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Estimating Pressurized Water Reactor Decommissioning Costs

A User's Manual for the PWR Cost Estimating Computer Program (CECP) Software

Final Report

Prepared by
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Operated by
Battelle Memorial Institute

Prepared for
U.S. Nuclear Regulatory Commission

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ABSTRACT

With the issuance of the Decommissioning Rule (July 27, 1988), nuclear power plant licensees are required to submit to the U.S. Regulatory Commission (NRC) for review, decommissioning plans and cost estimates. This user's manual and the accompanying Cost Estimating Computer Program (CECP) software provide a cost-calculating methodology to the NRC staff that will assist them in assessing the adequacy of the licensee submittals. The CECP, designed to be used on a personal computer, provides estimates for the cost of decommissioning pressurized water reactor power stations to the point of license termination. Such cost estimates include component, piping, and equipment removal costs; packaging costs; decontamination costs; transportation costs; burial costs; and manpower costs. In addition to costs, the CECP also calculates burial volumes, person-hours, crew-hours, and exposure person-hours associated with decommissioning.

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FOREWORD

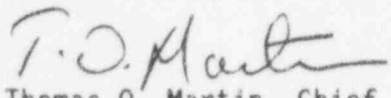
This user's manual and computer software have been developed to assist the U.S. Nuclear Regulatory Commission (NRC) in evaluating certain licensee submittals of their estimated costs to decommission pressurized water reactor (PWR) power plants. The report was prepared by Pacific Northwest Laboratory (PNL) for the NRC.

This document supported the effort to reanalyze the cost of decommissioning a reference PWR in NUREG/CR-5884, Revised Analyses of Decommissioning for the Reference Pressurized Water Reactor Power Station. This user's manual is a companion to the above-referenced document and provides the methodology that was used to prepare the results in NUREG/CR-5884. The NRC staff is considering use of this information to support its evaluation of licensee decommissioning plan submittals and its determination of the acceptability of licensees' decommissioning cost estimates.

Licensees are not required to use this computer program to plan their decommissioning activities and estimate their projected decommissioning costs. However, the program may be useful to licensees to obtain information on NRC's basis for cost estimates; likewise, others may find this software and user's manual useful to validate their independent studies. The computer software can be purchased from the Department of Energy, Energy Science and Technology Software Center, P.O. Box 1020, Oak Ridge, TN 37831-1020, Phone: (423) 576-2606.

NUREG/CR-6054 is not a substitute for NRC regulations, and compliance is not required. The approaches and/or methods described in this NUREG/CR are provided for information only. Publication of this report does not necessarily constitute NRC approval or agreement with the information contained herein.

Further technical information can be obtained from Mr. George J. Mencinsky, Office of Nuclear Regulatory Research, Mail Stop T-9 F31, U.S. Nuclear Regulatory Commission, Washington, DC 20555. Telephone (301) 415-6206.



Thomas O. Martin, Chief
Regulation Development Branch
Division of Regulatory Applications
Office of Nuclear Regulatory Research

ACKNOWLEDGMENTS

The author gratefully acknowledges the assistance provided by individuals at the Pacific Northwest Laboratory[a] during the course of this study and preparation of the report. Richard I. Smith and George J. Konzek provided most of the algorithms used in the CECP and validated many calculations. Patrick N. McDuffie provided a technical review of the CECP program. The editorial review prior to publication was contributed by David R. Payson.

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1.0 INTRODUCTION, REQUIREMENTS, AND PROGRAM INSTALLATION

The Cost Estimating Computer Program (CECP), designed for use on an IBM personal computer or equivalent, was developed for estimating the cost of decommissioning light-water reactor power stations to the point of license termination. Such costs estimates include component, piping, and equipment removal costs; packaging costs; decontamination costs; transportation costs; burial volumes and costs; and staffing costs. Using equipment and consumables costs and inventory data supplied by the user, the CECP calculates unit cost factors and then combines these factors with transportation and burial cost algorithms to produce a complete report of decommissioning costs. In addition to costs, the CECP also calculates person-hours, crew-hours, and exposure person-hours associated with decommissioning.

The CECP uses a data base, but it is not a commercial data base product. For this reason, data may be entered and information extracted only through the CECP program itself. The detailed and summary output files (Section 2.2) produced by the CECP are in ASCII format and may be accessed and printed using any IBM PC-compatible word processing program.

This document covers only the pressurized water reactor (PWR) version of the CECP software. The boiling water reactor (BWR) version is covered by a separate document.[1]

1.1 REQUIREMENTS

The CECP runs on IBM-compatible computers using a 386SX or higher processor. Basic requirements are

- DOS 5.0 or higher.
- A VGA monitor.
- 640K of standard memory. Expanded or extended memory is not required.

- A hard disk.
- HP LaserJet III or IV printer (required only if you want to print files directly from the CECP; see Section 1.2).

The CECP does not use a mouse or a math co-processor.

1.2 INSTALLATION

The CECP software can be installed onto your hard disk automatically (Section 1.2.1) or manually (Section 1.2.2). Automatic installation is recommended. You should install the software manually only if you encounter problems with the automatic installation. Before proceeding to Section 1.2.1, you need to read the remainder of this section to become familiar with the software and installation process.

The CECP software is distributed on a single 1.44M 3.5-inch diskette. Table 1.1 shows the files contained on the diskette. Before discussing the installation process, a brief discussion of these files is in order.

TABLE 1.1. Contents of the CECP Diskette

INSTALL.EXE	MPE.EXE	HANF.DAT
CECP-PWR.EXE	MPF.EXE	BARN.DAT
MP1.EXE	MPG.EXE	GENERIC.DAT
MP2.EXE	MPH.EXE	SITES.DAT
MP3.EXE	MPI.EXE	DEFAULT.PD
MPA.EXE	HANFBURY.EXE	GOTH.P
MPB.EXE	BARNBURY.EXE	CPORT.P
MPC.EXE	GENBURY.EXE	CLAND.P
MPD.EXE		

The first file, **INSTALL.EXE** (also referred to as **INSTALL**), is the CECP installation program to be discussed shortly. Files **CECP-PWR.EXE**, **MP1.EXE**, **MP2.EXE**, **MP3.EXE**, and **MPA.EXE** through **MPI.EXE** make up the CECP program itself. **DEFAULT.PD**, **SITES.DAT**, **HANF.DAT**, **BARN.DAT**, and **GENERIC.DAT** are default files. Once installed on your hard disk, these five default files must not be deleted; the CECP will not run without them. **GOTH.P**, **CPORT.P**, and **CLAND.P** are printer strings for Hewlett-Packard LaserJet III and IV series printers. The

remaining files (**HANFBURY.EXE**, **BARNBURY.EXE**, and **GENBURY.EXE**) are utility programs for setting up burial cost schedules (Section 5).

To load the CECP software onto your hard disk, you run the **INSTALL** program (Section 1.2.1). In brief, **INSTALL** will do the following: It will put the CECP program files and the utility files into a subdirectory of your hard disk. It will then put the default files into another subdirectory. Next it will ask you to supply the name of the word processing program you want to use as a file editor. Finally, it will create a small file, **P.LOC**, in the same subdirectory as your program files. Do not delete this file; it tells the CECP where the default data files reside.

As mentioned above, **INSTALL** will ask you to supply the full path name of the DOS word processing program you want to use as your file editor. The intent of the editor is to allow you to quickly view CECP output files while remaining within the CECP environment. It will not be necessary to perform any actual editing of these files. For this reason, it is recommended that you use the smallest, simplest ASCII editor you can find. **EDIT.COM**, the editor that comes with DOS 5.0, is a good choice; it loads fast and allows easy viewing of large files with no annoying "line wrap." Large, sophisticated word processing programs such as Wordperfect™ are not recommended for two reasons: First, because these programs use their own special internal formatting techniques, it may take an irritatingly long time to load and format a CECP file. Second, the line widths of many CECP files exceed 80 characters and will wrap around on the screen, making the file difficult to read. (You may, of course, set the font style, page size, and margins to correct the problem, but this takes time and defeats the purpose of examining the files quickly.)

INSTALL will also copy the three printer-string files (**GOTH.P**, **CPORT.P**, and **CLAND.P**) to your program subdirectory. This will make it possible to print your output files directly from the CECP, provided a Hewlett-Packard LaserJet III or IV printer is connected to your LPT1 port.

Before installing the CECP software, it is strongly recommended that you make a backup copy of the CECP diskette with the DOS utility, Diskcopy. Once

you have made the backup, you can load the CECP program and default files onto your hard disk by running **INSTALL** as described in Section 1.2.1. **INSTALL**'s operation is self-explanatory; just respond to the questions asked.

1.2.1 Automatic Installation

To install the CECP software automatically, proceed as follows:

1. Make sure you are in DOS, with the command prompt (usually **C:\>** or **D:\>**) visible.
2. Insert the CECP diskette in drive A.[a]
3. Type **a:** and then press <ENTER>.
4. Type **install** and then press <ENTER>.
5. **INSTALL** is now running. Follow the instructions on the screen.
6. After you exit the installation program, type **cecp-pwr**<ENTER> to run the CECP program.

1.2.2 Manual Installation

If you experience difficulties with **INSTALL**, you can load the CECP onto your hard disk manually. Follow these steps:

1. Create a subdirectory on your hard disk to hold the CECP program files. Assume, for purposes of illustration, that you choose **C:\PWRPROG**.
2. Copy all the program files (these files have an **EXE** extension) from the diskette into **C:\PWRPROG**. Do not copy **INSTALL.EXE**.
3. Create a second subdirectory on your hard disk to hold the CECP default data files. Assume that you choose **C:\PWRDATA**.
4. Copy all remaining files (except **INSTALL.EXE**, of course) into **C:\PWRDATA**.
5. Make sure you are at the **C:\PWRPROG** prompt, and then type the following:

(a) Drive A is used for illustration. You may, of course, use any legitimate 1.44M disk drive.

```
copy con p.loc<ENTER>
C:\PWRDATA<ENTER>
C:\DOS\EDIT.COM<Ctrl-Z><ENTER>
```

You have just created a file, **P.LOC**, located in **C:\PWRPROG**, which contains the path to the location of the CECP default files. The third line in the example above is the complete name, including path, of the editor or word processor you want to use as a file viewer. If you do not want to use an editor, omit the third line. You would then type this instead:

```
copy con p.loc<ENTER>
C:\PWRDATA<Ctrl-Z><ENTER>
```

6. To run the CECP, type **CECP-PWR**<ENTER> at the **C:\PWRPROG** prompt.

1.3 ERROR MESSAGES

If some or all of the default files fail to get transferred to the proper subdirectory during the installation procedure, you will get an error message similar to the one shown in Figure 1.1 when you start the CECP. To correct the problem, copy the missing files into the indicated subdirectory. If all five files are missing, it is probable that your **P.LOC** file contains the wrong subdirectory, as discussed in the next paragraph.

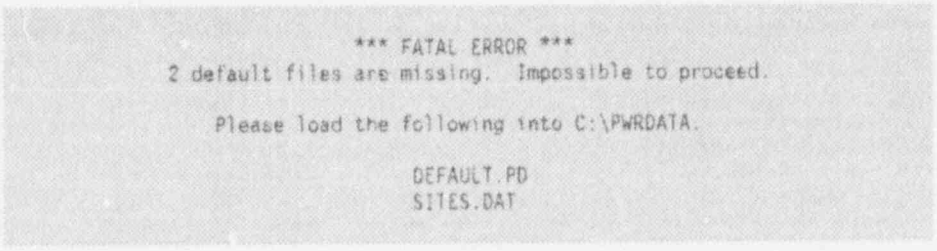

FIGURE 1.1. A Fatal Error Message

A second kind of error occurs if the CECP cannot find your **P.LOC** file. This is illustrated in Figure 1.2. To correct this error, type in the subdirectory containing the default files and press <Enter>. For the example shown in Figure 1.2, the subdirectory **c:\pwrdata** has been typed in. Once this is done, the **P.LOC** file will be created containing the subdirectory you typed in, and the CECP Main Menu should appear. If **P.LOC** contains the wrong subdirectory, you will get the fatal error message of Figure 1.1, with all

five default files listed. If this happens, delete **P.LOC** and perform Step 5 of Section 1.2.2.

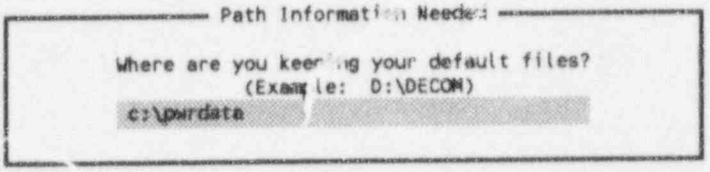

FIGURE 1.2. An Example of a Missing P.LOC File

The last error associated with CECP installation is more subtle. Suppose the Main Menu appears, but nothing happens when you press **2**, say, to call up Menu Item 2. This means the program file that runs Menu Item 2, **MP2.EXE**, is missing. To correct this type of error, exit from the CECP by pressing <Alt-X>. Then check to make sure that all the program files on the disks have been loaded into the program subdirectory on your hard disk. The easiest way to ensure that this has been done is to perform Step 2 of Section 1.2.2.

1.4 REFERENCES

1. M. C. Bierschbach. 1994. Estimating Boiling Water Decommissioning Costs. Draft NUREG/CR-6270, U.S. Nuclear Regulatory Commission Report by Pacific Northwest Laboratory, Richland, Washington.

2.0 COST ESTIMATING COMPUTER PROGRAM (CECP) OVERVIEW

The CECP Main Menu is shown in Figure 2.1. Your first task is to enter certain general data that the CECP will need later in calculating site-specific costs. This is done by selecting **1**, **2**, and **3** from the Main Menu. For example, when you type **1**, a file menu appears (Section 2.1), from which you select the data file **DEFAULT.PD**. (File nomenclature will be discussed later.) A data entry screen then appears, permitting you to enter labor costs, burial costs, overhead costs, consumables costs, physical constants (e.g., the density of reinforced concrete), etc. You may then modify whatever values you like and save this new information to a file. In fact, you may save data to several files during the same session. The next time you access Item **1**, you will have several files to choose from: the default file, **DEFAULT.PD** (which is always available), and the files you created. Any of these files may be loaded into memory and used as a basis for creating a new file. Data for items **2** and **3** are entered in the same way.

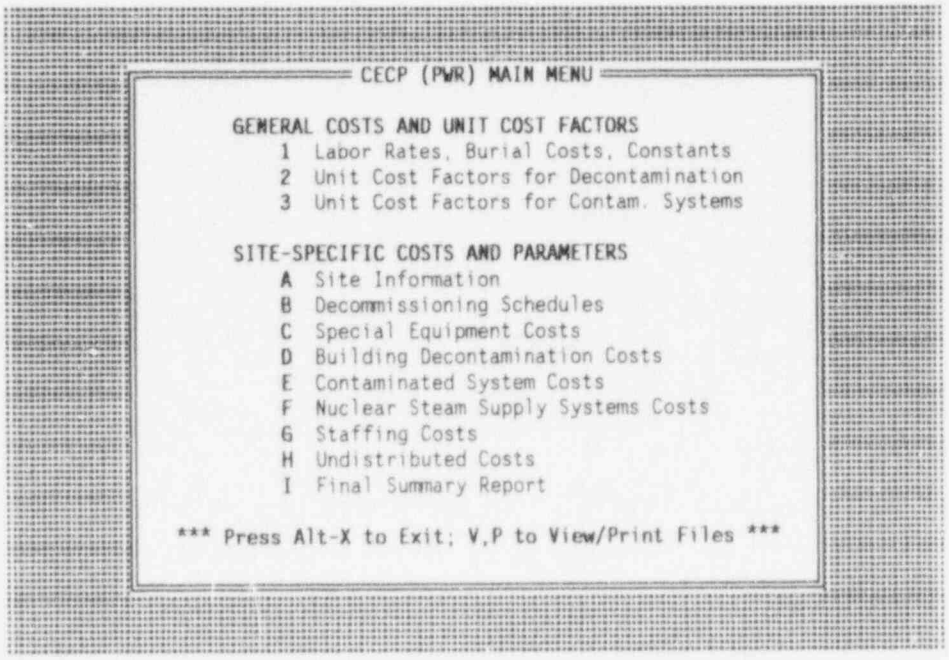

FIGURE 2.1. CECP Main Menu

Having entered general information into the data base, you now enter site-specific data. Data for menu Items **A**, **B** and **C** are entered first, in any order, then data for Items **D** through **H**, in any order. For each of the Items **D** through **H**, the CECP calculates cost and exposure information in detail and then writes the results to appropriate output files. To get a complete site summary that combines data from Items **A** through **H**, select Item **I**.

The overall method for entering data is outlined in Figure 2.2.

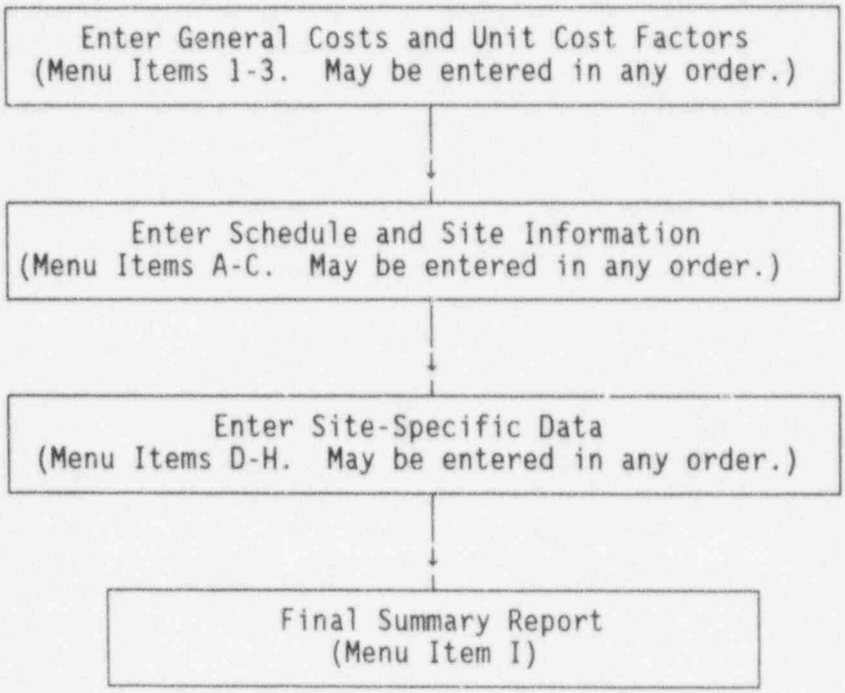

FIGURE 2.2. Flow Diagram for Entering Data into the CECP

2.1 FILE MENUS

When you select a menu item (**1-3** or **A-H**) from the Main Menu, the first thing you will see is the file menu. It is from this menu that you pick the data file you want the CECP to use for storing data pertaining to the Menu Item selected. Figure 2.3 shows the file menu from Menu Item 1. Files are selected by moving the selector bar (shown positioned over **DEFAULT.PD** in Figure 2.3) up and down with the arrow keys (↑ and ↓) and then pressing <Enter>. If you change your mind and decide not to proceed, you may return to

the Main Menu by pressing <Esc>. Once you have selected the data file, the file menu screen will be replaced by that menu item's data entry screen.

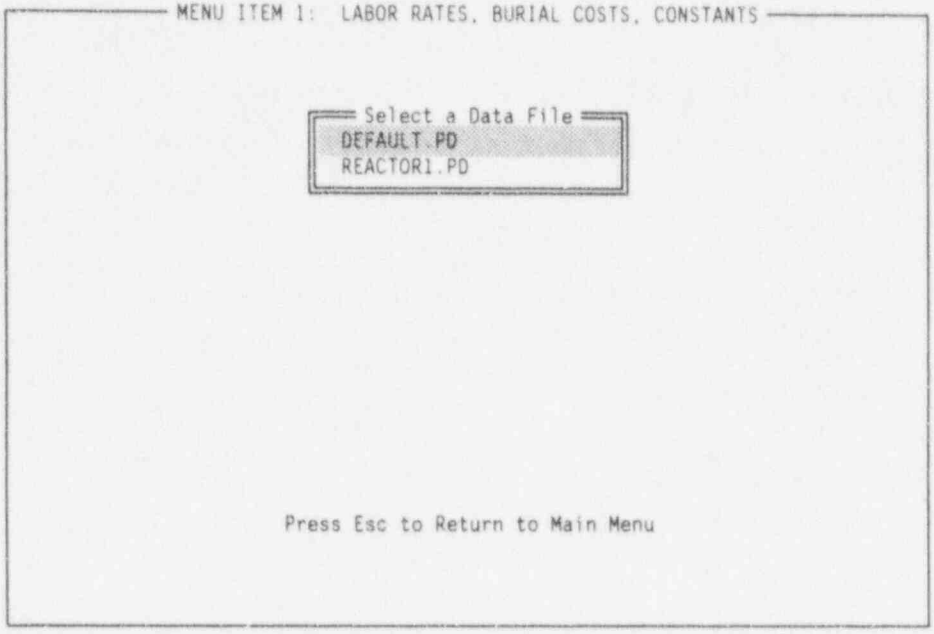

FIGURE 2.3. A File Menu

2.2 CECP FILES

The CECP **uses** data files and **produces** result files. Data files are specially coded files that cannot be viewed or printed. They are used by the CECP strictly for storing information. Data files use a **PD** extension, such as **DEFAULT.PD** or **REACTOR1.PD**. Result files make up the complete decommissioning cost estimates for a reactor study. Result files use **PRD**, **PRE**, **PRF**, **PRG**, and **PRI** extensions. The final letter in the file extension name refers to the menu item from which it was created. **PRF** files, for example, were created from Menu Item F. The following are a complete set of result files for a hypothetical case study "REACTOR1":

REACTOR1.PRD, a detailed description of building decontamination costs
REACTOR1.PRE, a detailed compilation of contaminated system costs
REACTOR1.PRF, a detailed breakdown of RPV and RPV internals costs
REACTOR1.PRG, a detailed account of staffing costs

REACTOR1.PRI, a general summary of all decommissioning costs.

All result files are in ASCII format and may be examined and printed out using any word processor the user desires. Examples of result files appear in Appendix A.

Figure 2.4 shows the **REACTOR1.PD** data file and the five result files the CECP creates from it. The data dependencies in the figure show what portions

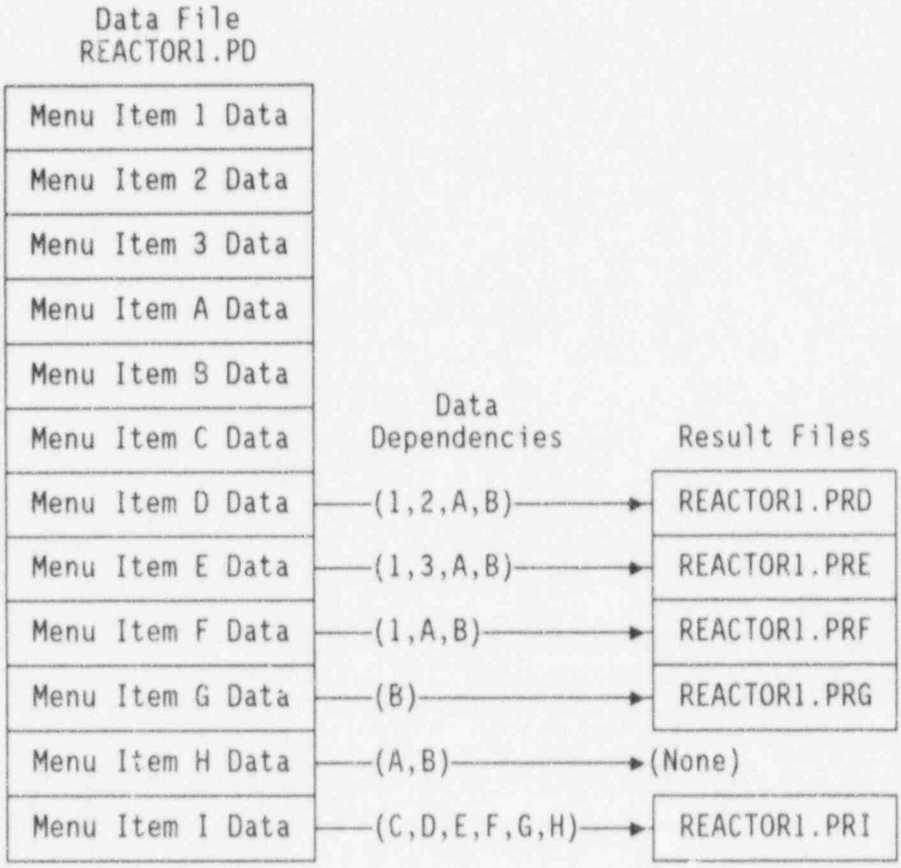

FIGURE 2.4. CECP File Relationships

of the data file are used by the CECP to create the output files. For example, when you leave Menu Item D, the CECP creates **REACTOR1.PRD** by combining Menu Item D data with the data you previously entered from Menu Items 1, 2, A, and B. In addition to the result files, the CECP produces one additional file, an input parameter file. This file uses a **PIN** suffix. Thus,

the **REACTOR1.PIN** file, for example, lists all user-supplied input parameters (from all menus) that the CECP used to produce the REACTOR1 study. An example **PIN** file is shown in Appendix A.

2.3 UNIT COST FACTORS, WORK DIFFICULTY FACTORS, AND RADIATION DOSE RATES

The algorithms used by the CECP for calculating unit cost factors and work difficulty factors are not discussed in this manual. Such information can be found in Appendix C of NUREG/CR-5884, Revised Analyses of Decommissioning for the Pressurized Water Reactor Power Station.

For simplicity, radiation dose rates are based solely on cobalt-60. It is assumed that this nuclide is by far the most significant source of occupational radiation exposure. When the user enters dose rates for the various decommissioning activities, it will be understood (unless specified otherwise) that these are the dose rates at the time of reactor shutdown. The CECP will use the decommissioning schedules and shutdown dose rates as a baseline for determining the actual dose rates prevailing at the times the activities are performed.

3.0 ENTERING GENERAL COST DATA AND UNIT COST FACTORS

This chapter describes how to use CECP Menu Items 1, 2, and 3 (Figure 2.1). Because of the structural dependencies discussed in Chapter 2, it is important that you enter data from these Menu Items before proceeding to Menu Items D through H.

3.1 MENU ITEM 1: LABOR RATES, BURIAL COSTS, CONSTANTS

As mentioned in Chapter 2, the first screen you see after you choose Menu Item 1 from the Main Menu is the File Menu. From this menu, you pick the data file you want, and the CECP will then load a portion of this file into memory and allow you access to this data through the input screen. Figure 3.1 shows an example input screen for Menu Item 1, with the **DEFAULT.PD** file chosen as the data file source. The selector bar is shown positioned over the first item, "Laborer hourly rate." There are 51 items in all, 21 of which are visible at any one time. Before describing the process of entering and saving data from the input screen, it is necessary to discuss the data itself.

MENU ITEM 1: LABOR RATES, BURIAL COSTS, CONSTANTS

1	Laborer hourly rate ($/hr)	26.37
2	Craft hourly rate ($/hr)	49.70
3	Crew leader hourly rate ($/hr)	54.84
4	Radiation operator hourly rate ($/hr)	36.82
5	Engineer hourly rate ($/hr)	59.09
6	Average shift differential (%)	5.00
7	Profit on equipment and material (%)	15.00
8	Utility overhead (%)	42.00
9	DOC overhead (%)	110.00
10	DOC profit (%)	15.00
11	Density of poured concrete (lb/ft3)	144.00
12	Density of reinforced conc (lb/ft3)	200.00
13	Density of stainless steel (lb/ft3)	500.00
14	DOT 17-H steel drum, 55-gal ($/ea)	26.80
15	Plastic sheets/bags ($/ft2)	0.04
16	Blotting paper ($/ft2)	0.32
17	Gas torch consumables ($/hr)	6.75
18	Burial costs/ft3 at geologic repos ($)	6500.00
19	Transportation escalation factor	1.00
20	Waste burial escalation factor	1.00
21	License termination survey cost ($)	1220187.00

Number of records: 51 File in use: DEFAULT.PD

↑↓ Home End PgUp PgDn Select item ↵ Enter Data Save Alt-X Quit

FIGURE 3.1. Data Entry Screen for Menu Item 1

3.1.1 Menu Item 1 Data Description

The data items you can access from the input screen are listed in Table 3.1. A definition of each of these items follows the table.

TABLE 3.1. Menu Item 1 Data

1	Laborer hourly rate ($/hr)	26.370
2	Craft hourly rate ($/hr)	49.700
3	Crew leader hourly rate ($/hr)	54.840
4	Radiation operator hourly rate ($/hr)	36.820
5	Engineer hourly rate ($/hr)	59.090
6	Average shift differential (%)	5.000
7	Profit on equipment and material (%)	15.000
8	Utility overhead (%)	42.000
9	DOC overhead (%)	110.000
10	DOC profit (%)	15.000
11	Density of poured concrete (lb/ft3)	144.000
12	Density of reinforced conc (lb/ft3)	200.000
13	Density of stainless steel (lb/ft3)	500.000
14	DOT 17-H steel drum, 55-gal ($/ea)	26.950
15	Plastic sheets/bags ($/ft2)	0.040
16	Blotting paper ($/ft2)	0.320
17	Gas torch consumables ($/hr)	6.750
18	Burial costs/ft3 at geologic repos ($)	6500.000
19	Transportation escalation factor	1.000
20	Waste burial escalation factor	1.000
21	License termination survey cost ($)	1220187.000
22	Effective standard box width (ft)	4.000
23	Effective standard box depth (ft)	4.000
24	Effective standard box length (ft)	6.000
25	Standard box 4 x 4 x 6 cost ($)	645.000
26	Maritime container 8 x 4 x 20 cost ($)	4965.000
27	Maritime container weight (lb)	3000.000
28	Maritime container volume (ft3)	640.000
29	Pipe hanger container cost ($)	4600.000
30	Pipe hanger container weight (lb)	2500.000
31	Pipe hanger container volume (ft3)	320.000
32	Cask liner for 8-120B cask ($)	4695.000
33	Special u-shaped container ($)	1565.000
34	Canister for GTCC material ($)	520.000
35	Spec. container, inner-wall shaped ($)	470.000
36	Cask liner for 8-120B cask, oval ($)	4695.000
37	High integrity container (HIC) ($)	7825.000
38	NuPac 14/210H cask rental ($/day)	1250.000
39	CNS 8-120B cask rental ($/day)	1250.000
40	NAC LWT cask rental ($/day)	3130.000
41	TN-8 cask rental ($/day)	3340.000
42	Laundry services ($/person-shift)	21.000
43	Uncompacted drums of waste (drums/day)	5.000
44	Dry waste compaction ratio	5.000
45	Small tools (% of direct labor costs)	2.000
46	Piping/equip/HXs (curies/ft2)	0.006
47	SG vessel & internals (curies/ft2)	0.021
48	RCS piping (curies/ft2)	0.080
49	Pressurizer & relief tank (curies/ft2)	0.004
50	Maint. allow. ($/yr) (SAFSTOR only)	17379.000
51	Length (ft) to which pipes will be cut	15.000

1-6: The personnel hourly labor rates (Items 1-5) include overhead costs. Item 6, average shift differential, is based on the assumption that there are two shifts, with rates for the second shift X% higher than the first. Thus, the average shift differential for both shifts is X/2%. For example, if the shift differential for the second shift is 10%, then the average shift differential is (10/2)% = 5%.

7-14: Self-explanatory.

15-17: The basic consumables used by the CECP in many decommissioning tasks.

18: Nominal cost for burial of one cubic foot of greater than class C (GTCC) material at a geologic repository. This cost is quite speculative, since a geologic repository (or other such disposal facility as the NRC may approve) does not yet exist.

19-20: These factors are unity for 1993 dollars. An escalation factor of 1.05, for example, increases prices by 5%. Item 20 is the low-level waste escalation factor.

21: This is the cost of the survey to determine whether the site may be released for unrestricted use. The survey is also known as **termination survey, post remedial-action survey** or **final survey**.

22-25: These items apply to the metal box used to bury waste at the low-level waste disposal site. The values shown here refer to the standard 4 x 4 x 6-ft B-25 container. If you do not want to use these dimensions, you may supply your own in Items 22 through 24. Permissible values for width and depth are from 2 to 8 feet. Permissible values for the length are from 2 to 20 feet. The CECP will not let you enter values outside these ranges. The CECP calculates the box volume as width x depth x length. The weight of the empty box is calculated as 9.375 x (width x depth + width x length + depth x length). For a 4 x 4 x 6-ft box this works out to 600 lb, the assumed weight of the standard B-25 container.

26-28: These items apply to the modified 8 x 4 x 20-ft maritime container. Permissible values for Item 28 are from 320 to 1280 cubic feet.

29-31: These apply to the 8 x 2 x 20-ft container used in pipe hanger disposal. Permissible values for Item 31 are from 160 to 1280.

32-36: These items are the costs for the special containers used in the packaging of the reactor pressure vessel (RPV) components that will be disposed of at a geologic repository.

37: The cost of one polyethylene high-integrity container (HIC).

38-41: These are the daily rental charges for the casks used in shipping radioactive waste.

42: Protective clothing, laundry, and equipment services are postulated to be provided by an offsite subcontractor. Units are $/person-shift, where one shift is eight hours.

43-44: These two items, taken together, determine the number of 55-gallon drums of compacted dry active waste that accumulate per day in the course of active decommissioning work. For example, if Item 43 is 6 and Item 44 is 3, then two 55-gallon drums of compacted waste are produced daily. Item 44 must be greater than or equal to 1 but not greater than 25.

45: This item sets the cost for small tools based on a percentage of direct labor costs.

46-49: These items refer to the assumed surface contamination levels (in curies per square foot) for the component types indicated. These levels are at shutdown.

50: This item is the annual equipment allowance used toward the repair of buildings during periods of extended safe storage. It applies only to SAFSTOR cases.

51: This sets the length, in feet, that system piping will be cut to before being put into the modified maritime container. Permissible values for Item 51 range from 2 to 20 feet.

3.1.2 Entering Data

To enter data, you must first put the selector bar over the desired item. The ↑ and ↓ keys move the selector up and down one line at a time. The <PgUp> and <PgDn> keys move the selector up and down the list a full screen (20 lines) at a time; the <Home> and <End> keys move the selector to the top and bottom of the list.

When the selector bar is positioned where you want it, press <Enter>. The portion of the bar over the data field will change color from white-on-blue to yellow-on-red, and a cursor will appear, indicating that you may begin entering data. When typing in the data, you may use the <BackSpace>, <Del>, or the left and right arrow keys (←, →) as needed. The <Ins> key toggles between the insert and typeover mode. A beep indicates that you tried to enter an illegal character. When satisfied with your entry, press <Enter>; the data field will revert to its original blue-on-white color, and the cursor

will disappear. If you change your mind while entering data, press <Esc> and the previous value of that field will be restored.

From Menu Item 1, you can enter data only for the 51 items listed in Table 3.1. You cannot delete an item or add additional items.

3.1.3 Saving Data

You are encouraged to save data as you go along. Pressing <S> will open the **Save Data to a File** window in the middle of the screen, and you will be invited to name and save your data to a file. Press <Esc> or <Enter> at this point, if you decide not to save your data. Otherwise, type in a file name, up to eight letters long, and press <Enter>. You cannot enter a file extension. The CECP will provide the correct extension (**PD**) for you. If, for example, you enter **reactor1**, the CECP will create the file **REACTOR1.PD**.

It is very important that the default data file supplied with the CECP software not be modified. For this reason, the CECP will not permit you to save a file named **DEFAULT**. If you try to do so, you will see an error message superimposed over the **Save Data to a File** window (Figure 3.2). Press any key to clear the error message.

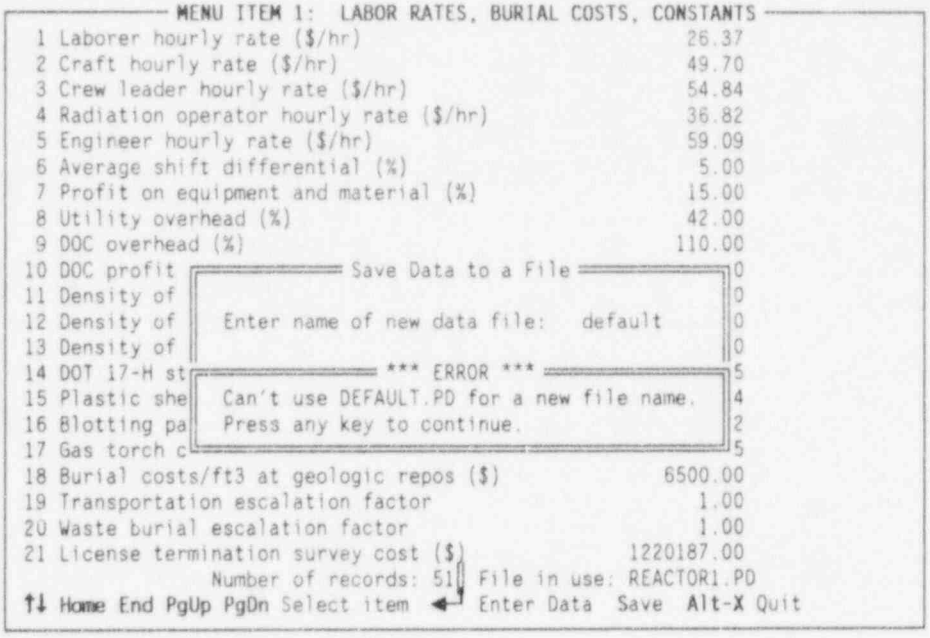

FIGURE 3.2. A File Name Error Message

3.1.4 Exiting

To leave this portion of the CECP, press <Alt-X>. The **Save Data to a File** window will open as described above, and you will be given a final opportunity to save your work, if you have not previously done so. If you elect not to save your work, press <Enter> or <Esc>, and you will be returned to the Main Menu. If you do save your work at this point, you will be returned to the Main Menu as soon as file processing is completed.

You may also exit the data entry screen by using short-cut keys, as explained in Chapter 6.

3.2 MENU ITEM 2: UNIT COST FACTORS FOR DECONTAMINATION

From this menu you modify that portion of the data file that the CECP uses to calculate unit cost factors for building decontamination. The data include crew sizes, work difficulty adjustments, non-productive time adjustments, material costs, and radiation dose rates. The data entry screen is shown in Figure 3.3 with the selector bar positioned over Item 17. There are 162 items in all; 21 are visible at any one time.

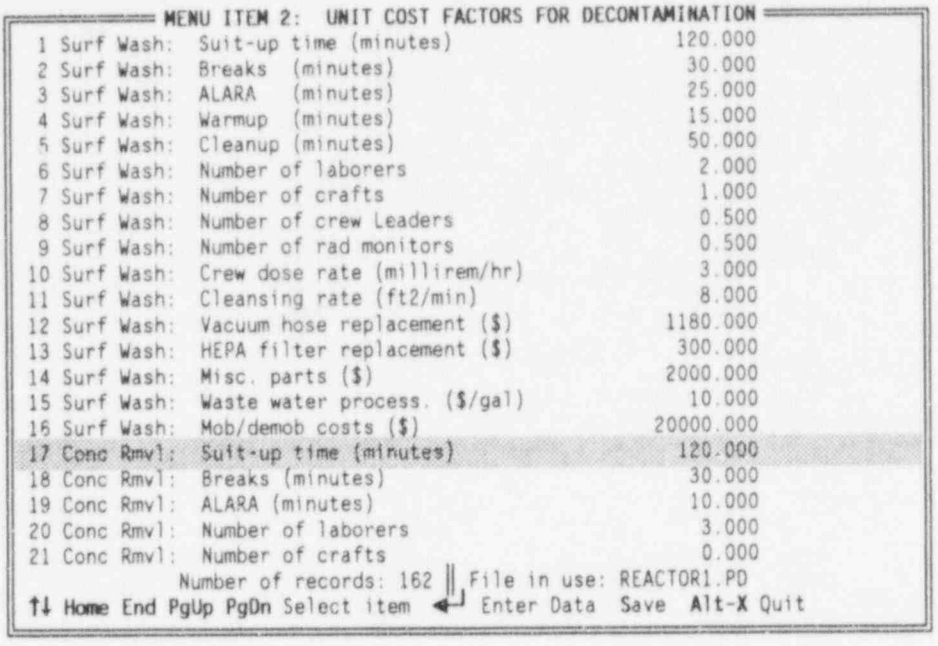

FIGURE 3.3. Data Entry Screen for Menu Item 2

3.2.1 Menu Item 2 Data Description

The data available from the input screen is shown in Table 3.2. As the table shows, there are 14 different categories of data: surface washing (lines 1-16), concrete removal (17-29), metal removal (30-40), concrete cutting (41-52), handrails (53-65), gratings (66-76), polar cranes (77-89), bridge cranes (90-102), refueling cranes (103-114), spent fuel pool water treatment and disposal (115-118), HVAC ducts and equipment (119-130), containment air coolers (131-142), floor drains (143-161), and asbestos (162). A discussion of these data items, by category, follows Table 3.2.

