NUREG/CR-2985

Evaluation of Nuclear-Facility Decommissioning Projects

Project Summary Report
Elk River Reactor

Prepared by R. L. Miller, J. A. Adams

UNC Nuclear Industries

Prepared for
U.S. Nuclear Regulatory Commission

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Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
NRC FIN B7568

EVALUATION OF NUCLEAR FACILITY DECOMMISSIONING PROJECTS

PROJECT SUMMARY REPORT

ELK RIVER REACTOR

Reviewed by DOE-RL:

J. D. White, Director, Surplus Facilities Management Program Office — 11/5/82 Date

Approved by UNC:

T. E. Dabrowski, Director, Office of Surplus Facilities Management — 11/5/82 Date

Approved by NRC:

D. W. Reisenweaver, NRC Program Manager — 11/10/82 Date

ABSTRACT

This report summarizes information concerning the decommissioning of the Elk River Reactor. Decommissioning data from available documents were input into a computerized data-handling system in a manner that permits specific information to be readily retrieved. The information is in a form that assists the Nuclear Regulatory Commission in its assessment of decommissioning alternatives and ALARA methods for future decommissionings projects. Samples of computer reports are included in the report. Decommissioning of other reactors, including NRC reference decommissioning studies, will be described in similar reports.

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(continued)

1.0 INTRODUCTION

This document presents, in summary form, information pertaining to the decommissioning of the Elk River Reactor. The purpose of this type of report is to provide the Nuclear Regulatory Commission (NRC) and its licensees comparative data to assist in their assessment of decommissioning alternatives and ALARA methods for future decommissioning projects.

Data were assembled in a form that permitted input into a computerized data-handling system. The computer program* used produces a flexible data accumulation, manipulation, and retrieval system which provides decommissioning performance information such as:

ALARA responsiveness
Cost estimate accuracy
Schedule adherence
Project labor hours and costs
Exposure accountability, and
Radwaste generation and disposition

When sufficient decommissioning data have been obtained from an adequate number of facilities of any one type (BWR, PWR, Research), comparisons can be made between the experiences at the facilities and with NRC decommissioning NUREGs. The comparisons will be documented to facilitate the assessment of future nuclear facility decommissioning plans.

*MAPPER is the computer software package selected for the program. MAPPER stands for Maintain, Prepare, and Produce Executive Reports. This system is used with DOE's UNIVAC system at Richland, Washington.

Facilities studied and included in the data system during 1982 are listed below:

Facility	Decommissioning Mode
Elk River Reactor (BWR)	DECON
NUREG/CR-0130 (Reference PWR)	DECON SAFSTOR ENTOMB
NUREG/CR-0672 (Reference BWR)	DECON SAFSTOR ENTOMB
NUREG/CR-1756 (Reference Research and Test Reactor)	DECON SAFSTOR ENTOMB
Ames Reactor (Research)	DECON
BONUS (Boiling Nuclear Superheat)	ENTOMB
Peach Bottom-1 (HTGR)	SAFSTOR (Surveillance data only)
Fermi-1 (LMFBR)	SAFSTOR

This summary report concerns only the Elk River Reactor decommissioning program. Summary reports for the other facilities listed above may be obtained from:

GPO Sales Program
Division of Technical and Information and Document Control
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

1.1 BACKGROUND

In 1981 the NRC Staff initiated a multi-year program to assess and evaluate the methods, radiation exposure and costs associated with the decommissioning of retired nuclear reactors. The program objective is to provide the NRC with data that will assist in the assessment of future decommissioning plans to assure implementation of NRC's ALARA policy.

The program was originated under the auspices of the Office of Nuclear Regulatory Research through its Chemical Engineering Branch. UNC Nuclear Industries (UNC) is responsible for the technical direction of the program and for preparation of documentation and summary comparisons of evaluated projects. See NUREG/CR-2522 "Evaluation of Nuclear Facility Decommissioning Projects" for a complete description of the Program Plan.

Licensees currently decommissioning reactor facilities or licensees who are planning such projects have been, or will be solicited for possible inclusion in the program. After collection of sufficient data, analyses of each project will be completed, then comparisons will be made between the actual methods, costs and exposure used by licensees and with data contained in reference decommissioning studies.

1.2 ACRONYMS - ABBREVIATIONS - DEFINITIONS

Definitions of Decommissioning Alternatives

DECON - to immediately remove all radioactive material to permit unrestricted release of the property.

SAFSTOR - to fix and maintain property so that risk to safety is acceptable for period of storage followed by decontamination and/or decay to an unrestricted level.

ENTOMB - to encase and maintain property in a strong and structurally long-lived material (e.g., concrete) to assure retention until radioactivity decays to an unrestricted level.

Acronyms - Abbreviations

A/C	Activated or Contaminated
AEC	Atomic Energy Commission
ALARA	As Low As Reasonably Achievable
Bio	Biological
BWR	Boiling Water Reactor
Ci	Curie
CS	Carbon Steel
Cu Ft	Cubic Feet
DDS	Decommissioning Data System
DNA	Data Not Available
DOE	Department of Energy
DOS RED FCT	Dose Reduction Factor
DPM	Disintegrations per Minute
ERR	Elk River Reactor
HTGR	High Temperature Gas-Cooled Reactor

LMFBR	Liquid Metal Fast Breeder Reactor
MAPPER	Maintain, Prepare, and Produce Executive Reports
MW	Megawatt
MWD	Megawatt Days
MWE	Megawatt Electrical
MWT	Megawatt Thermal
NRC	U.S. Nuclear Regulatory Commission
NSSS	Nuclear Steam Supply System
NUC ENG	Nuclear Engineering
PSIG	Pounds/Square Inch Gauge
PWR	Pressurized Water Reactor
RCPA	Rural Cooperative Power Association
Rich	Richland
RR	Railroad
Sched	Scheduled
Sheff	Sheffield
Spec No	Specification Number
SS	Stainless Steel
SYS/COMP	System Component
Trip Len	Trip Length
Typ	Type
UNC	UNC Nuclear Industries, Operations Division
UPA	United Power Association
W.O.	Work Order

2.0 FACILITY SUMMARY REPORT

This summary report is a duplication of information found in the computer printout in Section 4.0. The intent of this summary is to show, at a glance, the data necessary to become familiar with the facility.

2.1 FACILITY DESCRIPTION

Name: Elk River Reactor

Location: Elk River, Minnesota

Owner: AEC

Decommissioning Mode: DECON

Reactor Type: BWR

Startup Date: 1962

Shutdown Date: 1968

Power Rating: (MW) Electrical 23.8, Thermal 58.2

Lifetime Power: (MWD) Electrical DNA, Thermal 53,000

Reason for Decommissioning: End of AEC demonstration period

2.2 SUMMARY OF COSTS AND RADIOACTIVE WASTE

Total Decommissioning Costs: (1973$) 6,150,000*

Personnel Exposure: (Man-rem) 75

Radioactive Waste-Volume: (Cubic Feet) 92,000

Radioactive Waste-Activity: (Curie) 10,000

2.3 COMPARISON OF COST ITEMS

The statistical significance of the following comparative information is not fully developed at the present time. Comparative numbers should be meaningful when additional decommissionings have been accomplished.

*See page 4-1 for inflation rate table to adjust costs to year of interest

2.3.1 Dollar Costs

The following listed items are compared to the total dollar cost for the decommissioning project.

Total Decommissioning Cost: $6,150,000 (1973 Dollars)*

Item	Unit of Measurement	No. of Units	No. of Dollars Spent per Unit
Radioactivity	Ci	10,000	$615 per Ci
Radioactive Waste	Cu Ft	92,000	$65 per Cu Ft
Lifetime Power Output	MWD	53,000	$115 per MWD
Lifetime Electr. Output	MWD	DNA	DNA
Spending Rate	Months	38	$162,000 per Mo.

2.3.2 Man-rem Costs

The following listed items are compared to the amount of radiation exposure taken by decommissioning personnel.

Total man-rem used: 75

Item	Unit of Measurement	No. of Units	No. of Units per Man-rem
Radioactivity	Ci	10,000	130 Ci per man-rem
Radioactive Waste	Cu Ft	92,000	1,225 Cu Ft per man-rem
Decommissioning Cost	Dollar (1973)	6,150,000	$82,000 per man-rem

*See page 4-1 for inflation rate table to adjust costs to year of interest.

3.0 DESCRIPTION OF REPORTS

The reports described below are the basic reports used in the program. In addition to the basic reports, MAPPER provides the ability to produce other reports by manipulating the data available in the basic reports.

3.1 Decommissioning Code Table Index

The code table contains a list of facility buildings, systems and system components and a corresponding system/component number for each. The system/component number is used throughout DDS to relate data to specific facility components.

This basic report type may be expanded to include tables or indices of other kinds related to facility decommissioning. Candidate tables are labor category wage rates, shipping company rates, shipping company name codes, disposal site name codes and rates, or archived file tape names.

3.2 General Information

This report is a free format input report designed to accommodate descriptive data of any kind. Entries may be given any title and related to any facility system by a system component number. Data are entered in any format on any subject. The report should be used to record information that does not fit into any of the report types organized by column. This includes facility location, description, owners, operators, builders. Summary data may also be included where it is not readily derivable from other reports or for convenient reference.

3.3 Significant Event Report

This report is used to record the facility's operating history, which in some cases could impact facility decommissioning. It contains dates, system/component numbers, and event descriptions. Noteworthy events such as construction completion, startup, shutdowns, significant incidents, and accidents are recorded in this report.

3.4 Radionuclide Inventory

An inventory of radionuclides present in each facility system will be made prior to the start of decommissioning. The amount of each radionuclide or its concentration, the measurement date, and a description of each system's material composition will be recorded. It will be noted whether a radionuclide present in a system is the result of neutron activation or contamination.

3.5 Project Cost/Exposure Report

Costs, schedules, man-hours, man-rem, both estimated and actual, are listed for each activity specification number. These costs may be broken out on lines having a subactivity specification number. This report is the main respository of cost and exposure information for a decommissioning project.

3.6 Dose Rate and Contamination Report

Dose rates at locations throughout each facility are recorded prior to decommissioning. Locations relative to a reference map, elevation, system/component number, and type of measurement are recorded for each measurement. Both upper and lower limits of dose rates or contamination levels (in disintegrations per minute) are listed.

3.7 Project Labor Report

Decommissioning labor costs, exposure, and man-weeks for each activity specification are recorded at a to-be-determined frequency. This supplements the project cost/exposure report by providing data on how costs and exposures accumulate over the course of a decommissioning project.

3.8 ALARA Report

The ALARA report contains records of ALARA efforts by activity specification number. The affected facility system, date, cost items, exposure information, and a description of the ALARA effort are listed. This report can be used to calculate by activity specification number or for all activities the total estimated man-rem saved as well as total cost incurred through the implementation of the ALARA effort.

