers and canopies. All pull boxes, junction boxes, and fittings shall be provided with covers approved for the purpose. If metal covers are used they shall be grounded. In completed installations each outlet box shall have a cover, faceplate, or fixture canopy.

Location: Building 716A, Central Automotive Shop, immediately south of box EP-708.

Hazard: Uncovered conduit box exposing conductors.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(b)(1)(ii)(C)

(C) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such is deformed or missing pins or insulation damage, and for indication of possible internal damage. Equipment found damaged or defective may not be used until repaired.

Location: Building 716A, Central Automotive Shop, exide battery charger.

Hazard: Insulation on charger cord was cut to conductors. Equipment had not been visually inspected nor removed from service.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

Location: Building 716A, Central Automotive Shop, exide battery charger.

Hazard: Cord set was cut, exposing conductor.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

Location: Building 717A, Central Maintenance Shops, Welding Shop.

Hazard: Insulation on portable hand grinder cut, exposing conductors.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(b)(1)(ii)(C)

(C) Each cord set, attachment cap, plug and receptacle of cord sets, and any equipment connected by cord and plug, except cord sets and receptacles which are fixed and not exposed to damage, shall be visually inspected before each day's use for external defects, such as deformed or missing pins or insulation damage, and for indication of possible internal damage. Equipment found damaged or defective may not be used until repaired.

Location: Building 717A, Central Maintenance Shop, Welding Shop.

Hazard: Cord set on portable hand grinder not visually inspected for insulation damage. Grinder had not been removed from service.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.101(b)

(b) Compressed gases. The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tank cars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965.

Location: Building 717A, Central Maintenance Shops, Welding Shop.

Hazard: Compressed gas cylinder improperly stored so that it could be knocked over.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 717A, Central Maintenance Shop, Lighting Panel "C".

Hazard: Disconnect not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.181(j)(2)(ii)

(ii) Safety latch type hooks shall be used wherever possible.

Location: Building 717A, Central Maintenance Shops, hoist at Column J-3.

Hazard: Hoist hook safety latch had been painted. Latch would not function properly, so that it was not being used.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.304(a)(2)

(2) Polarity of connections. No grounded conductor may be attached to any terminal or lead so as to reverse designated polarity.

Location: Building 717A, Central Maintenance Electrical Shops, near receptacle drinking fountain outside office.

Hazard: Receptacle had reversed polarity.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.101(b)

(b) Compressed gases. The in-plant handling, storage, and utilization of all compressed gases in cylinders, portable tanks, rail tank cars, or motor vehicle cargo tanks shall be in accordance with Compressed Gas Association Pamphlet P-1-1965.

Location: Building 717A, Central Maintenance Shop, nitrogen bottle behind plasma arc.

Hazard: Improperly secured compressed gas cylinder.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.213(h)(4)

(4) Installation shall be in such a manner that the front end of the unit will be slightly higher than the rear, so as to cause the cutting head to return gently to the starting position when released by the operator.

Location: Building 717A, Central Maintenance Shops, Carpentry Shop. Dewalt radial air saw.

Hazard: Saw will not return to start position when released at end of cut.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(b)(1)(ii)

(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.

Location: Building 717A, Central Maintenance Shops, Carpentry Shop. Overhead cord reel, box and conduit.

Hazard: Electrical components inadequately secured.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(g)(8)

(8) The employer shall maintain copies of the required material safety data sheets for each hazardous chemical in the workplace, and shall ensure that they are readily accessible during each work shift to employees when they are in their work area(s).

Location: Building 717A, Central Maintenance Shops, bead blaster outside carpentry shop.

Hazard: MSDS for glass bead shot was not readily available with the appropriate custodian.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 717A, Central Maintenance Shops, lighting panel "H-2".

Hazard: Disconnect not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 717A, Central Maintenance Shop, lighting panel "D".

Hazard: Disconnect not identified as to intended purpose.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.181(j)(2)(ii)

(ii) Safety latch type hooks shall be used wherever possible.