TABLE 3.2. Menu Item 2 Data

1	Surf Wash:	Suit-up time (minutes)	120.000
2	Surf Wash:	Breaks (minutes)	30.000
3	Surf Wash:	ALARA (minutes)	25.000
4	Surf Wash:	Warmup (minutes)	15.000
5	Surf Wash:	Cleanup (minutes)	50.000
6	Surf Wash:	Number of laborers	2.000
7	Surf Wash:	Number of crafts	1.000
8	Surf Wash:	Number of crew leaders	0.500
9	Surf Wash:	Number of rad monitors	0.500
10	Surf Wash:	Crew dose rate (millirem/hr)	3.000
11	Surf Wash:	Cleansing rate (ft2/min)	8.000
12	Surf Wash:	Vacuum hose replacement ($)	1180.000
13	Surf Wash:	HEPA filter replacement ($)	300.000
14	Surf Wash:	Misc. parts ($)	2000.000
15	Surf Wash:	Waste water process. ($/gal)	10.000
16	Surf Wash:	Mob/demob costs ($)	20000.000
17	Conc Rmvl:	Suit-up time (minutes)	120.000
18	Conc Rmvl:	Breaks (minutes)	30.000
19	Conc Rmvl:	ALARA (minutes)	10.000
20	Conc Rmvl:	Number of laborers	3.000
21	Conc Rmvl:	Number of crafts	0.000
22	Conc Rmvl:	Number of crew leaders	0.250
23	Conc Rmvl:	Number of rad monitors	0.250
24	Conc Rmvl:	Crew dose rate (millirem/hr)	3.000
25	Conc Rmvl:	Cleansing rate (ft2/hr)	100.000
26	Conc Rmvl:	Cutting bits ($/hr)	13.000
27	Conc Rmvl:	Filters ($/hr)	2.500
28	Conc Rmvl:	Cleaning sys. rental ($/wk)	2300.000
29	Conc Rmvl:	Compressor rental ($/month)	2025.000
30	Mtl Rmvl:	Staging (in minutes)	60.000
31	Mtl Rmvl:	Height adjustment (%)	10.000
32	Mtl Rmvl:	Respiratory prot. adj. (%)	20.000
33	Mtl Rmvl:	ALARA (minutes)	25.000
34	Mtl Rmvl:	Suit-up time (minutes)	120.000
35	Mtl Rmvl:	Breaks (minutes)	30.000
36	Mtl Rmvl:	Number of laborers	3.000
37	Mtl Rmvl:	Number of crafts	1.500
38	Mtl Rmvl:	Number of crew leaders	0.500
39	Mtl Rmvl:	Number of rad monitors	0.500
40	Mtl Rmvl:	Crew dose rate (millirem/hr)	3.000

TABLE 3.2. (contd)

41	Conc Cttg:	Staging (in minutes)	60.000
42	Conc Cttg:	Height adjustment (%)	10.000
43	Conc Cttg:	Respiratory prot. adj. (%)	10.000
44	Conc Cttg:	ALARA (minutes)	25.000
45	Conc Cttg:	Suit-up time (minutes)	120.000
46	Conc Cttg:	Breaks (minutes)	30.000
47	Conc Cttg:	Number of laborers	1.000
48	Conc Cttg:	Number of crafts	1.000
49	Conc Cttg:	Number of crew leaders	0.500
50	Conc Cttg:	Dose rate (millirem/hr)	3.000
51	Conc Cttg:	Cutting rate (inch-feet/min)	1.000
52	Conc Cttg:	Blade costs ($/in-ft of cut)	0.440
53	Handrails:	Cleansing rate (ft/hr)	20.000
54	Handrails:	Suit-up time (minutes)	120.000
55	Handrails:	Breaks (minutes)	30.000
56	Handrails:	ALARA (minutes)	10.000
57	Handrails:	Number of laborers	2.000
58	Handrails:	Number of crafts	0.000
59	Handrails:	Number of crew leaders	0.500
60	Handrails:	Number of rad monitors	0.500
61	Handrails:	Dose rate (millirem/hr)	3.000
62	Hand ails:	Industrial wipes ($/ft2)	0.070
63	Handrails:	Wipe usage rate (ft2/ft)	1.350
64	Handrails:	Washing fluid ($/gal)	15.000
65	Handrails:	Washing fluid usage (ft/gal)	430.000
66	Gratings:	Removal rate (ft2/hr)	68.750
67	Gratings:	Suit-up time (minutes)	120.000
68	Gratings:	Breaks (minutes)	30.000
69	Gratings:	ALARA (minutes)	25.000
70	Gratings:	Respiratory prot. adj. (%)	20.000
71	Gratings:	Number of laborers	3.000
72	Gratings:	Number of crafts	0.000
73	Gratings:	Number of crew leaders	0.500
74	Gratings:	Number of rad monitors	0.500
75	Gratings:	Dose rate (millirem/hr)	3.000
76	Gratings:	Grating wgt. (lb/ft2)	10.400
77	P. Crane:	Number of polar cranes	1.000
78	P. Crane:	Number of crafts	2.000
79	P. Crane:	Number of laborers	2.000
80	P. Crane:	Number of rad monitors	0.500
81	P. Crane:	Number of crew leaders	0.500
82	P. Crane:	Vendor person-hr required	1904.000
83	P. Crane:	Cost of vendor person-hr ($)	55.000
84	P. Crane:	Removal time (hours)	264.000
85	P. Crane:	Cleanup time (hours)	40.000
86	P. Crane:	Equip. & mob/demob costs ($)	132300.000
87	P. Crane:	Cost of burial container ($)	3650.000
88	P. Crane:	Burial weight w/container (lb)	45000.000
89	P. Crane:	Burial volume (ft3)	1360.000
90	B. Crane:	Number of bridge cranes	1.000
91	B. Crane:	Number of crafts	2.000
92	B. Crane:	Number of laborers	2.000
93	B. Crane:	Number of rad monitors	0.500
94	B. Crane:	Number of crew leaders	0.500
95	B. Crane:	Vendor person-hr required	976.000
96	B. Crane:	Cost of vendor person-hr ($)	55.000
97	B. Crane:	Removal time (hours)	176.000

TABLE 3.2. (contd)

98	B. Crane:	Cleanup time (hours)	40.000
99	B. Crane:	Equip. & mob/demob costs ($)	22100.000
100	B. Crane:	Cost of burial container ($)	3650.000
101	B. Crane:	Burial weight w/container (lb)	40000.000
102	B. Crane:	Burial volume (ft3)	1360.000
103	R. Cranes:	Number of refueling cranes	2.000
104	R. Cranes:	Duration (in minutes)	720.000
105	R. Cranes:	Height adjustment (%)	0.000
106	R. Cranes:	Respiratory prot. adj. (%)	20.000
107	R. Cranes:	ALARA (minutes)	25.000
108	R. Cranes:	Suit-up time (minutes)	120.000
109	R. Cranes:	Breaks (minutes)	30.000
110	R. Cranes:	Number of laborers	3.000
111	R. Cranes:	Number of crafts	1.500
112	R. Cranes:	Number of rad monitors	0.500
113	R. Cranes:	Number of crew leaders	0.500
114	R. Cranes:	Dose rate (millirem/hr)	12.000
115	Fuel Pool:	Specialty contractor ($)	750000.000
116	Fuel Pool:	Number of HICs	5.000
117	Fuel Pool:	Days of cask rental	21.000
118	Fuel Pool:	Duration (days)	30.000
119	HVAC Duct:	Suit-up time (minutes)	120.000
120	HVAC Duct:	Breaks (minutes)	30.000
121	HVAC Duct:	ALARA (minutes)	25.000
122	HVAC Duct:	Resp. protection (%)	20.000
123	HVAC Duct:	Rmvl time (minute/ft)	8.875
124	HVAC Duct:	Number of laborers	2.000
125	HVAC Duct:	Number of crafts	0.000
126	HVAC Duct:	Number of crew leaders	0.500
127	HVAC Duct:	Number of rad monitors	0.500
128	HVAC Duct:	Crew dose rate (millirem/hr)	1.000
129	HVAC Duct:	Linear feet of ductwork	4566.000
130	HVAC Duct:	Wgt of assoc. eqpt. (lb)	129700.000
131	Air Coolers:	Suit-up time (minutes)	120.000
132	Air Coolers:	Breaks (minutes)	30.000
133	Air Coolers:	ALARA (minutes)	25.000
134	Air Coolers:	Height adjustment (%)	20.000
135	Air Coolers:	Number of laborers	2.000
136	Air Coolers:	Number of crafts	2.000
137	Air Coolers:	Number of crew leaders	0.500
138	Air Coolers:	Number of rad monitors	0.500
139	Air Coolers:	Dose rate (millirem/hr)	1.000
140	Air Coolers:	Rmvl time/cooler (min)	1442.000
141	Air Coolers:	Number of coolers	4.000
142	Air Coolers:	Weight per cooler (lb)	142752.000
143	Drains:	Number of drains	210.000
144	Drains:	Removal time (in minutes)	291.000
145	Drains:	Height adjustment (%)	7.000
146	Drains:	Respiratory prot. adj. (%)	0.000
147	Drains:	ALARA (minutes)	25.000
148	Drains:	Suit-up time (minutes)	120.000
149	Drains:	Breaks (minutes)	30.000
150	Drains:	Number of laborers	1.000
151	Drains:	Number of crafts	1.000
152	Drains:	Number of crew leaders	0.500
153	Drains:	Number of rad monitors	0.500
154	Drains:	Dose rate (millirem/hr)	0.500

TABLE 3.2. (contd)

155	Drains:	Drilling rate (inches/hr)	7.000
156	Drains:	Floor thickness (inches)	24.000
157	Drains:	Bit replacement costs ($/in)	4.600
158	Drains:	Power unit rental ($/week)	1035.000
159	Drains:	Drain puller rental ($/week)	138.000
160	Drains:	Absorbent material (ft2)	11.875
161	Drains:	Plastic (ft2)	50.000
162	Asbestos:	Total Cost ($)	165000.000

Surface Washing (Items 1-16)

All contaminated surfaces are washed using a manually operated cleaning system, which washes the surface using high-pressure (250 psig) jets and collects the water and removed material simultaneously using a vacuum collection system. The first five items are the lost time adjustments for the surface washing task and are based on the following assumptions:

- The crews work eight-hour shifts.
- Each crew member suits-up or unsuits in anticontamination clothing eight times per shift, taking 15 minutes each time, including travel time to and from the workplace (Item 1).
- The crews take two 15-minute breaks per shift (Item 2).
- The crew members devote 25 minutes per shift to ALARA-related activities, such as reviewing radiation protection guidance (Item 3).
- It takes 15 minutes to warm up and adjust the cleaning system at the beginning of each shift (Item 4).
- Cleanup activities at the end of each shift take 50 minutes (Item 5).

Items 6 through 9 describe the crew composition. Item 10 is the average dose rate in millirem/hr immediately after reactor shutdown. Item 11 is the postulated floor-cleansing rate, in square feet/minute. (The CECP will adjust the cleansing rate for walls and ceilings, as discussed in Section 4.4.1). Items 12 through 14 are the annual replacement costs for the listed parts.

The surface washing procedure produces waste water that will be processed and disposed of by a specialty contractor. Item 15 is the specialty

contractor's processing fee on a per-gallon basis. Item 16 is the cost of mobilizing and demobilizing the specialty contractor's personnel.

Concrete Removal (Items 17-29)

Contaminated concrete surfaces that are not sufficiently decontaminated using the high-pressure washing system are removed with a commercially available pneumatically operated surface removal system. You can adjust the depth of concrete to be removed, as discussed in Section 4.4.1. Items 17 through 24 have the same meanings as the corresponding items discussed above under surface washing and will not be discussed here. Item 25 is similar to Item 11, but note that the rate here is expressed in square feet/hr. Items 26 through 29 are material costs expressed in the units shown.

Metal Removal (Items 30-40)

All contaminated metal surfaces are assumed to be stainless steel and may be any thickness you specify, per Section 4.4.1. The metal is cut using a plasma arc torch mounted on a mechanically driven track system. The cutting rate is 4 ft/min, which includes the torch changeout time of 15 minutes for every 30 minutes of torch operation. The surfaces are cut into nominal 7.5 x 18-ft. segments for packaging in modified maritime containers.

Item 30, staging, is the time required to set up for and secure from the metal removal operation at a particular location. It includes installing scaffolding at the surface location and setting up the contamination control system. It also includes the time required to remove the contamination control system, take down the scaffolding and move to the next location. The times required to perform other operations (install the track-mounted torch system, attach lifting devices to surface section, make the cuts, and so on) are accounted for by metal removal algorithms within the CECP.

Items 31 and 32 are work difficulty factors: the height and respiratory protection adjustment factors, in percent. Workers are less efficient while working on scaffolding. The height adjustment factor is used to take this fact into account. The particular factor used here (10%) means that the crews work at 1/(1.1) = 91% of normal. Worker efficiency while working in respira-

tory equipment is set by Item 32. The value of 20% used here corresponds to an efficiency of 1/1.2 = 83%.

The remaining items in the metal removal category have the same meanings as those discussed in previous categories.

Concrete Cutting (Items 41-52)

All concrete walls and floors are assumed to be uncontaminated or to have been decontaminated before sawing operations begin. Thus, the costs of cutting uncontaminated concrete to provide access to other components are considered to be cascading costs. Although the concrete itself is considered to be uncontaminated, workers will still most likely be working in radiation areas. To allow for this, Item 50 may be used to specify an average area dose rate at reactor shutdown.

Material and labor costs for cutting uncontaminated concrete walls and floors are based on the cut measured in inch-feet (i.e., a cut 1 inch deep and 1 foot long equals 1 inch-foot). Specifying the number of inch-feet per cut is described in Section 4.4.1. The cutting rate is specified by Item 51, and saw blade costs by Item 52.

Item 42, staging, is the time required per location, in minutes, to install and remove scaffolding, to install and remove the track-mounted cutting system, and to install and remove the vacuum/water-spray dust control system. The meanings of the remaining items have been discussed previously.

Handrails (Items 53-65)

All contaminated handrails are assumed to be 2-inch-diameter carbon steel. One linear foot (LF) of handrail equals about 1/2 ft^2 of surface area. The decontamination rate, in LF/hr, is set by Item 53. Decontamination will be done manually using industrial wipes and Radiacwash™ (diluted 5:1). Fluid costs and fluid usage rates are set by Items 64 and 65. Costs and usage rates for the industrial wipes are set by Items 62 and 63. Note that the industrial wipe usage rate is expressed in units of square feet of wipe area per LF of handrail. Meanings for the remaining items have been discussed previously.

Steel Floor Gratings (Items 66-76)

It is assumed that contaminated steel floor grating (on stairs, platforms, and walkways) will be removed during decommissioning in essentially the same manner in which it was installed. Therefore, installation labor factors were used.[1]

The grating removal rate is set by Item 66. The weight of the grating, in lb/ft^2, is set by Item 76. The remaining items have their usual meanings.

Polar Cranes (Items 77-89) and Bridge Cranes (Items 90-102)

These items provide a means for specifying the removal of building cranes, which are complex, specialized jobs, requiring the assistance of a vendor. The number of polar cranes to be removed is specified by Item 77 and the number of bridge cranes by Item 90. The time required by vendor personnel to remove the cranes is set by Items 84 and 97. Vendor equipment costs are set by Items 86 and 99.

After the cranes have been removed, the decommissioning operations contractor (DOC) decontamination crew will begin work. The members of this crew are defined by Items 78-81 for polar cranes and Items 91-94 for bridge cranes. The times required for these crews to decontaminate the cranes are set by Items 85 and 98.

These cranes will be buried in special containers whose parameters may be set by Items 87-89 and 100-102.

Refueling Cranes (Items 103-114)

These cranes will be removed by DOC staff; no vendor assistance will be required. All items in this category have their previously defined meanings.

Spent Fuel Pool Water Treatment and Disposal (Items 115-118)

After the spent nuclear fuel inventory has been reduced to zero, the spent fuel pool (SFP) water must be treated before release, because all waste solutions are expected to contain measurable radioactivity. This specialized task is performed by a vendor whose costs may be defined by Item 115. The number of HICs required is specified by Item 116, and the number of days of

NuPac14/210H cask rental is specified by Item 117. Total duration in days is set by Item 118.

HVAC Ductwork (Items 119-130) and Containment Air Coolers (Items 131-142)

The HVAC systems are among the last items removed, because the HVAC systems need to be in service until essentially all the contaminated materials have been removed. It is assumed that the ductwork and equipment are only mildly contaminated, with very small dose rates associated with removal activities. This dose rate (which is the assumed dose rate at the time of removal, not adjusted from the reactor shutdown baseline) is set by Item 128 for ductwork and Item 139 for the air coolers.

The extent of the ductwork to be removed is specified by Item 129, LF of ductwork, and Item 130, the weight, in pounds, of the equipment associated with the ducts. The time to remove one LF of ductwork is specified by Item 123. The remaining ductwork items have their previously defined meanings.

Containment air cooler Items 131-139 have their previously defined meanings, and Items 140-142 are self-explanatory.

Removal of Contaminated Floor Drains (Items 143 - 161)

The removal operation for each drain consists of cutting out a concrete plug containing the drain. Each plug weighs about 550 pounds and has a volume of about 2.8 cubic feet, assuming the plug is 16 inches in diameter and the floor is two feet thick. The floor thickness can be set by Item 156. The time required to set up and remove each drain (**not** including the effects of the work difficulty adjustments and lost time adjustments, Items 145-149) is set by Item 144. The crew composition for this operation is set by Items 150-153. The weekly equipment rental costs for the two major pieces of equipment are set by Items 158 and 159. Bit replacement costs per inch of depth cut are set by Item 157. The remaining items are self-explanatory.

Removal of Asbestos (Item 162)

It is postulated that asbestos will be removed by an outside contractor at a total cost set by Item 162.

3.2.2 Entering Data, Saving Files, and Exiting

The data entry, file saving, and exiting procedures are precisely the same as for Sections 3.1.2, 3.1.3, and 3.1.4 and will not be repeated here.

3.3 MENU ITEM 3: UNIT COST FACTORS FOR CONTAMINATED SYSTEMS

This portion of the CECP allows you to enter data that the CECP uses to calculate unit cost factors for potentially contaminated plant systems. These data include crew sizes, work difficulty adjustments, non-productive time adjustments, material costs, and radiation dose rates.

The data entry screen is shown in Figure 3.4. The selector bar is shown positioned over Item 74. There are 172 items in all, with 21 visible at any one time.

```
MENU ITEM 3:  UNIT COST FACTORS FOR CONTAMINATED SYSTEMS
57 Tanks:  Suit-up and unsuit time (min)                120.000
58 Tanks:  Work break time (min)                         30.000
59 Tanks:  Number of laborers                             3.000
60 Tanks:  Number of crafts                               1.500
61 Tanks:  Number of crew leaders                         0.500
62 Tanks:  Number of rad monitors                         0.500
63 Lg Pump:  Duration (in minutes)                       90.000
64 Lg Pump:  Height adjustment (%)                       10.000
65 Lg Pump:  Respiratory prot. adjust. (%)               20.000
66 Lg Pump:  Rad/ALARA activities (min)                  25.000
67 Lg Pump:  Suit-up and unsuit time (min)              120.000
68 Lg Pump:  Work break time (min)                       30.000
69 Lg Pump:  Number of laborers                           2.000
70 Lg Pump:  Number of crafts                             1.000
71 Lg Pump:  Number of crew leaders                       0.500
72 Lg Pump:  Number of rad monitors                       0.500
73 Lg Pump:  Gases (hours)                                0.017
74 Sm Pump:  Duration (in minutes)                       40.000
75 Sm Pump:  Height adjustment (%)                        0.000
76 Sm Pump:  Respiratory prot. adjust. (%)               20.000
77 Sm Pump:  Rad/ALARA activities (min)                  25.000
             Number of records: 172  File in use: REACTOR1.PD
↑↓ Home End PgUp PgDn Select item  ↵ Enter Data  Save  Alt-X Quit
```

FIGURE 3.4. Data Entry Screen for Menu Item 3

3.3.1 Menu Item 3 Data Description

The data accessible from the Menu Item 3 input screen are shown Table 3.3. The data are grouped into fifteen categories of potentially contaminated system components:

1. Large Piping
2. Small Piping
3. Large Valves
4. Small Valves
5. Tanks
6. Large Pumps
7. Small Pumps
8. Large Heat Exchangers
9. Small Heat Exchangers
10. Large Electrical
11. Small Electrical
12. Large Miscellaneous
13. Small Miscellaneous
14. Large Pipe Hangers
15. Small Pipe Hangers

Within each category there are thirteen data items:

1. Duration (in minutes)
2. Height Adjustment (%)
3. Respiratory Prot. Adjust. (%)
4. Rad/ALARA Activities (min.)
5. Suit-up and Unsuit Time (min.)
6. Work Break Time (min.)
7. Number of Laborers
8. Number of Crafts
9. Number of Crew Leaders
10. Number of Rad Monitors
11. Absorbent Material (sq ft)
12. Plastic (sq ft)
13. Gases (hours)

Data Items 2 through 10 should be familiar from Section 3.2.1 and will not be discussed in detail again here. Item 1, Duration, is the time, in minutes, required for the crew (Items 7 through 10) to complete the removal operation, with no work difficulty adjustments (2,3) or nonproductive time factors (4,5,6) applied. In the case of tanks, staging includes only the equipment setup and removal times. The cutting times are a function of tank size and shape and are calculated by the CECP.

The quantity of consumable materials used during the removal operation is specified by items 11 through 13. Items 11 and 12 are required for piping and valves only; items 11 through 13 are not required for tanks. Note that the unit costs for items 11 through 13 are specified by the user in lines 15 through 17 of Menu Item 1.

TABLE 3.3. Menu Item 3 Data

1	Lg Pipe:	Duration (in minutes)	87.000
2	Lg Pipe:	Height adjustment (%)	10.000
3	Lg Pipe:	Respiratory prot. adjust. (%)	20.000
4	Lg Pipe:	Rad/ALARA activities (min)	25.000
5	Lg Pipe:	Suit-up and unsuit time (min)	120.000
6	Lg Pipe:	Work break time (min)	30.000
7	Lg Pipe:	Number of laborers	3.000
8	Lg Pipe:	Number of crafts	1.500
9	Lg Pipe:	Number of crew leaders	0.500
10	Lg Pipe:	Number of rad monitors	0.500
11	Lg Pipe:	Absorbent material (ft2)	15.000
12	Lg Pipe:	Plastic (ft2)	37.500
13	Lg Pipe:	Gases (hours)	0.033
14	Sm Pipe:	Duration (in minutes)	61.000
15	Sm Pipe:	Height adjustment (%)	10.000
16	Sm Pipe:	Respiratory prot. adjust. (%)	20.000
17	Sm Pipe:	Rad/ALARA activities (min)	25.000
18	Sm Pipe:	Suit-up and unsuit time (min)	120.000
19	Sm Pipe:	Work break time (min)	30.000
20	Sm Pipe:	Number of laborers	3.000
21	Sm Pipe:	Number of crafts	1.500
22	Sm Pipe:	Number of crew leaders	0.500
23	Sm Pipe:	Number of rad monitors	0.500
24	Sm Pipe:	Absorbent material (ft2)	10.000
25	Sm Pipe:	Plastic (ft2)	25.000
26	Sm Pipe:	Gases (hours)	0.017
27	Lg Valve:	Duration (in minutes)	87.000
28	Lg Valve:	Height adjustment (%)	10.000
29	Lg Valve:	Respiratory prot. adjust. (%)	20.000
30	Lg Valve:	Rad/ALARA activities (min)	25.000
31	Lg Valve:	Suit-up and unsuit time (min)	120.000
32	Lg Valve:	Work break time (min)	30.000
33	Lg Valve:	Number of laborers	3.000
34	Lg Valve:	Number of crafts	1.500
35	Lg Valve:	Number of crew leaders	0.500
36	Lg Valve:	Number of rad monitors	0.500
37	Lg Valve:	Absorbent material (ft2)	15.000
38	Lg Valve:	Plastic (ft2)	37.500
39	Lg Valve:	Gases (hours)	0.033
40	Sm Valve:	Duration (in minutes)	0.000
41	Sm Valve:	Height adjustment (%)	0.000
42	Sm Valve:	Respiratory prot. adjust. (%)	0.000
43	Sm Valve:	Rad/ALARA activities (min)	0.000
44	Sm Valve:	Suit-up and unsuit time (min)	0.000
45	Sm Valve:	Work break time (min)	0.000
46	Sm Valve:	Number of laborers	0.000
47	Sm Valve:	Number of crafts	0.000
48	Sm Valve:	Number of crew leaders	0.000
49	Sm Valve:	Number of rad monitors	0.000
50	Sm Valve:	Absorbent material (ft2)	0.000
51	Sm Valve:	Plastic (ft2)	0.000
52	Sm Valve:	Gases (hours)	0.000
53	Tanks:	Staging (in minutes)	90.000
54	Tanks:	Height adjustment (%)	10.000
55	Tanks:	Respiratory prot. adjust. (%)	20.000
56	Tanks:	Rad/ALARA activities (min)	25.000
57	Tanks:	Suit-up and unsuit time (min)	120.000

TABLE 3.3. (contd)

58 Tanks:	Work break time (min)	30.000
59 Tanks:	Number of laborers	3.000
60 Tanks:	Number of crafts	1.500
61 Tanks:	Number of crew leaders	0.500
62 Tanks:	Number of rad monitors	0.500
63 Lg Pump:	Duration (in minutes)	90.000
64 Lg Pump:	Height adjustment (%)	10.000
65 Lg Pump:	Respiratory prot. adjust. (%)	20.000
66 Lg Pump:	Rad/ALARA activities (min)	25.000
67 Lg Pump:	Suit-up and unsuit time (min)	120.000
68 Lg Pump:	Work break time (min)	30.000
69 Lg Pump:	Number of laborers	2.000
70 Lg Pump:	Number of crafts	1.000
71 Lg Pump:	Number of crew leaders	0.500
72 Lg Pump:	Number of rad monitors	0.500
73 Lg Pump:	Gases (hours)	0.017
74 Sm Pump:	Duration (in minutes)	40.000
75 Sm Pump:	Height adjustment (%)	0.000
76 Sm Pump:	Respiratory prot. adjust. (%)	20.000
77 Sm Pump:	Rad/ALARA activities (min)	25.000
78 Sm Pump:	Suit-up and unsuit time (min)	120.000
79 Sm Pump:	Work break time (min)	30.000
80 Sm Pump:	Number of laborers	2.000
81 Sm Pump:	Number of crafts	1.000
82 Sm Pump:	Number of crew leaders	0.500
83 Sm Pump:	Number of rad monitors	0.500
84 Sm Pump:	Gases (hours)	0.017
85 Lg HX:	Duration (in minutes)	90.000
86 Lg HX:	Height adjustment (%)	0.000
87 Lg HX:	Respiratory prot. adjust. (%)	20.000
88 Lg HX:	Rad/ALARA activities (min)	25.000
89 Lg HX:	Suit-up and unsuit time (min)	120.000
90 Lg HX:	Work break time (min)	30.000
91 Lg HX:	Number of laborers	2.000
92 Lg HX:	Number of crafts	1.000
93 Lg HX:	Number of crew leaders	0.500
94 Lg HX:	Number of rad monitors	0.500
95 Lg HX:	Gases (hours)	0.017
96 Sm HX:	Duration (in minutes)	40.000
97 Sm HX:	Height adjustment (%)	0.000
98 Sm HX:	Respiratory prot. adjust. (%)	20.000
99 Sm HX:	Rad/ALARA activities (min)	25.000
100 Sm HX:	Suit-up and unsuit time (min)	120.000
101 Sm HX:	Work break time (min)	30.000
102 Sm HX:	Number of laborers	2.000
103 Sm HX:	Number of crafts	1.000
104 Sm HX:	Number of crew leaders	0.500
105 Sm HX:	Number of rad monitors	0.500
106 Sm HX:	Gases (hours)	0.017
107 Lg Elec:	Duration (in minutes)	60.000
108 Lg Elec:	Height adjustment (%)	0.000
109 Lg Elec:	Respiratory prot. adjust. (%)	20.000
110 Lg Elec:	Rad/ALARA activities (min)	25.000
111 Lg Elec:	Suit-up and unsuit time (min)	120.000
112 Lg Elec:	Work break time (min)	30.000
113 Lg Elec:	Number of laborers	2.000

TABLE 3.3. (contd)

114 Lg Elec:	Number of crafts	1.000
115 Lg Elec:	Number of crew leaders	0.500
116 Lg Elec:	Number of rad monitors	0.500
117 Lg Elec:	Gases (hours)	0.017
118 Sm Elec:	Duration (in minutes)	40.000
119 Sm Elec:	Height adjustment (%)	0.000
120 Sm Elec:	Respiratory prot. adjust. (%)	20.000
121 Sm Elec:	Rad/ALARA activities (min)	25.000
122 Sm Elec:	Suit-up and unsuit time (min)	120.000
123 Sm Elec:	Work break time (min)	30.000
124 Sm Elec:	Number of laborers	2.000
125 Sm Elec:	Number of crafts	1.000
126 Sm Elec:	Number of crew leaders	0.500
127 Sm Elec:	Number of rad monitors	0.500
128 Sm Elec:	Gases (hours)	0.017
129 Lg Misc:	Duration (in minutes)	90.000
130 Lg Misc:	Height adjustment (%)	10.000
131 Lg Misc:	Respiratory prot. adjust. (%)	20.000
132 Lg Misc:	Rad/ALARA activities (min)	25.000
133 Lg Misc:	Suit-up and unsuit time (min)	120.000
134 Lg Misc:	Work break time (min)	30.000
135 Lg Misc:	Number of laborers	2.000
136 Lg Misc:	Number of crafts	1.000
137 Lg Misc:	Number of crew leaders	0.500
138 Lg Misc:	Number of rad monitors	0.500
139 Lg Misc:	Gases (hours)	0.017
140 Sm Misc:	Duration (in minutes)	40.000
141 Sm Misc:	Height adjustment (%)	0.000
142 Sm Misc:	Respiratory prot. adjust. (%)	20.000
143 Sm Misc:	Rad/ALARA activities (min)	25.000
144 Sm Misc:	Suit-up and unsuit time (min)	120.000
145 Sm Misc:	Work break time (min)	30.000
146 Sm Misc:	Number of laborers	2.000
147 Sm Misc:	Number of crafts	1.000
148 Sm Misc:	Number of crew leaders	0.500
149 Sm Misc:	Number of rad monitors	0.500
150 Sm Misc:	Gases (hours)	0.017
151 Lg Hanger:	Duration (in minutes)	60.000
152 Lg Hanger:	Height adjustment (%)	0.000
153 Lg Hanger:	Respiratory prot. adjust. (%)	20.000
154 Lg Hanger:	Rad/ALARA activities (min)	25.000
155 Lg Hanger:	Suit-up and unsuit time (min)	120.000
156 Lg Hanger:	Work break time (min)	30.000
157 Lg Hanger:	Number of laborers	3.000
158 Lg Hanger:	Number of crafts	1.500
159 Lg Hanger:	Number of crew leaders	0.500
160 Lg Hanger:	Number of rad monitors	0.500
161 Lg Hanger:	Gases (hours)	0.583
162 Sm Hanger:	Duration (in minutes)	20.000
163 Sm Hanger:	Height adjustment (%)	0.000
164 Sm Hanger:	Respiratory prot. adjust. (%)	20.000
165 Sm Hanger:	Rad/ALARA activities (min)	25.000
166 Sm Hanger:	Suit-up and unsuit time (min)	120.000
167 Sm Hanger:	Work break time (min)	30.000
168 Sm Hanger:	Number of laborers	3.000
169 Sm Hanger:	Number of crafts	1.500

TABLE 3.3. (contd)

170 Sm Hanger:	Number of crew leaders	0.500
171 Sm Hanger:	Number of rad monitors	0.500
172 Sm Hanger:	Gases (hours)	0.167

Note that the values for 40 through 52 (removal of small valves) are all zero. These zero values were used in the PWR decommissioning study because it was postulated that small valves would remain attached to the piping as the piping was removed.

3.3.2 Entering Data, Saving Files, and Exiting

The data entry, file saving, and exiting procedures are precisely the same as for Sections 3.1.2, 3.1.3, and 3.1.4 and will not be repeated here.

3.4 REFERENCES

1. Building Construction Cost Data. 1991. Robert Snow Means Company, Inc., Kingston, Massachusetts.

4.0 ENTERING SITE-SPECIFIC DATA AND CREATING OUTPUT FILES

Once the data described in Chapter 3 have been entered, you proceed to Menu Items A through I to complete the decommissioning costs for a specific reactor plant. This chapter describes in detail how this is done.

To illustrate the general process, consider this example. Suppose you want to do decommissioning costs for a project called **REACTOR1**. You would proceed as follows:

1. Make sure you have entered the data from Menu Items 1, 2, and 3 into **REACTOR1.PD**, as described in Chapter 3.

2. Enter data from Menu Items A, B, and C (in any order) into the same data file, **REACTOR1.PD**, as described in Sections 4.1, 4.2, and 4.3, below.

3. Enter data from Menu Items D, E, and F (in any order) into **REACTOR1.PD**. Because D, E, and F use the data you entered previously, this step must be performed after steps 1 and 2.

4. Enter the remaining data from Menu Items G and H (in either order) into **REACTOR1.PD** per Sections 4.7 and 4.8. This step is independent of step 3, but you must complete steps 1 and 2 before starting step 4.

5. Create **REACTOR1.PRI** per Section 4.9. This is the decommissioning summary report for the REACTOR1 case study. An example of this type of file (**TEST.PRI**) is shown in Appendix A.

The details of the above process are discussed in the following sections.

4.1 MENU ITEM A: SITE INFORMATION

From this portion of the CECP you define site characteristics such as site name, truck distances to the geologic repository (for GTCC waste) and low-level waste sites, and so on. When you select Menu Item A from the Main Menu, the file menu will prompt you for the data file to use. Once you have selected your data file (let's assume you picked **REACTOR1**), you will see a site information data entry screen, similar to the one shown in Figure 4.1.

Most of the terms shown on this screen should be self-explanatory. Line 2, "Area of Site (km^2)," is for information only; the CECP does not actually

use site area in any of its calculations. Distances in lines 5 through 9 are in miles. Line 10 allows you to select which low-level burial site to use. HANFORD and BARNWELL are the names of the low-level waste sites currently in operation. You may also select GENERIC if you want to use a hypothetical site. In Figure 4.1, Hanford has been chosen. This means, for example, that line 5 is the distance from "Reactor1" to Hanford and that line 8 is the distance from Hanford to the supplier. It is assumed there is only one geologic repository, and that it is located at Yucca Mountain, Nevada.

The "Supplier" refers to the supplier of transportation casks and HICs. (For simplicity, it is assumed that all casks and HICs are furnished by a single supplier.) Line 3, "Electrical Consumption at Shutdown (MW)," is the average electrical energy consumption rate for the site, in megawatts, at shutdown. Line 4, "Cost of Electricity ($/kWh)," is the cost, in dollars per kilowatt-hours, of the electrical energy consumed in Line 3.

MENU ITEM A: SITE INFORMATION

1	Reactor Site Name	TROJAN
2	Area of Site (km2)	4.7
3	Electrical Consumption at Shutdown (MW)	4
4	Cost of Electricity ($/kwh)	0.034
5	Distance from Reactor Site to Low-Level Burial Site (miles)	297
6	Distance from Reactor Site to Geologic Repository (miles)	907
7	Distance from Reactor Site to Supplier (miles)	2799
8	Distance from Low-Level Burial Site to Supplier (miles)	2674
9	Distance from Geologic Repository to Supplier (miles)	2070
10	Low-Level Burial Site Selected	HANFORD
11	Out-of-Compact Burial Fee Applies	NO

Using file REACTOR1.PD

↑↓ Position Bar ↵ Enter Data Save Alt-X Quit

FIGURE 4.1. Data Entry Screen for Menu Item A

4.1.1 Entering Data

To enter data, put the selector bar on the desired line with the ↑ or ↓ key, then press <Enter>. The portion of the bar over the data field will change color from white-on-blue to yellow-on-red and a cursor will appear, indicating that you may begin entering data. When typing in the data, you may use the <BackSpace>, <Del>, or the left and right arrow keys (←, →) as needed. The <Ins> key toggles between the insert and typeover modes. A beep indicates that you tried to enter an illegal character. When satisfied with your entry, press <Enter>; the data field will revert to its original blue-on-white color and the cursor will disappear. If you change your mind while entering data, press <Esc> and the previous value of that field will be restored.

As implied earlier, line 10 is a toggle. To enter data for this line, put the selector bar on the line and press <Enter> until the desired name (HANFORD, BARNWELL, or GENERIC) appears.

Entering data for line 1, **Site Name**, is a bit unusual. Put the selector bar on Item 1, and press <Enter>. The screen will change to the Site Selection Screen shown in Figure 4.2. Now use ↑, ↓, <PgUp>, <PgDn>, <Home>, and <End> to position the bar over the reactor name of your choice and press <Enter>. The screen will revert back to Figure 4.1, except that the site name and the truck distances from the reactor site to the repository and low-level waste site will have been changed to reflect the new site you have chosen. You must still enter your own values for lines 7, 8, and 9.

When in the Site Selection Screen, you may choose your own site name. To do this, press the space bar, enter the name when prompted, and press <Enter>. The screen will revert back to Figure 4.1, with your site name displayed. The other fields will show default values you can change as required.

4.1.2 Saving Data and Exiting

To save your site data, press <S>; the **Save Data to a File** window will open in the middle of the screen, and you will be prompted for a file name. Press <Esc> or <Enter> at this point, if you decide not to save your data. Otherwise, type in a file name up to eight letters long and press <Enter>.

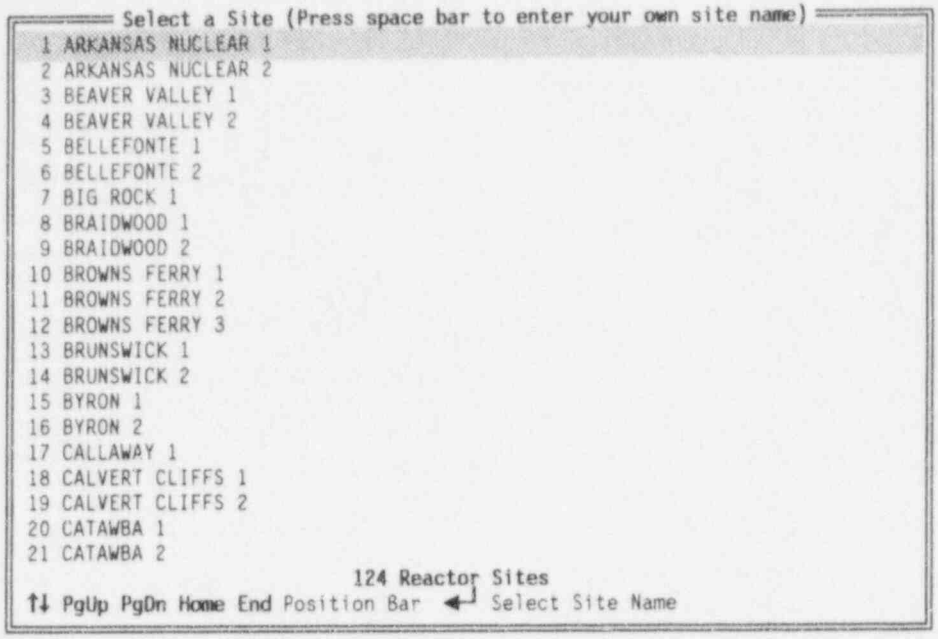

FIGURE 4.2. Site Selection Screen

If, for example, you enter **reactor1**, the CECP will update the data file **REACTOR1.PD**.