3.9 Shipment Report

Volumes, weights, and other physical data are recorded by waste type for material produced by each activity specification. These data are listed for each shipment of material from the decommissioning site. Trip lengths and vehicle dose rates are recorded in order to calculate public exposure.

3.10 Disposal Costs

The costs associated with each waste disposal shipment are recorded in the Disposal Costs Report. Costs are divided into transportation, burial, and container categories. Costs for each container type on the shipment are also listed.

3.11 Surveillance Report

The surveillance report is used to record annual costs and exposures associated with long term surveillance of a decommissioned facility. Under normal conditions a surveillance report would not be required for a facility decommissioned under Mode DECON.

4.0 COMPUTER REPORTS

Dollar values listed are in 1973 dollars. For adjusting costs listed in the computer reports to year of interest, use the inflation rate table below.

Inflation Rate Table*

Year	Inflation Rate
1966	.029
1967	.029
1968	.042
1969	.054
1970	.059
1971	.043
1972	.033
1973	.062
1974	.11
1975	.091
1976	.058
1977	.065
1978	.077
1979	.113
1980	.135
1981	.089
1982	.060 (estimated)

*Source: Statistical abstract of the United States, 1981 Consumer Price Index.

```
.ERR1       U.N.C. DECOMMISSIONING DATA SYSTEM - DECOMM CODE TABLE/INDEX   B1102
*       FACILITY       .SYS/COMP.
*  SYSTEM/COMPONENT    . NUMBER .
*====================.========.================================================
.  NOTE: THIS REPORT NORMALLY WOULD CONTAIN A LIST OF FACILITY  BUILDINGS,
.        SYSTEMS AND SYSTEM COMPONENTS AND A CORRESPONDING SYSTEM/COMPONENT
.        NUMBER FOR EACH.  THE SYSTEM/COMPONENT NUMBER IS THEN USED THROUGH-
.        OUT THE SYSTEM TO RELATE DATA TO PARTICULAR COMPONENTS.  ELK RIVER
.        REACTOR DECOMMISSIONING DOCUMENTS WERE NOT SUFFICIENTLY DETAILED
.        TO PERMIT ASSIGNMENT OF IDENTIFYING SYSTEM/COMPONENT NUMBERS.


                    ..... END REPORT .....
```

```
.ERR1       UNC DECOMMISSIONING DATA SYSTEM  GENERAL INFORMATION REPORT  72C1104
*                    .SYS/COMP.
* SYSTEM/COMPONENT   . NUMBER .             ENTRY TITLE
*==================.========.=============================================.
 DESCRIPTION                              OPERATING HISTORY
.
.  NAME: ELK RIVER REACTOR                  STARTUP DATE: NOVEMBER 1962
.  LOCATION: ELK RIVER, MINNESOTA           SHUTDOWN DATE: JANUARY 1968
.  OWNER: AEC                               MEGAWATT DAYS: 53,000
.  OPERATOR: RCPA                           MAJOR SHUTDOWNS: DNA
.  ARCHITECT/ENGINEER: SARGENT & LUNDY      DECOMMISSIONING MODE: DECON
.  BUILDER: CHICAGO BRIDGE & IRON
.  NSSS: ALLIS-CHALMERS MFG CO.

 REFERENCES
.
.   REPORTS:
.
.AEC-ELK RIVER FINAL PROGRAM REPORT (COO-651-93 REV )
.DISMANTLING PLAN (SS-836)
.MONTHLY PROGRESS REPORTS (ERR 1 THROUGH ERR-40)
.FINAL ELK RIVER REACTOR SITE SURVEY REPORT (COO-651-92)
.FINAL REPORT OF THE SAFETY REVIEW COMMITTEE
.ACTIVITY SPECIFICATIONS (1 THROUGH 11)
.DETAILED WORKING PROCEDURE (4.1 THROUGH 11.1)
.ERR DISMANTLING PROJECT DISPOSAL MANUAL
.
.   PAPERS:
.
.'DISMANTLING OF THE ELK RIVER BOILING WATER REACTOR
.J. W. JONES, R. W. PULLIAM, W. J. MANION
.
.'RADIOACTIVE OPERATIONS IN THE DISMANTLING OF THE ELK RIVER REACTOR,'
.J. F. NEMEC, R. BECKERS, R. BLUMBERG
.
.'DEMOLITION OF RADIOACTIVE AND CONTAMINATED STRUCTURES BY USE OF EXPLOSIVES,
.J. F. NEMEC, K. G. ANDERSON
.
.'HEALTH PHYSICS PLANNING FOR DISMANTLING OF THE ELK RIVER REACTOR,'
.DAN MCCONNON
.
.'OPERATIONAL HEALTH PHYSICS DURING DISMANTLING OF THE ELK RIVER REACTOR,
.DAN MCCONNON
.
.'THE RESPIRATORY PROTECTION PROGRAM FOR DISMANTLING OF THE ELK RIVER
.REACTOR,' D. MCCONNON, R. WONACOTT
.
.'EXPERIENCES IN DECONTAMINATION/DECOMMISSIONING OF THE ELK RIVER REACTOR,
.D. MCCONNON, J. F. NEMEC

.DECOMMISSIONING INFORMATION

.  PERSONNEL RADIATION EXPOSURE

.   NUMBER OF PERSONNEL MONITORED: 100
.   AVERAGE DOSE MANREM: 0.8
```

```
.ERR1       UNC DECOMMISSIONING DATA SYSTEM  GENERAL INFORMATION REPORT  72C1104
*                    .SYS/COMP.
* SYSTEM/COMPONENT   . NUMBER .             ENTRY TITLE
*==================.========.=============================================.
.   TOTAL MANREM USED: 75
.   DOSE TO PUBLIC-MANREM:DNA
.SEE PROJECT COST/EXPOSURE REPORT FOR ADDITIONAL PERSONNEL EXPOSURE INFO.

.  COST SUMMARY (1973 $)

.   TOTAL DECOMMISSIONING COST: 6,155,775 (INCLUDES $418,000 TECHNICAL SUP-
.    PORT SERVICES)

.   MANPOWER COSTS
.    PREDECOMMISSIONING ENGINEERING: 425,775
.    SECURITY: 216,495.
.    HEALTH & SAFETY: 735,470.
.    OPERATION AND MAINTENANCE: 526,715.
.    ENGINEERING AND ADMINISTRATION: 565,260.
.    STORAGE AND WAREHOUSING: 79,330

.   LABOR RATES ($/HR) (NOT INCLUDING BURDEN)
.    DECOMMISSIONING OPERATIONS CONTRACTOR
.    MANAGERS: 11.00
.    PROJECT ENGINEER: 10.00
.    PROJECT CONTROL ENGINEER: 5.45
.    SUPERVISORS: 6.20
.    CLERICAL:
.         TYPIST: 3.00
.         SECRETARY: 3.80
.    REACTOR OPERATIONS: 5.30
.    DECON TECH: 4.35
.    GUARDS: 4.30
.    HP TECH: 5.75
.    LAB TECH: 5.50
.    ELECTRICIANS: 5.70
.    LABORERS: 4.00
.    DRAFTSMAN: 4.95
.    JANITORS: 3.75

.    SUBCONTRACTORS

.    MANAGERS: 10.00
.    FOREMAN: 7.00
.    EXPLOSIVES ENGINEER: 11.25
.    HEAVY EQUIP. OPERATOR: 8.40
.    LIGHT EQUIP. OPERATOR: 7.65
.    LABORERS: 6.25

.  WASTE DISPOSAL COSTS( $ )          WASTE DISPOSAL RATES($)

.   BURIAL CHARGES: 75,437.            BURIAL  COSTS PER CU FT: 1.00
.   TRANSPORT CHARGES: 105,037.        CASK RENTAL RATES:  $3000/MO FOR 4.5 IN
.                                                          LEAD, 100 CU. FT.
.   CONTAINER COSTS: 263,614.          TRANSPORTATION RATE:
.
```

```
.ERR1       UNC DECOMMISSIONING DATA SYSTEM  GENERAL INFORMATION REPORT  72C1104
*                    .SYS/COMP.
* SYSTEM/COMPONENT   . NUMBER .              ENTRY TITLE
*==================.========.=============================================.
.   OVERWEIGHT PERMITS:                TO SHEFFIELD, ILL (410 MILES)
.                                      $1.50 PER 100 POUNDS-FULL TRUCK LOAD
.     ILLINOIS    $35.                 $1.15 PER 100 POUNDS-TRUCK ON RAIL FLATCAR
.     INDIANA     $55.
.     KENTUCKY    $20.                 TO MOREHEAD, KY (835 MILES)
.     MINNESOTA   $10.                 $2.75 PER 100 POUNDS-FULL TRUCK LOAD
.     WISCONSIN   $ 5.
.                                      TO HANFORD, WA (1500 MILES)
.                                      ATMX RR CAR TO HANFORD $2,400.
.
.
.                                      SURCHARGES: DNA

.WASTE DISPOSAL DATA

.   NUMBER OF SHIPMENTS: DNA
.   TOTAL VOLUME-RADWASTE CONCRETE 44,550 (CU FT)
.   TOTAL VOLUME-RADWASTE OTHER THAN CONCRETE 47,000 (CU FT)
.   TOTAL VOLUME-CLEAN: 83,700 (CU FT)
.   TOTAL MASS -RADWASTE:  2,400,000 (POUNDS) (DOES NOT INCLUDE CONCRETE)
.   TOTAL MASS -CLEAN:  (POUNDS) DNA
.   NUMBER OF CONTAINERS: DNA
.   TOTAL RADWASTE INVENTORY: 9,955 (CI)

.  OTHER COSTS

.   UTILITIES: DNA
.   MISC. SUPPLIES: DNA
.   NUCLEAR INS.: DNA
.   LICENSE FEES: DNA
.   FINAL SITE SURVEY: 27,240
.   TAXES: DNA
.   REAL ESTATE SALE VALUE: DNA

.FINAL SITE SURVEY
.  CRITERIA DOCUMENTS:
.   CONTRACT NO. AT (11-1)-651, MODIFICATION NO. 18
.   LETTER, KENNETH A. DUNBAR AEC TO MR. ROGER MILLER UPA DATED MARCH 5, 1971
.   AEC-ELK RIVER REACTOR DISMANTLING PLAN DATED AUGUST 27, 1971, AND
.   ENVRIONMENTAL STATEMENT FOR ELK RIVER REACTOR DISMANTLING DATED
.   MAY 1972 (WASH-15-16)
.
.CRITERIA SUMMARY:
. RESIDUAL RADIOACTIVITY IS THAT WHICH RESULTS FROM THE PRESENCE OR OPERATION
. OF THE ELK RIVER REACTOR AND THAT WHICH CAN BE DETECTED BY NORMALLY
. ACCEPTED SURVEY METHODS.
.
. RESIDUAL REACTOR-ORIGINATED RADIOACTIVITY WILL BE REMOVED WHERE IT IS
. PRACTICABLE TO DO SO,
.
. IN NO CASE WILL RESIDUAL REACTOR ORIGINATED RADIOACTIVITY WHICH IS NOT
. PRACTICABLE TO REMOVE, ENDANGER OR POSE UNDUE RISK TO PUBLIC HEALTH
```

```
.ERR1       UNC DECOMMISSIONING DATA SYSTEM  GENERAL INFORMATION REPORT  72C1104
*                    .SYS/COMP.
* SYSTEM/COMPONENT   . NUMBER .             ENTRY TITLE
*====================.========.=============================================.
. AND SAFETY.
.
. SURFACE CONTAMINATION LIMITS- DIRECT-BETA 100 C/M (PANCAKE GM)
.  ALPHA 100 D/M/100CM2
. SMEARABLE-BETA 100 D/M/100CM2
.  ALPHA 10 D/M/100CM2
.
. IF ON-SITE SAMPLES INDICATE CONCENTRATIONS ABOVE THOSE THAT EXIST OFF-SITE,
. AN EVALUATION OF POPULATION EXPOSURE WILL BE MADE.  IF EXPOSURE LEVELS TO
. THE GENERAL PUBLIC OF 500 MREM/YEAR MAXIMUM OR 170 MREM/YEAR AVERAGE ARE
. EXCEEDED, THE AREA WILL BE DECONTAMINATED
.
.INSTRUMENTS USED
. EBERLINE MODEL AC-2B 60 CM2 GAS FLOW PROPORTIONAL DETECTOR WITH PAC-4G
. COUNT RATE METER.  USED DIRECT BETA-GAMMA SURVEYS,  MINIMUM DETECTABLE
. ESTABLISHED PRIOR TO EACH USE.
.
. REUTER-STOKES  MODEL RSS-111 PRESSURIZED ION CHAMBER.  USED FOR MEASURING
. GAMMA-RAY EXPOSURE RATES.  MINIMUM DETECTABLE 1UR/HR OR LESS.
.
. 3 AND 5 INCH NAI GAMMA SPECTROMETER. USED FOR GAMMA ANALYSIS OF SOIL AND
. VEGETATION SAMPLES.
.
. GAS FLOW PROPORTIONAL COUNTER USED FOR GROSS BETA MEASUREMENTS OF SOIL &
. VEGETATION SAMPLES
.
.FINAL SURVEY RESULTS
. EXPOSURE RATE - 7.9 TO 13.8 MICRO-R/HR
. SURFACES - LESS THAN 100 C/M (PANCAKE GM)
. SOIL - AVERAGE GROSS BETA 43 PCI/GM.
. VEGETATION - AVERAGE GROSS BETA 96 PCI/GM.
. TRANSFERABLE (SURFACE SMEARS) LESS THAN 100 D/M 100 CM2
. RIVER BOTTOM SEDIMENTS - 29 TO 82 PCI/GM.
.
.BACKGROUND READINGS FROM OFFSITE LOCATIONS
. SOIL 16 TO 43 PCI/GM
. VEGETATION 59 TO 108 PCI/GM
.
.
.COSTS - SITE SURVEY
. DIRECT LABOR          7,200
. LABOR BURDEN          5,040
. MATERIAL             10,000
. ANALYTICAL SERVICES   5,000
.
. TOTAL                27,240

.                           TOTAL COST OF DECOMMISSIONING $(6,455,775)
.COMPARISON ITEMS           ------------------------------  = $ COST/UNIT
.                           NO. OF UNITS COMPARISON ITEMS

.   ITEMS                       NO. OF UNITS            COMPARISON COSTS
```