Location: Building 717A, Central Maintenance Shop, hoist at column F-2.

Hazard: Safety latch had been painted and was stuck in open position so that it was not being used.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.212(a)(1)

(1) Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nippoints, rotating parts, flying chips and sparks. Examples of guarding methods are-barrier guards, two-hand tripping devices, electronic safety devices, etc.

Location: Building 717A, Central Maintenance Shop, Machine Shop, FOSDICK drill press.

Hazard: Unguarded rotating shaft.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.157(e)(3)

(3) The employer shall assure that portable fire extinguishers are subjected to an annual maintenance check. Stored pressure extinguishers do not require an internal examination. The employer shall record the annual maintenance date and retain this record for one year after the last entry or the life of the shell, whichever is less. The record shall be available to the Assistant Secretary upon request.

Location: Building 8303, Receiving warehouse, fire extinguisher on dock.

Hazard: Fire extinguisher did not have evidence of annual inspection.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i) and (ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 8303, Receiving Warehouse, janitor's closet.

Hazard: Chemical container was not labeled as to contents or hazard.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 8303, Receiving Warehouse, power panel "PP-2".

Hazard: Disconnect not identified as to intended purpose.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 8303, Receiving Warehouse, lighting panel "C".

Hazard: Disconnect not identified as to intended purpose.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(a)(2)(i)(A)

(2) Temporary wiring.
(i) Uses permitted, 600 volts, nominal, or less. Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:
(A) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

Location: Building 8303, Receiving Warehouse, marking area.

Hazard: Temporary wiring used in place of permanent installation.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i) and (ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 8303, Receiving Warehouse, marking area.

Hazard: Chemical container not labeled as to contents or hazard.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(f)(5)(i) and (ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Building 8303, Receiving Warehouse, flammable storage cabinet.

Hazard: Safety can labeled "Solvent" did not identify chemical contents or hazard label.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(a)(2)(i)(A)

(2) Temporary wiring.
(i) Uses permitted, 600 volts, nominal, or less. Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:
(A) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

Location: Building 8303, Receiving Warehouse, tool stores.

Hazard: Temporary wiring used in place of permanent installation.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 8303, Receiving Warehouse, lighting Panel "A".

Hazard: Disconnect not identified as to intended purpose.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1910.37(q)

(q) Exit marking.

(1) Exits shall be marked by a readily visible sign. Access to exits shall be marked by readily visible signs in all cases where the exit or way to reach it is not immediately visible to the occupants.

(2) Any door, passage, or stairway which is neither an exit nor a way of exit access, and which is so located or arranged as to be likely to be mistaken for an exit, shall be identified by a sign reading "Not an Exit" or similar designation, or shall be identified by a sign indicating its actual character, such as "To Basement," "Storeroom," "Linen Closet," or the like.

(3) Every required sign designating an exit or way of exit access shall be so located and of such size, color, and design as to be readily visible. No decorations, furnishings, or equipment which impair visibility of an exit sign shall be permitted, nor shall there be any brightly illuminated sign (for other than exit purposes), display, or object in or near the line of vision to the required exit sign of such a character as to so detract attention from the exit sign that it may not be noticed.

(4) Every exit sign shall be distinctive in color and shall provide contrast with decorations, interior finish, or other signs.

(5) A sign reading "Exit", or similar designation, with an arrow indicating the directions, shall be placed in every location where the direction of travel to reach the nearest exit is not immediately apparent.

(6) Every exit sign shall be suitably illuminated by a reliable light source giving a value of not less than 5 foot-candles on the illuminated surface. Artificial lights giving illumination to exit signs other than the internally illuminated types shall have screens, discs, or lenses of not less than 25 square inches area made of translucent material to show red or other specified designating color on the side of the approach.

(7) Each internally illuminated exit sign shall be provided in all occupancies where reduction of normal illumination is permitted.