To exit this portion of the CECP, press <Alt-X>. The **Save Data to a File** window will open as described above, and you will be given a final opportunity to save your work, if you have not previously done so. If you elect not to save your work, press <Enter> or <Esc>, and you will be returned to the Main Menu. If you do save your work at this point, you will be returned to the Main Menu as soon as file processing is completed.

4.2 MENU ITEM B: DECOMMISSIONING SCHEDULES

From Menu Item B, you organize site decommissioning activities into schedules composed of up to five time periods. The data entry screen is shown in Figure 4.3.

4.2.1 Entering Data

When the data entry screen appears, you will be in the top part of the screen, and the selector bar will be positioned as shown in Figure 4.3. Each of the 5 lines in this part of the screen is composed of two fields: **Name of**

Period and **Duration (Years)**. To enter data, use the arrow keys (↑,↓,←,→) to move the selector bar over the desired field and press <Enter>. The bar will change color from white-on-blue to yellow-on-red and a cursor will appear, indicating that you may begin entering data. As you enter data, you may use the <Backspace>, <Del>, or the left and right arrow keys (←,→) as needed. The <Ins> key toggles between the insert and typeover modes. A beep indicates that you tried to enter an illegal character. When satisfied with your entry,

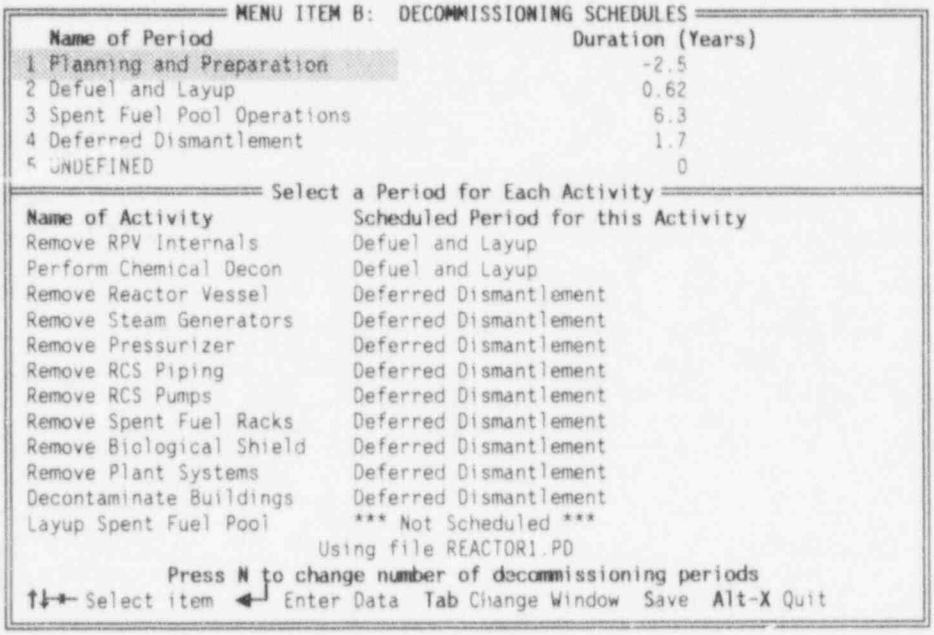

FIGURE 4.3. Data Entry Screen for Menu Item B

press <Enter>. The data field will revert to its original blue-on-white color and the cursor will disappear. If you change your mind while entering data, press <Esc> and the previous value of that field will be restored.

Period descriptions may be up to 30 characters long. The time duration field is in years and decimal fractions of years and is defined in relation to reactor shutdown, which occurs at year zero. Times before shutdown are negative, and all periods are to be entered chronologically. The first period in this example, "Planning and Preparation," has a duation of 2.5 years and since this period occurs before reactor shutdown, it is negative.

To specify the number of periods to be scheduled, press <N>. A window will open, requesting the number of periods. Enter a number from 1 to 5 and press <Enter>. If you specified, say, four periods, you will notice that period 5 on the top half of the screen is now labeled UNDEFINED, and you will be unable to access it. If you specified only two periods, then periods 3, 4, and 5 will be undefined and unaccessible.

Having defined the periods, you press <Tab> to enter the bottom half of the screen, **Select a Period for Each Activity**. While you are in this portion of the screen, the only editing keys you can use are ↑, ↓, and <Enter>. The arrow keys move you up and down the activity list and <Enter> cycles through the period descriptions you defined above. Thus, to assign steam generator removal to period 4, you would use ↑ or ↓ to put the bar opposite **Remove Steam Generators** and then press <Enter> until "Deferred Dismantlement" (the name you gave to period 4) appears. If you do not want to assign an activity to any period, just press <Enter> until ***** Not Scheduled ***** appears. This ensures that this activity will not appear in the summary tables (Section 4.9). You will also notice that it will not be possible to assign activities to undefined periods.

Notice that four periods are defined in Figure 4.3, but activities are scheduled only for periods 2 and 4. This is normal. Periods 1 and 3 still exist and there will be costs associated with them (e.g., Menu Item G), but no active decommissioning is taking place during these periods.

The last activity, **Layup Spent Fuel Pool**, applies only to decommissioning studies that use an extended safe storage period. If you schedule this activity, make sure it is scheduled to occur during the safe storage period. Scheduling this activity also causes the CECP to calculate an equipment repair allowance (Section 3.1.1, Item 47) for the safe storage period. Figure 4.4 shows the proper way to use a safe storage scenario.

4.2.2 Saving Data and Exiting

You may save data as you go along. Pressing <S> will open the **Save Data to a File** window in the middle of the screen, and you will be invited to save your data to a file. Press <Esc> or <Enter> at this point, if you decide not

to save your data. Otherwise, type in a file name up to eight letters long and press <Enter>. If, for example, you enter **reactor1**, the CECP will update the file **REACTOR1.PD**.

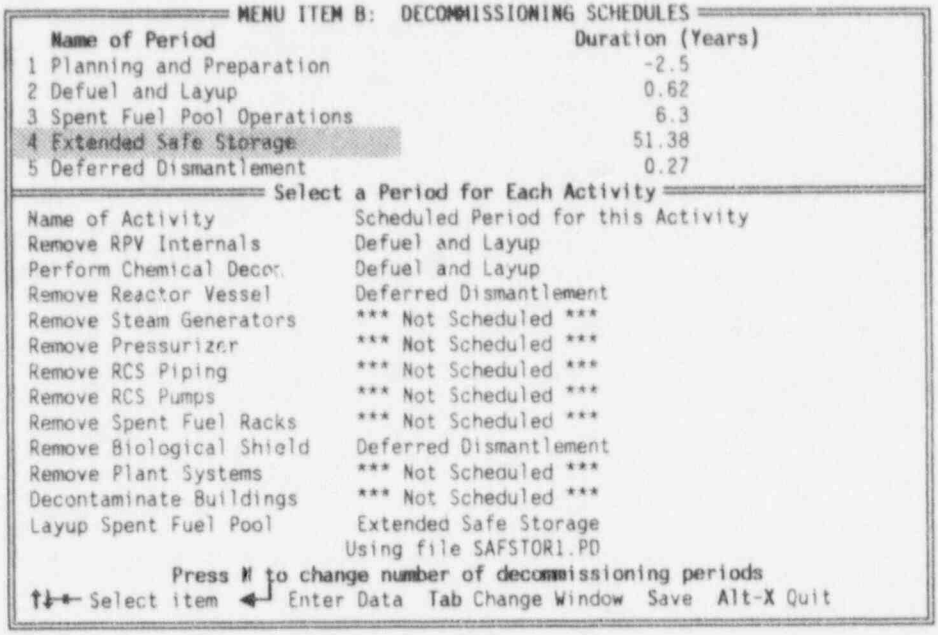

FIGURE 4.4. A Schedule Incorporating an Extended Safe Storage Period

To leave this portion of the CECP, press <Alt-X>. The **Save Data to a File** window will open as described above, and you will be given a final opportunity to save your work, if you have not previously done so. If you elect not to save your work, press <Enter> or <Esc> and you will be returned to the Main Menu. If you do save your work at this point, you will be returned to the Main Menu as soon as file processing is completed.

4.3 MENU ITEM C: SPECIAL EQUIPMENT COSTS

This portion of the CECP allows you to enter data about the specialized major equipment that must be available for decommissioning. Vendor and contract costs are not to be entered here. Menu Item C data are independent of all other data. Thus, the only requirement is that these data be entered sometime before running the Final Summary Report in Menu Item I.

When you select Menu Item C from the Main Menu, the file menu will prompt you for the data file to use. Once you have selected your file, the data entry screen, an example of which is shown in Figure 4.5, will appear.

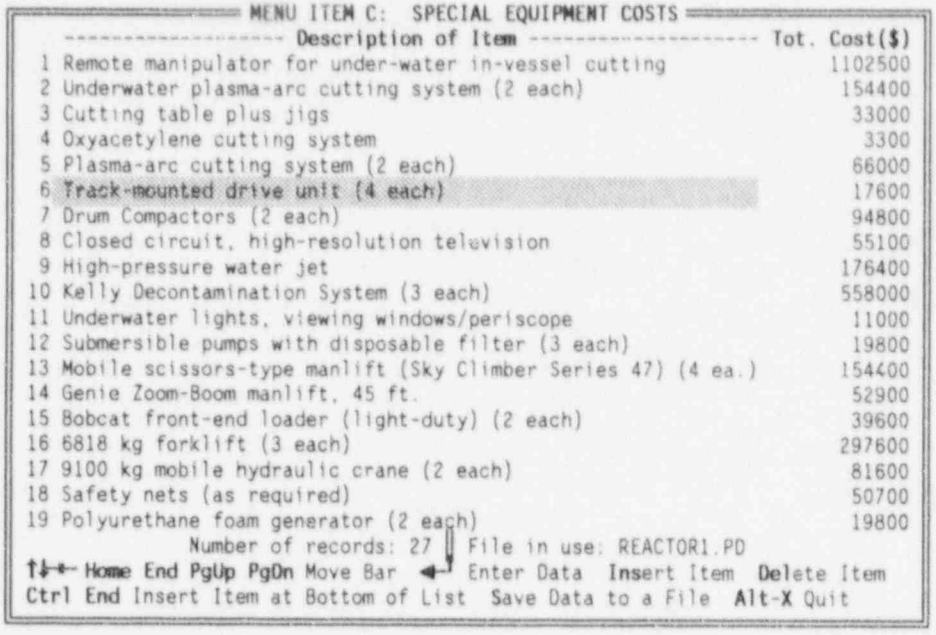

FIGURE 4.5. Data Entry Screen for Menu Item C

Figure 4.5 shows the first 19 of the 27 sample records that make up the **DEFAULT.PD** file. Each record consists of two fields: 1) a description of the piece of equipment and 2) its cost in dollars. You may enter up to 200 records to meet your specific needs.

4.3.1 Entering Data

To enter data, use the positioning keys (↑, ↓, →, ←, <PgUp>, <PgDn>, <Home>, and <End>) to put the blue selector bar over the item desired, and then type in the data. The ↑ and ↓ keys move the selector up and down one line at a time. The <PgUp> and <PgDn> keys move the selector up and down the list a screenful (18 lines) at a time; the <Home> and <End> keys move the selector to the top and bottom of the list. To move from one field to another on the same line, use the → and the ← keys.

With the selector bar positioned as desired, press <Enter>. The bar will change color from white-on-blue to yellow-on-red and a cursor will

appear, indicating that you may begin entering data. As you enter data, you may use the <Backspace>, <Del>, or the left and right arrow keys (←, →) as needed. The <Ins> key toggles between the insert and typeover modes. A beep indicates that you tried to enter an illegal character. When satisfied with your entry, press <Enter>; the data field will revert to its original blue-on-white color, and the cursor will disappear. If you change your mind while entering data, press <Esc> and the previous value of that field will be restored.

Adding and deleting records is straightforward. To add a record, place the selector bar anywhere on the line where you want the new record to go, then press <Ins>. As an example, suppose you want to add a new record at line 10. Placing the selector bar anywhere on line 10 and pressing <Ins> produces the result shown in Figure 4.6. Line 10 has been replaced by a new default data component, and the number of records has been updated to 28. At this point you replace the **No Name** equipment description with your own description, and then enter the cost information.

MENU ITEM C: SPECIAL EQUIPMENT COSTS

	Description of Item	Tot. Cost($)
1	Remote manipulator for under-water in-vessel cutting	1102500
2	Underwater plasma-arc cutting system (2 each)	154400
3	Cutting table plus jigs	33000
4	Oxyacetylene cutting system	3300
5	Plasma-arc cutting system (2 each)	66000
6	Track-mounted drive unit (4 each)	17600
7	Drum Compactors (2 each)	94800
8	Closed circuit, high-resolution television	55100
9	High-pressure water jet	176400
10	No Name	0
11	Kelly Decontamination System (3 each)	558000
12	Underwater lights, viewing windows/periscope	11000
13	Submersible pumps with disposable filter (3 each)	19800
14	Mobile scissors-type manlift (Sky Climber Series 47) (4 ea.)	154400
15	Genie Zoom-Boom manlift, 45 ft.	52900
16	Bobcat front-end loader (light-duty) (2 each)	39600
17	6818 kg forklift (3 each)	297600
18	9100 kg mobile hydraulic crane (2 each)	81600
19	Safety nets (as required)	50700

Number of records: 28 File in use: REACTOR1.PD

↑↓→← Home End PgUp PgDn Move Bar ↵ Enter Data Insert Item Delete Item
Ctrl End Insert Item at Bottom of List Save Data to a File Alt-X Quit

FIGURE 4.6. Data Entry Screen for Menu Item C: Adding a Record

Adding a record to the end of the list is slightly different. Place the selector bar on the last item in the list. (Pressing <End> will get you to the end of the list immediately.) Then press <Ctrl-End>. The new default item will appear at the end of the list. Update the record as described earlier.

To delete a record, put the selector bar on the desired line, and then press <Del>. A warning will appear, asking you to confirm the deletion. To proceed with the deletion, press <Y>. To cancel, press any other key.

4.3.2 Saving Data and Exiting

You may save data as you go along. Pressing <S> will open the **Save Data to a File** window in the middle of the screen, and you will be invited to save your data to a file. Press <Esc> or <Enter> at this point, if you decide not to save your data. Otherwise, type in a file name, up to 8 letters long, and press <Enter>. If, for example, you enter **reactor1**, the CECP will create the file **REACTOR1.PD**.

To leave this portion of the CECP, press <Alt-X>. The **Save Data to a File** window will open as described above, and you will be given a final opportunity to save your work, if you have not previously done so. If you elect not to save your work, press <Enter> or <Esc>, and you will be returned to the Main Menu. If you do save your work at this point, you will be returned to the Main Menu as soon as file processing is completed.

4.4 MENU ITEM D: BUILDING DECON COSTS

This part of the CECP allows you to specify, on a building-by-building basis, the concrete and metal surfaces that are to be washed (decontaminated) and the volumes of concrete and metal that are to be removed and subsequently buried. Handrails to be decontaminated and floor gratings to be removed may also be specified. Sometimes portions of walls, ceilings, or floors must be cut out to gain access to the regions beyond. These so-called cascading costs may also be specified in this section of the CECP.

The data entry screen for Menu Item D is shown in Figure 4.7. The first line of the screen shows the building to be decontaminated. The second line

consists of the field names for the components to be decontaminated or removed. The next 17 lines list the components themselves. (The selector bar is shown over the name of the first component.) The last line, just above the help menu, indicates the total number of building components and the file in use.

MENU ITEM D: BUILDING DECON COSTS

Building Name: Containment Bldg

	Component Description	Activity	L (ft)	W (ft)	Depth (in)	Orient
1	Inner Wall, Ceiling Washed	Conc Wash	263.72	263.72	N/A	Ceiling
2	SG Cavities Washed	Conc Wash	179.6	179.6	N/A	Wall
3	Press. Cavity, Inside Washed	Conc Wash	58	66	N/A	Wall
4	Press. Cavity, Outside Washed	Conc Wash	61	66	N/A	Wall
5	Press. Cavity, Top Washed	Conc Wash	17.41	17.41	N/A	Ceiling
6	Operating Floor Washed	Conc Wash	82.31	82.31	N/A	Floor
7	Bottom Floor Washed	Conc Wash	101.92	101.92	N/A	Floor
8	Bottom Floor Removed	Conc Rmvl	72.11	72.11	1	Floor
9	Refueling Cavity (Metal)	Mtl Wash	19	32	N/A	Floor
10	Refueling Cavity (Metal)	Mtl Wash	9	20	N/A	Floor
11	Refueling Cavity (Metal)	Mtl Wash	10.5	19	N/A	Wall
12	Refueling Cavity (Metal)	Mtl Wash	41	35	N/A	Wall
13	Refueling Cavity (Metal)	Mtl Wash	41	35	N/A	Wall
14	Refueling Cavity (Metal)	Mtl Wash	22	35	N/A	Wall
15	Refueling Cavity (Metal)	Mtl Wash	1.8	35	N/A	Wall
16	Refueling Cavity (Metal)	Mtl Rmvl	19	32	0.125	Floor
17	Refueling Cavity (Metal)	Mtl Rmvl	9	20	0.125	Floor

Number of components: 24 ‖ File in use: REACTOR1.PD

F1 F2 Select Building Change Building Name Ctrl F10 Delete Building

↑↓→← Home End PgUp PgDn Select Item ↵ Enter Data Insert Item

Ctrl End Insert Item at End Delete Item Save Data to a File Alt-X Quit

FIGURE 4.7. Data Entry Screen for Menu Item D

4.4.1 Component Definitions

Building decontamination data consist of components, and each component consists of six fields: Component Description, Activity, Length, Width, Depth, and Orientation. (See the line just above the first component in Figure 4.7). A data component is properly defined only when all six of these fields are provided with meaningful values. Each line of data on the screen represents one component. For example, the third line in Figure 4.7 describes a component having the following field values:

Field Name	Field Value
Component Description	**Press. Cavity, Inside Washed**
Activity	**Conc Wash** (i.e., concrete wash)
Length	58 (58 feet long)
Width	66 (66 feet wide)
Depth (in)	**N/A** (depth field not applicable)
Orientation	**Wall**

Each of these fields is discussed below. The actual process of entering the data is discussed later.

Component Description

This is the name of the component or region to be decontaminated or removed. You may enter any description you like, up to a maximum of 30 characters. While the description is completely arbitrary, you should try to make it be consistent with the activity name and orientation, as in the example above.

Activity

You may select from among the following activities: **Conc Wash** (concrete wash), **Conc Rmvl** (concrete removal), **Mtl Wash** (metal wash), **Mtl Rmvl** (metal removal), **Conc Cttg** (concrete cutting), **Handrails**, and **Gratings**. Note that handrails are decontaminated and not removed, and gratings are removed, not decontaminated.

Length, Width and Depth

In the case of concrete and metal removal, these three parameters define the area and depth of the material to be removed. For example, to specify the removal of a volume of concrete 4 feet long by 3 feet wide by 0.125 inch deep, you would enter 4 into the length field, 3 into the width field, and 0.125 into the depth field. Notice that the length and width fields are in feet and the depth field is in inches. If you know the surface area but not the individual length and width values, you can use the square root of the area for the length and width fields. The first entry shows an example of this: the known surface area of 69548 square feet is represented by length and width values of 263.72 feet.

In the cases of concrete and metal washing and gratings, only the length and width fields are defined. The depth field will be automatically marked **N/A**, and it will not be possible to enter a value in this field.

For concrete cutting, only the length and depth fields are defined (the width field is automatically marked **N/A**). Here, length refers to perimeter of the cut (in feet), and depth refers to the depth of the cut (in inches). For example, to specify the removal of a rectangular block 4 feet long by 3 feet wide from a concrete wall 12 inches thick, you would enter 14 in the **Length** field and 12 in the **Depth** field.

For handrails, only the **Length** of the rail is defined.

Orientation

Because decontaminating walls and ceilings is more time-consuming and costly than decontaminating floors, it is important that the orientation be specified for certain operations. The **Orient** field is used for this purpose. You may select **Floor**, **Wall**, **Ceiling**, or **Stairs**. Note that for gratings and handrails, the **Orient** field is not defined.

4.4.2 Entering Data

To enter data, use the positioning keys (↑, ↓, →, ←, <PgUp>, <PgDn>, <Home>, <End>) to put the blue selector bar over the item desired and then enter the data. The ↑ and ↓ keys move the selector up and down one line at a time. The <PgUp> and <PgDn> keys move the selector up and down the list a screenful (16 lines) at a time; the <Home> and <End> keys move the selector to the top and bottom of the list. To move from one field to another on the same line, use the → and the ← keys.

With the selector bar positioned as desired, press <Enter>. For all fields but the Activity and Orientation fields, the bar will change color from white-on-blue to yellow-on-red and a cursor will appear, indicating that you may begin entering data. As you enter data, you may use the <Backspace>, <Del>, or the left and right arrow keys (←, →) as needed. The <Ins> key toggles between the insert and typeover modes. A beep indicates that you tried to enter an illegal character. When satisfied with your entry, press

<Enter>; the data field will revert to its original blue-on-white color, and the cursor will disappear. If you change your mind while entering data, press <Esc>, and the previous value of that field will be restored.

For the case of the Activity and Orientation fields, you do not actually type in the data. Instead, you put the selector bar over the field and press <Enter> until the desired field name appears.

Adding and deleting components is straightforward. To add a component, place the selector bar anywhere on the line where you want the new component to go, then press <Ins>. As an example, suppose you want to add a new component at line 10. Placing the selector bar anywhere on line 10 and pressing <Ins> produces the result shown in Figure 4.8. Line 10 is now replaced by a new default data component. At this point, replace the **No Name** Component Description with your own description, and then enter your remaining data into the other fields.

MENU ITEM D: BUILDING DECON COSTS

Building Name: Containment Bldg

	Component Description	Activity	L (ft)	W (ft)	Depth (in)	Orient
1	Inner Wall, Ceiling Washed	Conc Wash	263.72	263.72	N/A	Ceiling
2	SG Cavities Washed	Conc Wash	179.6	179.6	N/A	Wall
3	Press. Cavity, Inside Washed	Conc Wash	58	66	N/A	Wall
4	Press. Cavity, Outside Washed	Conc Wash	61	66	N/A	Wall
5	Press. Cavity, Top Washed	Conc Wash	17.41	17.41	N/A	Ceiling
6	Operating Floor Washed	Conc Wash	82.31	82.31	N/A	Floor
7	Bottom Floor Washed	Conc Wash	101.92	101.92	N/A	Floor
8	Bottom Floor Removed	Conc Rmvl	72.11	72.11	1	Floor
9	Refueling Cavity (Metal)	Mtl Wash	19	32	N/A	Floor
10	No Name	Conc Wash	0	0	N/A	Wall
11	Refueling Cavity (Metal)	Mtl Wash	9	20	N/A	Floor
12	Refueling Cavity (Metal)	Mtl Wash	10.5	19	N/A	Wall
13	Refueling Cavity (Metal)	Mtl Wash	41	35	N/A	Wall
14	Refueling Cavity (Metal)	Mtl Wash	41	35	N/A	Wall
15	Refueling Cavity (Metal)	Mtl Wash	22	35	N/A	Wall
16	Refueling Cavity (Metal)	Mtl Wash	1.8	35	N/A	Wall
17	Refueling Cavity (Metal)	Mtl Rmvl	19	32	0.125	Floor

Number of components: 25 | File in use: REACTOR1.PD

F1 F2 Select Building Change Building Name Ctrl F10 Delete Building

↑↓→← Home End PgUp PgDn Select Item ↵ Enter Data Insert Item

Ctrl End Insert Item at End Delete Item Save Data to a File Alt-X Quit

FIGURE 4.8. Data Entry Screen for Menu Item D: Adding a Component

Adding a component to the end of the list is slightly different. Place the selector bar on the last item in the list. (Pressing <End> will get you to the end of the list immediately.) Then press <Ctrl-End>. The new default item will appear at the end of the list. Update the fields as described earlier; a total of 100 components may be entered.

An item is deleted by putting the selector bar on the desired line and then pressing <Del>. A warning will appear, asking you to confirm the deletion. To proceed with the deletion, press <Y>. To cancel, press any other key. So far, the discussion has been confined to a single building. To access other buildings, use <F1> and <F2>. Pressing <F1> moves you down the list of buildings; pressing <F2> moves you up. The CECP can accommodate up to 10 buildings. If data for a building is yet to be entered, the data screen will be essentially blank, as shown in Figure 4.9. For this discussion, assume that data have been entered for only three buildings. This means that Buildings 4 through 10 are undefined, and the names for these buildings are set to their default values: **Bldg 4**, **Bldg 5**, and so on.

To enter data for **Bldg 4** (Figure 4.9), press <N>. The building name field will change from blue-on-gray to yellow-on-red, and a cursor will appear. Type in the building name (up to 30 characters), using the edit keys as desired. Press <Enter> when done. You may now enter data for this building in the manner previously described.

To delete a building from the data base, press <Ctrl> <F10>. The CECP will then ask you to confirm the deletion by pressing the <Y> key. Pressing any other key will cancel the deletion. When a building is deleted, all data for that building will be deleted, the building name will be converted back to its original default value (**Bldg N**, where N is a number from 1 to 10), and the screen will once again resemble Figure 4.9.

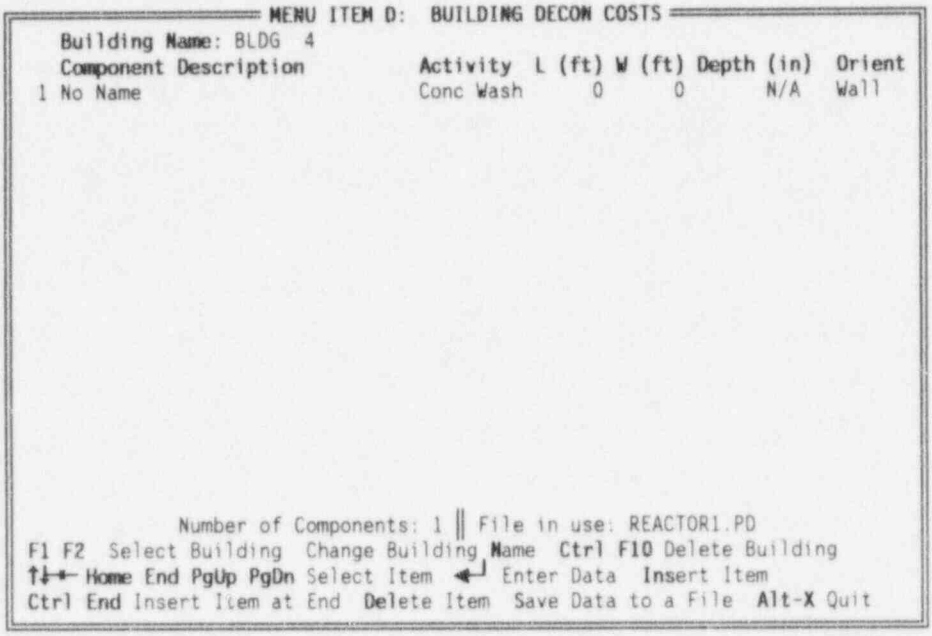

FIGURE 4.9. Data Entry Screen for Menu Item D: A Blank Screen

4.4.3 Data Files

To save your building decon data, press <S> to open the **Save Data to a File** window in the middle of the screen. You will be prompted for a file name. Press <Esc> or <Enter> if you decide not to save your data. Otherwise, type in a file name up to eight letters long and press <Enter>. If, for example, you enter **reactor1**, the CECP will update the **REACTOR1.PD** data file and create **REACTOR1.PRD**, a detailed report file in ASCII format which you can print out later at your convenience or examine with your editor or word processor.

4.4.4 Exiting

To leave the building decontamination portion of the CECP, press <Alt-X>. The **Save Data to a File** window will open as described above, and you will be given a final opportunity to save your work if you have not previously done so. If you elect not to save your work, or have previously done so, press <Enter> or <Esc>, and you will be returned to the Main Menu. If you do save your work at this point, you will be returned to the Main Menu as soon as file processing is completed.

4.5 MENU ITEM E: CONTAMINATED SYSTEMS COSTS

This menu item lets you enter data pertaining to contaminated or potentially contaminated process system components and piping components that must be removed for decommissioning work. This portion of the CECP is similar to Menu Item D except that data entry is performed on two screens. File creation is also similar to Menu Item D: the user creates or updates the data (**PD**) file, and the CECP creates the result file (**PRE**).

The double-wide data-entry screen is shown in Figure 4.10. The top part of Figure 4.10 shows the left side of the data screen; the bottom part shows the right half. (Accessing the left and right sides of the screen is explained in section 4.5.2.) The first line on both halves of this screen shows the contaminated system. The second line consists of the field names for the system components. The next fifteen lines list the components themselves. (The selector bar is shown over the name of the first system component.) The last line, just above the help menu, indicates the total number of components in the system and the file in use.

MENU ITEM E: CONTAMINATED SYSTEMS COSTS

System Name: Clean Radioactive Waste Treatment System

	Component Description	Category	Disposal	Quantity*
1	Reactor Coolant Drain Tank	Tank	Sea-Van	1
2	Reactor Coolant Drain Pump	Lg Pump	Sea-Van	2
3	Reactor Coolant Drain Filter	Tank	Mtl Box	1
4	Spent Resin Storage Tank	Tank	Sea-Van	1
5	Clean Waste Recv. Tank	Tank	Sea-Van	2
6	Clean Waste Recv. Pump	Lg Pump	Sea-Van	2
7	Treated Waste Mon. Tank	Tank	Sea-Van 0	2
8	Treated Waste Mon. Pump	Lg Pump	Sea-Van	2
9	Aux Building Drain Tank	Tank	Sea-Van	1
10	Aux Building Drain Pump	Lg Pump	Sea-Van	2
11	Chemical Waste Drain Tank	Tank	Sea-Van	1
12	Chemical Waste Drain Pump	Lg Pump	Sea-Van	2
13	Waste Conc. Hold. Tank	Tank	Sea-Van	1
14	Waste Conc. Hold. Pump	Lg Pump	Sea-Van	1
15	Clean Waste Filter	Tank	Mtl Box	1

*NOTE: For piping, Quantity refers to feet of piping. For other categories, Quantity refers to the number of items of equipment.

Number of records: 19 | File in use: REACTOR1.PD

F1 F2 Select System Change System Name Ctrl F10 Delete System

↑↓←→ Home End PgUp PgDn Select Item ↵ Enter Data Insert Item

Ctrl End Insert Item at End Delete Item Save Data to a File Alt-X Quit

MENU ITEM E: CONTAMINATED SYSTEMS COSTS

System Name: Clean Radioactive Waste Treatment System

	Volume (ft3)	Weight (lb)	Diameter*	Length*	Millirem/Hr
1	N/A	1670	3	8	100
2	8	500	1	0.167	100
3	N/A	350	1.3	4.7	100
4	N/A	6800	9	11	100
5	N/A	10958	10	30	100
6	8	500	1	0.167	100
7	N/A	11200	10	26	100
8	3	230	1	0.167	100
9	N/A	2090	6	9	50
10	12	1300	1	0.167	50
11	N/A	5400	10	15	50
12	3	200	1	0.167	50
13	N/A	2090	6	10	1000
14	3	230	1	0.167	1000
15	N/A	67	0.6	2.2	100

*NOTE: Diameters and lengths of valves and diameters of piping are in inches. Diameters and lengths of other equipment (if applicable) are in feet.

Number of records: 19 | File in use: REACTOR1.PD

F1 F2 Select System Change System Name Ctrl F10 Delete System

↑↓←→ Home End PgUp PgDn Select Item ↵ Enter Data Insert Item

Ctrl End Insert Item at End Delete Item Save Data to a File Alt-X Quit

FIGURE 4.10. Left and Right Halves of the Data Entry Screen for Menu Item E

4.5.1 Component Definitions

Contaminated system data consist of components. Each component has nine fields, the first four appearing on the left screen, the remainder on the right. The nine fields are Component Description, Category, Disposal, Quantity, Volume, Weight, Diameter, Height, and Dose Rate. A data component is properly defined only when all nine of these fields are provided with meaningful values. Each line of data on these screens represents one component. For example, line 4 of Figure 4.10 describes a component having the following field values:

Field Name	Field Value
Component Description	**Spent Resin Storage Tank**
Category	**Tank**
Disposal	**Sea-Van** (A modified maritime container)
Quantity	**1**
Volume	**N/A** (Volume not required for tanks)
Weight	**6800** (6800 pounds)
Diameter	**9** (9 feet in diameter)
Height	**11** (11 feet heigh)
Dose Rate	**100** (100 millirem/hr at shutdown)

Each of these fields is described below. Procedures for entering data are discussed later.

Component Description

This is the name of the contaminated system component that is to be removed. You may enter any description you like, up to a maximum of 42 characters. The description is arbitrary, but you should try to make it consistent with the category name, as in the example above.

Category

You may select from among the following categories:

1. **Lg Pipe** (piping diameter greater than 3 inches)
2. **Sm Pipe** (piping diameter 3 inches or less)
3. **Lg Valve** (valves greater than 3 inches)
4. **Sm Valve** (valves 3 inches or smaller)
5. **Tank**
6. **Lg Pump** (pumps greater than 100 pounds)

7. **Sm Pump** (pumps 100 pounds or less)
8. **Lg HX** (Heat exchangers greater than 100 pounds)
9. **Sm HX** (Heat exchangers 100 pounds or less)
10. **Lg Elec.** (electrical components greater than 100 pounds)
11. **Sm Elec.** (electrical components 100 pounds or less)
12. **Lg Misc.** (miscellaneous equipment greater than 100 pounds)
13. **Sm Misc.** (miscellaneous equipment less than 100 pounds)
14. **Lg Hngr.** (large piping hanger, for pipes greater than 4 inches in diameter)
15. **Sm Hngr.** (small piping hanger, for pipes 4 inches or less in diameter.)

Disposal

Disposal refers to the disposal container to be used and whether the shipment is contaminated. If you want the components to be shipped by B-25 metal container, use **Mtl Box** for contaminated shipments or **Mtl Box 0** for uncontaminated shipments. The B-25 container is 4 feet wide, 4 feet high, and 6 feet long, but you can specify different dimensions, as discussed in Section 3.1.1. To ship components by modified maritime container, use **Sea-Van** for contaminated shipments or **Sea-Van 0** for uncontaminated shipments. The maritime container is 8 feet wide, 4 feet high, and 20 feet long.

Quantity

Quantity is simply the number of items to be disposed of. But in the case of piping, quantity is the number of feet.

Volume

This is the volume, in cubic feet, of **each** item listed under quantity. That is, (quantity x volume) is the total volume of the components. In the case of piping, volume is the volume (in cubic feet) of one linear foot of piping. This field is marked **N/A** for tanks, because most tanks will be cut up for disposal, and the CECP will calculate effective tank volumes for you. The volume field for hangers is **N/A** also, since the CECP will calculate hanger volume based on the hanger size you specifiy in the diameter field.

Weight

This is the weight, in pounds, of **each** item listed under quantity. Thus (quantity x weight) is the total weight of the components. For piping, weight is the weight (in pounds) of one linear foot of piping. For hangers, the

weight field is **N/A** because the CECP will calculate hanger weight for you based on the hanger diameter specified in the diameter field.

Diameter and Length

For valves, piping, and hangers, units are in inches. But note that piping length is specified under Quantity, above. For hangers, length is **N/A**. For other equipment, units are in feet.

Millirem/Hr

This is the average dose rate, in millirem/hour, that the removal crew will be subjected to while removing that component, assuming work is done immediately after shutdown.

4.5.2 Entering Data

To enter data, use the positioning keys (↑, ↓, →, ←, <PgUp>, <PgDn>, <Home>, and <End>) to put the blue selector bar over the item desired and then type in the data. The ↑ and ↓ keys move the selector up and down one line at a time. The <PgUp> and <PgDn> keys move the selector up and down the list a screenful (14 lines) at a time; the <Home> and <End> keys move the selector to the top and bottom of the list. To move from one field to another on the same line, use the → and the ← keys. Pressing → when the selector is over the Quantity field will cause the display to shift to the right half of the screen, allowing access to the Volume, Weight, Diameter, Height, and Dose Rate fields. Similarly, pressing ← when the selector is over the Volume field will shift the display back to the left half of the screen.

When the selector bar is positioned as desired, press <Enter>. For all fields but Category and Disposal, the bar will change color from white-on-blue to yellow-on-red, and a cursor will appear. This indicates that you may begin entering data. When typing in the data, you may use the <BackSpace>, <Del>, or left and right arrow keys (←, →) as needed. The <Ins> key toggles between the insert and typeover modes. A beep indicates that you tried to enter an illegal character. When satisfied with your entry, press <Enter>; the data field will revert to its original blue-on-white color, and the cursor will

disappear. If you change your mind while entering data, press <Esc>; the previous value of that field will be restored.

For the case of the Category and Disposal fields, you do not actually type in the data. Instead, put the selector bar over the field and press <Enter> until the desired field name appears.

Adding and deleting system components are done in the same manner as described in Section 4.4.2 and will not be repeated here.

4.5.3 Saving Files and Exiting

Files are saved as described in Section 4.4.3, except that the result file is given a **PRE** extension. Thus, if you save the file with the name **REACTOR1**, a **REACTOR1.PRE** file is created. This file is a detailed report file listing the contaminated system items removed and their associated transportation and burial costs. Occupational radiation doses are also given. This file is discussed in greater detail in Chapter 7. In addition to this file, the CECP will update the **REACTOR1.PD** data file. You exit this portion of the CECP and return to the Main Menu as described in Section 3.1.4.

4.6 MENU ITEM F: NUCLEAR STEAM SUPPLY SYSTEM (NSSS) COSTS

Menu Item F is used for entering data pertaining to large NSSS components that must be decontaminated or removed as part of the decommissioning process. Figure 4.11 shows the input screen for Menu Item F. The general screen layout should be familiar from previous discussions and will not be discussed further.

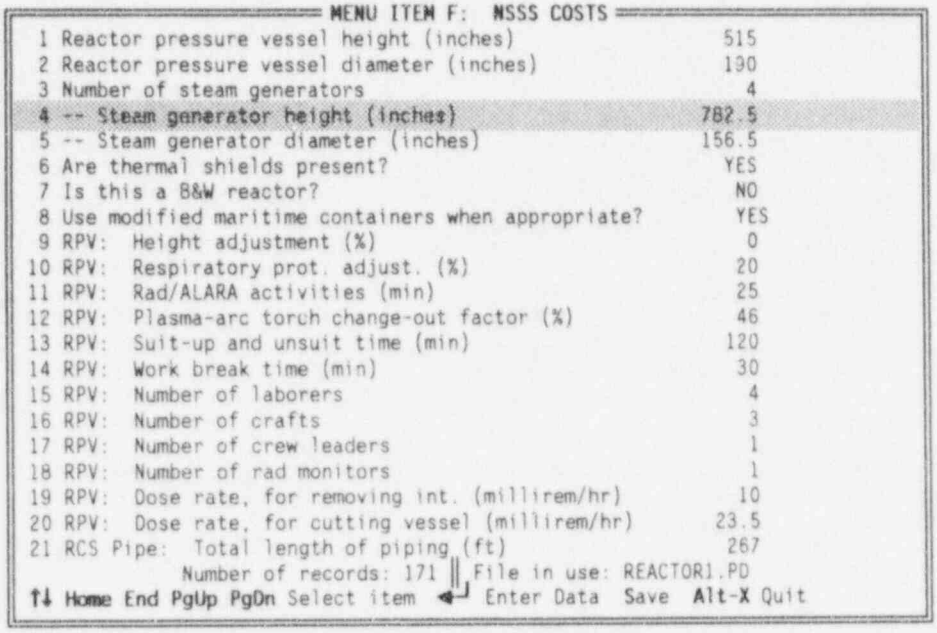

FIGURE 4.11. Data Entry Screen for Menu Item F

4.6.1 Menu Item F Data Description

The data available from the input screen are shown in Table 4.1. There are 13 categories of NSSS system components:

General Data (Items 1-8)
Reactor Pressure Vessel (9-20)
Reactor Coolant System (RCS) Piping (21-37)
Large Miscellaneous Piping (38-54)
Small Miscellaneous Piping (55-71)
RCS Insulation (72-73)
Pressurizer (74-95)
Reactor Coolant System Pumps (96-115)
Fuel Racks (116-119)
Biological Shield (120-150)
Steam Generator (151-160)
Chemical Decontamination of RCS (161-167)
Boron Disposal (168-171)

An explanation of each item in the file follows Table 4.1.