.ERR1 UNC DECOMMISSIONING DATA SYSTEM GENERAL INFORMATION REPORT 72C1104

SYSTEM/COMPONENT	.SYS/COMP. NUMBER	ENTRY TITLE	
CURIE	9,955	618	DOLLARS/CURIE
RAD WASTE (CU FT)	91,550	67	DOLLARS/CU FT
SPENDING RATE (MONTHS)	38	161,994	DOLLARS/MONTH
POWER RATING MEGAWATT ELECTRICAL (MWE)	23.8 DNA	258,646	DOLLARS/MWE
LIFETIME MAGAWATT DAYS THERMAL (MWDT) (MWDT)	53,000	116	DOLLARS/MWDT

NO OF UNITS COMPARISON ITEM
---------- = UNITS/MAN-REM
TOTAL MANREM USED

ITEM	NO OF UNITS	COMPARISON	
CURIES	9,955	132	CI/MAN-REM USED
RAD WASTE (CU FT)	91,550	1220	CU FT/MAN-REM
TOTAL COST ($)	6,155,755	82077	$/MAN-REM
LIFETIME MEGAWATT DAYS THERMAL (MWDT)	53,000	707	MWDT/MAN-REM
POWER RATING (MWE)	23.8	.32	MWE/MAN-REM

.ASSUMPTIONS

. COSTS ARE LISTED IN 1973 YEAR DOLLARS.

```
.ERR1       UNC DECOMMISSIONING DATA SYSTEM - SIGNIFICANT EVENT REPORT     D1106
*EVENT .SYS/COMP.
* DATE .NUMBER  .   SIGNIFICANT EVENT DESCRIPTION
*======.========.============================================================.
                  CONSTRUCTION START
 60               CONSTRUCTION COMPLETED
 621119           INITIAL CRITICALITY
 640713           INITIAL POWER OPERATION
 6506             START COMMERCIAL POWER OPERATION
 680131           END COMMERCIAL POWER OPERATION.
 690916           FUEL SHIPPED FROM SITE
 710323           OPERATING CONTRACT AMENDMENT FOR DISMANTLING
 711018           DISMANTLING PLAN ISSUED
 7205             FINAL ENVIRONMENTAL INPACT STATEMENT
 720605           DISMANTLING ORDER ISSUED
 740723           FINAL SITE SURVEY
 740930           TERMINATION ORDER
```

```
.ERR1       U.N.C. DECOMMISSIONING DATA SYSTEM - RADIONUCLIDE INVENTORY    H1136
*          .                                  .A.MEASUR.(-------RADIONUCLIDE-------).
*SYS/COMP.                                    ./.EMENT .       .       .CURIES. DPM/ .
* NUMBER .   SOURCE MATERIAL DESCRIPTION      .C. DATE . NAME .CURIES .FT**3 .100CM2.
*========.==================================.=.======.======.=======.======.======.===
.NOTE:  ALL BLANK ENTRIES INDICATE THAT DATA WAS NOT AVAILABLE(DNA)
.
 DNA       CONCRETE BIO SHIELD                A 710430 H    3 9.30E-5 DNA     DNA
           CONCRETE BIO SHIELD                A 710430 C   14 1.13E-2
           CONCRETE BIO SHIELD                A 710430 NA  22 1.08E-1
           CONCRETE BIO SHIELD                A 710430 AR  39 1.72E-3
           CONCRETE BIO SHIELD                A 710430 CA  45 9.46E-3
           CONCRETE BIO SHIELD                A 710430 MN  54 1.29E-3
           CONCRETE BIO SHIELD                A 710430 FE  55 8.47E-1
           CONCRETE BIO SHIELD                A 710430 CO  60 2.066
           CONCRETE BIO SHIELD                A 710430 EU 152 2.120
           CS CAN I                           A 710430 C   14 7.03E-8
           CS CAN I                           A 710430 MN  54 1.68E-1
           CS CAN I                           A 710430 FE  55 3.88E 1
           CS CAN I                           A 710430 CO  60 1.0534
           CS CAN II                          A 710430 C   14 6.06E-8
           CS CAN II                          A 710430 MN  54 6.41E-2
           CS CAN II                          A 710430 FE  55 3.34E 1
           CS CAN II                          A 710430 CO  60 9.08E-1
           CS LOWER BAFFLES                   A 710430 C   14 2.73E-7
           CS LOWER BAFFLES                   A 710430 V   49 1.95E-1
           CS LOWER BAFFLES                   A 710430 MN  54 2.458
           CS LOWER BAFFLES                   A 710430 FE  55 4.19E 2
           CS LOWER BAFFLES                   A 710430 CO  57 1.73E-1
           CS LOWER BAFFLES                   A 710430 CO  60 3.39E 2
           CS LOWER BAFFLES                   A 710430 NI  63 2.76E 1
           CS THERMAL SHIELD                  A 710430 C   14 1.08E-6
           CS THERMAL SHIELD                  A 710430 V   49 1.2038
           CS THERMAL SHIELD                  A 710430 MN  54 1.52E 1
           CS THERMAL SHIELD                  A 710430 FE  55 1.32E 3
           CS THERMAL SHIELD                  A 710430 CO  57 1.0711
           CS THERMAL SHIELD                  A 710430 CO  60 1.34E 3
           CS THERMAL SHIELD                  A 710430 NI  63 1.09E 2
           CS UPPER BAFFLES                   A 710430 C   14 5.46E-7
           CS UPPER BAFFLES                   A 710430 V   49 1.78E-1
           CS UPPER BAFFLES                   A 710430 MN  54 2.2474
           CS UPPER BAFFLES                   A 710430 FE  55 8.16E 2
           CS UPPER BAFFLES                   A 710430 CO  57 1.59E-1
           CS UPPER BAFFLES                   A 710430 CO  60 6.76E 2
           CS UPPER BAFFLES                   A 710430 NI  63 5.52E 1
           CS VESSEL BASE                     A 710430 C   14 8.75E-8
           CS VESSEL BASE                     A 710430 MN  54 1.9876
           CS VESSEL BASE                     A 710430 FE  55 7.92E 2
           CS VESSEL BASE                     A 710430 CO  60 4.33E 1
           LEAD OUTER THERMAL SHIELD          A 710430 V   49 7.99E-5
           LEAD OUTER THERMAL SHIELD          A 710430 MN  54 1.19E-3
           LEAD OUTER THERMAL SHIELD          A 710430 FE  55 4.13E-1
           LEAD OUTER THERMAL SHIELD          A 710430 CO  57 6.05E-5
           LEAD OUTER THERMAL SHIELD          A 710430 CO  60 3.13E-1
           LEAD OUTER THERMAL SHIELD          A 710430 NI  63 2.0136
           LEAD OUTER THERMAL SHIELD          A 710430 AG 108 1.16E-8
```

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - RADIONUCLIDE INVENTORY H1136