(8) Every exit sign shall have the word "Exit" in plainly legible letters not less than 6 inches high, with the principal strokes of letters not less than three-fourths-inch wide.

Location: Building 8303, Receiving Warehouse, mezzanine level.

Hazard: Exit not marked wilth a readily visible, properly marked sign.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(a)(2)(i)(A)

(2) Temporary wiring.
(i) Uses permitted, 600 volts, nominal, or less. Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:
(A) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

Location: Building 8312, Wood Storage Area, loft.

Hazard: Temporary wiring used in place of permanent installation.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.27(b)(1)(iv)

(iv) Rungs, cleats, and steps shall be free of splinters, sharp edges, burrs, or projections which may be a hazard.

Location: Building 8312, Wood Storage Area, ladder.

Hazard: Ladder rungs, cleats, rails, not free of splinters, sharp edges or burrs which could be a hazard.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.134(b)(6)

(6) Respirators shall be stored in a convenient, clean, and sanitary location.

Location: Building 8317, Sheet Metal, Abrasive Blasting Room.

Hazard: Abrasive blasting hood used as respiratory protection was covered with blasting grit and not stored in a clean, sanitary manner.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees.

Location: Building 8317, Sheet Metal, Welding Booth No. 1.

Hazard: Electrical cord on pedestal fan was damaged exposing conductors.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.303(f)

(f) Identification of disconnecting means and circuits. Each service, feeder, and branch circuit, at its disconnecting means or overcurrent device, shall be legibly marked to indicate its purpose, unless located and arranged so the purpose is evident. These markings shall be of sufficient durability to withstand the environment involved.

Location: Building 8317, Sheet Metal, Power Rack No. 2.

Hazard: Panel disconnect was not identified as to intended purpose.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building 8317, Sheet Metal, Abrasive Blasting.

Hazard: Breathing air compressor which reportedly did not provide Grade D breathing air was "abandoned" in an operational configuration.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(a)(2)(i)(A)

(2) Temporary wiring. Temporary electrical power and lighting wiring methods may be of a class less than would be required for a permanent installation. Except as specifically modified in this paragraph, all other requirements of this subpart for permanent wiring shall apply to temporary wiring installations.
(i) Uses permitted, 600 volts, nominal, or less. Temporary electrical power and lighting installations 600 volts, nominal, or less may be used only:
(A) During and for remodeling, maintenance, repair, or demolition of buildings, structures, or equipment, and similar activities;

Location: Building 8334, Boilermaker Shop, band saw.

Hazard: Temporary flexible cord used in place of permanent wiring.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(1)

(1) Types of guarding. One or more methods of machine guarding shall be provided to protect the operator and other employees in the machine area from hazards such as those created by point of operation, ingoing nip points, rotating parts, flying chips and sparks. Examples of guarding methods are-barrier guards, two-hand tripping devices, electronic safety devices, etc.

Location: Building 8334, Boilermaker Shop, Carlton drill press.

Hazard: Unguarded rotating parts on Carlton press.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(h)(1) and 1200(h)(2)

(h) Employee information and training. Employers shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.

(1) Information. Employees shall be informed of:
  (i) The requirements of this section;
  (ii) Any operations in their work area where hazardous chemicals are present; and,
  (iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

(2) Training. Employee training shall include at least:
  (i) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
  (ii) The physical and health hazards of the chemicals in the work area;
  (iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,
  (iv) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

Location: Building 8334, Boilermaker

Hazard: QC inspector could not describe any potential hazard or precautions to be taken when using chemicals.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.305(g)(1)(iii)(A)

(iii) Unless specifically permitted in paragraph (g)(1)(i) of this section, flexible cords and cables may not be used:
(A) As a substitute for the fixed wiring of a structure;

Location: Building 8334, Boilermaker Shop and Building 43744 - 475, Tool Room.

Hazard: Power to tool room building was provided by a temporary, flexible, unprotected cord.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)

(b) Examination, installation, and use of equipment-
(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:

Location: Building 8334, Boilermaker Shop, track machine for plasma arc.