TABLE 4.1. Menu Item F Data

1	Reactor pressure vessel height (inches)	515.000
2	Reactor pressure vessel diameter (inches)	190.000
3	Number of steam generators	4.000
4	-- Steam generator height (inches)	782.500
5	-- Steam generator diameter (inches)	156.500
6	Are thermal shields present?	YES
7	Is this a B&W reactor?	NO
8	Use modified maritime containers when appropriate?	YES
9	RPV: Height adjustment (%)	0.000
10	RPV: Respiratory prot. adjust. (%)	20.000
11	RPV: Rad/ALARA activities (min)	25.000
12	RPV: Plasma-arc torch change-out factor (%)	46.000
13	RPV: Suit-up and unsuit time (min)	120.000
14	RPV: Work break time (min)	30.000
15	RPV: Number of laborers	4.000
16	RPV: Number of crafts	3.000
17	RPV: Number of crew leaders	1.000
18	RPV: Number of rad monitors	1.000
19	RPV: Dose rate, for removing int. (millirem/hr)	10.000
20	RPV: Dose rate, for cutting vessel (millirem/hr)	23.500
21	RCS Pipe: Total length of piping (ft)	267.000
22	RCS Pipe: Total weight of piping (lb)	226070.000
23	RCS Pipe: Total volume of piping (ft3)	1758.000
24	RCS Pipe: Rmvl. time (in minutes)	190.000
25	RCS Pipe: Height adjustment (%)	10.000
26	RCS Pipe: Respiratory prot. adjust. (%)	20.000
27	RCS Pipe: Rad/ALARA activities (min)	25.000
28	RCS Pipe: Suit-up and unsuit time (min)	120.000
29	RCS Pipe: Work break time (min)	30.000
30	RCS Pipe: Number of laborers	3.000
31	RCS Pipe: Number of crafts	1.500
32	RCS Pipe: Number of crew leaders	0.500
33	RCS Pipe: Number of rad monitors	0.500
34	RCS Pipe: Absorbent material (ft2)	20.000
35	RCS Pipe: Plastic (ft2)	50.000
36	RCS Pipe: Gases (hours)	0.330
37	RCS Pipe: Dose rate (millirem/hr)	300.000
38	Lg Pipe: Total length of piping (ft)	600.000
39	Lg Pipe: Total weight of piping (lb)	28270.000
40	Lg Pipe: Total volume of piping (ft3)	306.000
41	Lg Pipe: Rmvl. time (in minutes)	87.000
42	Lg Pipe: Height adjustment (%)	10.000
43	Lg Pipe: Respiratory prot. adjust (%)	20.000
44	Lg Pipe: Rad/ALARA activities (min)	25.000
45	Lg Pipe: Suit-up and unsuit time (min)	120.000
46	Lg Pipe: Work break adjustment time (min)	30.000
47	Lg Pipe: Number of laborers	3.000
48	Lg Pipe: Number of crafts	1.500
49	Lg Pipe: Number of crew leaders	0.500
50	Lg Pipe: Number of rad monitors	0.500
51	Lg Pipe: Absorbent material (ft2)	15.000
52	Lg Pipe: Plastic (ft2)	37.500
53	Lg Pipe: Gases (hours)	0.033
54	Lg Pipe: Dose rate (millirem/hr)	300.000
55	Sm Pipe: Total length of piping (ft)	1600.000
56	Sm Pipe: Total weight of piping (lb)	3140.000
57	Sm Pipe: Total volume of piping (ft3)	34.000

TABLE 4.1. Menu Item F Data (contd)

58	Sm Pipe: Rmvl. time (in minutes)	61.000
59	Sm Pipe: Height adjustment (%)	10.000
60	Sm Pipe: Respiratory prot. adjust. (%)	20.000
61	Sm Pipe: Rad/ALARA activities (min)	25.000
62	Sm Pipe: Suit-up and unsuit time (min)	120.000
63	Sm Pipe: Work break time (min)	30.000
64	Sm Pipe: Number of laborers	3.000
65	Sm Pipe: Number of crafts	1.500
66	Sm Pipe: Number of crew leaders	0.500
67	Sm Pipe: Number of rad monitors	0.500
68	Sm Pipe: Absorbent material (ft2)	10.000
69	Sm Pipe: Plastic (ft2)	25.000
70	Sm Pipe: Gases (hours)	0.017
71	Sm Pipe: Dose rate (millirem/hr)	300.000
72	RCS Insulation Volume (ft3)	5120.000
73	RCS Insulation Weight (lb)	3200.000
74	Pressurizer: Weight (lb)	195500.000
75	Pressurizer: Volume (ft3)	2440.000
76	Pressurizer: Rmvl. time (in minutes)	480.000
77	Pressurizer: Height adjustment (%)	10.000
78	Pressurizer: Respiratory prot. adj. (%)	20.000
79	Pressurizer: Rad/ALARA activities (min.)	25.000
80	Pressurizer: Suit-up and unsuit time (min)	120.000
81	Pressurizer: Work break time (min)	30.000
82	Pressurizer: Number of laborers	3.000
83	Pressurizer: Number of crafts	1.500
84	Pressurizer: Number of crew leaders	0.500
85	Pressurizer: Number of rad monitors	0.500
86	Pressurizer: Absorbent material (ft2)	200.000
87	Pressurizer: Plastic (ft2)	500.000
88	Pressurizer: Gases (hours)	0.330
89	Pressurizer: Dose rate (millirem/hr)	300.000
90	Pressurizer: Transport cradle ($)	5000.000
91	Pressurizer: Barge/rail transport ($)	23075.520
92	Pressurizer: Unloading/misc. trans. ($)	149218.200
93	Pressurizer: Relief tank diameter (ft)	10.700
94	Pressurizer: Relief tank height (ft)	27.000
95	Pressurizer: Relief tank weight (lb)	27200.000
96	RCS Pumps: Number of pumps	4.000
97	RCS Pumps: Total weight all pumps (lb)	762400.000
98	RCS Pumps: Total volume (ft3)	4200.000
99	RCS Pumps: Rmvl. time (1 pump, minutes)	480.000
100	RCS Pumps: Height adjustment (%)	10.000
101	RCS Pumps: Respiratory prot. adj. (%)	20.000
102	RCS Pumps: Rad/ALARA activities (min)	25.000
103	RCS Pumps: Suit-up and unsuit time (min)	120.000
104	RCS Pumps: Work break time (min)	30.000
105	RCS Pumps: Number of laborers	3.000
106	RCS Pumps: Number of crafts	1.500
107	RCS Pumps: Number of crew leaders	0.500
108	RCS Pumps: Number of rad monitors	0.500
109	RCS Pumps: Absorbent material (ft2)	200.000
110	RCS Pumps: Plastic (ft2)	500.000
111	RCS Pumps: Gases (hours)	0.330
112	RCS Pumps: Dose rate (millirem/hr)	300.000
113	RCS Pumps: One shipping cradle ($)	5000.000
114	RCS Pumps: Barge/rail transport ($/pump)	23075.520
115	RCS Pumps: Unloading/misc. trans. ($/pump)	149218.200

TABLE 4.1. Menu Item F Data (contd)

116	Fuel Racks:	Number of fuel assemblies	1408.000
117	Fuel Racks:	Special container, ea ($)	5273.000
118	Fuel Racks:	Removal contract ($)	661500.000
119	Fuel Racks:	Dose rate (millirem/hr)	1.000
120	Biol Shld:	Height of shield to be removed (ft)	21.000
121	Biol Shld:	Inside diameter of shield (ft)	20.000
122	Biol Shld:	Outside diameter of shield (ft)	28.000
123	Biol Shld:	Initial equipment set up (minutes)	120.000
124	Biol Shld:	Install equipment (minutes/layer)	60.000
125	Biol Shld:	Ins. mats/start fog spray (min/blast)	30.000
126	Biol Shld:	Evac. area/ignite charges (min/blast)	15.000
127	Biol Shld:	Rmv. mats/stop fog spray (min/blast)	30.000
128	Biol Shld:	Remove rubble (minutes/blast)	120.000
129	Biol Shld:	Final cleanup and survey (minutes)	240.000
130	Biol Shld:	Drill 1 hole (minutes)	10.000
131	Biol Shld:	Place charge in 1 hole (minutes)	5.000
132	Biol Shld:	Verify 1 charge has detonated (min)	1.000
133	Biol Shld:	Cut 1 piece of re-bar w/torch (min)	2.000
134	Biol Shld:	Number of crew leaders	1.000
135	Biol Shld:	Number of laborers	2.000
136	Biol Shld:	Number of skilled workers	2.000
137	Biol Shld:	Number of explosive demolition experts	1.000
138	Biol Shld:	Number of rad monitors	0.500
139	Biol Shld:	Height adjustment (%)	10.000
140	Biol Shld:	Respiratory prot. adj. (%)	20.000
141	Biol Shld:	Rad/ALARA activities (min)	25.000
142	Biol Shld:	Suit-up and unsuit time (min)	120.000
143	Biol Shld:	Work break time (min)	30.000
144	Biol Shld:	Crew dose rate (millirem/hr)	50.000
145	Biol Shld:	Blasting mats ($/day)	22.000
146	Biol Shld:	Blasting caps ($ each)	1.790
147	Biol Shld:	Explosives ($/lb)	1.330
148	Biol Shld:	Track drill bits ($ each)	165.600
149	Biol Shld:	Air compressor, 750 CFM ($/month)	2575.000
150	Biol Shld:	Fog spray system nozzles ($ each)	139.090
151	Steam Gen:	Use items 152 - 160? (See user guide)	1.000
152	Steam Gen:	Decontamination costs per SG ($)	267677.750
153	Steam Gen:	Removal costs per SG ($)	1291258.000
154	Steam Gen:	Packaging costs per SG ($)	109340.750
155	Steam Gen:	Transportation costs per SG ($)	393766.800
156	Steam Gen:	Average shutdown curie content per SG	273.000
157	Steam Gen:	Ave. shutdown dose rate per SG (R/hr)	3.000
158	Steam Gen:	Person-rem at shutdown	149.084
159	Steam Gen:	Cascading costs ($) (See user guide)	141736.000
160	Steam Gen:	Undistributed costs ($) (See guide)	208885.000
161	Chem Decon:	Subcontractor costs ($)	13250000.000
162	Chem Decon:	Energy costs ($)	238000.000
163	Chem Decon:	Time required to perform decon (days)	135.000
164	Chem Decon:	Person-hours	8448.000
165	Chem Decon:	Estimated dose (person-rem)	45.700
166	Chem Decon:	Num of HICs req'd for chem decon	18.000
167	Chem Decon:	Num of HICs req'd for spent IX resin	5.000
168	Boron Disp:	Volume of boric acid solution (gal)	179100.000
169	Boron Disp:	Vendor disposal cost ($/gal)	6.000
170	Boron Disp:	Days required to pelletize above soln	164.000
171	Boron Disp:	Fuel Oil Energy Costs ($)	64900.000

1-6: Self-explanatory.

7: A Babcock and Wilcox (B&W) reactor has three steam generator nozzles per steam generator; other reactors have two.

8: Answering this item with a **NO** will cause the CECP to use B-25 containers for the disposal of all NSSS piping and insulation and the pressurizer relief tank. If this item is marked **YES**, the modified maritime container will be used for these components. It is strongly recommended that the you always answer this item **YES**.

9-11: Defined in Section 3.2.1.

12: This is a work difficulty factor based on the failure rate and changeout time for a plasma-arc cutting torch. This factor lengthens the time required to cut up the RPV internals. A factor of 46%, for example, means that, due to torch failures, the cutting time is increased by 46%. This work difficulty factor is applied only to cutting up the reactor internals.

13-18: Defined in Section 3.2.1.

19-20: Cutting the RPV internals will be done underwater by manipulators. Cutting the RPV vessel will be done at a later time, in air. Items 19 and 20 allow you to specify the dose rates, at reactor shutdown, for these two operations.

21-23: Self-explanatory.

24: The time in minutes associated with setting up all equipment and decontamination controls, making one circumferential cut, and then removing all equipment and moving on to the next cut location. This does not take into account any work difficulty factors or nonproductive time adjustments (Items 25-29).

25-37: Defined in Section 3.2.1.

38-71: These items have the same meanings as the corresponding ones in the RCS category (21-37).

72-73: This is the insulation removed from the various RCS components.

74-89: Items 74 and 75 are self-explanatory. Items 76-89 have their usual meanings. As always, the removal time (76) does not include the work difficulty factors (77-78) or nonproductive time factors (79-81).

90: The cost of the pressurizer shipping cradle, a modified steam generator cradle.

91: The cost of transporting the pressurizer by barge or rail.

92: The cost of removing the pressurizer from the barge or rail and then transporting it to the low-level burial site.

93-95: Self-explanatory.

96-115: These terms are either self-explanatory or have the same meanings as the corresponding ones for pressurizer removal.

116-119: The fuel racks will be removed by a contractor at the cost specified by Item 118. This contract cost does not include transportation or burial charges.

Based on the number of assemblies specified by Item 116, the CECP will estimate the number of special containers (117) that will be required to transport the fuel racks to the burial site. Item 119 is the average dose rate, in millirem/hour, above and at the edge of the SFP at the time the work is performed.

120-150: The activated portion of the reactor biological shield must be removed from the containment building by controlled drilling and blasting. The concrete bioshield is in the shape of a hollow cylinder, which will be removed in layers. Each layer consists of several concentric rings (the exact number of rings and layers is determined by the CECP, based on the values given in items 120-122). After one set of rings has been removed, the next set in the layer beneath is removed, and so on, until all sets have been removed. Because the rings are large, only half a ring will be removed at a time.

To remove the rings, a track drill is used to drill holes into the concrete on 2-foot centers, parallel to the axis of the cylinder. Explosives are inserted into the holes and back-filled with sand. After installing blasting mats and starting the fog spray system, the explosive charges are detonated.

Item 123 is the time required to set up all equipment for the complete job. Item 129 is the cleanup time after all drilling and blasting is completed. Item 124 is the equipment setup time for each layer. Items 125-128 specify the lengths of time required to perform the tasks associated with each blast (a blast removes one half of one ring of concrete). These tasks include installing the blasting mats and starting the fog spray system (125), evacuating the area and igniting the charges (126), etc.

Items 130-133 are self-explanatory.

Items 134-143 have their usual meanings.

Item 144 is the estimated dose rate at shutdown.

Items 145-150 are the material costs in the units specified.

151-160: These items refer to user-supplied steam generator parameters. Item 151 should be answered YES if the user wishes to provide his or her own values of items 152 through 160. If NO is selected, the CECP will disregard items 152 through 160 and use items 3, 4, and 5 to calculate geometric scaling factors. These factors will be then be used with default steam generator parameters to calculate steam generator cost and exposure data. Because steam generator decontamination, removal, and transportation methods are site-specific, the user is strongly urged to use the YES option.

Items 152-158 are self-explanatory. Use item 159 to enter so-called steam generator cascading costs, defined as those costs associated with the removal of noncontaminated and releasable material in support of the decommissioning process (e.g., if it is considered necessary to remove portions of the top floors or a roof to get at a bottom-floor nuclear component). Item 160 is a catch-all for capturing cost elements not covered by items 152-159. Training costs could be entered in Item 160, for example.

161-167: The chemical decontamination of the reactor coolant system is performed by a subcontractor at a cost specified by Item 161. Item 161 includes both the decontamination cost itself and the subsequent water treatment and release costs.

Total energy costs incurred during chemical decontamination operations are specified in Item 162. Primary contributors to these costs are the electrical costs associated with running the RCS and other pumps.

The remaining items are self-explanatory.

168-171: Deborating the primary system results in a large volume of concentrated boric acid solution. Items 168-170 refer to the disposition of this solution by a vendor. Item 168 is merely the volume of the solution, in gallons, and Item 169 is the vendor's processing charge in $/gallon. The end product, a pelletized powder, is then packaged in 55-gallon drums and shipped to the burial site. Shipping and burial charges are not included in the vendor's processing fee. Item 170 is self-explanatory. Item 171 is the cost of the fuel oil consumed in running the RCS pumps during the deboration operation.

4.6.2 Entering Data, Saving Files, and Exiting

Data entry is the same as described in Section 3.1.2. Files are saved as described in Section 4.5.3, except that the result file is given a **PRF** extension. Thus, if you save a file with the name **REACTOR1**, the **REACTOR1.PD**

file is updated and a **REACTOR1.PRF** file is created. The **REACTOR1.PRF** file is a detailed breakdown of costs associated with removing the reactor pressure vessel and its internals. You exit this portion of the CECP and return to the Main Menu as described in Section 3.1.4.

4.7 MENU ITEM G: STAFFING COSTS

This portion of the CECP allows you to enter utility and DOC staffing costs for each decommissioning period. The labor costs used in **DEFAULT.PD** are representative of labor costs (1993 dollars) at the Trojan Plant located in Ranier, Oregon. The utility overhead positions were supplied by the Portland General Electric Company, the majority owner and operator of the Trojan plant.

The data input screen for Menu Item G is shown in Figure 4.12. The first line of this screen lists the staffing fields: Job Description, Annual Salary, Overhead (in percent), Organization, and the person-years per year for periods 1 through 5 (1 2 3 4 5). Because it is not possible to fit all this information onto a single screen line, the person-years per year are

MENU ITEM G: STAFFING COSTS

	Job Description	Salary	Overhead	Org	1	2	3	4	5
1	Plant Manager	91210	42	U	*	*	*	*	0
2	Assistant Plant Manager	73820	42	U	*	*	*	0	0
3	Secretary	20500	42	U	*	*	*	*	0
4	Clerk	19120	42	U	0	*	*	*	0
5	Accountant	48610	42	U	0	*	*	*	0
6	Contracts/Procurement Spec.	48610	42	U	*	*	*	*	0
7	Industrial Safety Specialist	47600	42	U	0	*	*	*	0
8	Planning/Scheduling Engineer	52630	42	U	0	*	0	0	0
9	Radioactive Ship. Specialist	55950	42	U	0	*	*	*	0
10	Chemistry Supervisor	52630	42	U	*	*	0	0	0
11	Chemistry Technician	30290	42	U	0	*	*	*	0
12	Quality Assurance Manager	61140	42	U	*	*	0	0	0
13	Quality Assurance Engineer	34710	42	U	0	*	0	*	0
14	Quality Assurance Technician	30290	42	U	0	*	*	0	0
15	Health Physics Manager	55950	42	U	*	*	*	0	0
16	~Sr. Health Physics Technician	51440	42	U	0	*	*	0	0
17	Health Physics/ALARA Planner	51440	42	U	0	*	0	*	0
18	~Health Physics Technician	31710	42	U	0	*	0	0	0
19	Nuclear Records Specialist	43260	42	U	*	*	*	*	0

Number of records: 68 | File in use: REACTOR1.PD

↑↓←→ Home End PgUp PgDn Move Bar ↵ Enter Data Insert Item Delete Item
Ctrl End Insert Item at Bottom of List Save Data to a File Alt-X Quit

FIGURE 4.12. Data Entry Screen for Menu Item G

designated by asterisks (*) or 0. An asterisk simply means that data is present for this item, but there is no room to show it. A zero means this job position is not staffed for that period. As an example, consider line item 1. The Job Description is **Plant Manager**, the salary is **$91,210**, the overhead is **42%**, and the organization is **U** (for utility). But person-years per year for **Plant Manager** are shown on the screen as *, *, *, *, and **0** for periods 1 through 5.

The organization codes are **U**, **D**, and **N**, which stand for "Utility," "DOC," and "Neither." Use **N** for safety consultants, other specialists, or specialty contractors who are not part of the utility or DOC staffs. The CECP calculates the salary, including overhead as

Salary w/overhead = (1 + overhead/100) X (annual salary).

No overhead costs are calculated for the **N** category, so if you want to allow for overhead costs in this category, include them in the annual salary.

4.7.1 Entering Data, Saving Files, and Exiting

Data entry is very similar to the procedures discussed in Section 4.4 or 4.5. The only significant difference is in the entry of person-years per year for the various periods. By way of example, let's assume you want to examine the person-hours per year for period 1 for **Plant Manager** in Figure 4.12. Use the arrow keys to position the blue bar over the asterisk under the "1" column and press <Enter>. A small red window will open (Figure 4.13), showing you the person-years per year for **Plant Manager** for period 1 (0.05). To close the window without changing the value, just press <Esc> or <Enter>. To change the value, merely type in the number you want and press <Enter>. The small window will close. If you change your mind while entering a number, just press <Esc>, and the window will close, leaving the original value intact. If a period is not used or if a job position does not exist for that period, you should enter a **0**.

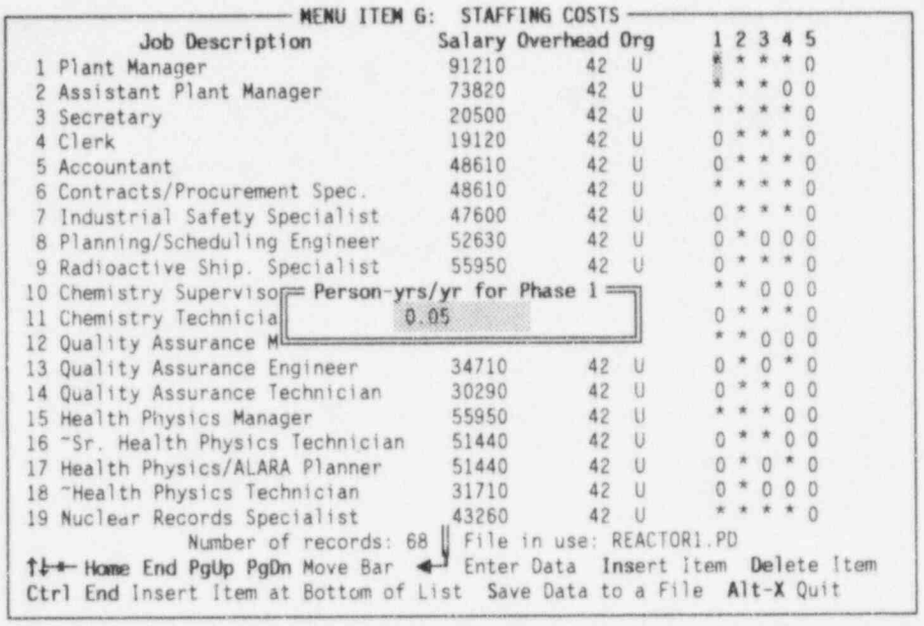

FIGURE 4.13. Entering a Value for Person-Hours per Year

It is important to remember that the values you are entering here are person-years per year, **not** person-years per period. If it is essential that a particular job be staffed for a certain number of person-years per period, you need to use the following relation:

person-years/year = (desired person-years/period)/(length of period in years).

As an example, in the Reference PWR study, a value of 1.7 years was used for period 4. But when the staffing requirements were calculated, it was found that some job positions would not be required for the entire period. The industrial safety specialist, for example, would be needed for only the first 1.5 years of the 1.7-year period. So, to determine the correct value for person-years/year for this job position, the preceding formula would be used:

person-years/year = (1.5 person-years/period)/(1.7 years/period) = 0.88235294.

This is the value used in **DEFAULT.PD**.

The only other field requiring special comment is the organization field. This field is set by pressing <Enter> until the desired value (**U**, **D**, or **N**) appears. To specify that a staff position is also a radiation worker position, precede the description with a tilde (~) as in line 16 or 18 in

Figure 4.12. The CECP makes additional calculations for radiation workers to find their occupational radiation exposures and protective clothing costs.

You save files as described in Section 3.1.3. Menu Item G produces result files with **PRG** file extensions. A **PRG** file contains a complete listing of staffing costs by period. Table 7.4 is an example **PRG** file. You exit this portion of the CECP and return to the Main Menu as described in Section 3.1.4.

4.8 MENU ITEM H: UNDISTRIBUTED COSTS

This portion of the CECP allows you to enter property taxes, insurance costs, and other undistributed costs for each decommissioning period. Figure 4.14 shows the input data screen.

For each decommissioning period, you may enter data for the following items:

1. Average annual property taxes
2. Average annual nuclear insurance costs
3. Annual Regulatory costs
4. DOC mobilization and de-mobilization costs
5. Energy consumption fraction
6. Environmental monitoring.

Figure 4.14 shows all six of these items for the first three periods and the first three items for period 4. Notice that property taxes, insurance, and regulatory costs are on an annual basis. Regulatory costs are costs associated with applicable state or NRC safety and security inspections.

There are significant costs associated with a contractor establishing itself at the work site. These costs include obtaining temporary office facilities, obtaining the required special equipment, and assembling the work force. There are similar costs for closing down the work site. All these costs are covered by Item 4.

The energy consumption fraction (Item 5) is the fraction of total site energy costs that is to be allocated to decommissioning activities. Enter a decimal number from 0 to 1. If you enter 1, all site energy costs will be allocated to decommissioning; if you enter 0, the utility will pay all energy costs. Energy costs paid by the utility are not charged to decommissioning.

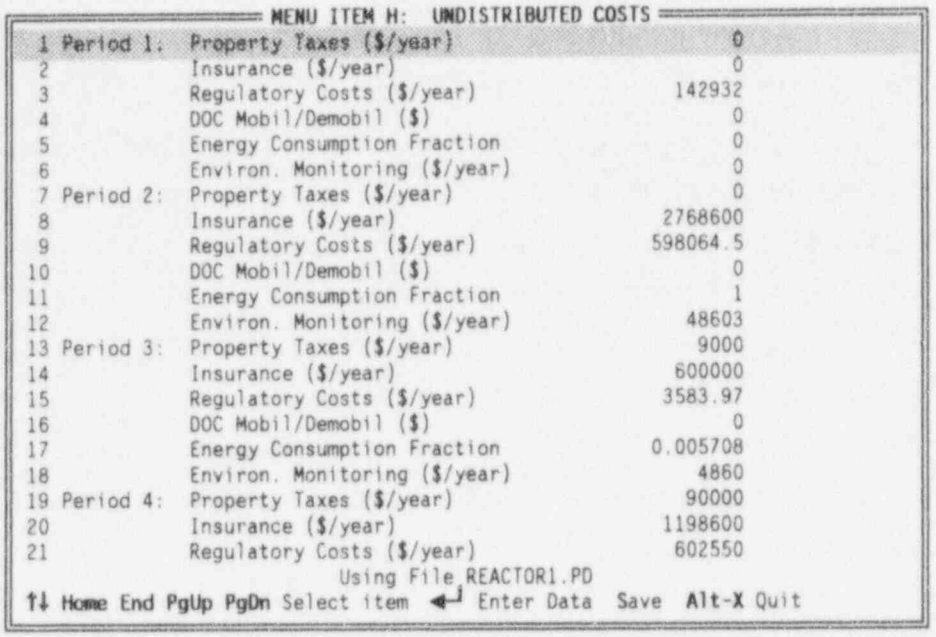

FIGURE 4.14. Data Entry Screen for Menu Item H

Environmental monitoring (Item 6) is the annual cost of monitoring the extent and consequences of releases of radioactivity or chemicals from the nuclear power plant. Such monitoring is conducted by a specialty contractor. The percentage of monitoring costs you charge to decommissioning depends on the amount of active decommissioning work done during each period. For the example used in **REACTOR1.PD**, no monitoring costs were assigned for period 1, 100% ($48603/year) were assigned in period 2, 10% ($4860/year) were assigned in period 3, and 100% were assigned in period 4.

4.8.1 Entering Data, Saving Files, and Exiting

Data are entered in precisely the same manner that was described in Section 3.1.2. Exit this portion of the CECP and return to the Main Menu as described in Section 3.1.4.

4.9 MENU ITEM I: FINAL SUMMARY REPORT

This part of the CECP creates a site summary of all decommissioning cost estimates. When you select Item I from the Main Menu, the file menu will appear, and you will be prompted to specify which **PD** file to use. The screen

shown in Figure 4.15 will then appear. From this screen, you select the case study for which you want to get a summary report. You may also copy and delete files from this menu.

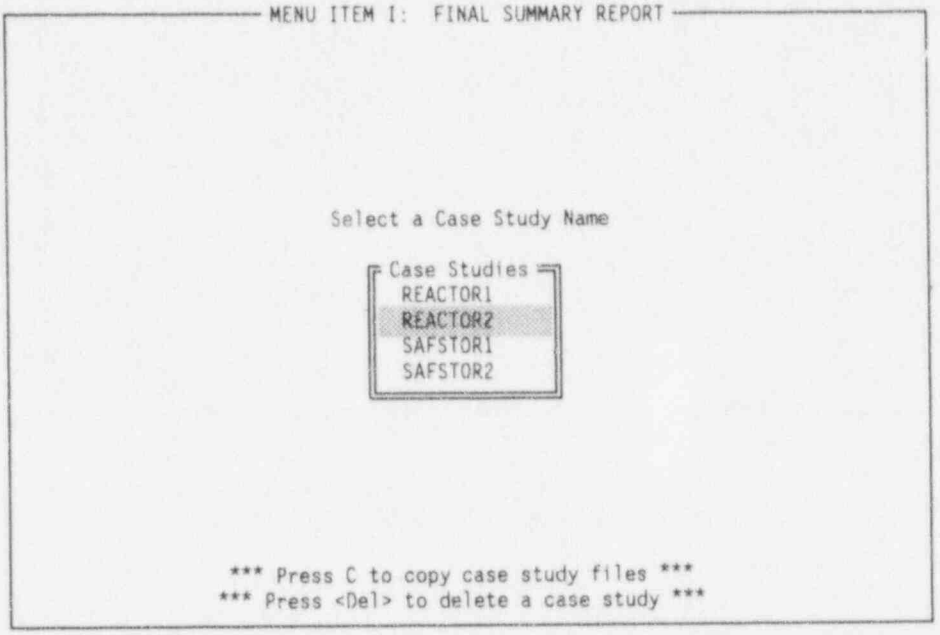

FIGURE 4.15. Selecting a Case Study

To obtain a summary report for a case study, move the selector bar up or down to pick the study you want. Assume you pick REACTOR2. Then the screen will appear as shown in Figure 4.16. This screen applies **only** to decommissioning studies that are variations of a base case. Suppose, for example, that Reactor1 is your primary case study for a certain reactor. You decide it would be interesting to see how increasing the work difficulty factors will increase overall decommissioning costs. To do this you run another case, Reactor2, say, which is identical to Reactor1, except that you have increased the work difficulty factors in file **REACTOR2.PD**. You create all other Reactor2 files in the usual way. They will be identical to the corresponding Reactor1 files except that they will have the **REACTOR2** prefix. Now you run Menu Item I to generate a summary for the Reactor2 case. Since Reactor2 is a "sensitivity case" (a variation of a base case study), you may

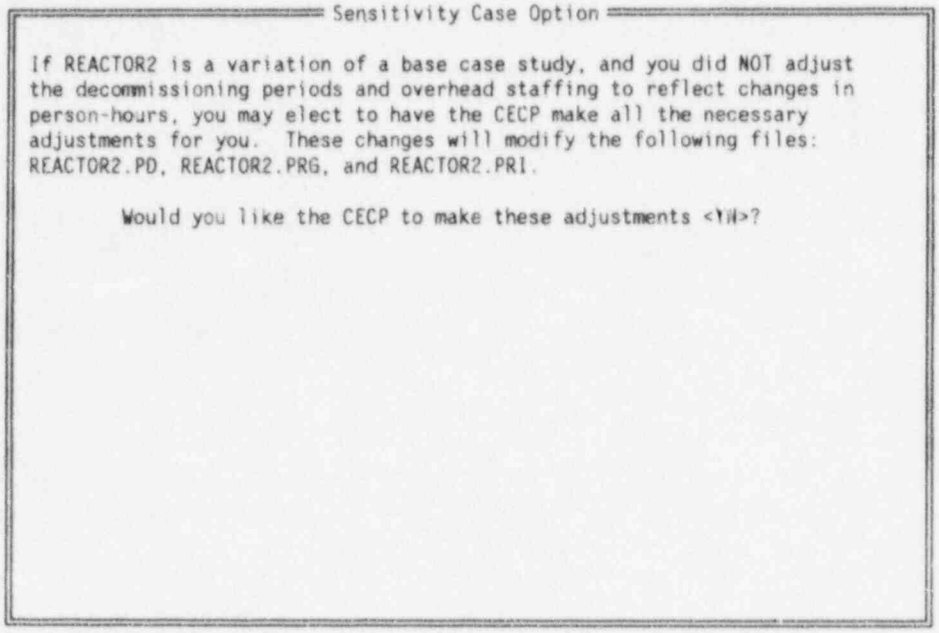

FIGURE 4.16. Sensitivity Case Option

want to answer "yes" to the prompt in Figure 4.16. Doing so will cause the screen to change as shown in Figure 4.17. Since Reactor1 is the base case for Reactor2, you would select **REACTOR1** and press <Enter>. The CECP will now automatically create new **REACTOR2.PD** and **REACTOR2.PRG** files to reflect the increased person-hours resulting from the increased work difficulty factors.

Whether or not you decide to make use of the sensitivity case option, the CECP will now proceed to create the summary by processing data from various portions of the data file (**REACTOR2.PD**). The result is **REACTOR2.PRI**, the summary report for the Reactor2 case. The CECP will report when it has completed building the summary file. You can then press <ESC> to return to the Main Menu.

As mentioned earlier, in addition to creating summary files, you may also copy and delete files from the screen shown in Figure 4.14. To copy files to a diskette or to another drive or subdirectory, move the selector bar up or down to pick the case you want, and then press <C>. A small window will open and you will be asked to specify the destination path name for the case files you selected. Type in the path name and press <Enter>. If the path exists,

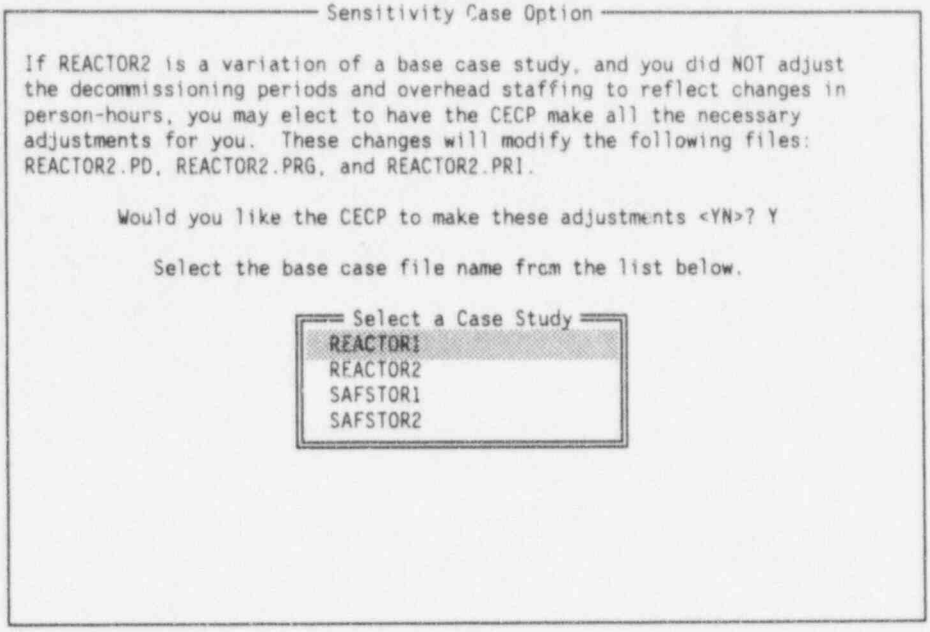

FIGURE 4.17. Selecting the Base Case

the files will be copied. If the path cannot be found or if a disk drive door is open, you will hear a beep, indicating an error. Make sure your path name is correct and try again. Should you decide not to copy files, press <ESC>.

To delete all files associated with a case study, move the selector bar up or down to pick the case you want, and then press <Del>. A warning window will open, asking you to confirm the deletion of all files. To continue with the deletion, press <Y>, and all files making up that study will be deleted. Pressing any key but <Y> will cancel the file deletion operation.

5.0 BURIAL COST DATA

With the exception of the highly activated reactor components that must to be sent to a GTCC geologic repository, the CECP assumes that all radioactive materials resulting from decommissioning will be sent to a low-level waste site.

Burial costs for the geologic repository are assumed to be based solely on a cost-per-unit-volume basis. This number is entered by the user as Item 18 in Menu Item 1 (Table 3.1).

Burial cost data for the low-level waste sites are more complex than the geologic repository and must be stored in files. Recall that the user tells the CECP which low-level burial site to use (Menu Item A, Figure 4.1, line 10). If the user specifies HANFORD, the CECP reads in a set of values appropriate to the Hanford Site from the **HANF.DAT** file. Similarly, if the user specifies BARNWELL, data from **BARN.DAT** are read. Finally, if the user specifies GENERIC, the CECP will read the **GENERIC.DAT** file.

The Hanford and Barnwell sites change their rate schedules frequently. To keep the data files up to date, three utility programs have been included with the CECP package. The **HANFBURY.EXE** utility updates **HANF.DAT**, **BARNBURY.EXE** updates **BARN.DAT**, and **GENBURY.EXE** updates **GENERIC.DAT**. These utilities are run at the DOS prompt, not from within the CECP itself.

5.1 BURIAL COSTS FOR HANFORD

This section explains how to use the **HANFBURY.EXE** utility to update the **HANF.DAT** file. To run **HANFBURY.EXE**, make sure you are in the CECP program subdirectory and then type **HANFBURY**<Enter> at the DOS prompt. Figure 5.1 shows the first screen that you will see. As the figure shows, Screen 1 is used for creating a lookup table for packages. The ">" symbol means "greater than." So line 5, for example, means that a package whose dose rate is greater than 5 R/hr but less than or equal to 10 R/hr will be charged $44.50 per cubic foot. The selector bar, shown positioned over the upper bound of

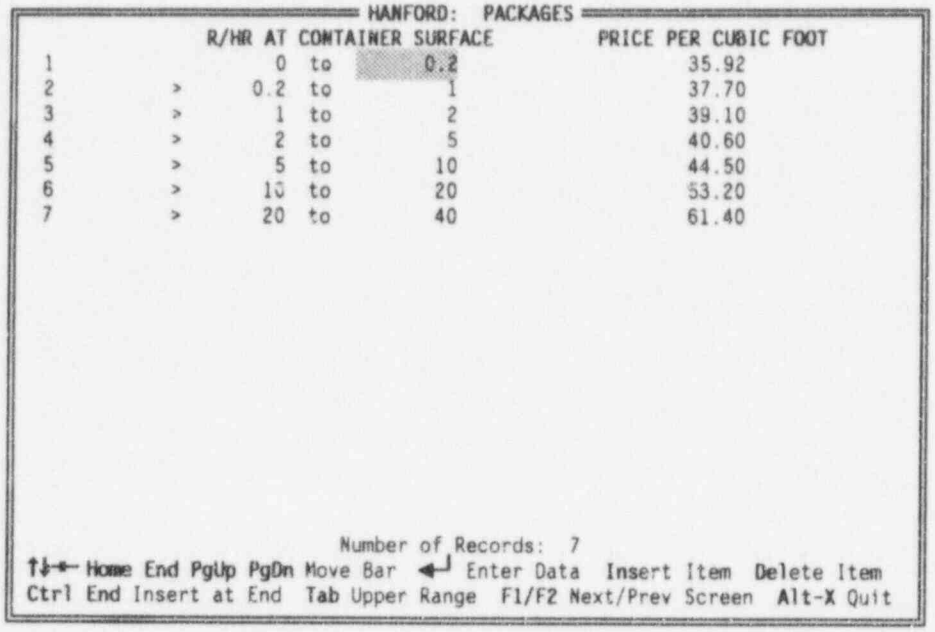

FIGURE 5.1. Hanford Burial Data, Screen 1

the first dose range in line 1, is moved around on the screen in a manner identical to that discussed in previous sections of this document and will not be discussed further here.