SYS/COMP. NUMBER	SOURCE MATERIAL DESCRIPTION	A/C	MEASUR. DATE	RADIONUCLIDE NAME	CURIES	CURIES FT**3	DPM/ 100CM2
	LEAD OUTER THERMAL SHIELD	A	710430	CD 109	2.52E-9		
	LEAD OUTER THERMAL SHIELD	A	710430	AG 110	4.54E-2		
	LEAD OUTER THERMAL SHIELD	A	710430	CD 113	1.20E-9		
	LEAD OUTER THERMAL SHIELD	A	710430	SN 113	6.85E-7		
	LEAD OUTER THERMAL SHIELD	A	710430	SN 119	5.57E-6		
	LEAD OUTER THERMAL SHIELD	A	710430	SN 121	1.72E-6		
	LEAD OUTER THERMAL SHIELD	A	710430	SN 123	3.86E-9		
	LEAD OUTER THERMAL SHIELD	A	710430	SB 125	1.31E-4		
	LEAD BOTTOM PLUG	A	710430	H 3	4.19E-8		
	LEAD BOTTOM PLUG	A	710430	C 14	3.20E-5		
	LEAD BOTTOM PLUG	A	710430	AR 39	1.26E-7		
	LEAD BOTTOM PLUG	A	710430	CA 45	8.94E-5		
	LEAD BOTTOM PLUG	A	710430	V 49	9.3E-14		
	LEAD BOTTOM PLUG	A	710430	MN 54	3.32E-3		
	LEAD BOTTOM PLUG	A	710430	FE 55	6.30E-1		
	LEAD BOTTOM PLUG	A	710430	CO 57	7.0E-14		
	LEAD BOTTOM PLUG	A	710430	CO 60	5.54E-3		
	LEAD BOTTOM PLUG	A	710430	NI 63	1.7E-11		
	LEAD BOTTOM PLUG	A	710430	AG 108	9.6E-12		
	LEAD BOTTOM PLUG	A	710430	CD 109	2.9E-18		
	LEAD BOTTOM PLUG	A	710430	AG 110	3.8E-11		
	LEAD BOTTOM PLUG	A	710430	CD 113	1.4E-18		
	LEAD BOTTOM PLUG	A	710430	SN 113	5.7E-16		
	LEAD BOTTOM PLUG	A	710430	SN 119	4.8E-15		
	LEAD BOTTOM PLUG	A	710430	SN 121	1.4E-15		
	LEAD BOTTOM PLUG	A	710430	SN 123	4.0E-18		
	LEAD BOTTOM PLUG	A	710430	SB 125	1.1E-13		
	ZR SHROUD	A	710430	C 14	6.22E-7		
	ZR SHROUD	A	710430	V 49	9.87E-3		
	ZR SHROUD	A	710430	MN 54	5.12E-2		
	ZR SHROUD	A	710430	FE 55	8.5731		
	ZR SHROUD	A	710430	CO 57	7.81E-3		
	ZR SHROUD	A	710430	CO 60	2.28E 2		
	ZR SHROUD	A	710430	NI 63	1.2428		
	ZR SHROUD	A	710430	CD 109	8.97E-5		
	ZR SHROUD	A	710430	CD 113	4.29E-5		
	ZR SHROUD	A	710430	SN 113	1.17E-2		
	ZR SHROUD	A	710430	SN 119	1.02E-1		
	ZR SHROUD	A	710430	SN 121	2.93E-2		
	ZR SHROUD	A	710430	SN 123	8.29E-5		
	ZR SHROUD	A	710430	SB 125	2.23		
	304 SS CORE PLATE	A	710430	C 14	5.19E-7		
	304 SS CORE PLATE	A	710430	V 49	4.57E-1		
	304 SS CORE PLATE	A	710430	MN 54	6.7345		
	304 SS CORE PLATE	A	710430	FE 55	1.12E 3		
	304 SS CORE PLATE	A	710430	CO 57	3.46E-1		
	304 SS CORE PLATE	A	710430	CO 60	8.58E 2		
	304 SS CORE PLATE	A	710430	AG 108	5.51E 1		
	304 SS PRESSURE CLAD	A	710430	V 49	1.63E-2		
	304 SS PRESSURE CLAD	A	710430	MN 54	2.40E-1		
	304 SS PRESSURE CLAD	A	710430	FE 55	1.52E 2		

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - RADIONUCLIDE INVENTORY H1136

SYS/COMP. NUMBER	SOURCE MATERIAL DESCRIPTION	A/C	MEASUREMENT DATE	RADIONUCLIDE NAME	CURIES	CURIES/FT**3	DPM/100CM2
304 SS	PRESSURE CLAD	A	710430	CO 57	1.23E-2		
304 SS	PRESSURE CLAD	A	710430	CO 60	1.16E 2		
304 SS	PRESSURE CLAD	A	710430	NI 63	7.4913		
304 SS	SHROUD	A	710430	C 14	1.92E-7		
304 SS	SHROUD	A	710430	V 49	1.70E-1		
304 SS	SHROUD	A	710430	MN 54	2.4981		
304 SS	SHROUD	A	710430	FE 55	4.16E 2		
304 SS	SHROUD	A	710430	CO 57	1.28E-1		
304 SS	SHROUD	A	710430	CO 60	3.18E 2		
304 SS	SHROUD	A	710430	NI 63	8.7922		
304 SS	SHROUD PLATE	A	710430	C 14	8.28E-8		
304 SS	SHROUD PLATE	A	710430	V 49	7.29E-2		
304 SS	SHROUD PLATE	A	710430	MN 54	1.0748		
304 SS	SHROUD PLATE	A	710430	FE 55	1.79E 2		
304 SS	SHROUD PLATE	A	710430	CO 57	5.53E-2		
304 SS	SHROUD PLATE	A	710430	CO 60	1.37E 2		
304 SS	SHROUD PLATE	A	710430	NI 63	8.7922		
304 SS	SUPPRT BARREL	A	710430	C 14	2.50E-8		
304 SS	SUPPRT BARREL	A	710430	V 49	2.20E-2		
304 SS	SUPPRT BARREL	A	710430	MN 54	3.24E-1		
304 SS	SUPPRT BARREL	A	710430	FE 55	5.40E 1		
304 SS	SUPPRT BARREL	A	710430	CO 57	1.67E-2		
304 SS	SUPPRT BARREL	A	710430	CO 60	4.13E 1		
304 SS	SUPPRT BARREL	A	710430	NI 63	2.6531		
430 SS	INSULATION	A	710430	C 14	1.20E-9		
430 SS	INSULATION	A	710430	V 49	3.50E-4		
430 SS	INSULATION	A	710430	MN 54	6.87E-3		
430 SS	INSULATION	A	710430	FE 55	1.2182		
430 SS	INSULATION	A	710430	CO 57	8.61E-6		
430 SS	INSULATION	A	710430	CO 60	7.93E-1		
430 SS	INSULATION	A	710430	NI 63	1.46E-3		

.ERR1 UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE B1422

ACTIVITY SPEC NO	COST ITEM/ ACTIVITY	SYS/COMP NUMBER	C.A.T.	SCHED START DATE	SCHED COMPL DATE	ESTIM. MAN HOURS	ESTIMTD COST $	ESTIM. MAN REM	ACTUAL START DATE	ACTUAL COMPL DATE	ACTUL. MAN HOURS	ACTUAL COST $	ACTUL. MAN REM

COMMENT----DATA IN THIS REPORT WAS TAKEN FROM THE FINAL ELK RIVER REACTOR PROGRESS REPORT DATED NOVEMBER 1974. BLANK SPACES SHOWN IN THIS REPORT REPRESENT DNA [DATA NOT AVAILABLE]. DISCREPANCIES BETWEEN ESTIMATED AND ACTUAL COSTS CANNOT BE EXPLAINED FROM EXISTING DOCUMENTED INFORMATION.

ACTIVITY SPEC NO	COST ITEM/ ACTIVITY	SYS/COMP NUMBER	C.A.T.	SCHED START DATE	SCHED COMPL DATE	ESTIM. MAN HOURS	ESTIMTD COST $	ESTIM. MAN REM	ACTUAL START DATE	ACTUAL COMPL DATE	ACTUL. MAN HOURS	ACTUAL COST $	ACTUL. MAN REM
01	SITE AND FACILITY PREPARATION												
01.00	UPA INDIRECT LABOR						62660					62660	
01.00	UPA INDIRECT BURDEN						40420					40420	
01.00	UPA DIRECT LABOR						11827					11827	
01.00	UPA DIRECT BURDEN						7595					7595	
01.00	SECURITY FENCE						3180					3275	
01.00	GUARD STATION						2050					2586	
01.00	POLE SHED						3830					3653	
01.00	PAVING						6530					6525	
01.00	TEMP WORK BUILDING						63300					68908	
01.00	CHANGE ROOM, LAUNDRY						25000					14591	
01.00	LARGE ACCESS HATCH CONTAINMENT OPENING FLOOR HATCH, SHORING SHORING BASEMENT LEVEL FLOOR						41850					47670	
01.00	VIBRATION MONITOR EQUIPMENT						3000					3441	
01.00	PIONEER POWER LABOR PERSONNEL											998	
01.00	MATERIALS, TRAVEL, PERSONNEL RELOC.						28600					28600	
01.00	TRAVEL											2760	
01.00	REMODEL FLUIDYNE BLD						400					1272	
01.00	TEMP TRAILER RENT FOR GUARDS											480	
01.00	MISCELLANEOUS ITEMS											3188	
	OTHER INDIRECT [W.O.1300->W.O.1700]						117568					149923	
01.00	CONTINGENCY						20890						
	TOTAL FOR ACTIVITY SPEC 01						438700					460372	

NOTE: BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O. 1700 ARE LISTED BELOW. BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS. DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE EXPLAINED FROM AVAILABLE DOCUMENTATION.

