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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Prepared for
Division of Engineering Technology
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 tne 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.

```
.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:
.
```

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

SYSTEM/COMPONENT	.SYS/COMP. NUMBER	ENTRY TITLE
OVERWEIGHT PERMITS:		TO SHEFFIELD, ILL (410 MILES) $1.50 PER 100 POUNDS-FULL TRUCK LOAD $1.15 PER 100 POUNDS-TRUCK ON RAIL FLATCAR
ILLINOIS $35. INDIANA $55. KENTUCKY $20. MINNESOTA $10. WISCONSIN $ 5.		TO MOREHEAD, KY (835 MILES) $2.75 PER 100 POUNDS-FULL TRUCK LOAD 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 $(6,155,775)
.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		23.8	258,646 DOLLARS/MWE
* ELECTRICAL (MWE)		DNA	
LIFETIME MAGAWATT DAYS		53,000	116 DOLLARS/MWDT
* THERMAL (MWDT) (MWDT)			

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

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	53,000	707 MWDT/MAN-REM
* THERMAL (MWDT)		
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
           CONCRETE BIO SHIELD                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 I                           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 CAN II                          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 LOWER BAFFLES                   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 THERMAL SHIELD                  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 UPPER BAFFLES                   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
           CS VESSEL BASE                     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
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.ERR1 U.N.C. DECOMMISSIONING DATA SYSTEM - RADIONUCLIDE INVENTORY H1136

*SYS/COMP. NUMBER	SOURCE MATERIAL DESCRIPTION	A.MEASUR./.EMENT. C.	DATE	RADIONUCLIDE NAME	CURIES	CURIES. DPM/ FT**3	CURIES. 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	.2428		
	ZR SHROUD	A	710430	CD 109	.7E-5		
	ZR SHROUD	A	710430	CD 113	.29E-5		
	ZR SHROUD	A	710430	SN 113	.17E-2		
	ZR SHROUD	A	710430	SN 119	1.02E-1		
	ZR SHROUD	A	710430	SN 121	2.73E-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	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 B1122

*ACTIVITY. SPEC NO .	COST ITEM/ ACTIVITY	.SYS/COMP. NUMBER	.C.SCHED .A.START .T.DATE	.SCHED .COMPL .DATE	.ESTIM. .MAN .HOURS	.ESTIMTD. .MAN .COST $	.ESTIM. .REM .	.ACTUAL .START . DATE	.ACTUL. .COMPL .DATE	.ACTUL. .MAN .HOURS	.ACTUAL .MAN .COST $	.ACTUL. .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.											
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	
*	LARGE ACCESS HATCH											
01.00	CONTAINMENT OPENING					41850					47670	
*	FLOOR HATCH, SHORING											
*	SHORING BASEMENT											
*	LEVEL FLOOR											
01.00	VIBRATION MONITOR					3000					3441	
*	EQUIPMENT											
01.00	PIONEER POWER LABOR										998	
*	PERSONNEL											
01.00	MATERIALS, TRAVEL,					28600					28600	
*	PERSONNEL RELOC.											
01.00	TRAVEL										2760	
01.00	REMODEL FLUIDYNE BLD					400					1272	
01.00	TEMP TRAILER RENT										480	
*	FOR GUARDS											
01.00	MISCELLANEOUS ITEMS										3188	
	OTHER INDIRECT					117568					149923	
*	(W.O.1300->W.O.1700)											
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.											
*01.00	HEALTH PHYSICS										47300	
*	W.O.1300											
*01.00	OPERATING AND										34520	
*	MAINT. COSTS											
*	W.O.1400											
*01.00	SECURITY COSTS										13485	

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

*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
*	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					304736	
.												
.	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

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
*	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.

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
*03.03	HEALTH PHYSICS											13810	
*	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 81122

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
*	WAREHOUSING												
*	W.O.1700										TOTAL WD 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.

ACTIVITY SPEC NO	COST ITEM/ ACTIVITY		ACTUAL COST $
*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		
*	INTERNALS		

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

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

.ERR1 UNC DECOMMISSIONING DATA SYSTEM - PROJECT COST/EXPOSURE 31122

*ACTIVITY. SPEC NO .	COST ITEM/ ACTIVITY	SYS/COMP. NUMBER	A.T.	SCHED START DATE	SCHED COMPL DATE	ESTIM. MAN HOURS	ESTIMTD. COST $	MAN REM	ACTUAL START DATE	ACTUL. COMPL DATE	ACTUL. MAN HOURS	ACTUAL COST $	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 81122