To see how to modify the data, suppose that a new Hanford rate schedule comes out that is identical to the previous one, except that line 7 has been modified and a new range (new line 8) has been added. The new rates are

R/HR AT CONTAINER SURFACE	PRICE PER CU. FT
> 20 - 30	61.40
> 30 - 40	72.30

Data from this modified schedule are incorporated as follows: First, move the bar down to line 7 and enter the new upper range, "30." Then, to create a new line of data at the bottom, press <Ctrl-End>. Figure 5.2 shows the situation at this point. Notice that the upper range value in line 7 (30 R/HR) has been automatically copied into the lower range value in line 8. So, the only values left to be entered are "40" and "72.40" in line 8. Entering new values

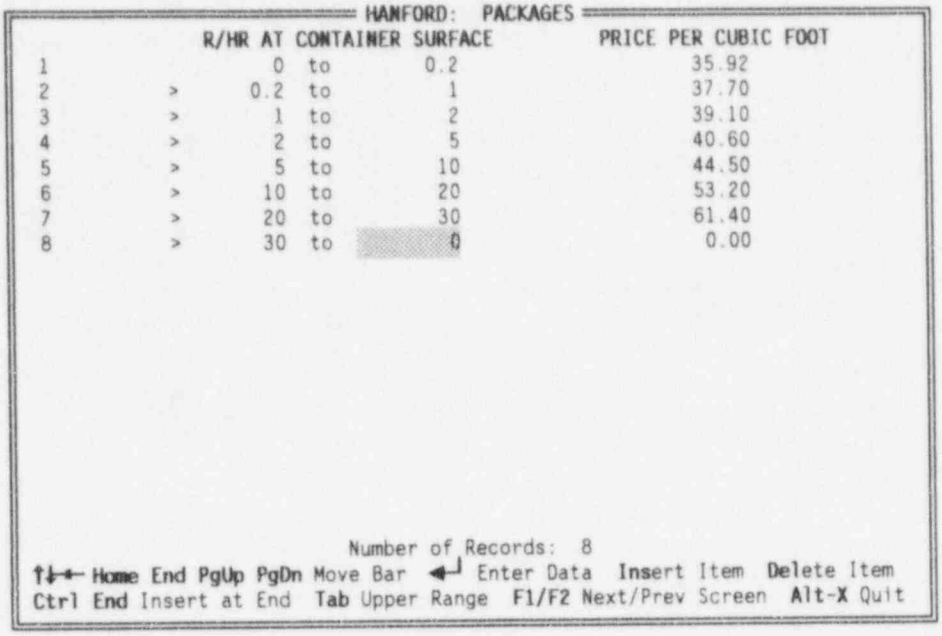

FIGURE 5.2. Entering New Data

into the middle of the table is done in a similar manner. Using the <Ins> key as needed, enter the upper range value for each line; the program will automatically adjust the lower range values for the line. Then enter the new values for the PRICE PER CUBIC FOOT column. Lines may be deleted using the <Del> key. The program will request confirmation before deleting any line.

To specify dose rates above the last value given in the table, use the <Tab> key to open the UPPER RANGE INFORMATION window. With the data as shown in Figure 5.1, the screen will appear as indicated in Figure 5.3 when the <Tab> key is pressed. To enter data in this window, just move the selector bar up or down, type in the data, and press <Enter>. Close the window by pressing <Esc>.

So far, the discussion has been confined to Screen 1 (HANFORD: PACKAGES). To move to the next screen, press <F1>; to move to the previous one, press <F2>. Data entry for Screens 2, 3, and 4 is the same as for Screen 1 and will not be discussed. Screen 5, HANFORD: SPECIAL CHARGES, TAXES AND FEES, is shown in Figure 5.4.

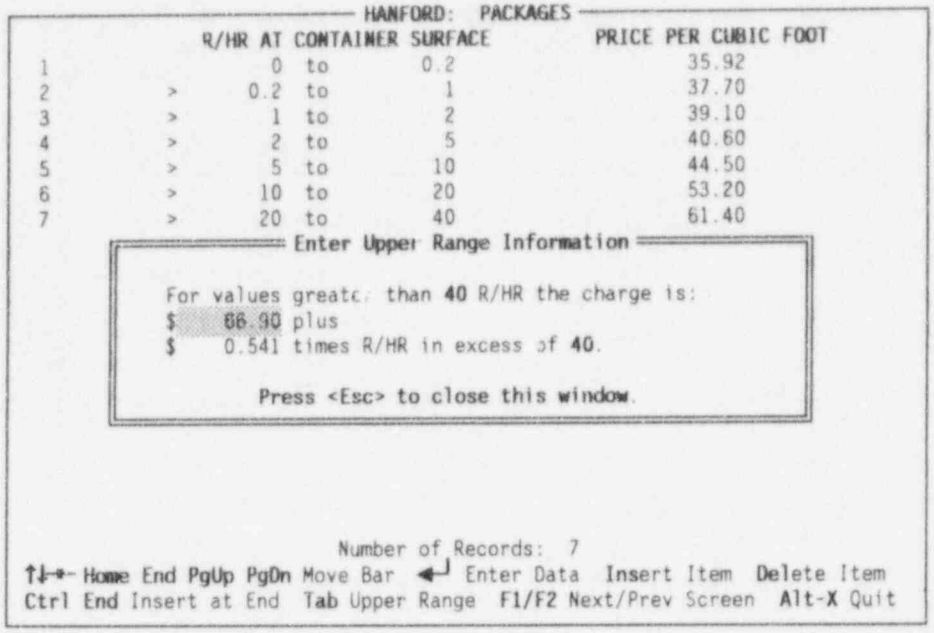

FIGURE 5.3. Entering Upper Range Information

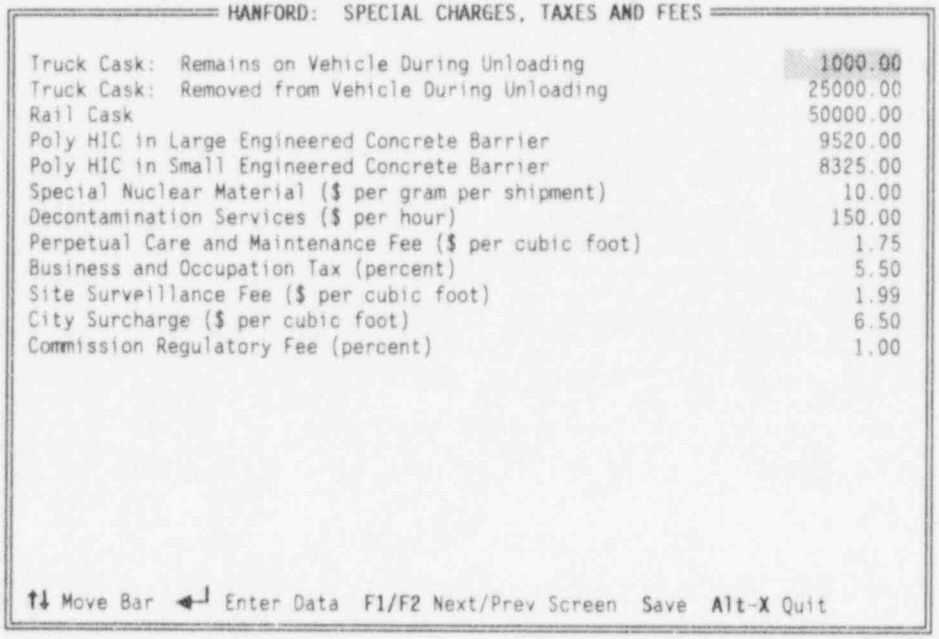

FIGURE 5.4. Miscellaneous Burial Data

As can be seen in Figure 5.4, Screen 5 consists of miscellaneous data. The last item, "Commission Regulatory Fee," is in percent; the remaining items are in dollars. Data entry for this screen is very simple: merely put the bar where you want it, press <Enter>, type in your data, and press <Enter> again.

You may save data to the **HANF.DAT** file at any time by pressing the <S> key. Note that this overwrites the previous data in the file. To exit from **HANFBURY.EXE**, press <Alt-X>.

5.2 BURIAL COSTS FOR BARNWELL AND GENERIC SITES

As mentioned previously, the burial cost data for Barnwell are stored in the **BARN.DAT** file. To update data in this file, the user runs the **BARNBURY.EXE** utility. To run the utility, make sure you are in the CECP program subdirectory, and then type **BARNBURY**<Enter> at the DOS prompt.

You enter data for the Barnwell Site in virtually the same way as you do for the Hanford Site discussed in Section 5.1. **BARNBURY.EXE** has only three lookup table screens, compared with four for **HANFBURY.EXE**. The fourth screen is a miscellaneous data screen similar to Screen 5 of the Hanford data.

To enter data for a generic site, the user runs the **GENERIC.EXE** utility to update the **GENERIC.DAT** file. Rate schedules for generic sites are modeled on the Hanford rate schedule. Thus, the screens in **GENERIC.EXE** are identical with **HANFBURY.EXE**, except that the word GENERIC replaces HANFORD.

6.0 A SAMPLE RUN

Now that the details of CECP operation have been presented, it is a good idea to actually create a case study, so that the user can see how all the parts of the CECP work together. Let us make a case study called **TEST**. Once **TEST** is created, you can examine its output files using the file viewer. In the interests of time and simplicity, we will use the default values throughout, so that no actual data entry will be required. This means we can start with Menu Item D. We will be using some short-cut keys that will make our work a little easier. We proceed as follows:

1. At the Main Menu, press <D> to access Menu Item D. Press <Enter> to pick the **DEFAULT.PD** file. Then, because we do not want to change any data, press <S> to save the file. Type in **TEST**<Enter> to create the **TEST.PD** file. This file is an exact copy of **DEFAULT.PD**. Notice that in addition to making **TEST.PD**, the CECP also creates the output file **TEST.PRD**. Now, instead of pressing <Alt-X> to get back to the Main Menu, press <Alt-E> instead. This short-cut key will put you directly into the file menu of Menu Item E.

2. At this point, you should be in the file menu of Menu Item E. Use the down arrow key to position the bar over **TEST** and press <Enter> to load **TEST.PD**. Now, to create the **TEST.PRE** file, just press <S> and type **TEST**<Enter>. Press <Alt-F> to get into the file menu of Menu Item F.

3. By now the process should be clear. Proceed as above until you get to the file menu of Menu Item I. (You may skip Menu Item H since we are not changing any data, and Item H does not produce an output file.) The screen now looks like Figure 4.15, except that the only case study available is the one you are constructing, TEST. Press <Enter> to accept TEST. The screen changes to Figure 4.16, but the files listed are the TEST files. TEST is not a variation of a previous study, so press <N> here. If all goes well, you will get a message saying that report file **TEST.PRI** is complete. In addition to **TEST.PRI**, the CECP has also created for you a list (**TEST.PIN**) of the input parameters the CECP used to create the **TEST** results.

To view the files you created (**TEST.PRD**, **TEST.PRE**, **TEST.PRF**, **TEST.PRG**, **TEST.PRI**, and **TEST.PIN**), press <Esc> and then <V> at the Main Menu, or just press <Alt-V> while still in Menu I. You should see the screen shown in

Figure 6.1. Then to examine, for example, the **PRI** files available, press <5>. The screen changes to the one shown in Figure 6.2. Because the only case study available is the one you just created, there is only one **PRI** file: **TEST.PRI**. (There is no **DEFAULT.PRI** file. In fact, the only **DEFAULT** file the CECP permits is the data input file that came on the distribution diskette.) Press <Enter> to select **TEST.PRI**. The CECP will then turn control over to the editor you specified during the installation procedure. Thus, you should see **TEST.PRI** on the screen, running in your editor. You may use your editor in the manner you are accustomed to. When you exit from your editor, the screen will revert to Figure 6.1. Should you decide to change to a different editor, press <W>. A small window will open, allowing you to type in the name of your new editor. The CECP will use this editor until you change it again from this menu. To exit from the File Viewer Menu, press <Esc>.

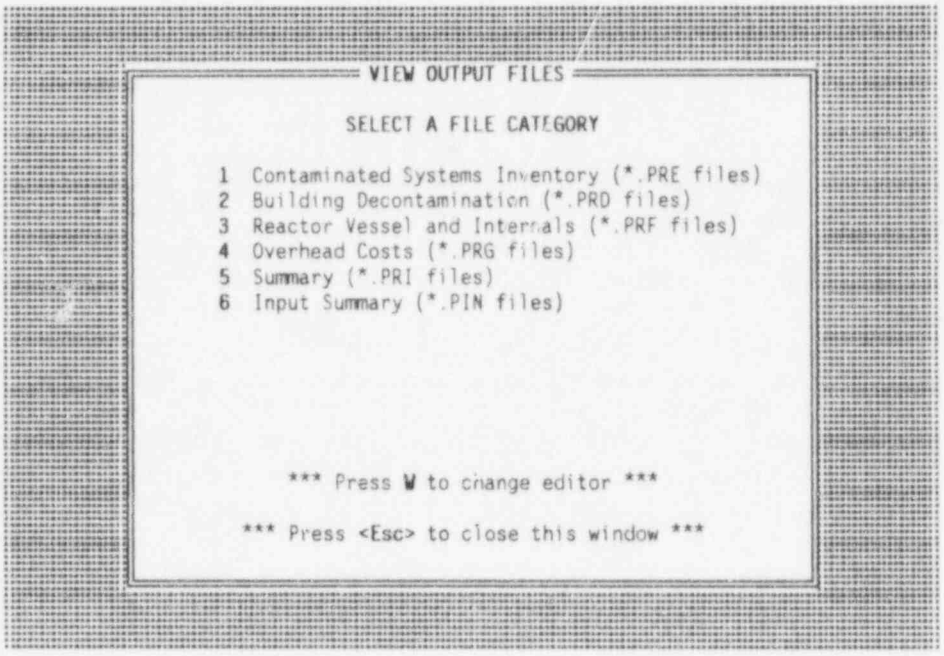

FIGURE 6.1. The File Viewer Menu

FIGURE 6.2. Selecting Summary Output Files

Printing an output file is accomplished exactly the same way as viewing it, except that you press <P> at the Main Menu, rather than <V>. If any of the printer-string files (**CLAND.P**, **CPORT.P**, and **GOTH.P**) are missing, the CECP will not print your output files. If the printer-string files are present, but a printer other than an HP LaserJet 3 or LaserJet 4 is connected to LPT1, your output files will probably not print out correctly.

APPENDIX A

CECP OUTPUT FILES

APPENDIX A

CECP OUTPUT FILES

This chapter contains complete listings of the five output files and the input parameter file produced by the CECP. The examples shown here are the **TEST** files you created in Chapter 6.

Table A.1 is the **TEST.PRE** file created from Menu Item E, which contains a detailed report of the potentially radioactive system components that are to be removed during the decommissioning process. Note that this report is in three parts: 1) "POTENTIALLY RADIOACTIVE SYSTEMS: PHYSICAL CHARACTERISTICS"; 2) "POTENTIALLY RADIOACTIVE SYSTEMS: CREW-HOURS, PERSON-HOURS, ETC."; and 3) "POTENTIALLY RADIOACTIVE SYSTEMS: REMOVAL, TRANSPORTATION, DISPOSAL COSTS." The column headings used in (1) were previously defined in Section 4.5. The headings in (2) are self-explanatory. The headings used in (3) are defined below.

Removal: The total labor costs (including overhead, shift differential and consumables costs) of removing the listed components.

Container: The cost of the B-25 containers or modified Sea-Vans needed to accommodate the component.

Transport: The cost of shipping the component by truck to the burial site.

Disposal: The cost of burying the component at the burial site, including applicable burial surcharges.

TABLE A.1. Contents of File TEST.PRE

File: E:\NRC\TEST.PRE
Plant Name: TROJAN

++
+ INVENTORY OF POTENTIALLY RADIOACTIVE SYSTEMS: PHYSICAL CHARACTERISTICS +
++

*** Component Cooling Water System

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
CCW HX	Lg HX	Sea-Van 0	2	628	70,000		
CCW Pump	Lg Pump	Sea-Van 0	2	257	15,000		
CCW Surge Tank	Tank	Sea-Van 0	2	22	5,500	7.00	8.00
Chemical Addition Tank	Tank	Sea-Van 0	1	3	800	2.00	5.00
Sample HX	Lg HX	Sea-Van	9	27	7,000		
24 Inch Valve	Lg Valve	Sea-Van	18	89	7,100		
18 Inch valve	Lg Valve	Sea-Van	4	61	4,900		
14 Inch Valve	Lg Valve	Sea-Van	10	31	2,760		
8 Inch Valve	Lg Valve	Sea-Van	45	15	1,029		
6 Inch Valve	Lg Valve	Sea-Van	4	7	588		
4 Inch Valve	Lg Valve	Sea-Van	6	3	268		
3 Inch Valve	Sm Valve	Sea-Van	10	1	153		
2 Inch Valve	Sm Valve	Sea-Van	2	1	90		
1 1/2 Inch Valve	Sm Valve	Sea-Van	31	1	62		
1 Inch Valve	Sm Valve	Sea-Van	29	0	50		
3/4 Inch Valve	Sm Valve	Sea-Van	10	0	30		

*** Clean Radioactive Waste Treatment System

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
Reactor Coolant Drain Tank	Tank	Sea-Van	1	10	1,670	3.00	8.00
Reactor Coolant Drain Pump	Lg Pump	Sea-Van	2	8	500		
Reactor Coolant Drain Filter	Tank	Mtl Box	1	1	350	1.30	4.70
Spent Resin Storage Tank	Tank	Sea-Van	1	30	6,800	9.00	11.00
Clean Waste Recv. Tank	Tank	Sea-Van	2	75	10,958	10.00	30.00
Clean Waste Recv. Pump	Lg Pump	Sea-Van	2	8	500		
Treated Waste Mon. Tank	Tank	Sea-Van 0	2	66	11,200	10.00	26.00
Treated Waste Mon. Pump	Lg Pump	Sea-Van	2	3	230		
Aux Building Drain Tank	Tank	Sea-Van	1	27	2,090	6.00	9.00
Aux Building Drain Pump	Lg Pump	Sea-Van	2	12	1,300		
Chemical Waste Drain Tank	Tank	Sea-Van	1	41	5,400	10.00	15.00
Chemical Waste Drain Pump	Lg Pump	Sea-Van	2	3	200		
Waste Conc. Hold. Tank	Tank	Sea-Van	1	29	2,090	6.00	10.00
Waste Conc. Hold. Pump	Lg Pump	Sea-Van	1	3	230		
Clean Waste Filter	Tank	Mtl Box	1	0	67	0.60	2.20
Clean Rad. Waste Evaporator	Lg HX	Sea-Van	1	2,052	40,000		
Clean Rad. Waste Evap. Condenser	Lg HX	Sea-Van	1	28	8,000		
3 Inch Valve	Sm Valve	Sea-Van	19	1	153		
2 Inch Valve	Sm Valve	Sea-Van	64	1	90		

TABLE A.1. Contents of File TEST.PRE (contd)

*** Containment Spray System

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
Pump	Lg Pump	Sea-Van	2	113	6,800		
Pump	Sm Pump	Sea-Van	2	2	100		
Tank	Tank	Sea-Van	1	28	2,500	9.00	10.00
18 Inch Valve	Lg Valve	Sea-Van	4	61	4,900		
14 Inch Valve	Lg Valve	Sea-Van	6	31	2,760		
10 Inch Valve	Lg Valve	Sea-Van	6	18	1,458		
3 Inch Valve	Sm Valve	Sea-Van	6	1	153		
1 1/2 Inch Valve	Sm Valve	Sea-Van	6	1	62		
1 Inch Valve	Sm Valve	Sea-Van	6	0	50		
3/4 Inch Valve	Sm Valve	Sea-Van	12	0	30		
Electrical Equipment	Sm Elec.	Sea-Van	6	2	75		
Electrical Equipment	Lg Elec.	Sea-Van	6	3	150		

*** Chemical and Volume Control System

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
Regenerative HX	Lg HX	Mtl Box	3	21	6,600		
Seal Water HX	Lg HX	Mtl Box	1	17	1,700		
Letdown HX	Lg HX	Mtl Box	1	32	1,900		
Excess Letdown HX	Lg HX	Mtl Box	1	7	1,600		
Centrif. Chrg. Pump	Lg Pump	Sea-Van	2	344	17,090		
Vol. Control Tank	Tank	Sea-Van	1	29	4,850	7.50	10.40
Chem. Mix Tank	Tank	Sea-Van	1	0	77	0.75	2.50
Holdup Tank	Tank	Sea-Van	3	121	30,000	18.00	34.00
Monitor Tank	Tank	Sea-Van	2	56	20,000	20.00	10.00
Boric Acid Tank	Tank	Sea-Van	2	90	20,000	12.00	34.00
Batch Tank	Tank	Sea-Van 0	1	24	1,450	4.00	5.80
Resin Fill Tank	Tank	Sea-Van 0	1	20	260	5.30	6.20
Reciprocal Charg. Pump	Lg Pump	Sea-Van	1	243	17,700		
Boric Acid Pump	Lg Pump	Sea-Van	2	10	618		
Reactor Coolant Filter	Tank	Mtl Box	1	1	200	1.25	4.25
Mixed Bed Demineralizer	Tank	Sea-Van	2	4	1,050	2.20	5.40
Cation IX	Tank	Mtl Box	1	4	1,050	2.20	5.40
Seal Injection Filter	Tank	Mtl Box	2	1	1,650	0.80	6.30
Concentrate Holding Tank	Tank	Sea-Van	1	24	3,500	5.50	7.80
Evaporator Feed IX	Tank	Mtl Box	3	4	1,050	2.20	5.40
Evaporator Condensate IX	Tank	Mtl Box	2	4	1,050	2.20	5.40
Condensate Filter	Tank	Mtl Box	1	0	40	0.67	3.25
Concentrates Filter	Tank	Mtl Box	1	0	40	0.67	3.25
Conc. Hold. Tank Transfer Pump	Lg Pump	Sea-Van	2	3	200		
Gas Stripper Feed Pump	Lg Pump	Sea-Van	2	3	200		
Boric Acid Evaporator Condenser	Tank	Sea-Van	2	6	20,000	2.10	8.20
Boric Acid Evaporator Vent Condenser	Tank	Sea-Van	2	1	600	1.10	5.00
Boric Acid Evap. Distillate Condenser	Tank	Sea-Van	2	3	300	1.10	12.10
IX Filter	Tank	Mtl Box	1	1	150	1.00	3.30

TABLE A.1. Contents of File TEST.PRE (contd)

Recirculation Pump	Lg Pump	Sea-Van	1	3	200		
Standpipes	Tank	Sea-Van	4	1	540	0.50	7.00
6 Inch Valve	Lg Valve	Sea-Van	2	7	588		
4 Inch Valve	Lg Valve	Sea-Van	35	3	268		
3 Inch Valve	Sm Valve	Sea-Van	49	1	153		
2 Inch Valve	Sm Valve	Sea-Van	184	1	90		
1 Inch Valve	Sm Valve	Sea-Van	28	0	50		
3/4 Inch Valve	Sm Valve	Sea-Van	80	0	30		

*** Dirty Radioactive Waste Treatment System

						----- Tanks -----	
Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Dia(ft)	Hgt(ft)
Reactor Cavity Drain Pump	Lg Pump	Sea-Van	1	47	800		
Reactor Containment Sump Pump	Lg Pump	Sea-Van	2	19	1,500		
Laundry Drain Tank	Tank	Sea-Van	1	27	2,000	6.00	9.00
Laundry Strainer	Tank	Sea-Van	1	--	150	0.00	0.00
Laundry Drain Tank Pump	Lg Pump	Sea-Van	1	3	200		
Laundry Waste Filter	Tank	Sea-Van	1	--	150	0.00	0.00
Dirty Waste Monitor Tank	Tank	Sea-Van	1	34	5,800	10.00	12.00
Dirty Waste Monitor Tank Pump	Lg Pump	Sea-Van	2	3	200		
Dirty Waste Monitor Tank Filter	Tank	Sea-Van	2	0	76	0.60	3.00
Dirty Waste Drain Tank	Tank	Sea-Van	1	36	6,540	10.00	13.00
Dirty Waste Drain Tank Pump	Lg Pump	Sea-Van	2	8	400		
Aux. Building Sump Pump	Lg Pump	Sea-Van	2	27	1,300		
3 Inch Valve	Sm Valve	Sea-Van	14	1	153		
2 Inch Valve	Sm Valve	Sea-Van	32	1	90		

*** Main Steam System (Within Containment)

						----- Tanks -----	
Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Dia(ft)	Hgt(ft)
Flow Orifices	Lg Misc.	Sea-Van 0	4	43	2,500		
28 Inch Piping	Lg Pipe	Sea-Van 0	590	4	248		
14 Inch Piping	Lg Pipe	Sea-Van 0	420	1	85		
3 Inch Piping	Sm Pipe	Sea-Van 0	500	0	10		

*** Radioactive Gaseous Waste System

						----- Tanks -----	
Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Dia(ft)	Hgt(ft)
Surge Tank	Tank	Sea-Van	1	8	890	3.00	6.00
Decay Tank	Tank	Sea-Van	4	43	10,800	10.00	16.00
Gas Compressor	Lg Misc.	Sea-Van	2	200	8,000		
Moisture Separator	Sm Misc.	Sea-Van	2	4	100		
Br. Seal Wtr. HX	Lg HX	Mtl Box	2	27	7,700		
4 Inch Valve	Lg Valve	Sea-Van	1	3	268		
3 Inch Valve	Sm Valve	Sea-Van	3	1	153		
2 Inch Valve	Sm Valve	Sea-Van	16	1	90		
1 1/2 Inch Valve	Sm Valve	Sea-Van	35	1	62		

TABLE A.1. Contents of File TEST.PRE (contd)

1 Inch Valve	Sm Valve	Sea-Van	12	0	50
3/4 Inch Valve	Sm Valve	Sea-Van	16	0	30
Electrical Equipment	Lg Elec.	Sea-Van	4	3	150
Mechanical Equipment	Lg Misc.	Sea-Van	2	100	5,000
HVAC Equipment	Lg Misc.	Sea-Van	1	3	150

*** Residual Heat Removal System

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	----- Tanks ----- Dia(ft)	Hgt(ft)
Pump	Lg Pump	Sea-Van	2	28	6,800		
HX Unit	Lg HX	Mtl Box	2	212	23,100		
Electrical Equipment	Sm Elec.	Sea-Van	12	2	75		
Electrical Equipment	Lg Elec.	Sea-Van	11	3	150		
Mechanical Equipment	Sm Misc.	Sea-Van	1	2	75		
14 Inch Valve	Lg Valve	Sea-Van	7	31	2,760		
12 Inch valve	Lg Valve	Sea-Van	3	24	1,972		
10 Inch Valve	Lg Valve	Sea-Van	2	18	1,458		
8 Inch Valve	Lg Valve	Sea-Van	18	15	1,029		
2 Inch Valve	Sm Valve	Sea-Van	2	1	90		
3/4 Inch Valve	Sm Valve	Sea-Van	10	0	30		

*** Safety Injection System

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	----- Tanks ----- Dia(ft)	Hgt(ft)
Accuml. Tank	Tank	Sea-Van	4	56	76,500	11.00	21.00
Boron Injection Tank	Tank	Sea-Van	1	37	28,500	5.50	12.50
Safety Injection Pump	Lg Pump	Sea-Van	2	165	8,600		
Refueling Water Storage Tank	Tank	Sea-Van	1	362	177,800	44.00	39.60
Primary Makeup Water Storage Tank	Tank	Sea-Van	1	206	99,200	30.00	35.40
Mechanical Equipment	Sm Misc.	Sea-Van	1	2	75		
Electrical Equipment	Sm Elec.	Sea-Van	10	2	75		
Electrical Equipment	Lg Elec.	Sea-Van	10	3	150		
10 Inch Valve	Lg Valve	Sea-Van	8	18	1,458		
8 Inch Valve	Lg Valve	Sea-Van	8	15	1,029		
6 Inch Valve	Lg Valve	Sea-Van	2	7	588		
4 Inch Valve	Lg Valve	Sea-Van	9	3	268		
3 Inch Valve	Sm Valve	Sea-Van	4	1	153		
2 Inch Valve	Sm Valve	Sea-Van	1	1	90		
1 1/2 Inch Valve	Sm Valve	Sea-Van	4	1	62		
1 Inch Valve	Sm Valve	Sea-Van	33	0	50		
3/4 Inch Valve	Sm Valve	Sea-Van	20	0	30		

TABLE A.1. Contents of File TEST.PRE (contd)

*** Spent Fuel Cooling System

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
Pump	Lg Pump	Sea-Van	1	15	1,000		
Pump	Lg Pump	Sea-Van	2	15	900		
Pump	Lg Pump	Sea-Van	1	12	700		
Filter	Tank	Mtl Box	1	1	360	0.90	3.80
Filter	Tank	Mtl Box	1	1	360	0.90	3.80
Filter	Tank	Mtl Box	1	1	150	0.75	3.80
Demineralizer	Tank	Sea-Van	1	40	2,200	4.00	10.00
Spent Fuel Pool Heat Exchangers	Lg HX	Mtl Box	2	44	6,100		
10 Inch Valve	Lg Valve	Sea-Van	8	18	1,458		
8 Inch Valve	Lg Valve	Sea-Van	12	15	1,029		
6 Inch Valve	Lg Valve	Sea-Van	1	7	588		
4 Inch Valve	Lg Valve	Sea-Van	16	3	268		
3 Inch Valve	Sm Valve	Sea-Van	9	1	153		
2 Inch Valve	Sm Valve	Sea-Van	2	1	90		
1 Inch Valve	Sm Valve	Sea-Van	10	0	50		
3/4 Inch Valve	Sm Valve	Sea-Van	5	0	30		

*** Stainless Steel Piping (3 - 24 Inches)

Component Description		Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
24 Inch Class I	(0.375" thick)	Lg Pipe	Sea-Van	170	3	95		
18 Inch Class III	(0.375" thick)	Lg Pipe	Sea-Van	30	2	71		
16 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	300	1	63		
14 Inch Class I	(1.250" thick)	Lg Pipe	Sea-Van	170	1	170		
14 Inch Class II	(0.250" thick)	Lg Pipe	Sea-Van	200	1	37		
14 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	270	1	55		
14 Inch Class III	(0.375" thick)	Lg Pipe	Sea-Van	610	1	55		
12 Inch Class I	(1.125" thick)	Lg Pipe	Sea-Van	150	1	140		
12 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	400	1	50		
12 Inch Class III	(0.406" thick)	Lg Pipe	Sea-Van	270	1	54		
10 Inch Class I	(1.000" thick)	Lg Pipe	Sea-Van	330	1	104		
10 Inch Class II	(0.165" thick)	Lg Pipe	Sea-Van	320	1	19		
10 Inch Class II	(0.365" thick)	Lg Pipe	Sea-Van	360	1	40		
10 Inch Class III	(0.365" thick)	Lg Pipe	Sea-Van	60	1	40		
10 Inch Non-Nuc. Grade	(0.165" thick)	Lg Pipe	Sea-Van	1,000	1	19		
8 Inch I	(0.906" thick)	Lg Pipe	Sea-Van	250	0	75		
8 Inch II	(0.322" thick)	Lg Pipe	Sea-Van	530	0	29		
8 Inch II	(0.500" thick)	Lg Pipe	Sea-Van	50	0	43		
8 Inch II	(0.906" thick)	Lg Pipe	Sea-Van	20	0	75		
8 Inch III	(0.322" thick)	Lg Pipe	Sea-Van	620	0	29		
8 Inch Non-Nuc. Grade	(0.148" thick)	Lg Pipe	Sea-Van	400	0	13		
8 Inch Non-Nuc. Grade	(0.322" thick)	Lg Pipe	Sea-Van	130	0	29		
6 Inch I	(0.718" thick)	Lg Pipe	Sea-Van	550	0	45		
6 Inch II	(0.134" thick)	Lg Pipe	Sea-Van	100	0	9		
6 Inch II	(0.280" thick)	Lg Pipe	Sea-Van	500	0	19		
6 Inch III	(0.280" thick)	Lg Pipe	Sea-Van	90	0	19		

TABLE A.1. Contents of File TEST.PRE (contd)

6 Inch Non-Nuc. Grade	(0.134" thick)	Lg Pipe	Sea-Van	1,400	0	9
4 Inch I	(0.531" thick)	Lg Pipe	Sea-Van	280	0	23
4 Inch II	(0.120" thick)	Lg Pipe	Sea-Van	250	0	6
4 Inch II	(0.237" thick)	Lg Pipe	Sea-Van	500	0	11
4 Inch II	(0.337" thick)	Lg Pipe	Sea-Van	70	0	15
4 Inch II	(0.531" thick)	Lg Pipe	Sea-Van	180	0	23
4 Inch III	(0.237" thick)	Lg Pipe	Sea-Van	1,340	0	11
4 Inch Non-Nuc. Grade	(0.120" thick)	Lg Pipe	Sea-Van	2,200	0	6
3 Inch I	(0.437" thick)	Sm Pipe	Sea-Van	40	0	14
3 Inch II	(0.120" thick)	Sm Pipe	Sea-Van	220	0	4
3 Inch II	(0.216" thick)	Sm Pipe	Sea-Van	2,000	0	8
3 Inch II	(0.437" thick)	Sm Pipe	Sea-Van	1,100	0	14
3 Inch III	(0.216" thick)	Sm Pipe	Sea-Van	1,460	0	8
3 Inch Non-Nuc. Grade	(0.120" thick)	Sm Pipe	Sea-Van	5,000	0	4
3 Inch Non-Nuc. Grade	(0.216" thick)	Sm Pipe	Sea-Van	20	0	8

*** Stainless Steel Piping (1/2 - 2 Inches)

Component Description		Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	----- Tanks ----- Dia(ft)	Hgt(ft)
2 Inch Class I	(0.343" thick)	Sm Pipe	Sea-Van	550	0	7		
2 Inch Class II	(0.154" thick)	Sm Pipe	Sea-Van	200	0	4		
2 Inch Class II	(0.218" thick)	Sm Pipe	Sea-Van	800	0	5		
2 Inch Class II	(0.343" thick)	Sm Pipe	Sea-Van	1,450	0	7		
2 Inch Class III	(0.154" thick)	Sm Pipe	Sea-Van	4,100	0	4		
2 Inch Non-Nuc. Grade	(0.154" thick)	Sm Pipe	Sea-Van	1,400	0	4		
1 1/2 Inch Class I	(0.281" thick)	Sm Pipe	Sea-Van	700	0	5		
1 1/2 Inch Class II	(0.145" thick)	Sm Pipe	Sea-Van	200	0	3		
1 1/2 Inch Class II	(0.200" thick)	Sm Pipe	Sea-Van	800	0	4		
1 1/2 Inch Class II	(0.281" thick)	Sm Pipe	Sea-Van	200	0	5		
1 1/2 Inch Class III	(0.145" thick)	Sm Pipe	Sea-Van	1,700	0	3		
1 1/2 Inch Non-Nuc. Grade	(0.145" thick)	Sm Pipe	Sea-Van	1,500	0	3		
1 Inch Class I	(0.250" thick)	Sm Pipe	Sea-Van	100	0	3		
1 Inch Class II	(0.133" thick)	Sm Pipe	Sea-Van	100	0	2		
1 Inch Class II	(0.179" thick)	Sm Pipe	Sea-Van	300	0	2		
1 Inch Class II	(0.250" thick)	Sm Pipe	Sea-Van	600	0	3		
1 Inch Class III	(0.133" thick)	Sm Pipe	Sea-Van	1,500	0	2		
1 Inch Non-Nuc. Grade	(0.133" thick)	Sm Pipe	Sea-Van	2,000	0	2		
3/4 Inch Class I	(0.218" thick)	Sm Pipe	Sea-Van	290	0	2		
3/4 Inch Class II	(0.113" thick)	Sm Pipe	Sea-Van	200	0	1		
3/4 Inch Class II	(0.154" thick)	Sm Pipe	Sea-Van	300	0	1		
3/4 Inch Class II	(0.218" thick)	Sm Pipe	Sea-Van	700	0	2		
3/4 Inch Class III	(0.113" thick)	Sm Pipe	Sea-Van	900	0	1		
3/4 Inch Non-Nuc. Grade	(0.113" thick)	Sm Pipe	Sea-Van	1,000	0	1		
1/2 Inch Class I	(0.187" thick)	Sm Pipe	Sea-Van	105	0	1		
1/2 Inch Class II	(0.147" thick)	Sm Pipe	Sea-Van	200	0	1		
1/2 Inch Class II	(0.187" thick)	Sm Pipe	Sea-Van	200	0	1		
1/2 Inch Class III	(0.109" thick)	Sm Pipe	Sea-Van	800	0	1		
1/2 Inch Non-Nuc. Grade	(0.109" thick)	Sm Pipe	Sea-Van	1,000	0	1		

TABLE A.1. Contents of File TEST.PRE (contd)

*** Retrofit Materials

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
2 Inch Piping	Sm Pipe	Sea-Van	52	0	4		
3/4 Inch Piping	Sm Pipe	Sea-Van	40	0	1		
1/2 Inch Piping	Sm Pipe	Sea-Van	304	0	1		
2 Inch valve	Sm Valve	Sea-Van	4	1	90		
1 Inch valve	Sm Valve	Sea-Van	3	0	50		
3/4 Inch valve	Sm Valve	Sea-Van	8	0	30		
Tank	Tank	Sea-Van	2	27	2,000	6.00	9.00
Dry waste compactor	Lg Misc.	Sea-Van	1	30	2,000		
Skid-mounted unit	Lg Misc.	Sea-Van	1	8	500		
Shielded box	Lg Misc.	Sea-Van	1	1	150		

*** Electrical Components and Annunciators

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
125 Volt DC Power	Lg Elec.	Sea-Van	2	3	150		
125 Volt DC Power	Lg Elec.	Sea-Van	2	10	500		
125 Volt DC Power	Lg Elec.	Sea-Van	1	100	5,000		
4.16 KV AC & Auxiliary Power	Lg Elec.	Sea-Van	1	10	500		
4.16 KV AC & Auxiliary Power	Lg Elec.	Sea-Van	1	400	20,000		
480 Volt AC Auxiliary Load Center	Lg Elec.	Sea-Van	7	10	500		
480 Volt AC Auxiliary Load Center	Lg Elec.	Sea-Van	7	400	20,000		
480 Volt AC MCC	Lg Elec.	Sea-Van	1	10	500		
480 Volt AC MCC	Lg Elec.	Sea-Van	12	400	20,000		
Annunciators (electrical portion)	Sm Elec.	Sea-Van 0	2	2	75		
Annunciators (mechanical portion)	Sm Misc.	Sea-Van 0	22	2	75		

*** Control Rod Drive

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
Electrical Equipment	Sm Elec.	Sea-Van	4	2	75		
Electrical Equipment	Lg Elec.	Sea-Van	4	3	150		
Mechanical Equipment	Lg Misc.	Sea-Van	1	3	150		

*** Small Hangers (4" pipe or less)

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
1 Inch Hangers	Sm Hngr.	Sea-Van	4,920	1	82		
2 Inch Hangers	Sm Hngr.	Sea-Van	2,962	1	123		
3 Inch Hangers	Sm Hngr.	Sea-Van	1,554	2	164		
4 Inch Hangers	Sm Hngr.	Sea-Van	1,172	2	205		

TABLE A.1. Contents of File TEST.PRE (contd)

*** Large Hangers (> 4" pipe)

Component Description	Category	Disposal	Qty	Vol(ft3)	Wgt(lb)	Tanks Dia(ft)	Tanks Hgt(ft)
6 Inch Hangers	Lg Hngr.	Sea-Van	452	3	288		
8 Inch Hangers	Lg Hngr.	Sea-Van	1,002	4	370		
10 Inch Hangers	Lg Hngr.	Sea-Van	246	5	453		
12 Inch Hangers	Lg Hngr.	Sea-Van	134	5	535		
14 Inch Hangers	Lg Hngr.	Sea-Van	236	6	618		
18 Inch Hangers	Lg Hngr.	Sea-Van	19	8	783		
20 Inch Hangers	Lg Hngr.	Sea-Van	3	9	865		
24 Inch Hangers	Lg Hngr.	Sea-Van	80	10	1,030		
28 Inch Hangers	Lg Hngr.	Sea-Van	32	12	1,195		

NOTE: For piping, "Qty" refers to feet of piping. For other categories "Qty" refers to the number of items of equipment.