ACTIVITY SPEC NO	COST ITEM/ ACTIVITY	SYS/COMP NUMBER	C.A.T.	SCHED START DATE	SCHED COMPL DATE	ESTIM. MAN HOURS	ESTIMTD COST $	ESTIM. MAN REM	ACTUAL START DATE	ACTUAL COMPL DATE	ACTUL. MAN HOURS	ACTUAL COST $	ACTUL. MAN REM
*01.00	HEALTH PHYSICS W.O.1300											47300	
*01.00	OPERATING AND MAINT. COSTS W.O.1400											34520	
*01.00	SECURITY COSTS											13485	

```
.ERR1       UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE        B1122
*           .                  .        .C.SCHED .SCHED .ESTIM.       .ESTIM.ACTUAL.ACTUAL.ACTUL.       .ACTUL.
*ACTIVITY.      COST ITEM/     .SYS/COMP.A.START .COMPL .MAN  .ESTIMTD.MAN  .START .COMPL .MAN  .ACTUAL .MAN  .
*SPEC NO .      ACTIVITY       . NUMBER .T.DATE  .DATE  .HOURS.COST $ .REM  . DATE  .DATE  .HOURS.COST $ .REM  .
*========.==================.========.=.======.======.=====.=======.=====.======.======.=====.=======.=====.
*           W.O.1500
*01.00      ENGINEERING &                                                                        36955
*          ADMINISTRATIVE
*          W.O.1600
*01.00      STORAGE &                                                                             5200
*          WAREHOUSING
*          W.O.1700
*                                                        TOTAL FOR W.O.1300-1700                137460
.
.
 02        REMOVAL OF PIPING                                                                                6
*          AND EQUIPMENT
.
 02.01     UPA LABOR & BURDEN
 02.01     UPA DIRECT LABOR                                33400                                  27993
 02.01     UPA DIRECT LABOR                                23112                                  19250
*          BURDEN
 02.02     SUBCONTRACTORS
 02.02     PIONEER POWER,INC.                              61550                                  56039
*          PERSONNEL)
 02.02     ENGINEERING CONSULT.                             4000
 02.02     HERBST&SONS CONSTR.                              4500                                   3464
*          CO.,INC.(RIGGING)
 02.03     OTHER COSTS
 02.03     POWER SAWS                                       1800                                   4514
 02.03     WELDING EQUIPMENT                                2000                                     31
 02.03     SCAFFOLDING                                      2600
 02.03     CUTTING TORCH GAS                                3000
*          ($200/MO)
 02.03     MISCELLANEOUS ITEMS                                                                     -404
 02.03     OTHER INDIRECT                                 107008                                 190849
*          (W.O.1300->1700)
 02.03     CONTINGENCY                                     60742
*            TOTAL FOR ACTIVITY SPEC 02                   303712                                 301736
.
.       NOTE: BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O.1700
.           ARE LISTED BELOW.  BREAKDOWN COSTS WERE TAKEN FROM WORKSHEETS.
.           DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE
.           EXPLAINED FROM AVAILABLE DOCUMENTATION.
.
*02.03     HEALTH PHYSICS                                                                        60235
*          W.O.1300
*02.03     OPERATING AND                                                                         43960
*          MAINT. COSTS
*          W. O. 1400
*02.03     SECURITY COSTS                                                                        17170
*          W. O. 1500
*02.03     ENGINEERING &                                                                         47055
*          ADMINISTRATION
*          W. O. 1600
*02.03     STORAGE AND                                                                            6620
```

```
.ERR1       UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE        B1122
*           .                    .         .C.SCHED .SCHED .ESTIM.        .ESTIM.ACTUAL.ACTUAL.ACTUL.        .ACTUL.
*ACTIVITY.      COST ITEM/       .SYS/COMP.A.START .COMPL .MAN  .ESTIMTD.MAN  .START .COMPL .MAN  .ACTUAL .MAN  .
*SPEC NO .      ACTIVITY         . NUMBER .T.DATE  .DATE  .HOURS.COST $ .REM  . DATE  .DATE  .HOURS.COST $ .REM  .
*========.====================.========.=.======.======.=====.=======.=====.======.======.=====.=======.=====.
*          WAREHOUSING
*          W. O. 1700
*                                                                TOTAL FOR W.O.1300-1700        175040
*
*
*

 03        REMOVAL OF SUPERHEAT
*          ER AND SUPERHEATER
*          BUILDING
*
 03.01     UPA LABOR&BURDEN
 03.01     UPA DIRECT LABOR                                        10933                          8490
 03.01     UPA DIRECT BURDEN                                        6555                          4953
 03.02     SUBCONTRACTORS
 03.02     STRACT CONST.                                                                          1000
*          (SUPERHEATER WALL
*          REPAIR)
 03.02     STRACT CONST.                                                                          4700
*          (SUPERHEATER ROOF
*          REPAIR)
 03.02     PIONEER POWER INC.                                       1400                          1500
*          (PERSONNEL)
 03.02     REMOVE BUILDING                                         24000
 03.02     HERBST&SONS(REMOVE                                      24700                         24700
*          SUPERHEATER)
 03.02     FOUNDATION PREP                                         15000
 03.03     OTHER COSTS
 03.03     TOOLS                                                    2000
 03.03     MISCELLANEOUS ITEMS                                                                    -268
 03.03     OTHER INDIRECT(W.O.                                     26325                         43771
*          1300->1700
 03.03     CONTINGENCY                                              5546
*            TOTAL FOR ACTIVITY SPEC 03                          116459                         88846
.
. NOTE: BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O. 1700
.       ARE LISTED BELOW.  BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS.
.       DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE
.       EXPLAINED FROM AVAILABLE DOCUMENTATION.
.
*03.03     HEALTH PHYSICS                                                                        13840
*          W.O.1300
*03.03     OPERATING AND                                                                         10080
*          MAINT. COSTS
*          W.O.1400
*03.03     SECURITY COSTS                                                                         3935
*          W.O.1500
*03.03     ENGINEERING AND                                                                       10790
*          ADMINISTRATION
*          W.O.1600
*03.03     STORAGE AND                                                                            1520
```

```
.ERR1       UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE        B1122
*           .                  .        .C.SCHED .SCHED .ESTIM.        .ESTIM.ACTUAL.ACTUAL.ACTUL.        .ACTUL.
*ACTIVITY.      COST ITEM/     .SYS/COMP.A.START .COMPL .MAN   .ESTIMTD.MAN   .START .COMPL .MAN   .ACTUAL .MAN   .
*SPEC NO .      ACTIVITY       . NUMBER .T.DATE  .DATE  .HOURS.COST $ .REM   . DATE  .DATE  .HOURS.COST $ .REM   .
*=========.====================.========.=.======.======.=====.=======.=====.======.======.=====.=======.=====.
*           WAREHOUSING
*           W.O.1700
*                                                                    TOTAL WO 1300-1700 ->     40135


 04         REMOVAL OF PASSAGE-
*           WAY AND EQUIPMENT
*
 04.01      UPA LABOR,BURDEN
 04.01      UPA DIRECT LABOR                                  6970                                64
 04.01      UPA DIRECT BURDEN                                 4930                                42
 04.02      SUBCONTRACTORS
 04.02      PIONEER POWER INC.                                                                  4268
*           (PERSONNEL)
 04.02      HERBST&SONS(REMOVAL                              40000                             36350
*           OF BLDG.FOUNDATION
*           PREP.&EQUIP.
 04.02      REPAIR PASSEGEWAY                                                                   5250
*           TUNNEL
 04.03      OTHER COSTS
 04.03      MISCELLANEOUS ITEMS                                                                   47
 04.03      OTHER INDIRECT(W.O.                              18117                             47626
*           1300-1700)
            CONTINGENCY                                      17505                             22970
*             TOTAL FOR ACTIVITY SPEC 04                     87522                             68991
.
.  NOTE:    BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O. 1700 ARE
.           LISTED BELOW.  BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS.
.           DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE
.           EXPLAINED FROM AVAILABLE DOCUMENTATION.
.
*04.03      HEALTH PHYSICS                                                                      7345
*           W.O.1300
*04.03      OPERATING AND                                                                       5360
*           MAINT. COSTS
*           W.O.1400
*04.03      SECURITY COSTS                                                                      2095
*           W.O.1500
*04.03      ENGINEERING &                                                                       5740
*           ADMINISTRATIVE
*           W.O.1600
*04.03      STORAGE AND                                                                          805
*           WAREHOUSING
*           W.O.1700
*                                                          TOTAL FOR W.O. 1300-1700          21345
*
*
*
 05         REMOVAL OF VESSEL                                                                                  12
*           INTERNALS
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.ERR1 UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE B1122