*ACTIVITY. SPEC NO .	COST ITEM/ ACTIVITY	.SYS/COMP. NUMBER	.A.C.SCHED .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										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.	START DATE	COMPL DATE	MAN HOURS	ESTIMTD. COST $	MAN REM	START DATE	COMPL DATE	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											109360	
*07.03	OPERATING AND												
*	MAINT. COSTS												
*	W.O.1400											42715	
*07.03	SECURITY COSTS												
*	W.O.1500											117065	
*07.03	ENGINEERING &												
*	ADMINISTRATIVE												
*	W.O.1600											16475	
*07.03	STORAGE AND												
*	WAREHOUSING												
*	W.O.1700										TOTAL FOR W.O. 1300-1700	435475	
*													
08	REMOVAL OF REACTOR												
*	BUILDING&STRUCTURES												
08.01	UPA LABOR AND BURDEN						21303					1722	
08.01	UPA DIRECT LABOR						13833					1095	
08.01	UPA BURDEN ON DIRECT												
*	LABOR												
08.02	SUBCONTRACTORS											8045	
08.02	PIONEER POWER INC												
*	(PERSONNEL)						685800					337709	
08.02	HERBST&SONS(REMOVAL												
*	OF CONCRETE&STEEL												
*	LINER)						5000					5912	
08.02	ENGINEERING CONSLT.												
*	(ATA)											3972	
08.02	SPECIALTY DEMOLITION												
*	(CONCRETE SAMPLES)											3389	
08.02	HAYDEN-MURPHY EQUIP.											-25000	
08.02	SAM BLOOM IRON&METAL												
*	(SALE OF STEEL LINER												
08.03	OTHER COSTS											89	
08.03	MISCELLANEOUS ITEMS											61922	
08.03	OTHER INDERECT COST						79194						
*	(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 81122

*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
*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 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
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 MATERIAL					13000					51	
10.03	BANDING MACHINE					600					789	
10.03	OTHER INDIRECT COST (WO 1300-1700)					394856					509289	
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 W.O.1300										160730	
10.03	OPERATING AND MAINT. COSTS W.O.1400										117290	
10.03	SECURITY COSTS W.O.1500										45815	
10.03	ENGINEERING & ADMINISTRATIVE W.O.1600										125555	
10.03	STORAGE AND WAREHOUSING W.O.1700										17670	
						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 LABOR					6529					109	
11.02	SUBCONTRACTORS											
11.02	SPECIALTY DEMOLITION (SAMPLING)										7955	
11.02	PIONEER POWER INC (PERSONNEL)										1816	
11.02	FIX STEAM PLANT WALL					2600						
11.02	FILL TO GRADE					15000					3000	
11.02	REMOVE TEMP BLDG & STRUCTURES					5000						
11.02	ENGINEERING CONSLT. (FINAL REPORT)					3000						
11.03	OTHER COSTS											

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

.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
					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

.NOTE: ALL BALNK ENTRIES INDICATE THAT DATA WAS NOT AVAILABLE(DNA)

```
.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

*SPEC NO	NUMBER	DATE	ALARA COST ITEM	ACTIVITY.SYS/COMP. COST $	ALARA SAVED. MAN-REM	INITIAL MR/HR	FINAL MR/HR	DOS. FCT.	RED. ALARA EFFORT DESCRIPTION
.NOTE: ALL BLANK ENTRIES INDICATE THAT DATA WAS NOT AVAILABLE(DNA)									
*									
	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	DESCRPTION	T. Y. P.	PHYS FORM	CHEMICAL FORM	DOT SHIP CLASS	(-- WASTE --- CUBIC FEET	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 LENS MILES	MR/HR CONTCT	MR/HR 6 FEET	MR/HR CAB	RADIONUCLIDE NAME	AMOUNT	ACTIVITY SPEC NO	WASTE DESCRPTION	TYP	PHYS FORM	CHEMICAL FORM	DOT SHIP CLASS	(-- WASTE ---) CUBIC FEET	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
740930		SHEFF					$55									
740930		SHEFF					861									
741031		SHEFF					1131									
741031		SHEFF					1297									
741031		SHEFF					995									
741231		SHEFF					1158									
741231		SHEFF					763									
741231		SHEFF					452									
741231		SHEFF					900									
741231		SHEFF					479									
741231		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									

.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)

.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				43				
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

DATE	SHIP NUM	DISP SITE	BURIAL CHARGES $ BASIC	CURIE	SP/HND	OTHER	TOTAL	SHIPPING COMPANY	TRANSPORTATION CHARGES $ BASIC	PERMIT	OTHER	TOTAL	CONTAINER CHARGES $ 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 CHARGES $ 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		23652	
720731													LINERS		3651	
720930													LINERS		26783	
720930													BC-48-22C			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		9885	
730128													LL-50-100			2400
730228													BOTTOM VES.HD.CONT		9860	
730228													LINERS	1	4780	
730228													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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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

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Costs, Comparison Studies

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