TABLE A.1. Contents of File TEST.PRE (contd)

File: E:\NRC\TEST.PRE
Plant Name: TROJAN

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+ POTENTIALLY RADIOACTIVE SYSTEMS: CREW-HOURS, PERSON-HOURS, ETC. +
++

*** Component Cooling Water System

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
CCW HX	Lg HX	Sea-Van 0	2	5.7	22.7	14.4	0.0	0.000
CCW Pump	Lg Pump	Sea-Van 0	2	6.1	24.6	15.6	0.0	0.000
CCW Surge Tank	Tank	Sea-Van 0	2	33.0	181.5	115.4	0.0	0.000
Chemical Addition Tank	Tank	Sea-Van 0	1	9.4	51.9	33.0	0.0	0.000
Sample HX	Lg HX	Sea-Van	9	25.5	102.0	64.8	0.3	0.234
24 Inch Valve	Lg Valve	Sea-Van	18	53.4	293.7	186.6	0.8	0.164
18 Inch valve	Lg Valve	Sea-Van	4	11.9	65.3	41.5	0.2	0.019
14 Inch Valve	Lg Valve	Sea-Van	10	29.7	163.2	103.7	0.8	0.030
8 Inch Valve	Lg Valve	Sea-Van	45	133.5	734.2	466.5	6.8	0.059
6 Inch Valve	Lg Valve	Sea-Van	4	11.9	65.3	41.5	0.7	0.003
4 Inch Valve	Lg Valve	Sea-Van	6	17.8	97.9	62.2	1.1	0.002
3 Inch Valve	Sm Valve	Sea-Van	10	0.0	0.0	0.0	0.0	0.003
2 Inch Valve	Sm Valve	Sea-Van	2	0.0	0.0	0.0	0.0	0.000
1 1/2 Inch Valve	Sm Valve	Sea-Van	31	0.0	0.0	0.0	0.0	0.003
1 Inch Valve	Sm Valve	Sea-Van	29	0.0	0.0	0.0	0.0	0.001
3/4 Inch Valve	Sm Valve	Sea-Van	10	0.0	0.0	0.0	0.0	0.000
				338	1,802	1,145	11	0.519

*** Clean Radioactive Waste Treatment System

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Reactor Coolant Drain Tank	Tank	Sea-Van	1	11.7	64.6	41.1	0.2	0.020
Reactor Coolant Drain Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Reactor Coolant Drain Filter	Tank	Mtl Box	1	9.4	51.6	32.8	0.1	0.005
Spent Resin Storage Tank	Tank	Sea-Van	1	23.5	129.3	82.2	0.3	0.099
Clean Waste Recv. Tank	Tank	Sea-Van	2	60.5	332.9	211.5	0.9	0.496
Clean Waste Recv. Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Treated Waste Mon. Tank	Tank	Sea-Van 0	2	57.3	315.3	200.3	0.8	0.000
Treated Waste Mon. Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Aux Building Drain Tank	Tank	Sea-Van	1	15.4	84.5	53.7	0.1	0.051
Aux Building Drain Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.0	0.003
Chemical Waste Drain Tank	Tank	Sea-Van	1	25.2	138.8	88.2	0.2	0.142
Chemical Waste Drain Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.0	0.003
Waste Conc. Hold. Tank	Tank	Sea-Van	1	15.4	84.8	53.9	2.2	0.055
Waste Conc. Hold. Pump	Lg Pump	Sea-Van	1	3.1	12.3	7.8	0.3	0.002
Clean Waste Filter	Tank	Mtl Box	1	8.2	45.3	28.8	0.1	0.001
Clean Rad. Waste Evaporator	Lg HX	Sea-Van	1	2.8	11.3	7.2	0.0	0.000
Clean Rad. Waste Evap. Condenser	Lg HX	Sea-Van	1	2.8	11.3	7.2	0.0	0.000
3 Inch Valve	Sm Valve	Sea-Van	19	0.0	0.0	0.0	0.0	0.005
2 Inch Valve	Sm Valve	Sea-Van	64	0.0	0.0	0.0	0.0	0.008
				266	1,405	893	5	0.899

TABLE A.1. Contents of File TEST.PRE (contd)

*** Containment Spray System Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Pump	Sm Pump	Sea-Van	2	2.5	10.1	6.4	0.0	0.003
Tank	Tank	Sea-Van	1	23.4	128.9	81.9	0.3	0.092
18 Inch Valve	Lg Valve	Sea-Van	4	11.9	65.3	41.5	0.2	0.019
14 Inch Valve	Lg Valve	Sea-Van	6	17.8	97.9	62.2	0.5	0.018
10 Inch Valve	Lg Valve	Sea-Van	6	17.8	97.9	62.2	0.8	0.012
3 Inch Valve	Sm Valve	Sea-Van	6	0.0	0.0	0.0	0.0	0.002
1 1/2 Inch Valve	Sm Valve	Sea-Van	6	0.0	0.0	0.0	0.0	0.000
1 Inch Valve	Sm Valve	Sea-Van	6	0.0	0.0	0.0	0.0	0.000
3/4 Inch Valve	Sm Valve	Sea-Van	12	0.0	0.0	0.0	0.0	0.000
Electrical Equipment	Sm Elec.	Sea-Van	6	7.6	30.2	19.2	0.0	0.000
Electrical Equipment	Lg Elec.	Sea-Van	6	11.3	45.3	28.8	0.0	0.000
				98	500	318	2	0.150

*** Chemical and Volume Control System Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Regenerative HX	Lg HX	Mtl Box	3	8.5	34.0	21.6	0.9	0.202
Seal Water HX	Lg HX	Mtl Box	1	2.8	11.3	7.2	0.0	0.052
Letdown HX	Lg HX	Mtl Box	1	2.8	11.3	7.2	1.4	0.105
Excess Letdown HX	Lg HX	Mtl Box	1	2.8	11.3	7.2	0.0	0.023
Centrif. Chrg. Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Vol. Control Tank	Tank	Sea-Van	1	21.0	115.7	73.5	0.3	0.075
Chem. Mix Tank	Tank	Sea-Van	1	8.3	45.4	28.9	0.1	0.002
Holdup Tank	Tank	Sea-Van	3	133.5	734.0	466.4	1.9	1.644
Monitor Tank	Tank	Sea-Van	2	69.7	383.4	243.6	2.5	0.566
Boric Acid Tank	Tank	Sea-Van	2	70.0	385.2	244.7	3.9	0.680
Batch Tank	Tank	Sea-Van 0	1	12.9	70.7	45.0	0.2	0.000
Resin Fill Tank	Tank	Sea-Van 0	1	14.1	77.4	49.2	0.2	0.000
Reciprocal Charg. Pump	Lg Pump	Sea-Van	1	3.1	12.3	7.8	0.0	0.002
Boric Acid Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.3	0.003
Reactor Coolant Filter	Tank	Mtl Box	1	9.4	51.5	32.7	0.1	0.004
Mixed Bed Demineralizer	Tank	Sea-Van	2	18.9	104.0	66.1	0.3	0.020
Cation IX	Tank	Mtl Box	1	9.5	52.0	33.0	0.1	0.010
Seal Injection Filter	Tank	Mtl Box	2	18.7	102.7	65.3	0.3	0.008
Concentrate Holding Tank	Tank	Sea-Van	1	14.2	77.9	49.5	0.2	0.041
Evaporator Feed IX	Tank	Mtl Box	3	28.4	156.0	99.1	0.4	0.030
Evaporator Condensate IX	Tank	Mtl Box	2	18.9	104.0	66.1	0.3	0.020
Condensate Filter	Tank	Mtl Box	1	8.3	45.4	28.9	0.1	0.002
Concentrates Filter	Tank	Mtl Box	1	8.3	45.4	28.9	0.1	0.002
Conc. Hold. Tank Transfer Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.0	0.003
Gas Stripper Feed Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Boric Acid Evaporator Condenser	Tank	Sea-Van	2	21.1	116.3	73.9	0.3	0.028
Boric Acid Evaporator Vent Condenser	Tank	Sea-Van	2	16.6	91.3	58.0	0.2	0.009
Boric Acid Evap. Distillate Condenser	Tank	Sea-Van	2	20.9	115.2	73.2	0.3	0.020
IX Filter	Tank	Mtl Box	1	8.3	45.6	28.9	0.1	0.003

TABLE A.1. Contents of File TEST.PRE (contd)

Recirculation Pump	Lg Pump	Sea-Van	1	3.1	12.3	7.8	0.0	0.002
Standpipes	Tank	Sea-Van	4	37.3	204.9	130.2	0.5	0.010
6 Inch Valve	Lg Valve	Sea-Van	2	5.9	32.6	20.7	0.3	0.002
4 Inch Valve	Lg Valve	Sea-Van	35	103.8	571.1	362.9	6.4	0.014
3 Inch Valve	Sm Valve	Sea-Van	49	0.0	0.0	0.0	0.0	0.012
2 Inch Valve	Sm Valve	Sea-Van	184	0.0	0.0	0.0	0.0	0.024
1 Inch Valve	Sm Valve	Sea-Van	28	0.0	0.0	0.0	0.0	0.001
3/4 Inch Valve	Sm Valve	Sea-Van	80	0.0	0.0	0.0	0.0	0.002
				725	3,919	2,490	22	3.628

*** Dirty Radioactive Waste Treatment System

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Reactor Cavity Drain Pump	Lg Pump	Sea-Van	1	3.1	12.3	7.8	0.0	0.002
Reactor Containment Sump Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Laundry Drain Tank	Tank	Sea-Van	1	15.4	84.5	53.7	0.2	0.051
Laundry Strainer	Tank	Sea-Van	1	0.0	0.0	0.0	0.0	0.000
Laundry Drain Tank Pump	Lg Pump	Sea-Van	1	3.1	12.3	7.8	0.0	0.002
Laundry Waste Filter	Tank	Sea-Van	1	0.0	0.0	0.0	0.0	0.000
Dirty Waste Monitor Tank	Tank	Sea-Van	1	25.0	137.5	87.4	0.4	0.120
Dirty Waste Monitor Tank Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Dirty Waste Monitor Tank Filter	Tank	Sea-Van	2	16.5	90.8	57.7	0.2	0.003
Dirty Waste Drain Tank	Tank	Sea-Van	1	25.1	138.0	87.7	0.4	0.127
Dirty Waste Drain Tank Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Aux. Building Sump Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.0	0.003
3 Inch Valve	Sm Valve	Sea-Van	14	0.0	0.0	0.0	0.0	0.004
2 Inch Valve	Sm Valve	Sea-Van	32	0.0	0.0	0.0	0.0	0.004
				113	574	364	1	0.325

*** Main Steam System (Within Containment)

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Flow Orifices	Lg Misc.	Sea-Van 0	4	12.3	49.1	31.2	0.0	0.000
28 Inch Piping	Lg Pipe	Sea-Van 0	590	116.7	641.8	407.8	0.8	0.000
14 Inch Piping	Lg Pipe	Sea-Van 0	420	83.1	456.8	290.3	2.3	0.000
3 Inch Piping	Sm Pipe	Sea-Van 0	500	69.3	381.3	242.3	4.5	0.000
				281	1,529	972	8	0.000

*** Radioactive Gaseous Waste System

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Surge Tank	Tank	Sea-Van	1	11.7	64.3	40.9	0.0	0.016
Decay Tank	Tank	Sea-Van	4	101.3	556.9	353.9	0.3	0.595
Gas Compressor	Lg Misc.	Sea-Van	2	6.1	24.6	15.6	0.0	0.000
Moisture Separator	Sm Misc.	Sea-Van	2	2.5	10.1	6.4	0.0	0.000
Br. Seal Wtr. HX	Lg HX	Mtl Box	2	5.7	22.7	14.4	0.1	0.176
4 Inch Valve	Lg Valve	Sea-Van	1	3.0	16.3	10.4	0.2	0.000
3 Inch Valve	Sm Valve	Sea-Van	3	0.0	0.0	0.0	0.0	0.000
2 Inch Valve	Sm Valve	Sea-Van	16	0.0	0.0	0.0	0.0	0.000
1 1/2 Inch Valve	Sm Valve	Sea-Van	35	0.0	0.0	0.0	0.0	0.003

TABLE A.1. Contents of File TEST.PRE (contd)

1 Inch Valve	Sm Valve	Sea-Van	12	0.0	0.0	0.0	0.0	0.000
3/4 Inch Valve	Sm Valve	Sea-Van	16	0.0	0.0	0.0	0.0	0.000
Electrical Equipment	Lg Elec.	Sea-Van	4	7.6	30.2	19.2	0.0	0.000
Mechanical Equipment	Lg Misc.	Sea-Van	2	6.1	24.6	15.6	0.0	0.000
HVAC Equipment	Lg Misc.	Sea-Van	1	3.1	12.3	7.8	0.0	0.000
				147	762	484	1	0.790

*** Residual Heat Removal System

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
HX Unit	Lg HX	Mtl Box	2	5.7	22.7	14.4	0.3	1.405
Electrical Equipment	Sm Elec.	Sea-Van	12	15.1	60.4	38.4	0.2	0.000
Electrical Equipment	Lg Elec.	Sea-Van	11	20.8	83.1	52.8	0.2	0.000
Mechanical Equipment	Sm Misc.	Sea-Van	1	1.3	5.0	3.2	0.0	0.000
14 Inch Valve	Lg Valve	Sea-Van	7	20.8	114.2	72.6	0.6	0.027
12 Inch valve	Lg Valve	Sea-Van	3	8.9	48.9	31.1	0.3	0.008
10 Inch Valve	Lg Valve	Sea-Van	2	5.9	32.6	20.7	0.3	0.004
8 Inch Valve	Lg Valve	Sea-Van	18	53.4	293.7	186.6	2.7	0.024
2 Inch Valve	Sm Valve	Sea-Van	2	0.0	0.0	0.0	0.0	0.000
3/4 Inch Valve	Sm Valve	Sea-Van	10	0.0	0.0	0.0	0.0	0.000
				138	685	435	5	1.472

*** Safety Injection System

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Accuml. Tank	Tank	Sea-Van	4	113.5	624.3	396.7	3.2	0.826
Boron Injection Tank	Tank	Sea-Van	1	15.5	85.5	54.3	0.2	0.059
Safety Injection Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.1	0.003
Refueling Water Storage Tank	Tank	Sea-Van	1	85.7	471.3	299.5	0.1	1.919
Primary Makeup Water Storage Tank	Tank	Sea-Van	1	61.1	336.2	213.6	0.1	1.071
Mechanical Equipment	Sm Misc.	Sea-Van	1	1.3	5.0	3.2	0.0	0.000
Electrical Equipment	Sm Elec.	Sea-Van	10	12 6	50.4	32.0	0.0	0.000
Electrical Equipment	Lg Elec.	Sea-Van	10	18.9	75.5	48.0	0.0	0.000
10 Inch Valve	Lg Valve	Sea-Van	8	23.7	130.5	82.9	1.1	0.016
8 Inch Valve	Lg Valve	Sea-Van	8	23.7	130.5	82.9	1.2	0.010
6 Inch Valve	Lg Valve	Sea-Van	2	5.9	32.6	20.7	0.3	0.002
4 Inch Valve	Lg Valve	Sea-Van	9	26.7	146.8	93.3	1.7	0.004
3 Inch Valve	Sm Valve	Sea-Van	4	0.0	0.0	0.0	0.0	0.001
2 Inch Valve	Sm Valve	Sea-Van	1	0.0	0.0	0.0	0.0	0.000
1 1/2 Inch Valve	Sm Valve	Sea-Van	4	0.0	0.0	0.0	0.0	0.000
1 Inch Valve	Sm Valve	Sea-Van	33	0.0	0.0	0.0	0.0	0.001
3/4 Inch Valve	Sm Valve	Sea-Van	20	0.0	0.0	0.0	0.0	0.000
				395	2,113	1,343	8	3.912

TABLE A.1. Contents of File TEST.PRE (contd)

*** Spent Fuel Cooling System

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Pump	Lg Pump	Sea-Van	1	3.1	12.3	7.8	0.0	0.002
Pump	Lg Pump	Sea-Van	2	6.1	24.6	15.6	0.0	0.003
Pump	Lg Pump	Sea-Van	1	3.1	12.3	7.8	0.0	0.002
Filter	Tank	Mtl Box	1	8.3	45.5	28.9	0.1	0.003
Filter	Tank	Mtl Box	1	8.3	45.5	28.9	0.1	0.003
Filter	Tank	Mtl Box	1	8.3	45.5	28.9	0.1	0.002
Demineralizer	Tank	Sea-Van	1	13.0	71.5	45.5	0.1	0.034
Spent Fuel Pool Heat Exchangers	Lg HX	Mtl Box	2	5.7	22.7	14.4	0.1	0.286
10 Inch Valve	Lg Valve	Sea-Van	8	23.7	130.5	82.9	1.1	0.016
8 Inch Valve	Lg Valve	Sea-Van	12	35.6	195.8	124.4	1.8	0.016
6 Inch Valve	Lg Valve	Sea-Van	1	3.0	16.3	10.4	0.2	0.001
4 Inch Valve	Lg Valve	Sea-Van	16	47.5	261.1	165.9	2.9	0.007
3 Inch Valve	Sm Valve	Sea-Van	9	0.0	0.0	0.0	0.0	0.002
2 Inch Valve	Sm Valve	Sea-Van	2	0.0	0.0	0.0	0.0	0.000
1 Inch Valve	Sm Valve	Sea-Van	10	0.0	0.0	0.0	0.0	0.000
3/4 Inch Valve	Sm Valve	Sea-Van	5	0.0	0.0	0.0	0.0	0.000
				166	884	561	6	0.375

*** Stainless Steel Piping (3 - 24 Inches)

Component Description		Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
24 Inch Class I	(0.375" thick)	Lg Pipe	Sea-Van	170	33.6	184.9	117.5	0.2	0.233
18 Inch Class III	(0.375" thick)	Lg Pipe	Sea-Van	30	5.9	32.6	20.7	0.1	0.031
16 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	300	59.3	326.3	207.4	1.4	0.270
14 Inch Class I	(1.250" thick)	Lg Pipe	Sea-Van	170	33.6	184.9	117.5	0.9	0.115
14 Inch Class II	(0.250" thick)	Lg Pipe	Sea-Van	200	39.6	217.5	138.2	1.1	0.159
14 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	270	53.4	293.7	186.6	1.5	0.211
14 Inch Class III	(0.375" thick)	Lg Pipe	Sea-Van	610	120.6	663.5	421.6	3.4	0.477
12 Inch Class I	(1.125" thick)	Lg Pipe	Sea-Van	150	29.7	163.2	103.7	1.1	0.093
12 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	400	79.1	435.1	276.5	2.9	0.283
12 Inch Class III	(0.406" thick)	Lg Pipe	Sea-Van	270	53.4	293.7	186.6	2.0	0.190
10 Inch Class I	(1.000" thick)	Lg Pipe	Sea-Van	330	65.3	359.0	228.1	3.0	0.170
10 Inch Class II	(0.165" thick)	Lg Pipe	Sea-Van	320	63.3	348.1	221.2	2.9	0.197
10 Inch Class II	(0.365" thick)	Lg Pipe	Sea-Van	360	71.2	391.6	248.8	3.3	0.213
10 Inch Class III	(0.365" thick)	Lg Pipe	Sea-Van	60	11.9	65.3	41.5	0.6	0.035
10 Inch Non-Nuc. Grade	(0.165" thick)	Lg Pipe	Sea-Van	1,000	197.8	1,087.7	691.2	9.2	0.615
8 Inch I	(0.906" thick)	Lg Pipe	Sea-Van	250	49.4	271.9	172.8	2.5	0.100
8 Inch II	(0.322" thick)	Lg Pipe	Sea-Van	530	104.8	576.5	366.3	5.3	0.250
8 Inch II	(0.500" thick)	Lg Pipe	Sea-Van	50	9.9	54.4	34.6	0.5	0.022
8 Inch II	(0.906" thick)	Lg Pipe	Sea-Van	20	4.0	21.8	13.8	0.2	0.008
8 Inch III	(0.322" thick)	Lg Pipe	Sea-Van	620	122.6	674.4	428.5	6.2	0.292
8 Inch Non-Nuc. Grade	(0.148" thick)	Lg Pipe	Sea-Van	400	79.1	435.1	276.5	4.0	0.197
8 Inch Non-Nuc. Grade	(0.322" thick)	Lg Pipe	Sea-Van	130	25.7	141.4	89.9	1.3	0.061
6 Inch I	(0.718" thick)	Lg Pipe	Sea-Van	550	108.8	598.3	380.1	6.0	0.168
6 Inch II	(0.134" thick)	Lg Pipe	Sea-Van	100	19.8	108.8	69.1	1.1	0.038
6 Inch II	(0.280" thick)	Lg Pipe	Sea-Van	500	98.9	543.9	345.6	5.4	0.179
6 Inch III	(0.280" thick)	Lg Pipe	Sea-Van	90	17.8	97.9	62.2	1.0	0.032

TABLE A.1. Contents of File TEST.PRE (contd)

6 Inch Non-Nuc. Grade	(0.134" thick)	Lg Pipe	Sea-Van	1,400	276.9	1,522.8	967.6	15.2	0.525
4 Inch I	(0.531" thick)	Lg Pipe	Sea-Van	280	55.4	304.6	193.5	3.4	0.057
4 Inch II	(0.120" thick)	Lg Pipe	Sea-Van	250	49.4	271.9	172.8	3.1	0.063
4 Inch II	(0.237" thick)	Lg Pipe	Sea-Van	500	98.9	543.9	345.6	6.1	0.119
4 Inch II	(0.337" thick)	Lg Pipe	Sea-Van	70	13.8	76.1	48.4	0.9	0.016
4 Inch II	(0.531" thick)	Lg Pipe	Sea-Van	180	35.6	195.8	124.4	2.2	0.037
4 Inch III	(0.237" thick)	Lg Pipe	Sea-Van	1,340	265.0	1,457.6	926.2	16.4	0.318
4 Inch Non-Nuc. Grade	(0.120" thick)	Lg Pipe	Sea-Van	2,200	435.1	2,393.0	1,520.6	26.9	0.553
3 Inch I	(0.437" thick)	Sm Pipe	Sea-Van	40	5.5	30.5	19.4	0.4	0.006
3 Inch II	(0.120" thick)	Sm Pipe	Sea-Van	220	30.5	167.8	106.6	2.0	0.042
3 Inch II	(0.216" thick)	Sm Pipe	Sea-Van	2,000	277.3	1,525.3	969.2	18.1	0.362
3 Inch II	(0.437" thick)	Sm Pipe	Sea-Van	1,100	152.5	838.9	533.1	10.0	0.170
3 Inch III	(0.216" thick)	Sm Pipe	Sea-Van	1,460	202.5	1,113.5	707.5	13.2	0.264
3 Inch Non-Nuc. Grade	(0.120" thick)	Sm Pipe	Sea-Van	5,000	693.3	3,813.3	2,423.1	45.3	0.962
3 Inch Non-Nuc. Grade	(0.216" thick)	Sm Pipe	Sea-Van	20	2.8	15.3	9.7	0.2	0.004
					4,153	22,842	14,514	231	8.138

*** Stainless Steel Piping (1/2 - 2 Inches)

Component Description		Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
2 Inch Class I	(0.343" thick)	Sm Pipe	Sea-Van	550	76.3	419.5	266.5	5.3	0.055
2 Inch Class II	(0.154" thick)	Sm Pipe	Sea-Van	200	27.7	152.5	96.9	1.9	0.024
2 Inch Class II	(0.218" thick)	Sm Pipe	Sea-Van	800	110.9	610.1	387.7	7.6	0.092
2 Inch Class II	(0.343" thick)	Sm Pipe	Sea-Van	1,450	201.1	1,105.9	702.7	13.9	0.145
2 Inch Class III	(0.154" thick)	Sm Pipe	Sea-Van	4,100	568.5	3,126.9	1,986.9	39.2	0.500
2 Inch Non-Nuc. Grade	(0.154" thick)	Sm Pipe	Sea-Van	1,400	194.1	1,067.7	678.5	13.4	0.171
1 1/2 Inch Class I	(0.281" thick)	Sm Pipe	Sea-Van	700	97.1	533.9	339.2	6.7	0.055
1 1/2 Inch Class II	(0.145" thick)	Sm Pipe	Sea-Van	200	27.7	152.5	96.9	1.9	0.019
1 1/2 Inch Class II	(0.200" thick)	Sm Pipe	Sea-Van	800	110.9	610.1	387.7	7.6	0.071
1 1/2 Inch Class II	(0.281" thick)	Sm Pipe	Sea-Van	200	27.7	152.5	96.9	1.9	0.016
1 1/2 Inch Class III	(0.145" thick)	Sm Pipe	Sea-Van	1,700	235.7	1,296.5	823.8	16.2	0.161
1 1/2 Inch Non-Nuc. Grade	(0.145" thick)	Sm Pipe	Sea-Van	1,500	208.0	1,144.0	726.9	14.3	0.142
1 Inch Class I	(0.250" thick)	Sm Pipe	Sea-Van	100	13.9	76.3	48.5	1.0	0.005
1 Inch Class II	(0.133" thick)	Sm Pipe	Sea-Van	100	13.9	76.3	48.5	1.0	0.006
1 Inch Class II	(0.179" thick)	Sm Pipe	Sea-Van	300	41.6	228.8	145.4	2.9	0.017
1 Inch Class II	(0.250" thick)	Sm Pipe	Sea-Van	600	83.2	457.6	290.8	5.7	0.029
1 Inch Class III	(0.133" thick)	Sm Pipe	Sea-Van	1,500	208.0	1,144.0	726.9	14.3	0.093
1 Inch Non-Nuc. Grade	(0.133" thick)	Sm Pipe	Sea-Van	2,000	277.3	1,525.3	969.2	19.1	0.124
3/4 Inch Class I	(0.218" thick)	Sm Pipe	Sea-Van	290	40.2	221.2	140.5	2.8	0.011
3/4 Inch Class II	(0.113" thick)	Sm Pipe	Sea-Van	200	27.7	152.5	96.9	1.9	0.010
3/4 Inch Class II	(0.154" thick)	Sm Pipe	Sea-Van	300	41.6	228.8	145.4	2.9	0.013
3/4 Inch Class II	(0.218" thick)	Sm Pipe	Sea-Van	700	97.1	533.9	339.2	6.7	0.025
3/4 Inch Class III	(0.113" thick)	Sm Pipe	Sea-Van	900	124.8	686.4	436.1	8.6	0.044
3/4 Inch Non-Nuc. Grade	(0.113" thick)	Sm Pipe	Sea-Van	1,000	138.7	762.7	484.6	9.6	0.049
1/2 Inch Class I	(0.187" thick)	Sm Pipe	Sea-Van	105	14.6	80.1	50.9	1.0	0.003
1/2 Inch Class II	(0.147" thick)	Sm Pipe	Sea-Van	200	27.7	152.5	96.9	1.9	0.006
1/2 Inch Class II	(0.187" thick)	Sm Pipe	Sea-Van	200	27.7	152.5	96.9	1.9	0.005
1/2 Inch Class III	(0.109" thick)	Sm Pipe	Sea-Van	800	110.9	610.1	387.7	7.6	0.029
1/2 Inch Non-Nuc. Grade	(0.109" thick)	Sm Pipe	Sea-Van	1,000	138.7	762.7	484.6	9.6	0.037
					3,313	18,224	11,580	228	1.956

TABLE A.1. Contents of File TEST.PRE (contd)

*** Retrofit Materials

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
2 Inch Piping	Sm Pipe	Sea-Van	52	7.2	39.7	25.2	0.5	0.006
3/4 Inch Piping	Sm Pipe	Sea-Van	40	5.5	30.5	19.4	0.4	0.002
1/2 Inch Piping	Sm Pipe	Sea-Van	304	42.2	231.9	147.3	2.9	0.010
2 Inch valve	Sm Valve	Sea-Van	4	0.0	0.0	0.0	0.0	0.001
1 Inch valve	Sm Valve	Sea-Van	3	0.0	0.0	0.0	0.0	0.000
3/4 Inch valve	Sm Valve	Sea-Van	8	0.0	0.0	0.0	0.0	0.000
Tank	Tank	Sea-Van	2	30.7	169.0	107.4	0.2	0.102
Dry waste compactor	Lg Misc.	Sea-Van	1	3.1	12.3	7.8	0.0	0.000
Skid-mounted unit	Lg Misc.	Sea-Van	1	3.1	12.3	7.8	0.0	0.000
Shielded box	Lg Misc.	Sea-Van	1	3.1	12.3	7.8	0.0	0.000
				95	508	323	4	0.120

*** Electrical Components and Annunciators

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
125 Volt DC Power	Lg Elec.	Sea-Van	2	3.8	15.1	9.6	0.0	0.000
125 Volt DC Power	Lg Elec.	Sea-Van	2	3.8	15.1	9.6	0.0	0.000
125 Volt DC Power	Lg Elec.	Sea-Van	1	1.9	7.6	4.8	0.0	0.000
4.16 KV AC & Auxiliary Power	Lg Elec.	Sea-Van	1	1.9	7.6	4.8	0.0	0.000
4.16 KV AC & Auxiliary Power	Lg Elec.	Sea-Van	1	1.9	7.6	4.8	0.0	0.000
480 Volt AC Auxiliary Load Center	Lg Elec.	Sea-Van	7	13.2	52.9	33.6	0.0	0.000
480 Volt AC Auxiliary Load Center	Lg Elec.	Sea-Van	7	13.2	52.9	33.6	0.0	0.000
480 Volt AC MCC	Lg Elec.	Sea-Van	1	1.9	7.6	4.8	0.0	0.000
480 Volt AC MCC	Lg Elec.	Sea-Van	12	22.7	90.6	57.6	0.0	0.000
Annunciators (electrical portion)	Sm Elec.	Sea-Van 0	2	2.5	10.1	6.4	0.0	0.000
Annunciators (mechanical portion)	Sm Misc.	Sea-Van 0	22	27.7	110.8	70.4	0.0	0.000
				94	378	240	0	0.000

*** Control Rod Drive

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
Electrical Equipment	Sm Elec.	Sea-Van	4	5.0	20.1	12.8	0.0	0.000
Electrical Equipment	Lg Elec.	Sea-Van	4	7.6	30.2	19.2	0.0	0.000
Mechanical Equipment	Lg Misc.	Sea-Van	1	3.1	12.3	7.8	0.0	0.000
				16	63	40	0	0.000

*** Small Hangers (4" pipe or less)

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
1 Inch Hangers	Sm Hngr.	Sea-Van	4,920	3,097.2	17,034.5	10,824.0	0.4	0.000
2 Inch Hangers	Sm Hngr.	Sea-Van	2,962	1,864.6	10,255.3	6,516.4	0.3	0.000
3 Inch Hangers	Sm Hngr.	Sea-Van	1,554	978.3	5,380.4	3,418.8	0.1	0.000
4 Inch Hangers	Sm Hngr.	Sea-Van	1,172	737.8	4,057.8	2,578.4	0.1	0.000
				6,678	36,728	23,338	1	0.000

TABLE A.1. Contents of File TEST.PRE (contd)

*** Large Hangers (> 4" pipe)

Component Description	Category	Disposal	Qty	Crew-Hrs	Pers-Hrs	Exp Hrs	Pers-Rem	Curies
6 Inch Hangers	Lg Hngr.	Sea-Van	452	853.6	4,694.9	2,983.2	0.1	0.000
8 Inch Hangers	Lg Hngr.	Sea-Van	1,002	1,892.3	10,407.7	6,613.2	0.3	0.000
10 Inch Hangers	Lg Hngr.	Sea-Van	246	464.6	2,555.2	1,623.6	0.1	0.000
12 Inch Hangers	Lg Hngr.	Sea-Van	134	253.1	1,391.8	884.4	0.0	0.000
14 Inch Hangers	Lg Hngr.	Sea-Van	236	445.7	2,451.3	1,557.6	0.1	0.000
18 Inch Hangers	Lg Hngr.	Sea-Van	19	35.9	197.4	125.4	0.0	0.000
20 Inch Hangers	Lg Hngr.	Sea-Van	3	5.7	31.2	19.8	0.0	0.000
24 Inch Hangers	Lg Hngr.	Sea-Van	80	151.1	831.0	528.0	0.0	0.000
28 Inch Hangers	Lg Hngr.	Sea-Van	32	60.4	332.4	211.2	0.0	0.000
				4,162	22,893	14,546	1	0.000

NOTE: For piping, "Qty" refers to feet of piping. For other categories "Qty" refers to the number of items of equipment.

TABLE A.1. Contents of File TEST.PRE (contd)

File: E:\NRC\TEST.PRE
Plant Name: TROJAN

+ POTENTIALLY RADIOACTIVE SYSTEMS: REMOVAL, TRANSPORTATION, DISPOSAL COSTS (DOLLARS) +

*** Component Cooling Water System

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
CCW HX	Lg HX	Sea-Van 0	2	955	18,786	5,039	157,733	182,514
CCW Pump	Lg Pump	Sea-Van 0	2	938	4,026	1,080	33,800	39,843
CCW Surge Tank	Tank	Sea-Van 0	2	6,331	1,476	396	12,393	20,596
Chemical Addition Tank	Tank	Sea-Van 0	1	1,799	107	29	901	2,836
Sample HX	Lg HX	Sea-Van	9	3,578	8,454	2,268	70,980	85,280
24 Inch Valve	Lg Valve	Sea-Van	18	10,288	17,149	4,600	143,988	176,025
18 Inch valve	Lg Valve	Sea-Van	4	2,286	2,630	706	22,083	27,704
14 Inch Valve	Lg Valve	Sea-Van	10	5,715	3,704	993	31,096	41,509
8 Inch Valve	Lg Valve	Sea-Van	45	25,720	6,214	1,667	52,170	85,770
6 Inch Valve	Lg Valve	Sea-Van	4	2,286	316	85	2,650	5,336
4 Inch Valve	Lg Valve	Sea-Van	6	3,429	216	58	1,812	5,515
3 Inch Valve	Sm Valve	Sea-Van	10	0	205	55	1,724	1,984
2 Inch Valve	Sm Valve	Sea-Van	2	0	24	6	203	233
1 1/2 Inch Valve	Sm Valve	Sea-Van	31	0	258	69	2,165	2,493
1 Inch Valve	Sm Valve	Sea-Van	29	0	195	52	1,634	1,880
3/4 Inch Valve	Sm Valve	Sea-Van	10	0	40	11	338	389
				63,324	63,800	17,114	535,670	679,908

*** Clean Radioactive Waste Treatment System

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Reactor Coolant Drain Tank	Tank	Sea-Van	1	2,246	224	60	1,882	4,411
Reactor Coolant Drain Pump	Lg Pump	Sea-Van	2	847	134	36	1,127	2,144
Reactor Coolant Drain Filter	Tank	Mtl Box	1	1,786	24	12	193	2,016
Spent Resin Storage Tank	Tank	Sea-Van	1	4,519	912	245	7,661	13,337
Clean Waste Recv. Tank	Tank	Sea-Van	2	11,791	2,941	789	24,692	40,213
Clean Waste Recv. Pump	Lg Pump	Sea-Van	2	847	134	36	1,127	2,144
Treated Waste Mon. Tank	Tank	Sea-Van 0	2	11,146	3,006	806	25,237	40,196
Treated Waste Mon. Pump	Lg Pump	Sea-Van	2	842	62	17	518	1,439
Aux Building Drain Tank	Tank	Sea-Van	1	2,948	280	75	2,355	5,658
Aux Building Drain Pump	Lg Pump	Sea-Van	2	850	349	94	2,929	4,222
Chemical Waste Drain Tank	Tank	Sea-Van	1	4,871	725	194	6,084	11,874
Chemical Waste Drain Pump	Lg Pump	Sea-Van	2	842	54	14	451	1,361
Waste Conc. Hold. Tank	Tank	Sea-Van	1	2,960	280	75	2,355	5,671
Waste Conc. Hold. Pump	Lg Pump	Sea-Van	1	421	31	8	259	719
Clean Waste Filter	Tank	Mtl Box	1	1,568	5	2	37	1,612
Clean Rad. Waste Evaporator	Lg HX	Sea-Van	1	587	5,368	1,440	45,067	52,461
Clean Rad. Waste Evap. Condenser	Lg HX	Sea-Van	1	398	1,074	288	9,013	10,773
3 Inch Valve	Sm Valve	Sea-Van	19	0	390	105	3,275	3,770
2 Inch Valve	Sm Valve	Sea-Van	64	0	773	207	6,490	7,470
				49,471	16,765	4,504	140,751	211,492

TABLE A.1. Contents of File TEST.PRE (contd)

*** Containment Spray System Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Pump	Lg Pump	Sea-Van	2	895	1,825	490	15,323	18,532
Pump	Sm Pump	Sea-Van	2	348	27	7	225	607
Tank	Tank	Sea-Van	1	4,500	335	90	2,817	7,742
18 Inch Valve	Lg Valve	Sea-Van	4	2,286	2,630	706	22,083	27,704
14 Inch Valve	Lg Valve	Sea-Van	6	3,429	2,222	596	18,658	24,905
10 Inch Valve	Lg Valve	Sea-Van	6	3,429	1,174	315	9,856	14,774
3 Inch Valve	Sm Valve	Sea-Van	6	0	123	33	1,034	1,191
1 1/2 Inch Valve	Sm Valve	Sea-Van	6	0	50	13	419	482
1 Inch Valve	Sm Valve	Sea-Van	6	0	40	11	338	389
3/4 Inch Valve	Sm Valve	Sea-Van	12	0	48	13	406	467
Electrical Equipment	Sm Elec.	Sea-Van	6	1,040	60	16	507	1,624
Electrical Equipment	Lg Elec.	Sea-Van	6	1,561	121	32	1,014	2,728
				17,489	8,656	2,322	72,679	101,146

*** Chemical and Volume Control System Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Regenerative HX	Lg HX	Mtl Box	3	1,187	1,359	234	10,928	13,708
Seal Water HX	Lg HX	Mtl Box	1	395	117	60	938	1,510
Letdown HX	Lg HX	Mtl Box	1	399	130	67	1,049	1,645
Excess Letdown HX	Lg HX	Mtl Box	1	391	110	57	883	1,440
Centrif. Chrg. Pump	Lg Pump	Sea-Van	2	959	4,587	1,230	38,509	45,285
Vol. Control Tank	Tank	Sea-Van	1	4,039	651	175	5,464	10,329
Chem. Mix Tank	Tank	Sea-Van	1	1,571	10	3	87	1,671
Holdup Tank	Tank	Sea-Van	3	26,245	12,077	3,240	101,400	142,961
Monitor Tank	Tank	Sea-Van	2	13,451	5,368	1,440	45,067	65,325
Boric Acid Tank	Tank	Sea-Van	2	13,701	5,368	1,440	45,067	65,576
Batch Tank	Tank	Sea-Van 0	1	2,457	195	52	1,634	4,338
Resin Fill Tank	Tank	Sea-Van 0	1	2,693	35	9	293	3,031
Reciprocal Charg. Pump	Lg Pump	Sea-Van	1	479	2,375	637	19,942	23,434
Boric Acid Pump	Lg Pump	Sea-Van	2	849	166	44	1,393	2,452
Reactor Coolant Filter	Tank	Mtl Box	1	1,784	14	7	110	1,915
Mixed Bed Demineralizer	Tank	Sea-Van	2	3,607	282	76	2,366	6,330
Cation IX	Tank	Mtl Box	1	1,803	72	37	580	2,492
Seal Injection Filter	Tank	Mtl Box	2	3,556	113	58	1,821	5,549
Concentrate Holding Tank	Tank	Sea-Van	1	2,715	470	126	3,943	7,254
Evaporator Feed IX	Tank	Mtl Box	3	5,410	72	37	1,739	7,258
Evaporator Condensate IX	Tank	Mtl Box	2	3,607	72	37	1,159	4,875
Condensate Filter	Tank	Mtl Box	1	1,571	3	1	22	1,598
Concentrates Filter	Tank	Mtl Box	1	1,571	3	1	22	1,598
Conc. Hold. Tank Transfer Pump	Lg Pump	Sea-Van	2	842	54	14	451	1,361
Gas Stripper Feed Pump	Lg Pump	Sea-Van	2	842	54	14	451	1,361
Boric Acid Evaporator Condenser	Tank	Sea-Van	2	4,038	5,368	1,440	45,067	55,912
Boric Acid Evaporator Vent Condenser	Tank	Sea-Van	2	3,163	161	43	1,352	4,719
Boric Acid Evap. Distillate Condenser	Tank	Sea-Van	2	3,994	81	22	676	4,772
IX Filter	Tank	Mtl Box	1	1,576	10	5	83	1,675

