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WESTINGHOUSE SAVANNAH RIVER COMPANY (WSRC) APPROACH TO NUCLEAR FACILITY MAINTENANCE

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BACKGROUND

The Savannah River Site (SRS) in South Carolina is a 300+ square mile facility owned by the U.S. Department of Energy (DOE) and operated by Westinghouse Savannah River Company (WSRC), the prime contractor; Bechtel Savannah River, Incorporated (BSRI) is a major subcontractor. The site has used all of the five nuclear reactors and it has the necessary nuclear materials processing facilities, as well as waste management and research facilities. The site has produced materials for the U.S. nuclear arsenal and various isotopes for use in space research and nuclear medicine for more than 30 years. In 1989, WSRC took over as prime contractor, replacing E. I. du Pont de Nemours and Company. At this time, a concentrated effort began to more closely align the operating standards of this site with those accepted by the commercial nuclear industry of the United States. Generally, this meant acceptance of standards of the Institute of Nuclear Power Operations (INPO) for nuclear-related facilities at the site.

At this writing, some of the Savannah River Site facilities have been shut down until improvements in operating conditions can assure the Department of Energy and the American public that the facilities can be operated safely. However, several of the nuclear materials processing facilities and waste management facilities continue to operate under strict scrutiny of the DOE and various oversight groups while improvements are underway.

It is worthy of note that not all of the facilities at the site are nuclear related. For instance, the site contains coal-fired boilers, a fleet of vehicles, five locomotives and associated equipment, etc. The subject of this paper is maintenance of nuclear facilities and, therefore, excludes discussion of the maintenance of these non-nuclear facilities and equipment.

SYNOPSIS

It is generally recognized that it is impossible for facilities that were previously not required to meet INPO standards to comply immediately with all of the guidelines. Compliance with INPO 85-038, Guidelines for the Conduct of Maintenance at Nuclear Power Stations, is no exception. For instance, inaccurate drawings and incomplete instrument lists make it impossible to quickly comply with Chapter IV, Types of Maintenance, or Chapter XI, Control and Calibration of Measuring and Test Equipment. It is also reasonable to assume that funds for recovery of these items is not unlimited, given the current budgetary problems faced by the DOE and the nation as a whole. Therefore, various schemes were devised to allow operation of facilities that are necessary for maintenance of the U.S. nuclear deterrent while ensuring

the DOE and the nation as a whole. Therefore, various schemes were devised to allow operation of facilities that are necessary for maintenance of the U.S. nuclear deterrent while ensuring public safety. A graded approach was taken. Nuclear reactors are not being restarted until all appropriate standards are met, while some other facilities with lesser risks are being run under a Justification for Continued Operation (JCO). Still other facilities such as the low level waste solidification facility are running with standards acceptable to the DOE.

It is the graded approach to maintenance standards and the scheduling of INPO standard implementation that is the subject of this paper.

DISCUSSION

The transition from an "industry best practice" maintenance philosophy with very little oversight to a highly regulated and scrutinized maintenance philosophy with considerable oversight is a difficult one. INPO standards are easy to accept in concept since they represent an excellent approach to maintenance and provide an understandable program for oversight groups to use to determine if facilities are safe to operate. However, the cost is high in manpower and dollars. The Nuclear Materials Processing Division (NMPD) of Westinghouse Savannah River Company, along with other divisions, recognized this and budgeted improvements through DOE five-year plans and intricate schedules for compliance. NMPD is made up primarily of a reactor materials program, a separations program, a tritium production program, a waste management program, and the defense waste processing (waste solidification) program. This division's approach will be used as an example of the SRS approach to maintenance.