Hazard: Flexible power cord was damaged. Cut in cord exposed electrical conductors.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.212(a)(2)

(2) General requirements for machine guards. Guards shall be affixed to the machine where possible and secured elsewhere if for any reason attachment to the machine is not possible. The guard shall be such that it does not offer an accident hazard in itself.

Location: Building 980, Defense Waste Processing Facility (DWPF), Electrical Fire Pump Room.

Hazard: Guards not present on all electrical pumps in the room.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.305(j)(2)(ii)

(ii) A receptacle installed in a wet or damp location shall be suitable for the location.

Location: Building 980, Defense Waste Processing Facility (DWPF), Domestic Water Treatment Pump Room.

Hazard: Two 110 VAC outlets were not protected by GFT, although the floor was subjected to water leaks from numerous pipes.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.303(b)(1)(vii)

(1) Examination. Electrical equipment shall be free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined using the following considerations:
(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with the equipment.

Location: Building 980, Defense Waste Processing Facility (DWPF), Electrical Equipment Room.

Hazard: Motor controller (5980-120-201-00-Y) shut off panel was loose.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.95(c)(1)

(c) Hearing conservation program.
(1) The employer shall administer a continuing, effective hearing conservation program, as described in paragraphs (c) through (o) of this section, whenever employee noise exposures equal or exceed an 8-hour time-weighted average sound level (TWA) of 85 decibels measured on the A scale (slow response) or, equivalently, a dose of fifty percent. For purposes of the hearing conservation program, employee noise exposures shall be computed in accordance with Appendix A and Table G-16a, and without regard to any attenuation provided by the use of personal protective equipment.

Location: Central Shops

Hazard: No evidence of a Hearing Conservation program in place.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.95(d)(1) and 95(d)(1)(i)-ii

(d) Monitoring.
(1) When information indicates that any employee's exposure may equal or exceed an 8-hour time-weighted average of 85 decibels, the employer shall develop and implement a monitoring program.
(i) The sampling strategy shall be designed to identify employees for inclusion in the hearing conservation program and to enable the proper selection of hearing protectors.
(ii) Where circumstances such as high worker mobility, significant variations in sound level, or a significant component of impulse noise make area monitoring generally inappropriate, the employer shall use representative personal sampling to comply with the monitoring requirements of this paragraph unless the employer can show that area sampling produces equivalent results.

Location: Central Shops

Hazard: No evidence of noise monitoring of worker population to identify employees for inclusion in a Hearing Conservation program.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.95(g)(1)

(g) Audiometric testing program.
(1) The employer shall establish and maintain an audiometric testing program as provided in this paragraph by making audiometric testing available to all employees whose exposures equal or exceed an 8-hour time-weighted average of 85 decibels.

Location: Central Shops

Hazard: No evidence of an audiometric testing program for all employees whose 8-hour time-weighted average noise level equals or exceeds 85dB.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.95(g)(5)(i)

(5) Baseline audiogram.
(i) Within 6 months of an employee's first exposure at or above the action level, the employer shall establish a valid baseline audiogram against which subsequent audiograms can be compared.

Location: Central Shops

Hazard: No evidence of baseline audiograms being collected within six months for all employees whose 8-hour time-weighted average noise level equals or exceeds 85dB.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.95(g)(6)

(6) Annual audiogram. At least annually after obtaining the baseline audiogram, the employer shall obtain a new audiogram for each employee exposed at or above an 8-hour time-weighted average of 85 decibels.

Location: Central Shops

Hazard: No evidence of annual audiogram for all employees whose 8-hour time-weighted average noise level equals or exceeds 85dB.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.95(k)(1)

(k) Training program.
(1) The employer shall institute a training program for all employees who are exposed to noise at or above an 8-hour time-weighted average of 85 decibels, and shall ensure employee participation in such program.