TABLE A.1. Contents of File TEST.PRE (contd)

Recirculation Pump	Lg Pump	Sea-Van	1	421	27	7	225	681
Standpipes	Tank	Sea-Van	4	7,092	290	78	2,434	9,893
6 Inch Valve	Lg Valve	Sea-Van	2	1,143	158	42	1,325	2,668
4 Inch Valve	Lg Valve	Sea-Van	35	20,004	1,259	338	10,568	32,169
3 Inch Valve	Sm Valve	Sea-Van	49	0	1,006	270	8,447	9,722
2 Inch Valve	Sm Valve	Sea-Van	184	0	2,222	596	18,658	21,476
1 Inch Valve	Sm Valve	Sea-Van	28	0	188	50	1,577	1,816
3/4 Inch Valve	Sm Valve	Sea-Van	80	0	322	86	2,704	3,112
				137,558	44,844	12,076	378,432	572,909

*** Dirty Radioactive Waste Treatment System

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Reactor Cavity Drain Pump	Lg Pump	Sea-Van	1	435	107	29	901	1,472
Reactor Containment Sump Pump	Lg Pump	Sea-Van	2	855	403	108	3,380	4,745
Laundry Drain Tank	Tank	Sea-Van	1	2,948	268	72	2,253	5,542
Laundry Strainer	Tank	Sea-Van	1	0	20	5	169	195
Laundry Drain Tank Pump	Lg Pump	Sea-Van	1	421	27	7	225	681
Laundry Waste Filter	Tank	Sea-Van	1	0	20	5	169	195
Dirty Waste Monitor Tank	Tank	Sea-Van	1	4,814	778	209	6,535	12,336
Dirty Waste Monitor Tank Pump	Lg Pump	Sea-Van	2	842	54	14	451	1,361
Dirty Waste Monitor Tank Filter	Tank	Sea-Van	2	3,140	20	5	171	3,337
Dirty Waste Drain Tank	Tank	Sea-Van	1	4,833	878	235	7,368	13,315
Dirty Waste Drain Tank Pump	Lg Pump	Sea-Van	2	847	107	29	901	1,885
Aux. Building Sump Pump	Lg Pump	Sea-Van	2	859	349	94	2,929	4,231
3 Inch Valve	Sm Valve	Sea-Van	14	0	287	77	2,413	2,778
2 Inch Valve	Sm Valve	Sea-Van	32	0	386	104	3,245	3,735
				19,994	3,706	994	31,112	55,806

*** Main Steam System (Within Containment)

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Flow Orifices	Lg Misc.	Sea-Van 0	4	1,735	1,342	360	11,267	14,704
28 Inch Piping	Lg Pipe	Sea-Van 0	590	22,481	19,625	5,264	164,774	212,144
14 Inch Piping	Lg Pipe	Sea-Van 0	420	16,003	4,785	1,284	40,179	62,252
3 Inch Piping	Sm Pipe	Sea-Van 0	500	13,348	688	184	5,774	19,994
				53,567	26,440	7,092	221,994	309,094

*** Radioactive Gaseous Waste System

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Surge Tank	Tank	Sea-Van	1	2,233	119	32	1,003	3,388
Decay Tank	Tank	Sea-Van	4	19,561	5,797	1,555	48,672	75,585
Gas Compressor	Lg Misc.	Sea-Van	2	922	2,147	576	18,027	21,672
Moisture Separator	Sm Misc.	Sea-Van	2	350	27	7	225	609
Br. Seal Wtr. HX	Lg HX	Mtl Box	2	795	1,057	273	8,499	10,624
4 Inch Valve	Lg Valve	Sea-Van	1	572	36	10	302	919
3 Inch Valve	Sm Valve	Sea-Van	3	0	62	17	517	596
2 Inch Valve	Sm Valve	Sea-Van	16	0	193	52	1,622	1,867
1 1/2 Inch Valve	Sm Valve	Sea-Van	35	0	291	78	2,445	2,814

TABLE A.1. Contents of File TEST.PRE (cont'd)

1 Inch Valve	Sm Valve	Sea-Van	12	0	81	22	676	778
3/4 Inch Valve	Sm Valve	Sea-Van	16	0	64	17	541	622
Electrical Equipment	Lg Elec.	Sea-Van	4	1,041	81	22	676	1,819
Mechanical Equipment	Lg Misc.	Sea-Van	2	891	1,342	360	11,267	13,859
HVAC Equipment	Lg Misc.	Sea-Van	1	421	20	5	169	616
				26,785	11,316	3,025	94,641	135,767

*** Residual Heat Removal System

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Pump	Lg Pump	Sea-Van	2	860	1,825	490	15,323	18,497
HX Unit	Lg HX	Mtl Box	2	861	0	1,538	31,212	33,611
Electrical Equipment	Sm Elec.	Sea-Van	12	2,081	121	32	1,014	3,248
Electrical Equipment	Lg Elec.	Sea-Van	11	2,862	221	59	1,859	5,002
Mechanical Equipment	Sm Misc.	Sea-Van	1	173	10	3	85	271
14 Inch Valve	Lg Valve	Sea-Van	7	4,001	2,593	695	21,767	29,056
12 Inch valve	Lg Valve	Sea-Van	3	1,715	794	213	6,665	9,387
10 Inch Valve	Lg Valve	Sea-Van	2	1,143	391	105	3,285	4,925
8 Inch Valve	Lg Valve	Sea-Van	18	10,288	2,485	667	20,868	34,308
2 Inch Valve	Sm Valve	Sea-Van	2	0	24	6	203	233
3/4 Inch Valve	Sm Valve	Sea-Van	10	0	40	11	338	389
				23,984	8,505	3,820	102,619	138,927

*** Safety Injection System

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Accuml. Tank	Tank	Sea-Van	4	22,022	41,062	11,015	344,760	418,858
Boron Injection Tank	Tank	Sea-Van	1	2,987	3,824	1,026	32,110	39,947
Safety Injection Pump	Lg Pump	Sea-Van	2	912	2,308	619	19,379	23,218
Refueling Water Storage Tank	Tank	Sea-Van	1	17,114	23,859	6,400	200,321	247,694
Primary Makeup Water Storage Tank	Tank	Sea-Van	1	12,122	13,312	3,571	111,765	140,769
Mechanical Equipment	Sm Misc.	Sea-Van	1	173	10	3	85	271
Electrical Equipment	Sm Elec.	Sea-Van	10	1,734	101	27	845	2,707
Electrical Equipment	Lg Elec.	Sea-Van	10	2,602	201	54	1,690	4,547
10 Inch Valve	Lg Valve	Sea-Van	8	4,572	1,565	420	13,141	19,699
8 Inch Valve	Lg Valve	Sea-Van	8	4,572	1,105	296	9,275	15,248
6 Inch Valve	Lg Valve	Sea-Van	2	1,143	158	42	1,325	2,668
4 Inch Valve	Lg Valve	Sea-Van	9	5,144	324	87	2,718	8,272
3 Inch Valve	Sm Valve	Sea-Van	4	0	82	22	690	794
2 Inch Valve	Sm Valve	Sea-Van	1	0	12	3	101	117
1 1/2 Inch Valve	Sm Valve	Sea-Van	4	0	33	9	279	322
1 Inch Valve	Sm Valve	Sea-Van	33	0	221	59	1,859	2,140
3/4 Inch Valve	Sm Valve	Sea-Van	20	0	81	22	676	778
				75,098	88,257	23,674	741,019	928,049

TABLE A.1. Contents of File TEST.PRE (contd)

*** Spent Fuel Cooling System

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Pump	Lg Pump	Sea-Van	1	426	134	36	1,127	1,723
Pump	Lg Pump	Sea-Van	2	852	242	65	2,028	3,187
Pump	Lg Pump	Sea-Van	1	425	94	25	789	1,333
Filter	Tank	Mtl Box	1	1,576	25	13	199	1,812
Filter	Tank	Mtl Box	1	1,576	25	13	199	1,812
Filter	Tank	Mtl Box	1	1,574	10	5	83	1,672
Demineralizer	Tank	Sea-Van	1	2,492	295	79	2,479	5,345
Spent Fuel Pool Heat Exchangers	Lg HX	Mtl Box	2	804	837	216	6,733	8,590
10 Inch Valve	Lg Valve	Sea-Van	8	4,572	1,565	420	13,141	19,699
8 Inch Valve	Lg Valve	Sea-Van	12	6,859	1,657	444	13,912	22,872
6 Inch Valve	Lg Valve	Sea-Van	1	572	79	21	662	1,334
4 Inch Valve	Lg Valve	Sea-Van	16	9,145	575	154	4,831	14,706
3 Inch Valve	Sm Valve	Sea-Van	9	0	185	50	1,551	1,786
2 Inch Valve	Sm Valve	Sea-Van	2	0	24	6	203	233
1 Inch Valve	Sm Valve	Sea-Van	10	0	67	18	563	648
3/4 Inch Valve	Sm Valve	Sea-Van	5	0	20	5	169	195
				30,872	5,834	1,571	48,669	86,947

*** Stainless Steel Piping (3 - 24 Inches)

Component Description		Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
24 Inch Class I	(0.375" thick)	Lg Pipe	Sea-Van	170	6,478	2,158	579	18,631	27,846
18 Inch Class III	(0.375" thick)	Lg Pipe	Sea-Van	30	1,143	284	76	2,386	3,889
16 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	300	11,431	2,519	676	22,339	36,965
14 Inch Class I	(1.250" thick)	Lg Pipe	Sea-Van	170	6,478	3,883	1,042	32,603	44,005
14 Inch Class II	(0.250" thick)	Lg Pipe	Sea-Van	200	7,621	985	264	8,736	17,606
14 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	270	10,288	1,977	530	17,531	30,327
14 Inch Class III	(0.375" thick)	Lg Pipe	Sea-Van	610	23,243	4,467	1,198	40,134	69,042
12 Inch Class I	(1.125" thick)	Lg Pipe	Sea-Van	150	5,715	2,812	754	23,606	32,887
12 Inch Class II	(0.375" thick)	Lg Pipe	Sea-Van	400	15,241	2,660	714	23,588	42,203
12 Inch Class III	(0.406" thick)	Lg Pipe	Sea-Van	270	10,288	1,939	520	17,197	29,945
10 Inch Class I	(1.000" thick)	Lg Pipe	Sea-Van	330	12,574	4,611	1,237	39,801	58,223
10 Inch Class II	(0.165" thick)	Lg Pipe	Sea-Van	320	12,193	803	215	7,215	20,426
10 Inch Class II	(0.365" thick)	Lg Pipe	Sea-Van	360	13,717	1,956	525	17,340	33,537
10 Inch Class III	(0.365" thick)	Lg Pipe	Sea-Van	60	2,286	326	87	2,736	5,436
10 Inch Non-Nuc. Grade	(0.165" thick)	Lg Pipe	Sea-Van	1,000	38,103	2,509	673	23,137	64,423
8 Inch I	(0.906" thick)	Lg Pipe	Sea-Van	250	9,526	2,506	672	21,038	33,741
8 Inch II	(0.322" thick)	Lg Pipe	Sea-Van	530	20,195	2,030	545	18,244	41,013
8 Inch II	(0.500" thick)	Lg Pipe	Sea-Van	50	1,905	291	78	2,444	4,719
8 Inch II	(0.906" thick)	Lg Pipe	Sea-Van	20	762	200	54	1,683	2,699
8 Inch III	(0.322" thick)	Lg Pipe	Sea-Van	620	23,624	2,375	637	21,342	47,978
8 Inch Non-Nuc. Grade	(0.148" thick)	Lg Pipe	Sea-Van	400	15,241	719	193	6,547	22,700
8 Inch Non-Nuc. Grade	(0.322" thick)	Lg Pipe	Sea-Van	130	4,953	498	134	4,299	9,884
6 Inch I	(0.718" thick)	Lg Pipe	Sea-Van	550	20,957	3,343	897	29,646	54,842
6 Inch II	(0.134" thick)	Lg Pipe	Sea-Van	100	3,810	125	33	1,105	5,074
6 Inch II	(0.280" thick)	Lg Pipe	Sea-Van	500	19,051	1,273	341	11,436	32,102
6 Inch III	(0.280" thick)	Lg Pipe	Sea-Van	90	3,429	229	61	1,978	5,697

TABLE A.1. Contents of File TEST.PRE (contd)

6 Inch Non-Nuc. Grade	(0.134" thick)	Lg Pipe	Sea-Van	1,400	53,344	1,745	468	16,092	71,650
4 Inch I	(0.531" thick)	Lg Pipe	Sea-Van	280	10,669	846	227	7,300	19,042
4 Inch II	(0.120" thick)	Lg Pipe	Sea-Van	250	9,526	188	50	1,691	11,455
4 Inch II	(0.237" thick)	Lg Pipe	Sea-Van	500	19,051	724	194	6,505	26,474
4 Inch II	(0.337" thick)	Lg Pipe	Sea-Van	70	2,667	141	38	1,181	4,027
4 Inch II	(0.531" thick)	Lg Pipe	Sea-Van	180	6,859	544	146	4,693	12,241
4 Inch III	(0.237" thick)	Lg Pipe	Sea-Van	1,340	51,058	1,940	520	17,889	71,408
4 Inch Non-Nuc. Grade	(0.120" thick)	Lg Pipe	Sea-Van	2,200	83,827	1,656	444	15,270	101,197
3 Inch I	(0.437" thick)	Sm Pipe	Sea-Van	40	1,068	77	21	645	1,811
3 Inch II	(0.120" thick)	Sm Pipe	Sea-Van	220	5,873	128	34	1,149	7,184
3 Inch II	(0.216" thick)	Sm Pipe	Sea-Van	2,000	53,392	2,034	546	18,757	74,729
3 Inch II	(0.437" thick)	Sm Pipe	Sea-Van	1,100	29,366	2,114	567	18,992	51,038
3 Inch III	(0.216" thick)	Sm Pipe	Sea-Van	1,460	38,976	1,485	398	13,693	54,552
3 Inch Non-Nuc. Grade	(0.120" thick)	Sm Pipe	Sea-Van	5,000	133,480	2,905	779	27,882	165,046
3 Inch Non-Nuc. Grade	(0.216" thick)	Sm Pipe	Sea-Van	20	534	20	5	171	731
					799,941	64,028	17,175	568,652	1,449,796

*** Stainless Steel Piping (1/2 - 2 Inches)

Component Description		Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
2 Inch Class I	(0.343" thick)	Sm Pipe	Sea-Van	550	14,683	549	147	4,869	20,248
2 Inch Class II	(0.154" thick)	Sm Pipe	Sea-Van	200	5,339	98	26	869	6,332
2 Inch Class II	(0.218" thick)	Sm Pipe	Sea-Van	800	21,357	539	145	4,905	26,946
2 Inch Class II	(0.343" thick)	Sm Pipe	Sea-Van	1,450	38,709	1,448	388	13,177	53,723
2 Inch Class III	(0.154" thick)	Sm Pipe	Sea-Van	4,100	109,454	2,008	539	19,273	131,273
2 Inch Non-Nuc. Grade	(0.154" thick)	Sm Pipe	Sea-Van	1,400	37,374	686	184	6,322	44,567
1 1/2 Inch Class I	(0.281" thick)	Sm Pipe	Sea-Van	700	18,687	457	122	4,102	23,368
1 1/2 Inch Class II	(0.145" thick)	Sm Pipe	Sea-Van	200	5,339	73	20	647	6,079
1 1/2 Inch Class II	(0.200" thick)	Sm Pipe	Sea-Van	800	21,357	390	105	3,547	25,398
1 1/2 Inch Class II	(0.281" thick)	Sm Pipe	Sea-Van	200	5,339	130	35	1,157	6,661
1 1/2 Inch Class III	(0.145" thick)	Sm Pipe	Sea-Van	1,700	45,383	620	166	5,721	51,891
1 1/2 Inch Non-Nuc. Grade	(0.145" thick)	Sm Pipe	Sea-Van	1,500	40,044	547	147	5,048	45,787
1 Inch Class I	(0.250" thick)	Sm Pipe	Sea-Van	100	2,670	38	10	329	3,047
1 Inch Class II	(0.133" thick)	Sm Pipe	Sea-Van	100	2,670	23	6	200	2,898
1 Inch Class II	(0.179" thick)	Sm Pipe	Sea-Van	300	8,009	87	23	775	8,894
1 Inch Class II	(0.250" thick)	Sm Pipe	Sea-Van	600	16,018	229	61	2,054	18,362
1 Inch Class III	(0.133" thick)	Sm Pipe	Sea-Van	1,500	40,044	338	91	3,118	43,591
1 Inch Non-Nuc. Grade	(0.133" thick)	Sm Pipe	Sea-Van	2,000	53,392	451	121	4,157	58,121
3/4 Inch Class I	(0.218" thick)	Sm Pipe	Sea-Van	290	7,742	75	20	669	8,507
3/4 Inch Class II	(0.113" thick)	Sm Pipe	Sea-Van	200	5,339	30	8	272	5,650
3/4 Inch Class II	(0.154" thick)	Sm Pipe	Sea-Van	300	8,009	59	16	532	8,616
3/4 Inch Class II	(0.218" thick)	Sm Pipe	Sea-Van	700	18,687	182	49	1,637	20,556
3/4 Inch Class III	(0.113" thick)	Sm Pipe	Sea-Van	900	24,026	136	37	1,258	25,458
3/4 Inch Non-Nuc. Grade	(0.113" thick)	Sm Pipe	Sea-Van	1,000	26,696	152	41	1,398	28,286
1/2 Inch Class I	(0.187" thick)	Sm Pipe	Sea-Van	105	2,803	18	5	158	2,984
1/2 Inch Class II	(0.147" thick)	Sm Pipe	Sea-Van	200	5,339	29	8	259	5,636
1/2 Inch Class II	(0.187" thick)	Sm Pipe	Sea-Van	200	5,339	35	9	309	5,693
1/2 Inch Class III	(0.109" thick)	Sm Pipe	Sea-Van	800	21,357	91	24	841	22,314
1/2 Inch Non-Nuc. Grade	(0.109" thick)	Sm Pipe	Sea-Van	1,000	26,696	114	31	1,052	27,892
					637,902	9,634	2,584	88,658	738,778

TABLE A.1. Contents of File TEST.PRE (contd)

*** Retrofit Materials

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
2 Inch Piping	Sm Pipe	Sea-Van	52	1,388	25	7	220	1,640
3/4 Inch Piping	Sm Pipe	Sea-Van	40	1,068	6	2	52	1,128
1/2 Inch Piping	Sm Pipe	Sea-Van	304	8,116	35	9	312	8,471
2 Inch valve	Sm Valve	Sea-Van	4	0	48	13	406	467
1 Inch valve	Sm Valve	Sea-Van	3	0	20	5	169	195
3/4 Inch valve	Sm Valve	Sea-Van	8	0	32	9	270	311
Tank	Tank	Sea-Van	2	5,896	537	144	4,507	11,083
Dry waste compactor	Lg Misc.	Sea-Van	1	431	268	72	2,253	3,024
Skid-mounted unit	Lg Misc.	Sea-Van	1	424	67	18	563	1,072
Shielded box	Lg Misc.	Sea-Van	1	420	20	5	169	614
				17,741	1,059	284	8,921	28,006

*** Electrical Components and Annunciators

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
125 Volt DC Power	Lg Elec.	Sea-Van	2	520	40	11	338	909
125 Volt DC Power	Lg Elec.	Sea-Van	2	527	134	36	1,127	1,824
125 Volt DC Power	Lg Elec.	Sea-Van	1	284	671	180	5,633	6,769
4.16 KV AC & Auxiliary Power	Lg Elec.	Sea-Van	1	263	67	18	563	912
4.16 KV AC & Auxiliary Power	Lg Elec.	Sea-Van	1	325	2,684	720	22,533	26,262
480 Volt AC Auxiliary Load Center	Lg Elec.	Sea-Van	7	1,844	470	126	3,943	6,383
480 Volt AC Auxiliary Load Center	Lg Elec.	Sea-Van	7	2,275	18,786	5,039	157,733	183,834
480 Volt AC MCC	Lg Elec.	Sea-Van	1	263	67	18	563	912
480 Volt AC MCC	Lg Elec.	Sea-Van	12	3,901	32,205	8,639	270,400	315,145
Annunciators (electrical portion)	Sm Elec.	Sea-Van 0	2	347	20	5	169	541
Annunciators (mechanical portion)	Sm Misc.	Sea-Van 0	22	3,815	221	59	1,859	5,955
				14,365	55,366	14,852	464,863	549,446

*** Control Rod Drive

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
Electrical Equipment	Sm Elec.	Sea-Van	4	694	40	11	338	1,083
Electrical Equipment	Lg Elec.	Sea-Van	4	1,041	81	22	676	1,819
Mechanical Equipment	Lg Misc.	Sea-Van	1	421	20	5	169	616
				2,156	141	38	1,183	3,517

*** Small Hangers (4" pipe or less)

Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
1 Inch Hangers	Sm Hngr.	Sea-Van	4,920	594,425	57,705	16,707	283,907	952,744
2 Inch Hangers	Sm Hngr.	Sea-Van	2,962	357,863	52,304	15,143	257,335	682,646
3 Inch Hangers	Sm Hngr.	Sea-Van	1,554	187,751	36,656	10,613	180,346	415,366
4 Inch Hangers	Sm Hngr.	Sea-Van	1,172	141,599	34,595	10,016	170,206	356,416
				1,281,639	181,259	52,479	891,795	2,407,172

TABLE A.1. Contents of File TEST.PRE (contd)

*** Large Hangers (> 4" pipe) Component Description	Category	Disposal	Qty	Removal	Container	Transport	Disposal	Tot. Costs
6 Inch Hangers	Lg Hngr.	Sea-Van	452	164,080	18,702	5,415	92,016	280,213
8 Inch Hangers	Lg Hngr.	Sea-Van	1,002	363,734	53,343	15,444	262,448	694,969
10 Inch Hangers	Lg Hngr.	Sea-Van	246	89,300	16,014	4,636	78,787	188,737
12 Inch Hangers	Lg Hngr.	Sea-Van	134	48,643	10,312	2,986	50,735	112,676
14 Inch Hangers	Lg Hngr.	Sea-Van	236	85,670	20,960	6,069	103,125	215,823
18 Inch Hangers	Lg Hngr.	Sea-Van	19	6,897	2,138	619	10,520	20,174
20 Inch Hangers	Lg Hngr.	Sea-Van	3	1,089	373	108	1,836	3,406
24 Inch Hangers	Lg Hngr.	Sea-Van	80	29,041	11,849	3,431	58,297	102,617
28 Inch Hangers	Lg Hngr.	Sea-Van	32	11,616	5,499	1,592	27,053	45,760
				800,070	139,190	40,299	684,816	1,664,375

NOTE: For piping, "Qty" refers to feet of piping. For other categories "Qty" refers to the number of items of equipment.

Table A.2 is **TEST.PRD**, a building decontamination file created from Menu Item D in Chapter 6. The first three sections of this file have the same general format as **TEST.PRE**. Most of the terms in the file are defined in Section 4.4. The removal, container, transport, and disposal costs have the same meanings as for **TEST.PRE**, discussed above.

For the case of metal and surface washing, nothing is actually removed, so "removal" costs refer to the labor costs associated with washing or decontaminating the surfaces. Because nothing is shipped, container costs and transportation costs are zero. However, there is a waste water processing cost (set by Menu Item 2). This cost is reflected in the disposal cost column.

The last part of the file is a general building summary of costs, person-hours and other parameters associated with each type of building decon activity: concrete and metal washing, concrete and metal removal, concrete cutting, handrail and stair tread decontamination, and floor grating removal.

TABLE A.2. Contents of File TEST.PRD

File Name: E:\NRC\TEST.PRD

Plant Name: TROJAN

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+ BUILDING COMPONENTS TO BE DECONTAMINATED +
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*** Fuel Bldg

Component Description	Activity	Length (ft.)	Width (ft.)	Depth (in.)	Orientation
Fuel Pool (Two Walls)	Mtl Wash	58.0	40.5	N/A	Wall
Fuel Pool (Two Walls)	Mtl Wash	80.0	40.5	N/A	Wall
Fuel Pool (Floor)	Mtl Wash	29.0	40.0	N/A	Floor
Cask Loading Pit (Two walls)	Mtl Wash	24.0	40.5	N/A	Wall
Cask Loading Pit (Two walls)	Mtl Wash	16.0	40.5	N/A	Wall
Cask Loading Pit (Floor)	Mtl Wash	8.0	12.0	N/A	Floor
Wash Pit (Two Walls)	Mtl Wash	32.0	21.0	N/A	Wall
Wash Pit (Two Walls)	Mtl Wash	34.0	21.0	N/A	Wall
Wash Pit (Floor)	Mtl Wash	16.0	17.0	N/A	Floor
Load Pit Gate (Two Walls)	Mtl Wash	3.0	25.0	N/A	Wall
Load Pit Gate (Two Walls)	Mtl Wash	2.0	25.0	N/A	Wall
Load Pit Gate (Two Walls)	Mtl Wash	7.0	25.0	N/A	Wall
Load Pit Gate (Floor)	Mtl Wash	1.5	3.0	N/A	Floor
Load Pit Gate (Floor)	Mtl Wash	3.5	5.0	N/A	Floor
Transfer Canal (Two walls)	Mtl Wash	89.0	40.5	N/A	Wall
Transfer Canal (Two walls)	Mtl Wash	8.0	40.5	N/A	Wall
Transfer Canal (Two walls)	Mtl Wash	8.0	40.5	N/A	Wall
Transfer Canal (Two walls)	Mtl Wash	7.0	40.5	N/A	Wall
Transfer Canal (Floor)	Mtl Wash	4.0	44.5	N/A	Floor
Canal Gate (Two walls)	Mtl Wash	4.5	25.0	N/A	Wall
Canal Gate (Two walls)	Mtl Wash	3.0	25.0	N/A	Wall
Canal Gate (Two walls)	Mtl Wash	2.5	25.0	N/A	Wall
Canal Gate (Floor)	Mtl Wash	2.3	6.5	N/A	Floor
Canal Gate (Floor)	Mtl Wash	1.3	3.5	N/A	Floor
Fuel Pool (Two walls)	Mtl Rmvl	58.0	40.5	0.125	Wall
Fuel Pool (Two walls)	Mtl Rmvl	80.0	40.5	0.125	Wall
Fuel Pool (Floor)	Mtl Rmvl	29.0	40.0	0.125	Floor
Cask Loading Pit (Two walls)	Mtl Rmvl	24.0	40.5	0.125	Wall
Cask Loading Pit (Two walls)	Mtl Rmvl	16.0	40.5	0.125	Wall
Cask Loading Pit (Floor)	Mtl Rmvl	8.0	12.0	0.125	Floor
Wash Pit (Two walls)	Mtl Rmvl	32.0	21.0	0.125	Wall
Wash Pit (Two walls)	Mtl Rmvl	34.0	21.0	0.125	Wall
Wash Pit (Floor)	Mtl Rmvl	16.0	17.0	0.125	Floor
Load Pit Gate (Two walls)	Mtl Rmvl	3.0	25.0	0.125	Wall
Load Pit Gate (Two walls)	Mtl Rmvl	2.0	25.0	0.125	Wall
Load Pit Gate (Two walls)	Mtl Rmvl	7.0	25.0	0.125	Wall
Load Pit Gate (Floor)	Mtl Rmvl	1.5	3.0	0.125	Floor
Load Pit Gate (Floor)	Mtl Rmvl	3.5	5.0	0.125	Floor
Transfer Canal (Two walls)	Mtl Rmvl	89.0	40.5	0.125	Wall
Transfer Canal (Two walls)	Mtl Rmvl	8.0	40.5	0.125	Wall
Transfer Canal (Two walls)	Mtl Rmvl	8.0	40.5	0.125	Wall
Transfer Canal (Two walls)	Mtl Rmvl	7.0	40.5	0.125	Wall
Transfer Canal (Floor)	Mtl Rmvl	4.0	44.5	0.125	Floor
Canal Gate (Two walls)	Mtl Rmvl	4.5	25.0	0.125	Wall
Canal Gate (Two walls)	Mtl Rmvl	3.0	25.0	0.125	Wall
Canal Gate (Two walls)	Mtl Rmvl	2.5	25.0	0.125	Wall
Canal Gate (Floor)	Mtl Rmvl	2.3	6.5	0.125	Floor
Canal Gate (Floor)	Mtl Rmvl	1.3	3.5	0.125	Floor
Concrete Washed - 4th Floor	Conc Wash	74.4	74.4	N/A	Floor
Concrete Washed - 3rd Floor	Conc Wash	64.1	64.1	N/A	Floor
Concrete Washed - 2nd Floor	Conc Wash	65.6	65.6	N/A	Floor
Concrete Washed - 1st Floor	Conc Wash	94.4	94.4	N/A	Floor
Concrete Removed - 3rd Floor	Conc Rmvl	36.4	36.4	1.000	Floor
Concrete Removed - 2nd Floor	Conc Rmvl	45.1	45.1	1.000	Floor
Concrete Removed - 1st Floor	Conc Rmvl	56.7	56.7	1.000	Floor
Concrete Cutting - 4th Floor	Conc Cttg	104.0	N/A	30.000	Floor

TABLE A.2. Contents of File TEST.PRD (contd)

Concrete Cutting - 3rd Floor	Conc Cttg	32.0	N/A	18.000	Floor
Concrete Cutting - 2nd Floor 1	Conc Cttg	32.0	N/A	12.000	Wall
Concrete Cutting - 2nd Floor 2	Conc Cttg	82.0	N/A	12.000	Floor
Concrete Cutting - 1st Floor 1	Conc Cttg	60.0	N/A	12.000	Floor
Concrete Cutting - 1st Floor 2	Conc Cttg	96.0	N/A	30.000	Wall

*** Containment Bldg

Component Description	Activity	Length (ft.)	Width (ft.)	Depth (in.)	Orientation
Inner Wall, Ceiling Washed	Conc Wash	263.7	263.7	N/A	Ceiling
SG Cavities Washed	Conc Wash	179.6	179.6	N/A	Wall
Press. Cavity, Inside Washed	Conc Wash	58.0	66.0	N/A	Wall
Press. Cavity, Outside Washed	Conc Wash	61.0	66.0	N/A	Wall
Press. Cavity, Top Washed	Conc Wash	17.4	17.4	N/A	Ceiling
Operating Floor Washed	Conc Wash	82.3	82.3	N/A	Floor
Bottom Floor Washed	Conc Wash	101.9	101.9	N/A	Floor
Bottom Floor Removed	Conc Rmvl	72.1	72.1	1.000	Floor
Refueling Cavity (Metal)	Mtl Wash	19.0	32.0	N/A	Floor
Refueling Cavity (Metal)	Mtl Wash	9.0	20.0	N/A	Floor
Refueling Cavity (Metal)	Mtl Wash	10.5	19.0	N/A	Wall
Refueling Cavity (Metal)	Mtl Wash	41.0	35.0	N/A	Wall
Refueling Cavity (Metal)	Mtl Wash	41.0	35.0	N/A	Wall
Refueling Cavity (Metal)	Mtl Wash	22.0	35.0	N/A	Wall
Refueling Cavity (Metal)	Mtl Wash	1.8	35.0	N/A	Wall
Refueling Cavity (Metal)	Mtl Rmvl	19.0	32.0	0.125	Floor
Refueling Cavity (Metal)	Mtl Rmvl	9.0	20.0	0.125	Floor
Refueling Cavity (Metal)	Mtl Rmvl	10.5	19.0	0.125	Wall
Refueling Cavity (Metal)	Mtl Rmvl	41.0	35.0	0.125	Wall
Refueling Cavity (Metal)	Mtl Rmvl	41.0	35.0	0.125	Wall
Refueling Cavity (Metal)	Mtl Rmvl	22.0	35.0	0.125	Wall
Refueling Cavity (Metal)	Mtl Rmvl	1.8	35.0	0.125	Wall
Steel Floor Grating	Gratings	6,254.0	1.5	N/A	N/A
Handrails	Handrails	5,613.0	N/A	N/A	N/A

*** Auxiliary Bldg

Component Description	Activity	Length (ft.)	Width (ft.)	Depth (in.)	Orientation
Concrete Washed (Elev 93)	Conc Wash	90.0	90.0	N/A	Floor
Concrete Washed (Elev 77)	Conc Wash	89.5	89.5	N/A	Floor
Concrete Washed (Elev 61)	Conc Wash	84.8	84.8	N/A	Floor
Concrete Washed (Elev 45)	Conc Wash	97.9	97.9	N/A	Floor
Concrete Washed (Elev 25)	Conc Wash	71.6	71.6	N/A	Floor
Concrete Washed (Elev 5)	Conc Wash	76.5	76.5	N/A	Floor
Conc Rmvd (El 77 - 11 cells)	Conc Rmvl	66.0	8.0	1.000	Floor
Conc Rmvd (El 77 - 15 cells)	Conc Rmvl	75.0	7.0	1.000	Floor
Conc Rmvd (El 77 - 1 cell)	Conc Rmvl	106.0	5.0	1.000	Floor
Conc Rmvd (El 61)	Conc Rmvl	12.0	14.0	1.000	Floor
Conc Rmvd (El 61)	Conc Rmvl	6.0	23.0	1.000	Floor
Conc Rmvd (El 61)	Conc Rmvl	12.0	15.0	1.000	Floor
Conc Rmvd (El 61) (2 areas)	Conc Rmvl	28.0	16.0	1.000	Floor
Conc Rmvd (El 61) (4 areas)	Conc Rmvl	60.0	15.0	1.000	Floor
Conc Rmvd (El 61)	Conc Rmvl	10.0	8.0	1.000	Floor
Conc Rmvd (El 61)	Conc Rmvl	19.0	26.0	1.000	Floor
Conc Rmvd (El 45)	Conc Rmvl	32.0	40.0	1.000	Floor
Conc Rmvd (El 45)	Conc Rmvl	16.0	25.0	1.000	Floor
Conc Rmvd (El 45)	Conc Rmvl	32.0	11.0	1.000	Floor
Conc Rmvd (El 25)	Conc Rmvl	30.0	37.0	1.000	Floor
Conc Rmvd (El 25)	Conc Rmvl	8.0	12.0	1.000	Floor
Conc Rmvd (El 25)	Conc Rmvl	8.0	15.0	1.000	Floor
Conc Rmvd (El 25)	Conc Rmvl	30.0	21.0	1.000	Floor
Conc Rmvd (El 5)	Conc Rmvl	26.0	10.0	1.000	Floor
Conc Rmvd (El 5)	Conc Rmvl	11.0	18.0	1.000	Floor
Conc Rmvd (El 5)	Conc Rmvl	28.0	15.0	1.000	Floor
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	20.0	10.0	1.000	Floor
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	20.0	15.0	1.000	Floor
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	20.0	10.0	1.000	Floor

TABLE A.2. Contents of File TEST.PRD (contd)

Conc Rmvd (El 5)	Conc Rmvl	15.0	14.0	1.000	Floor
Conc Rmvd (El 5)	Conc Rmvl	6.0	10.0	1.000	Floor
Cutting (El 61)	Conc Cttg	26.0	N/A	24.000	Floor
Cutting (El 45 - Two areas)	Conc Cttg	52.0	N/A	12.000	Floor
Cutting (El 25 - Three areas)	Conc Cttg	78.0	N/A	12.000	Floor
Cutting (El 25)	Conc Cttg	26.0	N/A	24.000	Floor
Cutting (El 5)	Conc Cttg	96.0	N/A	12.000	Floor
Steel Floor Gratings	Gratings	1,256.0	1.5	N/A	N/A
Stair Treads	Mtl Wash	934.6	5.0	N/A	Stairs
Handrails	Handrails	5,613.0	N/A	N/A	N/A

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+ BUILDING DECONTAMINATION: TIMES AND EXPOSURES +
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*** Fuel Bldg

Component Description	Activity	Time (hours)	Pers-hours	Exposure Pers-hours	Pers-Rem
Fuel Pool (Two Walls)	Mtl Wash	11.7	47.0	11.7	0.01
Fuel Pool (Two Walls)	Mtl Wash	16.2	64.8	16.2	0.02
Fuel Pool (Floor)	Mtl Wash	4.8	19.3	4.8	0.01
Cask Loading Pit (Two walls)	Mtl Wash	4.9	19.4	4.9	0.01
Cask Loading Pit (Two walls)	Mtl Wash	3.2	13.0	3.2	0.00
Cask Loading Pit (Floor)	Mtl Wash	0.4	1.6	0.4	0.00
Wash Pit (Two Walls)	Mtl Wash	3.4	13.4	3.4	0.00
Wash Pit (Two Walls)	Mtl Wash	3.6	14.3	3.6	0.00
Wash Pit (Floor)	Mtl Wash	1.1	4.5	1.1	0.00
Load Pit Gate (Two Walls)	Mtl Wash	0.4	1.5	0.4	0.00
Load Pit Gate (Two Walls)	Mtl Wash	0.3	1.0	0.3	0.00
Load Pit Gate (Two Walls)	Mtl Wash	0.9	3.5	0.9	0.00
Load Pit Gate (Floor)	Mtl Wash	0.0	0.1	0.0	0.00
Load Pit Gate (Floor)	Mtl Wash	0.1	0.3	0.1	0.00
Transfer Canal (Two walls)	Mtl Wash	18.0	72.1	18.0	0.02
Transfer Canal (Two walls)	Mtl Wash	1.6	6.5	1.6	0.00
Transfer Canal (Two walls)	Mtl Wash	1.6	6.5	1.6	0.00
Transfer Canal (Two walls)	Mtl Wash	1.4	5.7	1.4	0.00
Transfer Canal (Floor)	Mtl Wash	0.7	3.0	0.7	0.00
Canal Gate (Two walls)	Mtl Wash	0.6	2.3	0.6	0.00
Canal Gate (Two walls)	Mtl Wash	0.4	1.5	0.4	0.00
Canal Gate (Two walls)	Mtl Wash	0.3	1.3	0.3	0.00
Canal Gate (Floor)	Mtl Wash	0.1	0.2	0.1	0.00
Canal Gate (Floor)	Mtl Wash	0.0	0.1	0.0	0.00
Fuel Pool (Two walls)	Mtl Rmvl	13.7	75.6	48.0	0.06
Fuel Pool (Two walls)	Mtl Rmvl	16.0	88.2	56.1	0.07
Fuel Pool (Floor)	Mtl Rmvl	8.7	47.7	30.3	0.04
Cask Loading Pit (Two walls)	Mtl Rmvl	8.6	47.3	30.1	0.04
Cask Loading Pit (Two walls)	Mtl Rmvl	7.1	39.1	24.8	0.03
Cask Loading Pit (Floor)	Mtl Rmvl	3.1	17.3	11.0	0.01
Wash Pit (Two walls)	Mtl Rmvl	5.8	32.1	20.4	0.02
Wash Pit (Two walls)	Mtl Rmvl	5.9	32.3	20.5	0.02
Wash Pit (Floor)	Mtl Rmvl	4.4	24.0	15.3	0.02
Load Pit Gate (Two walls)	Mtl Rmvl	3.1	17.0	10.8	0.01
Load Pit Gate (Two walls)	Mtl Rmvl	3.1	17.0	10.8	0.01
Load Pit Gate (Two walls)	Mtl Rmvl	3.1	17.2	10.9	0.01
Load Pit Gate (Floor)	Mtl Rmvl	0.0	0.0	0.0	0.00
Load Pit Gate (Floor)	Mtl Rmvl	0.0	0.0	0.0	0.00
Transfer Canal (Two walls)	Mtl Rmvl	16.4	90.3	57.4	0.07
Transfer Canal (Two walls)	Mtl Rmvl	5.6	30.8	19.6	0.02
Transfer Canal (Two walls)	Mtl Rmvl	5.6	30.8	19.6	0.02
Transfer Canal (Two walls)	Mtl Rmvl	4.2	23.2	14.7	0.02
Transfer Canal (Floor)	Mtl Rmvl	4.2	22.9	14.5	0.02
Canal Gate (Two walls)	Mtl Rmvl	3.1	17.1	10.9	0.01
Canal Gate (Two walls)	Mtl Rmvl	3.1	17.0	10.8	0.01
Canal Gate (Two walls)	Mtl Rmvl	3.1	17.0	10.8	0.01
Canal Gate (Floor)	Mtl Rmvl	0.0	0.0	0.0	0.00
Canal Gate (Floor)	Mtl Rmvl	0.0	0.0	0.0	0.00
Concrete Washed - 4th Floor	Conc Wash	23.1	92.3	23.1	0.03