WSRC and its NMPD are dedicated to the concept of Total Quality and, therefore, sought to communicate to its customer, DOE, how (and when) new, acceptable standards would be met by each of its major programs. A Performance Improvement Plan (PIP) was created which defines general directions; deliverable scopes; and schedules for implementation of Conduct of Operations, Conduct of Training, Conduct of Technical, Management Systems and, of course, Conduct of Maintenance. Conduct of Maintenance was further divided into 17 chapters:

1. Maintenance Program Organization and Administration
2. Training and Qualification of Maintenance Personnel
3. Maintenance of Facilities, Equipment, and Tools
4. Types of Maintenance
5. Maintenance Procedures
6. Planning, Scheduling, and Coordinating Maintenance
7. Control of Maintenance Activities
8. Postmaintenance Testing

9. Procurement of Parts, Materials, and Services

10. Material Receipt, Inspection, Handling, Storage, Retrieval, and Issuance

11. Control and Calibration of Measuring and Test Equipment

12. Maintenance Tools and Equipment Control

13. Facility Material Condition Inspection

14. Management Involvement

15. Maintenance History

16. Analysis of Maintenance Problems

17. Modification Control

The first 16 chapters correspond to the 16 chapters of INPO 85-038; Chapter 17, Modification Control, was added in response to DOE Order 4330.XXX. Perhaps it is wise to mention here that NMPD maintenance is required to meet DOE orders and not INPO standards. However, with few exceptions, the two are extremely close.

Having produced a manpower-loaded schedule and deliverable scope statements, the document was then given to the customer and used for planning. (Attachment 1 contains the scope and schedule for Chapter 4.3.2.3-11 of W RC-RP-78-495.) This approach held several advantages. First, by choosing a division-wide approach, synergy was used to minimize creation of new programs by each maintenance department. For instance, if one department defined a good program for Analysis of Maintenance Problems, the program was generally copied by the other departments. In addition, for complicated programs, such as Work Control, pilot programs were initiated to allow proper manpower and cost forecasting for all facilities. Of course, INPO standards and good practices were used extensively in the development of these programs.

The scheduling of maintenance improvements and the acceptance (or at least understanding) of these schedules by the DOE relieved the burden of "instant compliance." Schedules differed by facility, but the logic used was essentially the same.

- Implement first those programs necessary to ensure that the safety envelope is not violated. For instance, since measuring and test equipment (M&TE) must be accurate for equipment to operate safely, compliance with this chapter was expedited.

- Quickly implement parts of the improvement process that would have major payback in improved equipment operations and, thus, reduced cost--programs such as improved lubrication, preventive and predictive maintenance, etc.

- Reformat existing programs to make them auditable by INPO standards. Of course, many existing programs were acceptable by previous standards, and with minimum change, are acceptable by INPO standards.

- Implement those programs that provide 80% of the payback with 20% of the effort as well as those that are easily attainable as early as possible.

- If funding is lacking, delay programs designed to provide improvements to maintenance rather than those deemed necessary to maintain nuclear facilities. These programs are in categories like facility material condition inspection.

Some of the major difficulties in the prioritization of the various programs are in the area of configuration management. While the need for accurate design information is unquestionable, the manpower to re-baseline a large existing facility is costly, and the time needed to accomplish such a task is not minor. The SRS approach has been to accomplish the task by the following:

1. Categorize equipment in various categories based on impact to safety. These categories are nuclear safety, critical protection, process support, and general service. Re-baseline the equipment based on severity of classification beginning with nuclear safety related equipment.

2. Use configuration control boards to keep new changes from taking place without proper documentation.

3. Where operations or maintenance of a facility is questionable, given the lack of assurance with the accuracy of existing configuration documentation or program inadequacy, require a JCO which outlines measures taken to ensure system and personnel safety. This may require special procedures, additional oversight, etc.

CONCLUSIONS

Westinghouse Savannah River Company and Bechtel Savannah River, Incorporated have taken a path which will ensure that maintenance at the Savannah River Site is conducted in a way that assures public safety while minimizing cost to the public. The implementation of INPO standards is being conducted in a timely manner that considers availability of funds along with the need for disciplined operations. The end result is maintenance that can face the scrutiny of various oversight organizations without the need for unduly high budgets and manpower.