Location: Central Shops

Hazard: No evidence of an employee training program for all employees whose 8-hour time-weighted average noise level equals or exceeds 85dB.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.95(k)(2)

(2) The training program shall be repeated annually for each employee included in the hearing conservation program. Information provided in the training program shall be updated to be consistent with changes in protective equipment and work processes.

Location: Central Shops

Hazard: No evidence of annual training for all employees whose 8-hour time-weighted average noise level equals or exceeds 85dB.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1926.150(c)(1)(viii)

Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No. 10A-1970.

Location: All construction areas at the RTF.

Hazard: The following fire extinguishers were found without their required yearly maintenance inspection.

Location	Extinguisher Number
Construction Site	32
Construction Site	10
Construction Site	27
Construction Site	34
Building 13	13
Rt. 9	8
Rt. 9	10
Rt. 9	11

It was determined that most fire extinguishers at the RTF construction site had not had their required yearly inspection.

Bechtel/MK Ferguson Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1926.403(b)(1)(ii), 403(b)(1)(vii)

(1) The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:
(ii) Mechanical strength and durability, including, for parts designed to enclose and protect other equipment, the adequacy of the protection thus provided.
(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with equipment.

Location: Construction area just outside Try Shop, DWPF.

Hazard: Hole found in extension cord outlet box.

Bechtel/Miller Dunn Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1926.403(b)(1)(vii)

(1) The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:
(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with equipment.

Location: Electrical Shop, DWPF

Hazard: No required cord inspection performed on 13.5 KW space heater power cord.

Bechtel/MK Ferguson Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1926.59(f)(5)(i); 59(f)(5)(ii)

(5) Except as provided in paragraphs (f)(6) and (f)(7) the employer shall ensure that each container of hazardous chemicals in the workplace is labeled, tagged or marked with the following information:
(i) Identity of the hazardous chemical(s) contained therein; and
(ii) Appropriate hazard warnings.

Location: Pipe Shop, DWPF

Hazard: Pistol oiler found without required label as to contents or hazard warnings. Machine coolant sprayer labeled as "coolant only" not adequate. ID as to contents. Label must properly identify contents and relate to MSDS. Proper label should have read "Amcool". This container also did not contain a hazard warning.

Spray bottle without required label or hazard warning.

Bechtel/Miller Dunn Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Electrical Shop, DWPF.

Hazard: Fluorescent light bulb grinder attached to 55 gallon drum should have been evaluated by a qualified person for operation. Also, the drum should have an adequate warning such as "fluorescent light bulbs only, potential hazard due to mercury vapor if operated or if waste is disposed of improperly".

Bechtel/MK Ferguson/Miller-Dunn Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1926.150(c)(1)(viii)

(viii) Portable fire extinguishers shall be inspected periodically and maintained in accordance with Maintenance and Use of Portable Fire Extinguishers, NFPA No.10A-1970.

Location: Try Shop, Electrical Shop, Pipe Shop, DWPF.

Hazard: All fire extinguishers found at the above buildings did not have the required yearly inspection.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1910.147(d)(2); 147(d)(3)

(2) Machine or Equipment Shutdown.

The machine or equipment shall be turned off or shut down using the procedures required by this standard. An orderly shutdown must be utilized to avoid any addition or increased hazard to employees as a result of equipment deenergization.

(3) Machine or Equipment Isolation.

All energy isolating devices that are needed to control the energy to the machine or equipment shall be physically located and operated in such a manner as to isolate the machine or equipment from the energy source.

Location: Building RT10, RTF

Hazard: A 480 VAC conduit with three taped wires extending from it was found behind five welding power units. The shutoff switch for this conductor was turned off and the fuse was removed. However, the conduit was not clearly tagged as dead, and the shutoff switch was not locked out and tagged.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1926.403(b)(1)(vii)

(1) Examination: The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with equipment.

Location: Building RT9, RTF.

Hazard: A solid copper two wire conductor strung overhead was insulated with nondurable material. This insulation is subject to wear and should be replaced with a wire insulated with a more durable type insulation.