*ACTIVITY. *SPEC NO .	COST ITEM/ ACTIVITY	.SYS/COMP. NUMBER	.C.A.T.	.SCHED START DATE	.SCHED COMPL DATE	.ESTIM. MAN HOURS.	.ESTIMTD. COST $	.ESTIM. MAN .REM	.ACTUAL START . DATE	.ACTUAL COMPL .DATE	.ACTUL. MAN .HOURS.	.ACTUL. ACTUAL COST $	.ACTUL. MAN .REM .
05.01	UPA LABOR & BURDEN												
05.01	UPA DIRECT LABOR						31520					13199	
05.01	UPA BURDEN ON						21074					8420	
*	DIRECT LABOR												
05.02	SUBCONTRACTORS												
05.02	METCON, INC.											3217	
05.02	HERBST & SONS											14094	
*	CONSTRUCTION CO.												
05.02	ORNL (TOOLING,DESIGN						311000					307482	
*	& DEVEL.)												
05.02	PIONEER POWER, INC.						10600					47066	
*	(PERSONNEL)												
05.02	ENGINEERING CONSLT.						10000						
05.03	OTHER COSTS												
05.03	RADIOACTIVE MATRL						6000						
*	CONTROL (MTL&EQUIP)												
05.03	GAS & POWER						4000					11196	
05.03	MOCK-UP AT ERR						6000						
05.03	TRAVEL (PRIMARILY											11073	
*	OPERATING TRAINING												
*	AT ORNL)												
05.05	MISCELLANEOUS ITEMS											9637	
05.05	OTHER INDIRECT COST						425446					28856	
*	(W.O. 1300-1700)												
05.05	CONTINGENCY						123847						
*	TOTAL FOR ACTIVITY SPEC 05						949487					785110	
.													
. NOTE:	BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O. 1700 ARE												
.	LISTED BELOW. BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS.												
.	DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE												
.	EXPLAINED FROM AVAILABLE DOCUMENTATION.												
.													
*05.05	HEALTH PHYSICS											11386	
*	W.O.1300												
*05.05	OPERATING AND											83090	
*	MAINT. COSTS												
*	W.O.1400												
*05.05	SECURITY COSTS											32455	
*	W.O.1500												
*05.05	ENGINEERING &											88945	
*	ADMINISTRATIVE												
*	W.O.1600												
*05.05	STORAGE AND											12515	
*	WAREHOUSING												
*	W.O.1700												
*								TOTAL FOR W.O. 1300-1700				330870	
06	REMOVAL & DISPOSAL												45

.ERR1 UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE B1122

*ACTIVITY. SPEC NO .	COST ITEM/ ACTIVITY	SYS/COMP. NUMBER	A. T.	C.SCHED START DATE	SCHED COMPL DATE	ESTIM. MAN HOURS	ESTIMTD. COST $	ESTIM. MAN REM	ACTUAL START DATE	ACTUAL COMPL DATE	ACTUL. MAN HOURS	ACTUAL COST $	ACTUL. MAN REM
*	OF PRESSURE VESSEL												
06.01	UPA LABOR&BURDEN												
06.01	UPA DIRECT LABOR						29975					6269	
06.01	UPA BURDEN ON						19746					3861	
*	DIRECT LABOR												
06.02	SUBCONTRACTORS												
06.02	ORNL(TOOLING,DESIGN						400000					489782	
*	& DEVEL.)												
06.02	PIONEER POWER INC						50000					70204	
*	(PERSONNEL)												
06.02	ENGINEERING CONSLT.						10000						
06.02	HERBST&SONS CONST.											21451	
*	CO.,INC.												
06.02	METCON INC.											4314	
06.03	OTHER COSTS												
06.03	RADIOACTIVE MATER-						1000						
*	IALS CONTROL												
*	(MATL & EQUIP)												
06.03	GAS & POWER						4000					10684	
06.03	MOCK UP AT ERR						3000						
06.03	VESSEL CLOSURE						1000						
*	PLATES												
06.03	TRAVEL											7244	
06.03	MISCELLANEOUS ITEMS											13929	
06.03	OTHER INDIRECT COST						120881					429599	
*	(WO 1300-1700)												
06.03	CONTINGENCY						159900						
*	TOTAL FOR ACTIVITY SPEC 06						799502					1057337	

. NOTE: BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O. 1700 ARE LISTED BELOW. BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS. DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE EXPLAINED FROM AVAILABLE DOCUMENTATION.

*06.03	HEALTH PHYSICS											135900	
*	W.O.1300												
*06.03	OPERATING AND											99175	
*	MAINT. COSTS												
*	W.O.1400												
*06.03	SECURITY COSTS											38735	
*	W.O.1500												
*06.03	ENGINEERING &											106160	
*	ADMINISTRATIVE												
*	W.O.1600												
*06.03	STORAGE AND											14940	
*	WAREHOUSING												
*	W.O.1700												
*								TOTAL FOR W.O. 1300-1700				394910	

.ERR1 UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE B1122

*ACTIVITY. SPEC NO .	COST ITEM/ ACTIVITY	.SYS/COMP. NUMBER	.C.SCHED .A.START .T.DATE	.SCHED .COMPL .DATE	.ESTIM. .MAN .HOURS	.ESTIMTD. .COST $	.ESTIM.MAN .REM	.ACTUAL .START . DATE	.ACTUAL .COMPL .DATE	.ACTUL. .MAN .HOURS	.ACTUAL .COST $	.ACTUL. .MAN .REM
07	REMOVAL & DISPOSAL OF BIOLOGICAL SHIELD											12
07.01	UPA LABOR & BURDEN											
07.01	UPA LABOR & BURDEN											
07.01	UPA DIRECT LABOR					14850					6018	
07.01	UPA BURDEN ON DIRECT LABOR					9652					3583	
07.02	SUBCONTRACTORS											
07.02	AIR POWER EQUIP.CORP (RESTOCK CHANGE ON INGERSOLL HYDRABOOM)										5500	
07.02	TRADE TOOLS(1 DARDA SPLITTER)										3037	
07.02	TRADE TOOLS(STEEL DRILLS)										39	
07.02	EQUIP. NOT RECOVER-ABLE (SPECIALTY DEMOLITION)										3196	
07.02	CONCRETE SAMPLING (SPECIALTY DEMO)										3972	
07.02	CONCRETE REMOVAL (CONTAMINATED CONCRETE ONLY)					37500						
07.02	PIONEER POWER INC (PERSONNEL)										77496	
07.02	INSTRUMENT TUBE REMOVAL(SPECIALTY DEMOLITION)					20000					69000	
07.02	ENGINEERING CONSLT. (ATA)					5000					38382	
07.02	HERBST&SONS										498693	
07.02	MINNEAPOLIS EQUIP.										5417	
07.02	HAYDEN-MURPHY EQUIP.										3511	
07.03	OTHER COSTS											
07.03	SPECIAL TOOLING					4000						
07.03	LOADING BASKET					1000						
07.03	SHIELDING WORK PLATFORM					8000						
07.03	TRAVEL										5448	
07.03	OTHER MATRL.COST IN CONNECTION WITH CORE DRILLING										871	
07.03	MISCELLANEOUS ITEMS										24140	
07.03	OTHER INDIRECT COST (WO 1300-1700)					132903					474404	
07.03	CONTINGENCY					116452						
	TOTAL FOR ACTIVITY SPEC 07					349357					1222707	

. NOTE: BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O. 1700 ARE
. LISTED BELOW. BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS.

.ERR1 UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE 81122

*ACTIVITY SPEC NO	COST ITEM/ ACTIVITY	SYS/COMP NUMBER	A,T	SCHED START DATE	SCHED COMPL DATE	ESTIM. MAN HOURS	ESTIMTD COST $	ESTIM. MAN REM	ACTUAL START DATE	ACTUAL COMPL DATE	ACTUL. MAN HOURS	ACTUAL COST $	ACTUL. MAN REM
.	DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE EXPLAINED FROM AVAILABLE DOCUMENTATION.												
*07.03	HEALTH PHYSICS											148860	
*	W.O.1300												
*07.03	OPERATING AND											109360	
*	MAINT. COSTS												
*	W.O.1400												
*07.03	SECURITY COSTS											42715	
*	W.O.1500												
*07.03	ENGINEERING &											117065	
*	ADMINISTRATIVE												
*	W.O.1600												
*07.03	STORAGE AND											16475	
*	WAREHOUSING												
*	W.O.1700												
*							TOTAL FOR W.O. 1300-1700					435475	
08	REMOVAL OF REACTOR												
*	BUILDING&STRUCTURES												
08.01	UPA LABOR AND BURDEN												
08.01	UPA DIRECT LABOR						21303					1722	
08.01	UPA BURDEN ON DIRECT						13833					1095	
*	LABOR												
08.02	SUBCONTRACTORS												
08.02	PIONEER POWER INC											8045	
*	(PERSONNEL)												
08.02	HERBST&SONS(REMOVAL						685800					337709	
*	OF CONCRETE&STEEL												
*	LINER)												
08.02	ENGINEERING CONSLT.						5000					5912	
*	(ATA)												
08.02	SPECIALTY DEMOLITION											3972	
*	(CONCRETE SAMPLES)												
08.02	HAYDEN-MURPHY EQUIP.											3389	
08.02	SAM BLOOM IRON&METAL											-25000	
*	(SALE OF STEEL LINER												
08.03	OTHER COSTS												
08.03	MISCELLANEOUS ITEMS											89	
08.03	OTHER INDERECT COST						79194					61922	
*	(WO 1300-1700)												
08.03	CONTINGENCY						201282						
*	TOTAL FOR ACTIVITY SPEC 08						1006412					398855	

. NOTE: BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O. 1700 ARE LISTED BELOW. BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS. DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE EXPLAINED FROM AVAILABLE DOCUMENTATION.

.ERR1 UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE B1122

*ACTIVITY. SPEC NO	COST ITEM/ ACTIVITY	SYS/COMP. NUMBER	C.SCHED A.START T.DATE	SCHED COMPL DATE	ESTIM. MAN HOURS	ESTIMTD. COST $	ESTIM. MAN REM	ACTUAL START DATE	ACTUAL COMPL DATE	ACTUL. MAN HOURS	ACTUAL COST $	ACTUL. MAN REM
*08.03	HEALTH PHYSICS										19540	
*	W.O.1300											
*08.03	OPERATING AND										14260	
*	MAINT. COSTS											
*	W.O.1400											
*08.03	SECURITY COSTS										5570	
*	W.O.1500											
*08.03	ENGINEERING AND										15265	
*	ADMINISTRATIVE											
*	W.O.1600											
*08.03	STORAGE AND										2150	
*	WAREHOUSING											
*	W.O.1700											
*							TOTAL FOR W.O. 1300-1700				56785	
09	REMOVAL OF MISC.											
*	EQUIPMENT											
09.01	UPA LABOR & BURDEN											
09.01	UPA DIRECT LABOR					4000					12	
09.01	UPA BURDEN ON					2600					7	
*	DIRECT LABOR											
09.03	OTHER COSTS											
09.03	OTHER INDIRECT COST					11902						
09.03	CONTINGENCY					4626						
*	TOTAL FOR ACTIVITY SPEC 09					23128					19	
10	MATERIAL DISPOSAL											
10.01	UPA LABOR & BURDEN											
10.01	UPA DIRECT LABOR					50534					9751	
10.01	UPA BURDEN ON DIRECT					31685					6552	
*	LABOR											
10.02	SUBCONTRACTORS											
10.02	PIONEER POWER INC										50965	
*	(PERSONNEL)											
10.02	ENGINEERING CONSLT.					2000						
10.03	OTHER COSTS											
10.03	PLYWOOD BOXES					6750					6800	
10.03	SPECIAL PLYWOOD					250					30660	
*	BOXES											
10.03	STEEL DRUMS					10880					8123	
10.03	FIBER DRUMS					2450						
10.03	ANL BINS					5250					8440	
10.03	TRAVEL										6361	
10.03	MISCELLANEOUS ITEMS										22771	

.ERR1 UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE 81122

*ACTIVITY. SPEC NO .	COST ITEM/ ACTIVITY	.SYS/COMP. NUMBER	.C.T.	.SCHED .START DATE	.SCHED .COMPL DATE	.ESTIM. .MAN .HOURS	.ESTIMTD. COST $	.ESTIM. .MAN .REM	.ACTUAL .START DATE	.ACTUAL .COMPL DATE	.ACTUL. .MAN .HOURS	.ACTUL. .ACTUAL COST $	.ACTUL. .MAN .REM
10.03	CASK RENTAL&LINERS						74000					270415	
10.03	TRANS TO BURIALSITE						56700					178857	
10.03	SPECIAL CASK&LINERS						33000						
10.03	BURIAL COSTS						45700					134230	
10.03	NON-CONTAMINATED						13000					51	