ACKNOWLEDGMENT

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4.3.2.3-11 PIP IMPLEMENTING TASK: NMPD

SCOPE STATEMENT FOR CONTROL AND CALIBRATION OF MEASURING AND TEST EQUIPMENT

DELIVERABLE:

Establish a program for control and calibration of measuring and test equipment (M & TE) to ensure the accurate performance of instrumentation and equipment used for testing, calibrations, and repairs.

DELIVERABLE SCOPE:

1. Develop, approve and issue NMPD procedure.

2. Perform self assessment and prepare implementation plan.

RM		1	MW
T		1	MW
SEP	COMPLETE		
WM		1	MW
DWPF	COMPLETE		

3. Revise, approve, and issue PMT procedure.

RM		2	MW
T		2	MW
SEP	COMPLETE		
WM		4	MW
DWPF	COMPLETE		

4. Obtain adequate staffing.

RM	COMPLETE		
T	COMPLETE		
SEP	COMPLETE		
WM		1	MW
DWPF	COMPLETE		

5. Indoctrinate applicable personnel on PMT procedure.

RM		2	MW
T		1	MW
SEP	COMPLETE		
WM		4	MW
DWPF	COMPLETE		

6. Implement PMT M & TE procedure.

RM		1	MW
T		1	MW
SEP	COMPLETE		
WM		1	MW
DWPF	COMPLETE		

7. Develop an M & TE master list and identify each piece of M & TE with a unique number.

RM		1	MW
T		2	MW
SEP		4	MW
WM		1	MW
DWPF	COMPLETE		

8. Assess PMT implementation and compliance with NMPD procedure.

RM	4	MW
T	4	MW
SEP	4	MW
WM	4	MW
DWPF	4	MW

DELIVERABLE ACCEPTANCE CRITERIA:

1. NMPD procedure approved and issued.
2. Self assessment is complete and documented.
3. PMT M&TE control procedure is approved and issued.
4. Staffing is obtained to implement PMT procedure.
5. Personnel indoctrination is complete and documented.
6. M & TE control procedure is implemented.

7. Implementation assessment report is issued.

8. Each M & TE item is assigned a unique number and included in a master list.

ASSUMPTIONS:

1. Staffing and facilities are available when needed.

2. This plan will not consider permanently installed field equipment.

MANPOWER:

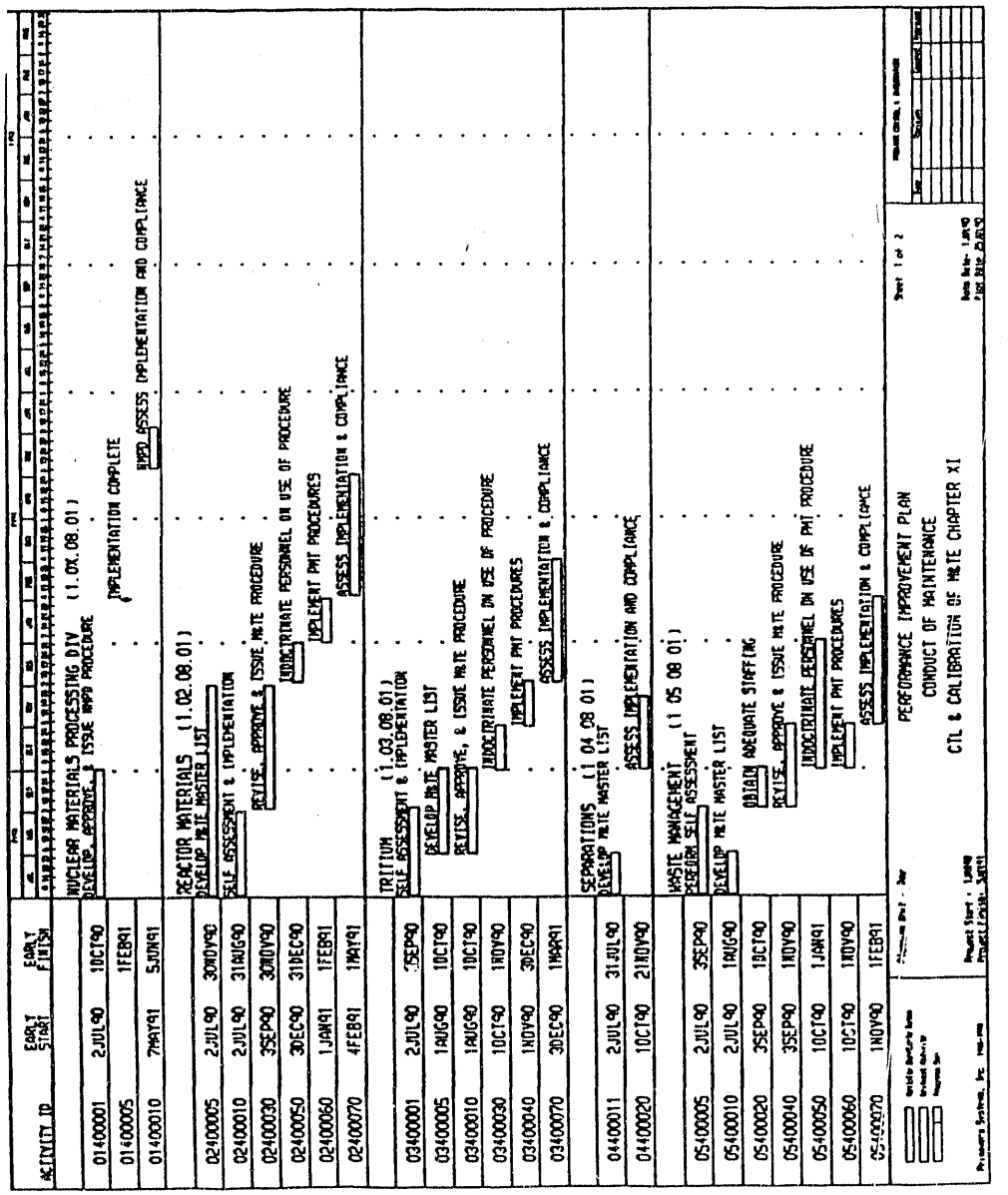
BUDGET ESTIMATES:

1. TOTAL COST FOR IMPLEMENTATION:
(does not include sustaining manpower if required)

PMT	$ 1000's
RM	22
T	18
SEP	16
WM	32
DWPF	8
TOTAL NMPD	96

2. PORTION OF ITEM 1 COSTS NOT CURRENTLY REFLECTED IN BUDGET PLANS:

PMT	$ 1000's
RM	-0-
T	-0-
SEP	-0-
WM	21
DWPF	-0-
TOTAL NMPD	21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REACTOR MATERIALS (1.02.08.01)
DEVELOP MAT MASTER LIST
SELF ASSESSMENT & IMPLEMENTATION
REVISE, APPROVE & ISSUE MAT PROCEDURE
INDOCTRINATE PERSONNEL ON USE OF PROCEDURE
IMPLEMENT MAT PROCEDURES
ASSESS IMPLEMENTATION & COMPLIANCE
TRITIUM (1.03.08.01)
SELF ASSESSMENT & IMPLEMENTATION
DEVELOP MAT MASTER LIST
REVISE, APPROVE, & ISSUE MAT PROCEDURE
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IMPLEMENT MAT PROCEDURES
ASSESS IMPLEMENTATION & COMPLIANCE
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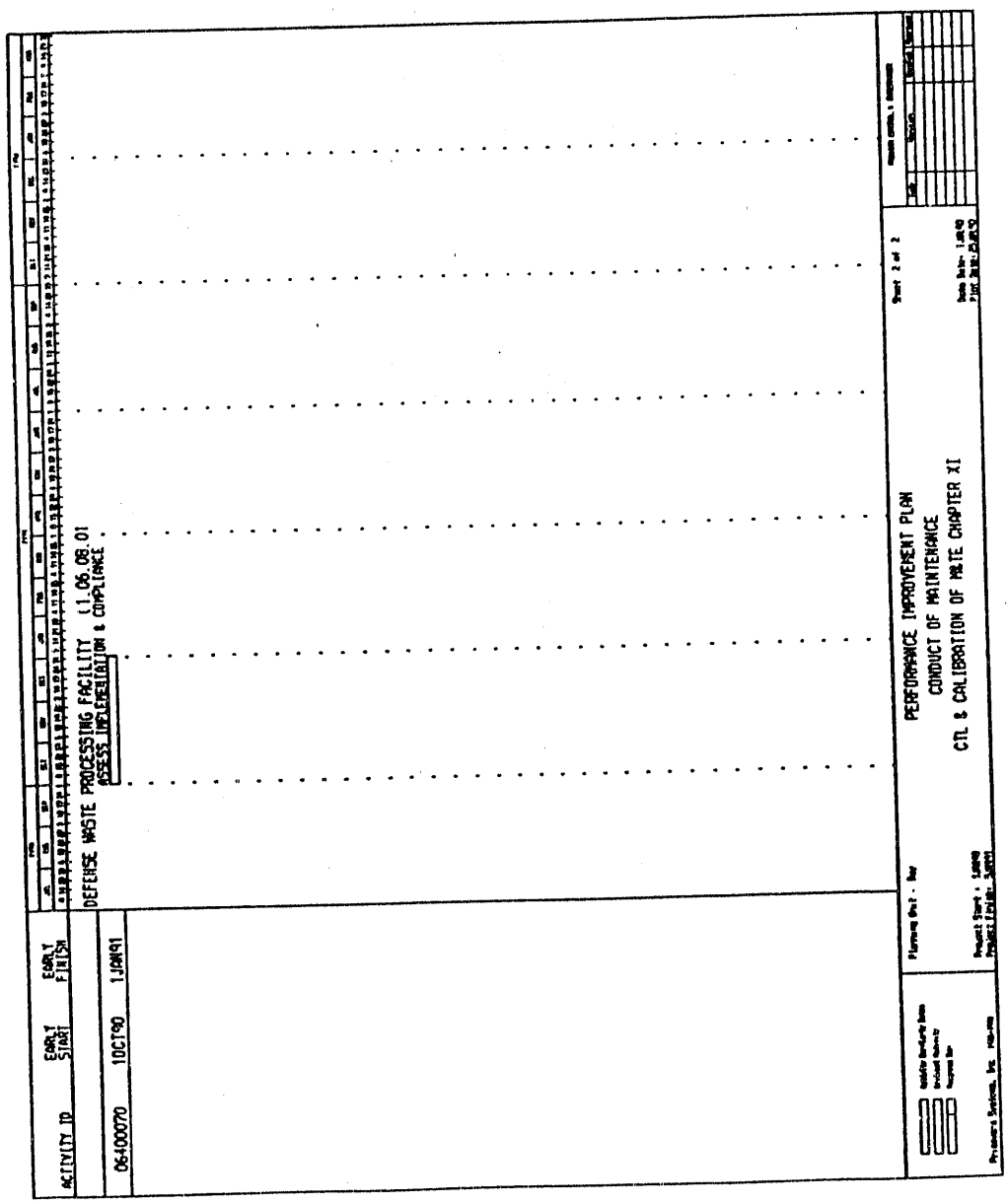
ASSESS IMPLEMENTATION AND COMPLIANCE
WASTE MANAGEMENT (1.05.08.01)
PERFORM SELF ASSESSMENT
DEVELOP MAT MASTER LIST
OBTAIN ADEQUATE STAFFING
REVISE, APPROVE & ISSUE MAT PROCEDURE
INDOCTRINATE PERSONNEL ON USE OF MAT PROCEDURE
IMPLEMENT MAT PROCEDURES
ASSESS IMPLEMENTATION & COMPLIANCE
PERFORMANCE IMPROVEMENT PLAN
CONDUCT OF MAINTENANCE
CTL & CALIBRATION OF MATE CHAPTER XI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PERFORMANCE IMPROVEMENT PLAN
CONDUCT OF MAINTENANCE
CTL & CALIBRATION OF M&TE CHAPTER XI

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