Bechtel/North Brothers Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1926.405(j)(1)(i)

(i) Live parts: Fixtures, lampholders, lamps, rosettes, and receptacles shall have no live parts normally exposed to employee contact. However, rosettes and cleat-type lampholders and receptacles located at least 8 feet (2.44m) above the floor may have exposed parts.

Location: BRT 10, RTF.

Hazard: The following outlets had openings subjecting employees to live uninsulated conductors:

Box	Circuit
F2	20
F2	23
F2	22
F2	14
F2	31
F2	25

Bechtel/North Brothers Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1926.403(b)(1)(ii); 403(b)(1)(iv); 405(a)(2)(ii)(F);

(1) Examination: The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(ii) Mechanical strength and durability, including for parts designated to enclose and protect other equipment the adequacy of the protection thus provided.

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with equipment.

(F) Temporary lights shall not be suspended by their electric cords unless cords and lights are designed for this means of suspension.

Location: BRT 10, RTF, Exterior North West (NW) corner of building.

Hazard: Flexible extension cord connected to exterior light fixture from inside building to area at the exterior NW corner of building RT10.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1926.59(f)(1)(i)

(1) The chemical manufacturer, importer, or distributor shall ensure that each container of hazardous chemicals leaving the workplace is labeled, tagged or marked with the following information:

(i) Identity of the hazardous chemicals.

Location: RT9, RTF

Hazard: One liter container labeled acetone with appropriate hazard warning contained a clear liquid that was not acetone. This container was mislabeled. The clear liquid appeared to be freon 113.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

General Duty Clause, Public Law 91-596, Section 5(a)(1)

5(a) Each employer (1) shall furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or likely to cause death or serious physical harm to his employees.

Location: Building RT9, RTF, Clean Room

Hazard: Compressed air used for drying purposes did not have dead end protection. In addition, the noise from the drying nozzle could be made quiet by use of an alternative quiet nozzle.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1926.403(b)(1)(vii)

(1) The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with equipment.

Location: Building RT9, RTF, Clean Room

Hazard: Temporary wiring permanently installed at outlet #FABBCKT21.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1926.59(g)(8)

(8) The employer shall maintain copies of the required material safety data sheets for each hazardous chemical in the workplace, and shall ensure that they are readily accessible during each workshift to employees when they are in their work area.

Location: RTF Warehouse.

Hazard: Despite looking for over 20 minutes, the supervisor could not obtain MSDS's for the following randomly selected chemicals: naval jelly and stair tread adhesive.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1926.59(h)(1)(iii)

(1) Information. Employees shall be informed of:
(iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.

Location: Building RTF Warehouse.

Hazard: Do not have an inventory of chemicals in the warehouse. Although there is a site inventory, the intent of the standard was to require inventories for businesses with areas smaller than this entire plant site. An inventory of this work area was not readily available.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
De Minimis	20877	Savannah River Site

Description

1926.403(b)(1)(vii)

(1) Examination: The employer shall ensure that electrical equipment is free from recognized hazards that are likely to cause death or serious physical harm to employees. Safety of equipment shall be determined on the basis of the following considerations:

(vii) Other factors which contribute to the practical safeguarding of employees using or likely to come in contact with equipment.

Location: Building RTF

Hazard: Numerous, more than five, two copper wire conductor outlets were found strung from overhead. These conductors were insulated with nondurable material which was subject to wear.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Serious	20877	Savannah River Site

Description

1926.451(a)(4); 451(a)(6)

(4) Guard rails and toeboards shall be installed on all open sides and ends of platforms more than 10 feet above the ground or floor, except needle beam scaffold and floats [see Paragraph (p) and (w) of this section]. Scaffolds 4 feet to 10 feet in height having a minimal horizontal direction of less than 45 inches, shall have standard guardrails installed on all open sides and ends of the platform.