*	MATERIAL												
10.03	BANDING MACHINE						600					789	
10.03	OTHER INDIRECT COST						394856					509289	
*	(WO 1300-1700)												
10.03	CONTINGENCY						181914						
*	TOTAL FOR ACTIVITY SPEC 10						909569					1244054	
.													
.	NOTE: BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU 1700												
.	ARE LISTED BELOW. BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS.												
.	DISCREPANCIES BETWEEN BREAKDOWN COSTS AND TOTALS CANNOT BE												
.	EXPLAINED FROM AVAILABLE DOCUMENTATION.												
.													
*10.03	HEALTH PHYSICS											160730	
*	W.O.1300												
*10.03	OPERATING AND											117290	
*	MAINT. COSTS												
*	W.O.1400												
*10.03	SECURITY COSTS											45815	
*	W.O.1500												
*10.03	ENGINEERING &											125555	
*	ADMINISTRATIVE												
*	W.O.1600												
*10.03	STORAGE AND											17670	
*	WAREHOUSING												
*	W.O.1700												
*							TOTAL FOR W.O. 1300-1700 -->					467060	
11	FACILITY CLOSEOUT												
11.01	UPA LABOR & BURDEN												
11.01	UPA DIRECT LABOR						10054					173	
11.01	UPA BURDEN ON DIRECT						6529					109	
*	LABOR												
11.02	SUBCONTRACTORS												
11.02	SPECIALTY DEMOLITION											7955	
*	(SAMPLING)												
11.02	PIONEER POWER INC											1816	
*	(PERSONNEL)												
11.02	FIX STEAM PLANT WALL						2600						
11.02	FILL TO GRADE						15000					3000	
11.02	REMOVE TEMP BLDG						5000						
*	& STRUCTURES												
11.02	ENGINEERING CONSLT.						3000						
*	(FINAL REPORT)												
11.03	OTHER COSTS												

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.ERR1       UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE        B1122
*          .                  .          .C.SCHED .SCHED .ESTIM.          .ESTIM.ACTUAL.ACTUAL.ACTUL.          .ACTUL.
*ACTIVITY. .      COST ITEM/  .SYS/COMP.A.START .COMPL .MAN  .ESTIMTD.MAN  .START .COMPL .MAN  .ACTUAL .MAN  .
*SPEC NO . .      ACTIVITY    . NUMBER .T.DATE  .DATE  .HOURS.COST $ .REM  . DATE .DATE  .HOURS.COST $ .REM  .
*========.====================.========.=.======.======.=====.=======.=====.=====.======.=====.=======.=====.
 11.03     TRAVEL                                                                                  1010
 11.03     MISCELLANEOUS                                                                           10422
 11.03     OTHER INDIRECT COST                                      49545                          85263
*          (WO 1300-1700)
 11.03     CONTINGENCY                                              22932
*            TOTAL FOR ACTIVITY SPEC 11                             114660                         109748
.
.  NOTE:   BREAKDOWN OF ACTUAL COSTS FOR W.O. 1300 THRU W.O. 1700 ARE
.          LISTED BELOW.  BREAKDOWN COSTS WERE TAKEN FROM WORK SHEETS.
.          DISCREPANCIES BETWEEN COSTS AND TOTALS CANNOT BE EXPLAINED
.          FROM AVAILABLE DOCUMENTATION.
.
*11.03     HEALTH PHYSICS                                                                          26885
*          W.O.1300
*11.03     OPERATING AND                                                                           19620
*          MAINT. COSTS
*          W.O.1400
*11.03     SECURITY COSTS                                                                          7665
*          W.O.1500
*11.03     ENGINEERING &                                                                           21000
*          ADMINISTRATIVE
*          W.O.1600
*11.03     STORAGE AND                                                                             2955
*          WAREHOUSING
*          W.O.1700
*                                                  TOTAL FOR WO 1300 - 1700 -->                   78125
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.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - DOSE RATE G1114

MAP REFERENCE	BUILDING	ELEV FEET	MAP COORD.	SYS/COMP NUMBER	TYP.	MR/HR LOWER	MR/HR UPPER	DPM/100CM2 LOWER	DPM/100CM2 UPPER	MEASUREMENT DATE	COMMENT
.NOTE: ALL BALNK ENTRIES INDICATE THAT DATA WAS NOT AVAILABLE(DNA)											
					CON		33500			710602	OUTSIDE PRESSURE VESSEL
					CON		828000			710602	INSIDE INNER TH. SHIELD
					CON	6.0E 6	DNA			710602	CORE & SHROUD PLATES
					CON		2.4E 6			710602	UPPER BAFFLE PLATE (OR SHADOW SHIELD)
					CON		3150			710602	CORE SAMPLE BIOLOGICAL SHIELD
					CON		650			710602	CORE SAMPLE BIOLOGICAL SHIELD
					CON	350	500			710602	PRIMARY WATER SYSTEM PIPING
					CON		800			710602	PURIFICATION SYSTEM PIPING
					CON		220			710602	PURIFICATION SYSTEM PIPING
					CON		135			710602	PURIFICATION SYSTEM PIPING
					CON		200			710602	DECAY HEAT REMOVAL SYSTEM
					CON		150			710602	DECAY HEAT REMOVAL SYSTEM
					CON		1500			710602	FUEL ELEMENT STORAGE WELL COOLING SYSTEM
					CON		350			710602	FUEL ELEMENT STORAGE WELL COOLING SYSTEM
					CON		20000			710602	LIQUID WASTE SYSTEM
					CON		170			710602	LIQUID WASTE SYSTEM
					CON		230			710602	REACTOR WATER COLUMN SYSTEM
					CON		120			710602	REACTOR SUB BASEMENT FLOOR AREA
					CON	25	400			710602	REACTOR MAIN FLOOR LEVEL

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - PROJECT LABOR F1132

*ACTIVITY.	.		.MAN.LABOR	.MAN-.
*SPEC NO .	DATE .	LABOR CATEGORY	.WKS.COST $.	REM .
*========.	======.	==========.	===.======.	====.==========

.NOTE: ALL BLANK FNTRIES INDICATE THAT DATA WAS NOT AVAILABLE(DNA)

.

	71	ADMINISTRATIVE STAFF	188
	72	ADMINISTRATIVE STAFF	413
	73	ADMINISTRATIVE STAFF	336
	74	ADMINISTRATIVE STAFF	176
	71	HEALTH & SAFETY PERSONNEL	298
	72	HEALTH & SAFETY PERSONNEL	613
	73	HEALTH & SAFETY PERSONNEL	528
	74	HEALTH & SAFETY PERSONNEL	202
	71	CLERICAL & SERVICES	138
	72	CLERICAL & SERVICES	366
	73	CLERICAL & SERVICES	303
	74	CLERICAL & SERVICES	129
	71	INSTRUMENT TECHNICIANS	14
	72	INSTRUMENT TECHNICIANS	52
	73	INSTRUMENT TECHNICIANS	26
	74	INSTRUMENT TECHNICIANS	
	71	ELECTRICIANS	15
	72	ELECTRICIANS	52
	73	ELECTRICIANS	29
	74	ELECTRICIANS	
	71	REACTOR OPERATORS	56
	72	REACTOR OPERATORS	104
	73	REACTOR OPERATORS	73
	74	REACTOR OPERATORS	35
	71	DECONTAMINATION TECHS	42
	72	DECONTAMINATION TECHS	119
	73	DECONTAMINATION TECHS	111
	74	DECONTAMINATION TECHS	16
	71	SECURITY GUARDS	223
	72	SECURITY GUARDS	520
	73	SECURITY GUARDS	163
	74	SECURITY GUARDS	32

*

* NOTE--- DATA ON MAN-REM BY LABOR CATEGORY IS NOT AVAILABLE.
* MONTHLY ACCUMULATION OF PERSONNEL EXPOSURE IS RECORDED BELOW.

*	7201	1.7
	7202	2.2
	7203	1
	7204	1.1
	7205	.3
	7206	1.3
	7207	2.2
	7208	2.7
	7209	2.2
	7210	3.5
	7211	2.7
	7301	6.5
	7302	6.8
	7303	5.1
	7304	5

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - PROJECT LABOR F1132

*ACTIVITY. SPEC NO	DATE	LABOR CATEGORY	MAN.WKS	LABOR COST $	MAN-REM
	7305				3
	7306				13.8
	7307				5.2
	7308				.2
	7309				.4
	7310				.3
	7311				1
	7312				6.8

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - ALARA REPORT E1110

.NOTE: ALL BLANK ENTRIES INDICATE THAT DATA WAS NOT AVAILABLE[DNA]

ACTIVITY SPEC NO	SYS/COMP. NUMBER	DATE	ALARA COST ITEM	ALARA COST $	MAN-REM SAVED	INITIAL MR/HR	FINAL MR/HR	DOS. RED. FCT.	ALARA EFFORT DESCRIPTION
06			BOLT SHEARING TOOL						REMOTE SEPARATION OF UPPER AND LOWER SHROUD BY SHEARING 60 BOLTS.
06			NIBBLER						REMOTE SEGMENTATION OF SHROUDS INTO SHIPPABLE PIECES.
06			LIFTING FIXTURES						PERMITTED REMOTE TRANSFER OF VESSEL COMPONENTS TO FUEL STORAGE BASIN.
06			IMPACT WRENCHES						SPECIAL LONG HANDLED WRENCHES USED TO REMOVE HOLD-DOWN BOLTS ON CORE SUPPORT PLATES.
06			PLASMA TORCH						CUTTING OF INNER THERMAL SHIELD INTO SHIPPABLE PIECES.
06			SEGMENT SUPPORT TOOLS						SUPPORTED SEGMENTS DURING AND AFTER CUTTING OPERATIONS.
06			EXPLOSIVES						REMOVAL OF BIOLOGICAL SHIELD.
06			BLASTING MATS						CONTROLLED RADIOACTIVE DEBRIS DURING BLASTING OPERATIONS.
06			FOG SPRAY						CONTROLLED RADIOACTIVE DEBRIS DURING BLASTING OPERATIONS.

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - SHIPMENT REPORT C1124

SHIP DATE	SHIP NUM	TRIP LEN$ MILES	MR/HR CONTCT	MR/HR 6 FEET	MR/HR CAB	RADIONUCLIDE NAME	ACTIVITY AMOUNT	WASTE SPEC NO	WASTE DESCRPTION	T.Y.P.	PHYS FORM	CHEMICAL FORM	DOT SHIP CLASS	WASTE CUBIC FEET	WASTE POUNDS
.NOTE: ALL BLANK ENTRIES INDICATE DATA THAT WAS NOT AVAILABLE(DNA)															
710831									A/C MATRL					1000	50000
710930									A/C MATRL					3000	70000
711031									A/C MATRL					1000	30000
711130									A/C MATRL					3000	180000
711231									A/C MATRL					1000	40000
720131									A/C MATRL					1000	50000
720430									A/C MATRL					2500	80000
720630									A/C MATRL					1000	20000
720731									A/C MATRL					500	30000
720831									A/C MATRL					1500	190000
720930									A/C MATRL					500	20000
721031									A/C MATRL					500	70000
721231									A/C MATRL					1500	80000
730131									A/C MATRL					2000	110000
730228									A/C MATRL					500	30000
730331									A/C MATRL					2000	60000
730430									A/C MATRL					1500	60000
730531									A/C MATRL					1000	110000
730630									A/C MATRL					3000	70000
730731									A/C MATRL					2500	350000
730831									A/C MATRL					500	10000
730930									A/C MATRL					1000	20000
731031									A/C MATRL					2000	40000
731130									A/C MATRL					2000	120000
731231									A/C MATRL					1500	20000
740131									A/C MATRL					1000	100000
740430									A/C MATRL					2500	100000
740531									A/C MATRL					2500	160000
740731									A/C MATRL					3000	80000
730731									A/C CONC.					540	
730831									A/C CONC.					810	
731031									A/C CONC.					6750	
731130									A/C CONC.					4860	
731231									A/C CONC.					4050	
740131									A/C CONC.					4590	
740228									A/C CONC.					5940	
740331									A/C CONC.					10260	
740430									A/C CONC.					6750	
. NOTE---ALL WASTE PRESENTED BELOW WAS NONCONTAMINATED----------															
*710831									CONCRETE					300	
*711031									CONCRETE					4000	
*711131									CONCRETE					300	
*720131									CONCRETE					300	
*740531									CONCRETE					600	
*740631									CONCRETE					62000	
*740731									CONCRETE					16200	
*710930									SCRAPMETAL						4000
*711031									SCRAPMETAL						300000