(6) Where persons are required to work or pass under the scaffold, scaffolds shall be provided with a screen between the toeboard and the guardrail, extending along the entire opening, consisting of No.18 gauge U.S. Standard wire 1/2-inch mesh, or the equivalent.

Location: Building RTF, at main exhaust stack.

Hazard: Incomplete scaffold without a toeboard, handrail, midrail, positioned over a major access to the RTF construction site. Height of scaffold approximately 30 feet.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1904.12(f)

(f) "Lost workdays": The number of days (consecutive or not) after, but not including, the day of injury or illness during which the employee would have worked but could not do so; that is, could not perform all or any part of his normal assignment during all or any part of the workday or shift, because of the occupational injury or illness.

Location: All Westinghouse Locations.

Hazard: A random check of the H Area first aid log for December revealed one case that had statements in the log restricting an employee from a normal assignment. This case was not recorded on the OSHA 200 log as a restricted workday. The date and descriptions of this case from the first aid log was as follows:

12/4/90 - Flat laceration from staple remover - Restricted from work with alpha two days.

This is a minor recording area, however, it points to a flaw in the recording system. Medical personnel fill out a form referring a case to the safety department for follow-up. This was not done in the case on 12/4/89, even though the individual was restricted from alpha work for two days. Apparently, the medical staff was unaware of the requirements of the OSHA General Industry Standard. The requirements of the OSHA reporting system should be reviewed systematically with the medical staff.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.1200(h)(1) and 1200(h)(2)

(h) Employee information and training. Employers shall provide employees with information and training on hazardous chemicals in their work area at the time of their initial assignment, and whenever a new hazard is introduced into their work area.
(1) Information. Employees shall be informed of:
(i) The requirements of this section;
(ii) Any operations in their work area where hazardous chemicals are present; and,
(iii) The location and availability of the written hazard communication program, including the required list(s) of hazardous chemicals, and material safety data sheets required by this section.
(2) Training. Employee training shall include at least:
(i) Methods and observations that may be used to detect the presence or release of a hazardous chemical in the work area (such as monitoring conducted by the employer, continuous monitoring devices, visual appearance or odor of hazardous chemicals when being released, etc.);
(ii) The physical and health hazards of the chemicals in the work area;
(iii) The measures employees can take to protect themselves from these hazards, including specific procedures the employer has implemented to protect employees from exposure to hazardous chemicals, such as appropriate work practices, emergency procedures, and personal protective equipment to be used; and,
(iv) The details of the hazard communication program developed by the employer, including an explanation of the labeling system and the material safety data sheet, and how employees can obtain and use the appropriate hazard information.

Location: Building RT9, Clean Shop

Hazard: Workers cleaning pipes with freon could describe the dermatitis health effects of freon, but were not aware of its narcotic effects. Although working next to a welding area, did not know the respiratory hazards of freon vapors in the presence of welding operations.

Bechtel Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.179(j)(2)(iii)

(iii) Hooks with deformation or cracks. Visual inspection daily; monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the hook inspected. For hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10° twist from the plane of the unbent hook refer to paragraph (l)(3)(iii)(a) of this section.

Location: Throughout plant site.

Hazard: Signed inspection reports documenting crane hook inspections, for cracks or deformation, not performed monthly as required.

Westinghouse Savannah River Company

Type of Violation	Inspection Number	Inspection Site
Other-Than-Serious	20877	Savannah River Site

Description

1910.179(j)(2)(iii)

(iii) Hooks with deformation or cracks. Visual inspection daily; monthly inspection with a certification record which includes the date of inspection, the signature of the person who performed the inspection and the serial number, or other identifier, of the hook inspected. For hooks with cracks or having more than 15 percent in excess of normal throat opening or more than 10° twist from the plane of the unbent hook refer to paragraph (l)(3)(iii)(a) of this section.

Location: Thoughout plant site.

Hazard: Signed inspection reports documenting crane hook inspections for cracks or deformation, not performed monthly as required.