*711130									SCRAPMETAL						20000
*730630									SCRAPMETAL						20000

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - SHIPMENT REPORT C1124

SHIP DATE	SHIP NUM	TRIP LEN$ MILES	MR/HR CONTCT	MR/HR 6 FEET	MR/HR CAB	RADIONUCLIDE NAME	RADIONUCLIDE AMOUNT	ACTIVITY SPEC NO	WASTE DESCRPTION	T.Y.P.	PHYS FORM	CHEMICAL FORM	DOT SHIP CLASS	WASTE CUBIC FEET	WASTE POUNDS
*740630									SCRAPMETAL						520000
*740731									SCRAPMETAL						298000

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - DISPOSAL COSTS D1126

SHIP DATE	SHIP NUM	DISP SITE	BURIAL CHARGES $ BASIC	CURIE	SP/HND	OTHER	TOTAL	SHIPPING COMPANY	TRANSPORTATION CHARGES $ BASIC	PERMIT	OTHER	TOTAL	CONTAINER TYPE	NO CONT	CONT COST	CONT RENT
.NOTE: AVAILABLE DOCUMENTS DO NOT PERMIT COORDINATION OF INDIVIDUAL SHIPMENTS AND CHARGES. THE TOTAL NUMBER OF SHIPMENTS IS UNKNOWN. ALL BLANK ENTRIES INDICATE THAT THE DATA WAS NOT AVAILABLE(DNA)																
710930		SHEFF					$55									
710930		SHEFF					861									
711031		SHEFF					1131									
711031		SHEFF					1297									
711031		SHEFF					995									
711231		SHEFF					1158									
711231		SHEFF					763									
711231		SHEFF					452									
711231		SHEFF					900									
711231		SHEFF					479									
711231		SHEFF					1011									
720131		SHEFF					1395									
720430		SHEFF					1986									
720731		SHEFF					930									
720831		SHEFF					870									
720831		SHEFF					1008									
720930		RICH					3047									
720930		SHEFF					100									
720930		SHEFF					2400									
720930		SHEFF					2400									
720930		SHEFF					825									
721130		SHEFF					155									
721130		SHEFF					1550									
721130		SHEFF					1750									
730131		SHEFF					1057									
730131		SHEFF					1010									
730131		SHEFF					113									
730228		SHEFF					897									
730228		SHEFF					312									
730228		SHEFF					533									
730331		SHEFF					887									
730331		SHEFF					200									
730431		SHEFF					976									
730431		RICH					1089									
730531		SHEFF					934									
730531		SHEFF					1039									
730630		SHEFF					978									
730630		SHEFF					964									
730630		SHEFF					1194									
730731		SHEFF					884									
730831		SHEFF					920									
730831		SHEFF					509									
730831		SHEFF					480									
730831		SHEFF					731									
730831		SHEFF					336									
730831		SHEFF					233									
730831		SHEFF					1344									

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - DISPOSAL COSTS D1126

SHIP DATE	SHIP NUM	DISP SITE	BURIAL CHARGES $ BASIC	CURIE	SP/HND.	OTHER	TOTAL	SHIPPING COMPANY	TRANSPORTATION CHARGES $ BASIC	PERMIT.	OTHER	TOTAL	CONTAINER TYPE	NO CONT.	CONT COST	CONT RENT
730831		SHEFF					933									
730831		SHEFF					952									
730930		SHEFF					480									
731031		SHEFF					1008									
731130		SHEFF					840									
731130		SHEFF					2448									
731130		SHEFF					1306									
731130		SHEFF					1673									
731130		SHEFF					1563									
731130		SHEFF					1682									
731130		SHEFF					925									
731130		SHEFF					854									
731231		SHEFF					616									
731231		SHEFF					1939									
731231		SHEFF					1539									
731231		SHEFF					1416									
731231		SHEFF					1888									
731231		SHEFF					1416									
731231		SHEFF					2136									
731231		SHEFF					2248									
731231		SHEFF					1942									
710930								NUC ENG				550				
710930								NUC ENG				550				
711030								NUC ENG				550				
711030								NUC ENG				550				
711030								NUC ENG				550				
711031								BIG LAKE				63				
711130								BIG LAKE				245				
711231								NUC ENG				550				
711231								NUC ENG				1100				
711231								NUC ENG				550				
711231								NUC ENG				550				
711231								NUC ENG				550				
711231								BIG LAKE				18				
720131								NUC ENG				1100				
720228								BIG LAKE				18				
720430								NUC ENG				1100				
720731								NUC ENG				550				
720831								BURL NORTH				5741				
720831								TRI STATE				942				
720831								TRI STATE				942				
720831								TRI STATE				1299				
720831								TRI STATE				942				
720831								TRI STATE				942				
720831								TRI STATE				-690				
720831								NUC ENG				550				
720930								TRI STATE				1878				
720930								TRI STATE				1429				
720930								NUC ENG				550				
721031								TRI STATE				1299				
721031								TRI STATE				1933				

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - DISPOSAL COSTS D1126

SHIP DATE	SHIP NUM	DISP SITE	BURIAL CHARGES $ BASIC	CURIE	SP/HND	OTHER	TOTAL	TRANSPORTATION CHARGES $ SHIPPING COMPANY	BASIC	PERMIT	OTHER	TOTAL	CONTAINER TYPE	NO CONT	CONT COST	CONT RENT
721031								NUC ENG				60				
721130								NUC ENG				550				
721130								TRI STATE				849				
721130								TRI STATE				1927				
721231								TRI STATE				1878				
730131								NUC ENG				550				
730131								NUC ENG				550				
730131								BURL NORTH				2407				
730228								NUC ENG				550				
730228								NUC ENG				550				
730228								TRI STATE				988				
730228								TRI STATE				1249				
730228								TRI STATE				1249				
730228								TRI STATE				643				
730228								TRI STATE				849				
730228								TRI STATE				-942				
730331								TRI STATE				1299				
730331								NUC ENG				550				
730430								TRI STATE				992				
730430								TRI STATE				1299				
730430								TRI STATE				1413				
730430								NUC ENG				550				
730531								TRI STATE				1179				
730531								NUC ENG				550				
730531								NUC ENG				550				
730630								TRI STATE				1299				
730630								TRI STATE				1299				
730630								NUC ENG				550				
730630								NUC ENG				550				
730731								NUC ENG				550				
730831								EL MURPHY				821				
730831								EL MURPHY				790				
730831								EL MURPHY				814				
730831								NUC ENG				550				
730831								NUC ENG				550				
730831								NUC ENG				550				
730831								NUC ENG				550				
730831								NUC ENG				550				
730831								TRI STATE				1299				
730831								TRI STATE				1299				
730930								NUC ENG				550				
731031								NUC ENG				550				
731130								EL MURPHY				440				
731130								EL MURPHY				454				
731130								EL MURPHY				454				
731130								EL MURPHY				469				
731130								EL MURPHY				890				
731130								TRI STATE				645				
731130								TRI STATE				645				
731130								TRI STATE				400				
731130								NUC ENG				1300				

.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - DISPOSAL COSTS D1126

SHIP DATE	SHIP NUM	DISP SITE	BURIAL CHARGES $ BASIC	CURIE	SP/HND.	OTHER	TOTAL	TRANSPORTATION CHARGES $ SHIPPING COMPANY	BASIC.	PERMIT.	OTHER	TOTAL	CONTAINER TYPE	NO CONT.	CONT COST	CONT RENT
731130								NUC ENG				1300				
731130								NUC ENG				1300				
731130								NUC ENG				2200				
731130								NUC ENG				2200				
731130								NUC ENG				3300				
731130								NUC ENG				2200				
731130								NUC ENG				1300				
731231								EL MURPHY				479				
731231								NUC ENG				1300				
731231								NUC ENG				2600				
731231								NUC ENG				2600				
731231								NUC ENG				1950				
731231								NUC ENG				2600				
731231								NUC ENG				1950				
731231								NUC ENG				2600				
731231								NUC ENG				1950				
731231								NUC ENG				2600				
731231								NUC ENG				2600				
710930													55 GALLON DRUMS		1276	
710930													BARREL	239	1733	
711031													55 GALLON DRUMS	240	1740	
711031													PLYWOOD BOXES		5810	
711031													PACKING CRATE	1	119	
711231													PLYWOOD BOXES		990	
720131													M-3 BINS	30	4826	
720228													55 GALLON DRUMS	206	1524	
720531													LINERS		20652	
720731													LINERS		36519	
720930													LINERS		26783	
720930													BC-48-220			3300
720930													LL-50-50-100			3000
720930													STEEL LINERS	5	17900	
721031													LL-50-100			1300
721021													LINER & LID		4455	
721130													LL-50-100			2600
721231													LINERS		3895	
730228													LL-50-100			2400
730288													BOTTOM VES.HD.CONT		9860	
730288													LINERS	1	4780	
730288													55 GALLON DRUMS	250	1850	
730331													CASK		1430	
730430													LINERS		3065	
730630													DISPOSAL BINS	100	30265	
730630													CONCRETE LINERS	6	9300	
730731													LL-50-100		8100	
730831													SPECIAL PLYWOOD BOX	12	1137	
731031													M-3 BINS		30300	
731130													M-3 BINS		13950	
731130													SHIPPING CRATES	40	3774	
731231													M-3 BINS	50	14750	
731231													SHIPPING CRATES	30	2831	

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U S NUCLEAR REGULATORY COMMISSION

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NUREG/CR-2985

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Elk River Reactor

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7 AUTHOR(S)
R. L. Miller, J. A. Adams

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Technical

PERIOD COVERED (Inclusive dates)

15 SUPPLEMENTARY NOTES

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16. ABSTRACT (200 words or less)

This report summarizes information concerning the decommissioning of the Elk River Reactor. Decommissioning data from available documents were input into a computerized data-handling system in a manner that permits specific information to be readily retrieved. The information is in a form that assists the Nuclear Regulatory Commission in its assessment of decommissioning alternatives and ALARA methods for future decommissioning projects. Samples of computer reports are included in the report. Decommissioning of other reactors, including NRC reference decommissioning studies, will be described in similar reports.

17 KEY WORDS AND DOCUMENT ANALYSIS

17a DESCRIPTORS

Decommissioning, Reactors
Program Plan,
ALARA, Radiation Exposure
Costs, Comparison Studies

17b IDENTIFIERS/OPEN-ENDED TERMS

18 AVAILABILITY STATEMENT
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19 SECURITY CLASS (This report)
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21 NO OF PAGES

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