TABLE A.2. Contents of File TEST.PRD (contd)

Concrete Washed - 3rd Floor	Conc Wash	17.1	68.5	17.1	0.02
Concrete Washed - 2nd Floor	Conc Wash	17.9	71.7	17.9	0.02
Concrete Washed - 1st Floor	Conc Wash	37.1	148.5	37.1	0.04
Concrete Removed - 3rd Floor	Conc Rmvl	122.3	428.1	244.6	0.30
Concrete Removed - 2nd Floor	Conc Rmvl	187.8	657.1	375.5	0.45
Concrete Removed - 1st Floor	Conc Rmvl	296.4	1,037.6	592.9	0.72
Concrete Cutting - 4th Floor	Conc Cttg	91.8	229.4	145.8	0.18
Concrete Cutting - 3rd Floor	Conc Cttg	18.4	45.9	29.2	0.04
Concrete Cutting - 2nd Floor 1	Conc Cttg	14.0	34.9	22.2	0.03
Concrete Cutting - 2nd Floor 2	Conc Cttg	30.1	75.3	47.8	0.06
Concrete Cutting - 1st Floor 1	Conc Cttg	22.5	56.3	35.8	0.04
Concrete Cutting - 1st Floor 2	Conc Cttg	92.5	231.3	147.0	0.18

*** Containment Bldg

Component Description	Activity	Time (hours)	Pers-hours	Exposure Pers-hours	Pers-Rem
Inner Wall, Ceiling Washed	Conc Wash	347.7	1,391.0	347.7	0.42
SG Cavities Washed	Conc Wash	161.3	645.1	161.3	0.19
Press. Cavity, Inside Washed	Conc Wash	19.1	76.6	19.1	0.02
Press. Cavity, Outside Washed	Conc Wash	20.1	80.5	20.1	0.02
Press. Cavity, Top Washed	Conc Wash	1.5	6.1	1.5	0.00
Operating Floor Washed	Conc Wash	28.2	112.9	28.2	0.03
Bottom Floor Washed	Conc Wash	43.3	173.1	43.3	0.05
Bottom Floor Removed	Conc Rmvl	480.0	1,680.0	960.0	1.16
Refueling Cavity (Metal)	Mtl Wash	2.5	10.1	2.5	0.00
Refueling Cavity (Metal)	Mtl Wash	0.8	3.0	0.8	0.00
Refueling Cavity (Metal)	Mtl Wash	1.0	4.0	1.0	0.00
Refueling Cavity (Metal)	Mtl Wash	7.2	28.7	7.2	0.01
Refueling Cavity (Metal)	Mtl Wash	7.2	28.7	7.2	0.01
Refueling Cavity (Metal)	Mtl Wash	3.9	15.4	3.9	0.00
Refueling Cavity (Metal)	Mtl Wash	0.3	1.3	0.3	0.00
Refueling Cavity (Metal)	Mtl Rmvl	5.8	32.0	20.3	0.02
Refueling Cavity (Metal)	Mtl Rmvl	4.2	23.3	14.8	0.02
Refueling Cavity (Metal)	Mtl Rmvl	4.3	23.5	14.9	0.02
Refueling Cavity (Metal)	Mtl Rmvl	10.0	55.1	35.0	0.04
Refueling Cavity (Metal)	Mtl Rmvl	10.0	55.1	35.0	0.04
Refueling Cavity (Metal)	Mtl Rmvl	5.9	32.4	20.6	0.02
Refueling Cavity (Metal)	Mtl Rmvl	3.1	17.0	10.8	0.01
Steel Floor Grating	Gratings	257.7	1,030.8	491.2	0.59
Handrails	Handrails	421.0	1,262.9	561.3	0.68

*** Auxiliary Bldg

Component Description	Activity	Time (hours)	Pers-hours	Exposure Pers-hours	Pers-Rem
Concrete Washed (Elev 93)	Conc Wash	33.8	135.1	33.8	0.04
Concrete Washed (Elev 77)	Conc Wash	33.4	133.4	33.4	0.04
Concrete Washed (Elev 61)	Conc Wash	30.0	119.9	30.0	0.04
Concrete Washed (Elev 45)	Conc Wash	39.9	159.6	39.9	0.05
Concrete Washed (Elev 25)	Conc Wash	21.3	85.4	21.3	0.03
Concrete Washed (Elev 5)	Conc Wash	24.4	97.5	24.4	0.03
Conc Rmvd (El 77 - 11 cells)	Conc Rmvl	48.7	170.6	97.5	0.12
Conc Rmvd (El 77 - 15 cells)	Conc Rmvl	48.5	169.6	96.9	0.12
Conc Rmvd (El 77 - 1 cell)	Conc Rmvl	48.9	171.2	97.8	0.12
Conc Rmvd (El 61)	Conc Rmvl	15.5	54.3	31.0	0.04
Conc Rmvd (El 61)	Conc Rmvl	12.7	44.6	25.5	0.03
Conc Rmvd (El 61)	Conc Rmvl	16.6	58.2	33.2	0.04
Conc Rmvd (El 61) (2 areas)	Conc Rmvl	41.4	144.7	82.7	0.10
Conc Rmvd (El 61) (4 areas)	Conc Rmvl	83.1	290.8	166.2	0.20
Conc Rmvd (El 61)	Conc Rmvl	7.4	25.8	14.8	0.02
Conc Rmvd (El 61)	Conc Rmvl	45.6	159.6	91.2	0.11
Conc Rmvd (El 45)	Conc Rmvl	118.2	413.5	236.3	0.29
Conc Rmvd (El 45)	Conc Rmvl	36.9	129.2	73.8	0.09
Conc Rmvd (El 45)	Conc Rmvl	32.5	113.7	65.0	0.08
Conc Rmvd (El 25)	Conc Rmvl	102.5	358.6	204.9	0.25
Conc Rmvd (El 25)	Conc Rmvl	8.9	31.0	17.7	0.02
Conc Rmvd (El 25)	Conc Rmvl	11.1	38.8	22.2	0.03

TABLE A.2. Contents of File TEST.PRD (contd)

Conc Rmvd (El 25)	Conc Rmvl	58.2	203.5	116.3	0.14
Conc Rmvd (El 5)	Conc Rmvl	24.0	84.0	48.0	0.06
Conc Rmvd (El 5)	Conc Rmvl	18.3	64.0	36.6	0.04
Conc Rmvd (El 5)	Conc Rmvl	38.8	135.7	77.5	0.09
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	18.5	64.6	36.9	0.04
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	27.7	96.9	55.4	0.07
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	18.5	64.6	36.9	0.04
Conc Rmvd (El 5)	Conc Rmvl	19.4	67.8	38.8	0.05
Conc Rmvd (El 5)	Conc Rmvl	5.5	19.4	11.1	0.01
Cutting (El 61)	Conc Cttg	19.7	49.3	31.4	0.04
Cutting (El 45 - Two areas)	Conc Cttg	19.7	49.3	31.4	0.04
Cutting (El 25 - Three areas)	Conc Cttg	28.7	71.8	45.7	0.06
Cutting (El 25)	Conc Cttg	19.7	49.3	31.4	0.04
Cutting (El 5)	Conc Cttg	35.0	87.4	55.6	0.07
Steel Floor Gratings	Gratings	51.8	207.0	98.7	0.12
Stair Treads	Mtl Wash	20.4	81.8	20.4	0.02
Handrails	Handrails	421.0	1,262.9	561.3	0.68

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+ BUILDING DECONTAMINATION: COSTS (DOLLARS) +
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*** Fuel Bldg

Component Description	Activity	Removal	Container	Transport	Disposal
Fuel Pool (Two Walls)	Mtl Wash	1,618	0	0	2,936
Fuel Pool (Two Walls)	Mtl Wash	2,232	0	0	4,050
Fuel Pool (Floor)	Mtl Wash	667	0	0	1,450
Cask Loading Pit (Two walls)	Mtl Wash	669	0	0	1,215
Cask Loading Pit (Two walls)	Mtl Wash	446	0	0	810
Cask Loading Pit (Floor)	Mtl Wash	55	0	0	120
Wash Pit (Two Walls)	Mtl Wash	463	0	0	840
Wash Pit (Two Walls)	Mtl Wash	492	0	0	893
Wash Pit (Floor)	Mtl Wash	156	0	0	340
Load Pit Gate (Two Walls)	Mtl Wash	52	0	0	94
Load Pit Gate (Two Walls)	Mtl Wash	34	0	0	63
Load Pit Gate (Two Walls)	Mtl Wash	121	0	0	219
Load Pit Gate (Floor)	Mtl Wash	3	0	0	6
Load Pit Gate (Floor)	Mtl Wash	10	0	0	22
Transfer Canal (Two walls)	Mtl Wash	2,483	0	0	4,506
Transfer Canal (Two walls)	Mtl Wash	223	0	0	405
Transfer Canal (Two walls)	Mtl Wash	223	0	0	405
Transfer Canal (Two walls)	Mtl Wash	195	0	0	354
Transfer Canal (Floor)	Mtl Wash	102	0	0	222
Canal Gate (Two walls)	Mtl Wash	77	0	0	141
Canal Gate (Two walls)	Mtl Wash	52	0	0	94
Canal Gate (Two walls)	Mtl Wash	43	0	0	78
Canal Gate (Floor)	Mtl Wash	8	0	0	18
Canal Gate (Floor)	Mtl Wash	3	0	0	5
Fuel Pool (Two walls)	Mtl Rmvl	2,625	1,642	440	13,784
Fuel Pool (Two walls)	Mtl Rmvl	3,069	2,264	607	19,013
Fuel Pool (Floor)	Mtl Rmvl	1,656	811	217	6,807
Cask Loading Pit (Two walls)	Mtl Rmvl	1,642	679	182	5,704
Cask Loading Pit (Two walls)	Mtl Rmvl	1,354	453	121	3,803
Cask Loading Pit (Floor)	Mtl Rmvl	597	67	18	563
Wash Pit (Two walls)	Mtl Rmvl	1,113	470	126	3,943
Wash Pit (Two walls)	Mtl Rmvl	1,120	499	134	4,190
Wash Pit (Floor)	Mtl Rmvl	831	190	51	1,596
Load Pit Gate (Two walls)	Mtl Rmvl	588	52	14	440
Load Pit Gate (Two walls)	Mtl Rmvl	587	35	9	293
Load Pit Gate (Two walls)	Mtl Rmvl	595	122	33	1,027
Load Pit Gate (Floor)	Mtl Rmvl	0	3	1	26
Load Pit Gate (Floor)	Mtl Rmvl	0	12	3	103
Transfer Canal (Two walls)	Mtl Rmvl	3,143	2,519	676	21,151
Transfer Canal (Two walls)	Mtl Rmvl	1,066	226	61	1,901
Transfer Canal (Two walls)	Mtl Rmvl	1,066	226	61	1,901
Transfer Canal (Two walls)	Mtl Rmvl	801	198	53	1,664
Transfer Canal (Floor)	Mtl Rmvl	791	124	33	1,045

TABLE A.2. Contents of File TEST.PRD (contd)

Canal Gate (Two walls)	Mtl Rmvl	591	79	21	660
Canal Gate (Two walls)	Mtl Rmvl	588	52	14	440
Canal Gate (Two walls)	Mtl Rmvl	588	44	12	367
Canal Gate (Floor)	Mtl Rmvl	0	10	3	86
Canal Gate (Floor)	Mtl Rmvl	0	3	1	26
Concrete Washed - 4th Floor	Conc Wash	3,185	0	0	6,923
Concrete Washed - 3rd Floor	Conc Wash	2,364	0	0	5,139
Concrete Washed - 2nd Floor	Conc Wash	2,475	0	0	5,379
Concrete Washed - 1st Floor	Conc Wash	5,125	0	0	11,139
Concrete Removed - 3rd Floor	Conc Rmvl	17,414	714	573	9,510
Concrete Removed - 2nd Floor	Conc Rmvl	26,734	1,096	880	14,599
Concrete Removed - 1st Floor	Conc Rmvl	42,210	1,731	1,390	23,050
Concrete Cutting - 4th Floor	Conc Cttg	11,343	0	0	0
Concrete Cutting - 3rd Floor	Conc Cttg	2,247	0	0	0
Concrete Cutting - 2nd Floor 1	Conc Cttg	1,688	0	0	0
Concrete Cutting - 2nd Floor 2	Conc Cttg	3,706	0	0	0
Concrete Cutting - 1st Floor 1	Conc Cttg	2,762	0	0	0
Concrete Cutting - 1st Floor 2	Conc Cttg	11,323	0	0	0

*** Containment Bldg

Component Description	Activity	Removal	Container	Transport	Disposal
Inner Wall, Ceiling Washed	Conc Wash	47,900	0	0	86,935
SG Cavities Washed	Conc Wash	22,216	0	0	40,320
Press. Cavity, Inside Washed	Conc Wash	2,636	0	0	4,785
Press. Cavity, Outside Washed	Conc Wash	2,773	0	0	5,033
Press. Cavity, Top Washed	Conc Wash	209	0	0	379
Operating Floor Washed	Conc Wash	3,896	0	0	8,469
Bottom Floor Washed	Conc Wash	5,974	0	0	12,985
Bottom Floor Removed	Conc Rmvl	68,343	2,803	2,251	37,321
Refueling Cavity (Metal)	Mtl Wash	350	0	0	760
Refueling Cavity (Metal)	Mtl Wash	104	0	0	225
Refueling Cavity (Metal)	Mtl Wash	137	0	0	249
Refueling Cavity (Metal)	Mtl Wash	988	0	0	1,794
Refueling Cavity (Metal)	Mtl Wash	988	0	0	1,794
Refueling Cavity (Metal)	Mtl Wash	530	0	0	963
Refueling Cavity (Metal)	Mtl Wash	43	0	0	79
Refueling Cavity (Metal)	Mtl Rmvl	1,110	425	114	3,568
Refueling Cavity (Metal)	Mtl Rmvl	808	126	34	1,056
Refueling Cavity (Metal)	Mtl Rmvl	813	139	37	1,171
Refueling Cavity (Metal)	Mtl Rmvl	1,913	1,003	269	8,421
Refueling Cavity (Metal)	Mtl Rmvl	1,913	1,003	269	8,421
Refueling Cavity (Metal)	Mtl Rmvl	1,125	538	144	4,518
Refueling Cavity (Metal)	Mtl Rmvl	586	44	12	370
Steel Floor Grating	Gratings	30,095	13,699	3,675	115,018
Handrails	Handrails	36,274	108	70	1,435

*** Auxiliary Bldg

Component Description	Activity	Removal	Container	Transport	Disposal
Concrete Washed (Elev 93)	Conc Wash	4,661	0	0	10,132
Concrete Washed (Elev 77)	Conc Wash	4,605	0	0	10,008
Concrete Washed (Elev 61)	Conc Wash	4,139	0	0	8,995
Concrete Washed (Elev 45)	Conc Wash	5,509	0	0	11,973
Concrete Washed (Elev 25)	Conc Wash	2,946	0	0	6,403
Concrete Washed (Elev 5)	Conc Wash	3,365	0	0	7,313
Conc Rmvd (El 77 - 11 cells)	Conc Rmvl	6,940	285	229	3,790
Conc Rmvd (El 77 - 15 cells)	Conc Rmvl	6,900	283	227	3,768
Conc Rmvd (El 77 - 1 cell)	Conc Rmvl	6,966	286	229	3,804
Conc Rmvd (El 61)	Conc Rmvl	2,208	91	73	1,206
Conc Rmvd (El 61)	Conc Rmvl	1,814	74	60	990
Conc Rmvd (El 61)	Conc Rmvl	2,366	97	78	1,292
Conc Rmvd (El 61) (2 areas)	Conc Rmvl	5,888	241	194	3,215
Conc Rmvd (El 61) (4 areas)	Conc Rmvl	11,829	485	390	6,460
Conc Rmvd (El 61)	Conc Rmvl	1,051	43	35	574
Conc Rmvd (El 61)	Conc Rmvl	6,493	266	214	3,546
Conc Rmvd (El 45)	Conc Rmvl	16,823	690	554	9,187
Conc Rmvd (El 45)	Conc Rmvl	5,257	216	173	2,871

TABLE A.2. Contents of File TEST.PRD (contd)

Conc Rmvd (El 45)	Conc Rmvl	4,626	190	152	2,526
Conc Rmvd (El 25)	Conc Rmvl	14,589	598	480	7,967
Conc Rmvd (El 25)	Conc Rmvl	1,262	52	42	689
Conc Rmvd (El 25)	Conc Rmvl	1,577	65	52	861
Conc Rmvd (El 25)	Conc Rmvl	8,280	340	273	4,522
Conc Rmvd (El 5)	Conc Rmvl	3,417	140	113	1,866
Conc Rmvd (El 5)	Conc Rmvl	2,602	107	86	1,421
Conc Rmvd (El 5)	Conc Rmvl	5,520	226	182	3,014
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	2,629	108	87	1,435
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	3,943	162	130	2,153
Conc Rmvd (El 5 - Two areas)	Conc Rmvl	2,629	108	87	1,435
Conc Rmvd (El 5)	Conc Rmvl	2,760	113	91	1,507
Conc Rmvd (El 5)	Conc Rmvl	789	32	26	431
Cutting (El 61)	Conc Cttg	2,419	0	0	0
Cutting (El 45 - Two areas)	Conc Cttg	2,419	0	0	0
Cutting (El 25 - Three areas)	Conc Cttg	3,535	0	0	0
Cutting (El 25)	Conc Cttg	2,419	0	0	0
Cutting (El 5)	Conc Cttg	4,307	0	0	0
Steel Floor Gratings	Gratings	6,044	2,751	738	23,099
Stair Treads	Mtl Wash	2,820	0	0	5,841
Handrails	Handrails	36,274	108	70	1,435

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++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
+ SUMMARY OF BUILDING DECONTAMINATION DATA (ALL COSTS IN DOLLARS) +
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++

*** Fuel Bldg

  Concrete Washing--
    Surface Area:          22,864 ft2
    Decon Costs:          $13,150
    Crew Hours:               95
    Pers-Hours:              381
    Pers-Rem:               0.12

  Metal Washing--
    Surface Area:          15,428 ft2
    Decon Costs:          $10,427
    Crew Hours:               76
    Pers-Hours:              303
    Pers-Rem:               0.09

  Concrete Removal--
    Surface Area:           6,570 ft2
    Weight Removed:        78,846 lb
    Removal Costs:         $86,357
    Container Costs:        $3,541
    Shipping Costs:         $2,844
    Burial Costs:          $47,158
    Burial Volume:             972 ft3
    Number of Drums:        131.41
    Crew Hours:                607
    Pers-Hours:              2,123
    Pers-Rem:                1.46

  Metal Removal--
    Surface Area:          15,428 ft2
    Weight Removed:        80,354 lb
    Removal Costs:         $24,410
    Container Costs:       $10,783
    Shipping Costs:         $2,892
    Burial Costs:          $90,532
    Burial Volume:           1,390 ft3
    Number of Vans:           2.17
    Crew Hours:                128
    Pers-Hours:                704
    Pers-Rem:                 0.54
```

TABLE A.2. Contents of File TEST.PRD (contd)

```
Concrete Cutting--
  Inch-feet:              8,664
  Cutting Costs:         $33,069
  Crew Hours:                269
  Pers-Hours:                673
  Pers-Rem:                 0.52


*** Containment Bldg

Concrete Washing--
  Surface Area:         127,124 ft2
  Decon Costs:           $85,605
  Crew Hours:                621
  Pers-Hours:              2,485
  Pers-Rem:                 0.75

Metal Washing--
  Surface Area:           4,690 ft2
  Decon Costs:            $3,141
  Crew Hours:                 23
  Pers-Hours:                 91
  Pers-Rem:                 0.03

Concrete Removal--
  Surface Area:           5,200 ft2
  Weight Removed:        62,398 lb
  Removal Costs:         $68,343
  Container Costs:        $2,803
  Shipping Costs:         $2,251
  Burial Costs:          $37,321
  Burial Volume:              770 ft3
  Number of Drums:         104.00
  Crew Hours:                480
  Pers-Hours:              1,680
  Pers-Rem:                 1.16

Metal Removal--
  Surface Area:           4,690 ft2
  Weight Removed:        24,430 lb
  Removal Costs:          $8,267
  Container Costs:        $3,278
  Shipping Costs:           $879
  Burial Costs:          $27,524
  Burial Volume:              423 ft3
  Number of Vans:           0.66
  Crew Hours:                 43
  Pers-Hours:                239
  Pers-Rem:                 0.18

Handrails--
  Length                  5,613 ft
  Decon Costs:           $36,274
  Container Costs:          $108
  Shipping Costs:            $70
  Burial Costs:           $1,435
  Burial Volume:               30 ft3
  Number of Drums:           4.00
  Crew Hours:                421
  Pers-Hours:              1,263
  Pers-Rem:                 0.68

Floor Gratings--
  Area:                   9,381 ft2
  Removal Costs:         $30,095
  Container Costs:       $13,699
  Shipping Costs:         $3,675
  Burial Costs:         $115,018
```

TABLE A.2. Contents of File TEST.PRD (contd)

```
   Burial Volume:          1,766 ft3
   Number of Vans:          2.76
   Crew Hours:               258
   Pers-Hours:             1,031
   Pers-Rem:                0.59


*** Auxiliary Bldg

  Concrete Washing--
    Surface Area:         43,860 ft2
    Decon Costs:         $25,224
    Crew Hours:              183
    Pers-Hours:              731
    Pers-Rem:               0.22

  Concrete Removal--
    Surface Area:          9,827 ft2
    Weight Removed:      117,924 lb
    Removal Costs:       $129,159
    Container Costs:       $5,297
    Shipping Costs:        $4,254
    Burial Costs:         $70,531
    Burial Volume:         1,454 ft3
    Number of Drums:       196.54
    Crew Hours:               907
    Pers-Hours:             3,175
    Pers-Rem:                2.19

  Concrete Cutting--
    Inch-feet:             3,960
    Cutting Costs:       $15,099
    Crew Hours:              123
    Pers-Hours:              307
    Pers-Rem:               0.24

  Handrails--
    Length                 5,613 ft
    Decon Costs:         $36,274
    Container Costs:       $108
    Shipping Costs:         $70
    Burial Costs:         $1,435
    Burial Volume:             30 ft3
    Number of Drums:         4.00
    Crew Hours:               421
    Pers-Hours:             1,263
    Pers-Rem:               0.68

  Floor Gratings--
    Area:                  1,884 ft2
    Removal Costs:         $6,044
    Container Costs:       $2,751
    Shipping Costs:          $738
    Burial Costs:         $23,099
    Burial Volume:             355 ft3
    Number of Vans:          0.55
    Crew Hours:                52
    Pers-Hours:               207
    Pers-Rem:               0.12

  Stair Treads--
    Area:                  4,673 ft2
    Decon Costs:           $2,820
    Crew Hours:                20
    Pers-Hours:                82
    Pers-Rem:               0.02
```

Reactor pressure vessel costs are provided by **TEST.PRF**, shown in Table A.3. **TEST.PRF** was created from Menu Item F in Chapter 6. All terms in Table A.3 should be self-explanatory. A summary of these costs appears in **TEST.PRI**, discussed below.

TABLE A.3. Contents of File TEST.PRF

File name: E:\NRC\TEST.PRF

COSTS (IN DOLLARS) FOR REACTOR PRESSURE VESSEL AND INTERNALS

COMPONENTS	CUTTING	CONTAINERS	TRANSPORT	DISPOSAL	TOTAL
Insulation	50,439	1,290 4,695	1,332 33,189	9,311 8,345	108,600
Setup/Teardown	77,974				77,974
Top Plate	3,409	1,565	1,332	34,508	40,813
Upper Portion CRD Guides		1,290	1,332	11,441	
Upper Portion Post and Columns	79,304	2,580	1,332	18,622	212,155
Lower Portion, Posts, Columns, CRD Guides		9,390	39,852	47,013	
Upper Core Barrel	12,305	1,290 14,085	1,332 47,396	13,780 36,840	127,028
Thermal Shields	17,667	3,120	124,864	327,600	473,252
Shroud Plates and Formers	50,551	4,160	159,111	436,800	650,621
Upper/Lower Grid Plates	25,219	4,160	125,970	436,800	592,149
Upper Portion of Support Posts and Inst. Guides	22,930	1,040	61,446	109,200	194,616
Lower Core Barrel	67,720	11,440	401,358	1,201,200	1,681,718
Support Forging and Tie Plates	42,712	28,170	68,537	84,170	223,589
Lower Posts and Instrument Guides	22,930	4,695	33,449	11,643	72,717
Setup/Teardown	51,983				51,983
Upper/Lower RPV Heads	28,224	4,515	4,661	107,139	144,539
Upper/Lower RPV Flanges	11,238	4,515	4,661	69,864	90,278
Nozzle Sections	4,346	3,760	5,327	66,847	80,281
Lower Wall	28,480	103,290	184,231	257,783	573,784
Studs & Nuts	0	1,290	1,332	14,636	17,258
CRD & Instrument Penetrations	37,468	645	1,332	4,656	44,101
TOTALS	634,899	210,985	1,303,375	3,308,196	5,457,456

TABLE A.3. Contents of File TEST.PRF (contd)

RPV Internals

Crew Hours	Pers Hours	Exposure Hours	Pers-Rem
1,456.37	13,107.30	2,932.90	63.99

PRESSURE VESSEL

Crew Hours	Pers Hours	Exposure Hours	Pers-Rem
497.83	4,480.43	1,654.66	17.68

A detailed report of staffing (overhead) costs by decommissioning period is provided by **TEST.PRG** in Table A.4. This file was created from Menu Item G in Chapter 6. The names of the decommissioning periods are as defined by Menu Item B. Job descriptions preceded by a tilde (~) are discussed in Section 4.7.1.

TABLE A.4. Contents of File TEST.PRG

Overhead Costs (in dollars) for Planning and Preparation

Job Description	Overhead Position	Annual Salary	Annual Salary w/Ovhd	Pers-yrs per Period	Total
Plant Manager	Utility	91,210	129,518	0.125	16,190
Assistant Plant Manager	Utility	73,820	104,824	0.125	13,103
Secretary	Utility	20,500	29,110	0.125	3,639
Contracts/Procurement Spec.	Utility	48,610	69,026	0.625	43,141
Chemistry Supervisor	Utility	52,630	74,735	0.250	18,684
Quality Assurance Manager	Utility	61,140	86,819	0.625	54,262
Health Physics Manager	Utility	55,950	79,449	0.125	9,931
Nuclear Records Specialist	Utility	43,260	61,429	0.250	15,357
Training Engineer	Utility	52,630	74,735	0.250	18,684
Operations Manager	Utility	68,620	97,440	0.125	12,180
Plant Engineer	Utility	51,140	72,619	5.000	363,095
Maintenance Manager	Utility	67,190	95,410	0.125	11,926
Licensing Engineer	Utility	50,890	72,264	0.125	9,033
Security Manager	Utility	61,140	86,819	0.125	10,852
Project Manager	DOC	91,210	220,272	2.500	550,680
Assistant Project Manager	DOC	73,820	178,275	2.500	445,688
Secretary/Clerk	DOC	19,805	47,829	12.500	597,863
Lawyer/Financial Administrator	DOC	62,420	150,744	5.000	753,720
Contracts Specialist/Buyer	DOC	48,600	117,369	2.500	293,423
Procurement Specialist	DOC	44,200	106,743	2.500	266,858
Accountant	DOC	48,600	117,369	5.000	586,845
Engineer	DOC	50,890	122,899	5.000	614,495
Drafting Specialist	DOC	28,080	67,813	7.500	508,598
Quality Assurance Engineer	DOC	34,710	83,825	2.500	209,563
Utility Overhead Costs for Planning and Preparation					600,077
DOC Overhead Costs for Planning and Preparation					4,827,733
Other Overhead Costs for Planning and Preparation					0
Total Overhead Costs for Planning and Preparation					5,427,810

TABLE A.4. Contents of File TEST.PRG (contd)

Overhead Costs (in dollars) for Defuel and Layup

Job Description	Overhead Position	Annual Salary	Annual Salary w/Ovhd	Pers-yrs per Period	Total
Plant Manager	Utility	91,210	129,518	0.620	80,301
Assistant Plant Manager	Utility	73,820	104,824	0.620	64,991
Secretary	Utility	20,500	29,110	3.690	107,416
Clerk	Utility	19,120	27,150	9.850	267,428
Accountant	Utility	48,610	69,026	1.230	84,902
Contracts/Procurement Spec.	Utility	48,610	69,026	1.850	127,698
Industrial Safety Specialist	Utility	47,600	67,592	1.850	125,045
Planning/Scheduling Engineer	Utility	52,630	74,735	0.620	46,336
Radioactive Ship. Specialist	Utility	55,950	79,449	1.850	146,981
Chemistry Supervisor	Utility	52,630	74,735	0.620	46,336
Chemistry Technician	Utility	30,290	43,012	2.460	105,81[illegible]
Quality Assurance Manager	Utility	61,140	86,819	0.620	53,828
Quality Assurance Engineer	Utility	34,710	49,288	2.460	121,248
Quality Assurance Technician	Utility	30,290	43,012	4.920	211,619
Health Physics Manager	Utility	55,950	79,449	0.620	49,258
~Sr. Health Physics Technician	Utility	51,440	73,045	2.460	179,691
Health Physics/ALARA Planner	Utility	51,440	73,045	0.620	45,288
~Health Physics Technician	Utility	31,710	45,028	9.850	443,526
Nuclear Records Specialist	Utility	43,260	61,429	0.620	38,086
Training Engineer	Utility	52,630	74,735	0.620	46,336
Operations Manager	Utility	68,620	97,440	0.620	60,413
Administration Manager	Utility	61,140	86,819	0.620	53,828
Operations Supervisor	Utility	61,140	86,819	2.460	213,575
~Control Operator	Utility	51,400	72,988	9.850	718,932
~Plant Equipment Operator	Utility	36,470	51,787	9.850	510,102
Plant Engineer	Utility	51,140	72,619	2.460	178,643
Maintenance Manager	Utility	67,190	95,410	0.620	59,154
Maintenance Supervisor	Utility	61,430	87,231	2.460	214,588
Licensing Engineer	Utility	50,890	72,264	1.850	133,688
~Craftsman	Utility	42,810	60,790	9.850	598,782
Custodian	Utility	22,710	32,248	1.230	39,665
Security Manager	Utility	61,140	86,819	0.620	53,828
Security Shift Supervisor	Utility	27,070	38,439	2.460	94,560
Security Patrolman	Utility	24,560	34,875	19.690	686,689
Utility Overhead Costs for Defuel and Layup					6,008,571
DOC Overhead Costs for Defuel and Layup					0
Other Overhead Costs for Defuel and Layup					0
Total Overhead Costs for Defuel and Layup					6,008,571

TABLE A.4. Contents of File TEST.PRG (contd)

Overhead Costs (in dollars) for Spent Fuel Pool Operations

Job Description	Overhead Position	Annual Salary	Annual Salary w/Ovhd	Pers-yrs per Period	Total
Plant Manager	Utility	91,210	129,518	0.630	81,596
Assistant Plant Manager	Utility	73,820	104,824	0.630	66,039
Secretary	Utility	20,500	29,110	0.630	18,339
Clerk	Utility	19,120	27,150	3.150	85,522
Accountant	Utility	48,610	69,026	0.630	43,486
Contracts/Procurement Spec.	Utility	48,610	69,026	0.630	43,486
Industrial Safety Specialist	Utility	47,600	67,592	0.630	42,583
Radioactive Ship. Specialist	Utility	55,950	79,449	0.630	50,053
Chemistry Technician	Utility	30,290	43,012	0.630	27,098
Quality Assurance Technician	Utility	30,290	43,012	0.630	27,098
Health Physics Manager	Utility	55,950	79,449	0.630	50,053
~Sr. Health Physics Technician	Utility	51,440	73,045	1.890	138,055
Nuclear Records Specialist	Utility	43,260	61,429	0.630	38,700
Operations Manager	Utility	68,620	97,440	0.630	61,387
Administration Manager	Utility	61,140	86,819	0.630	54,696
Operations Supervisor	Utility	61,140	86,819	0.630	54,696
~Control Operator	Utility	51,400	72,988	2.520	183,930
~Plant Equipment Operator	Utility	36,470	51,787	3.780	195,755
Plant Engineer	Utility	51,140	72,619	0.630	45,750
Maintenance Supervisor	Utility	61,430	87,231	0.630	54,956
Licensing Engineer	Utility	50,890	72,264	0.630	45,526
~Craftsman	Utility	42,810	60,790	2.520	153,191
Custodian	Utility	22,710	32,248	1.260	40,632
Security Manager	Utility	61,140	86,819	0.630	54,696
Security Shift Supervisor	Utility	27,070	38,439	1.890	72,650
Security Patrolman	Utility	24,560	34,875	5.040	175,770
Project Manager	DOC	91,210	220,272	0.500	110,136
Assistant Project Manager	DOC	73,820	178,275	0.500	89,138
Secretary/Clerk	DOC	19,805	47,829	2.500	119,573
Lawyer/Financial Administrator	DOC	62,420	150,744	1.000	150,744
Contracts Specialist/Buyer	DOC	48,600	117,369	0.500	58,684
Procurement Specialist	DOC	44,200	106,743	0.500	53,371
Accountant	DOC	48,600	117,369	1.000	117,369
Engineer	DOC	50,890	122,899	1.000	122,899
Drafting Specialist	DOC	28,080	67,813	1.500	101,719
Quality Assurance Engineer	DOC	34,710	83,825	0.500	41,912
Utility Overhead Costs for Spent Fuel Pool Operations					1,905,743
DOC Overhead Costs for Spent Fuel Pool Operations					965,545
Other Overhead Costs for Spent Fuel Pool Operations					0
Total Overhead Costs for Spent Fuel Pool Operations					2,871,288

TABLE A.4. Contents of File TEST.PRG (contd)

Overhead Costs (in dollars) for Deferred Dismantlement

Job Description	Overhead Position	Annual Salary	Annual Salary w/Ovhd	Pers-yrs per Period	Total
Plant Manager	Utility	91,210	129,518	1.700	220,181
Secretary	Utility	20,500	29,110	1.700	49,487
Clerk	Utility	19,120	27,150	6.800	184,620
Accountant	Utility	48,610	69,026	1.700	117,344
Contracts/Procurement Spec.	Utility	48,610	69,026	1.700	117,344
Industrial Safety Specialist	Utility	47,600	67,592	1.500	101,388
Radioactive Ship. Specialist	Utility	55,950	79,449	1.500	119,173
Chemistry Technician	Utility	30,290	43,012	0.400	17,205
Quality Assurance Engineer	Utility	34,710	49,288	1.700	83,790
Health Physics/ALARA Planner	Utility	51,440	73,045	1.700	124,176
Nuclear Records Specialist	Utility	43,260	61,429	1.700	104,429
Training Engineer	Utility	52,630	74,735	1.500	112,102
Operations Supervisor	Utility	61,140	86,819	3.000	260,457
~Control Operator	Utility	51,400	72,988	4.500	328,446
~Plant Equipment Operator	Utility	36,470	51,787	4.500	233,041
Plant Engineer	Utility	51,140	72,619	6.000	435,714
Maintenance Supervisor	Utility	61,430	87,231	1.500	130,846
Licensing Engineer	Utility	50,890	72,264	1.700	122,849
~Craftsman	Utility	42,810	60,790	5.300	322,187
Custodian	Utility	22,710	32,248	3.400	109,643
Security Manager	Utility	61,140	86,819	0.200	17,364
Security Shift Supervisor	Utility	27,070	38,439	0.600	23,063
Security Patrolman	Utility	24,560	34,875	1.600	55,800
Project Manager	DOC	91,210	220,272	1.700	374,462
Assistant Project Manager	DOC	73,820	178,275	1.700	303,067
Secretary/Clerk	DOC	19,805	47,829	13.600	650,474
Industrial Safety Specialist	DOC	47,600	114,954	4.500	517,293
Planning/Scheduling Engineer	DOC	52,630	127,101	5.100	648,215
Radioactive Shipment Spec.	DOC	55,950	135,119	1.500	202,678
Lawyer/Financial Administrator	DOC	62,420	150,744	0.800	120,595
Contracts/Accounting Super.	DOC	62,420	150,744	1.700	256,265
Contracts Specialist/Buyer	DOC	48,600	117,369	1.700	199,527
Procurement Specialist	DOC	44,200	106,743	1.500	160,114
Accountant	DOC	48,600	117,369	1.700	199,527
Health Physics Supervisor	DOC	61,550	148,643	1.700	252,693
Health Physics/ALARA Planner	DOC	51,440	124,228	1.700	211,188
Engineering Supervisor	DOC	61,140	147,653	1.500	221,479
D&D Operations Supervisor	DOC	61,140	147,653	9.000	1,328,877
Engineer	DOC	50,890	122,899	12.000	1,474,788
Drafting Specialist	DOC	28,080	67,813	4.500	305,158
Quality Assurance Supervisor	DOC	61,140	147,653	1.700	251,010
Quality Assurance Engineer	DOC	34,710	83,825	1.700	142,502

TABLE A.4. Contents of File TEST.PRG (contd)

Quality Assurance Technician	DOC	31,710	76,580	6.000	459,480
~Sr. Health Physics Technician	DOC	51,440	124,228	5.100	633,563
~Health Physics Technician	DOC	31,710	76,580	18.000	1,378,440
~Health Phys. Tech (m. hand.)	DOC	31,710	76,580	3.000	229,740
~Craftsman (mat'l handling)	DOC	42,810	103,386	3.000	310,158
~Utility Operator (m. hand.)	DOC	36,470	88,075	3.000	264,225
~Crew Leader (m. hand.)	DOC	47,230	114,060	1.500	171,090
Tool Crib Attendant	DOC	31,770	76,725	3.000	230,175
Protective Clothing Attendant	DOC	31,770	76,725	3.000	230,175
Licensing Engineer	DOC	50,890	122,899	1.700	208,928
Safety Consultant	Other	242,200	242,200	0.500	121,100
Utility Overhead Costs for Deferred Dismantlement					3,390,649
DOC Overhead Costs for Deferred Dismantlement					11,935,886
Other Overhead Costs for Deferred Dismantlement					121,100
Total Overhead Costs for Deferred Dismantlement					15,447,635

The last output file, **TEST.PRI**, is shown in Table A.5. This file, produced from Menu Item I in Chapter 6, summarizes the data shown in **TEST.PRE**, **TEST.PRD**, and **TEST.PRG**. The data are organized into the decommissioning periods defined by Menu Item B. The notes following the table expain where each cost item originates.

The second part of each **PRI** file shows total decommissioning costs reorganized into the categories of labor and materials, energy, and waste disposal. These categories provide the cost terms in the decommissioning cost escalation formula presented in 10 CFR 50.75(c). That formula has been slightly modified to exclude escalation of property taxes and nuclear insurance costs from the calculation. The revised formula is

$$\text{Estimated Cost (year X)} = [\text{Reduced Cost (base year)}]\,[A\,L_x + B\,E_x + C\,B_x] + \text{Taxes \& Insurance (year X)},$$

where base year is the year for which the CECP input data are applicable. (The base year for **TEST.PRI** is 1993). Each **PRI** file provides the following elements of this equation: Reduced Cost (base year), the base-year labor and materials fraction (A), the base-year energy fraction (B), and the base-year disposal cost fraction (C). The user supplies the factors L_x, E_x, and B_x, which are the escalation of labor, energy, and waste disposal costs from the base year until the year of the estimate (year X). The user must also supply the taxes and insurance costs for year X. A complete discussion of the escalation equation will be found in the Report on Waste Burial Charges.[1]

The last portion of a **PRI** file consists of a brief summary of burial volumes and percentages by waste class.

TABLE A.5. Contents of File TEST.PRI

Final Summary Report for TEST

PERIOD 1: Planning and Preparation (Year -2.5000 to Year 0.0000)

	Costs (dollars)										
Undistributed Costs	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Utility Staff[1]	0	0	0	0	0	600,077	600,077	0	0	0	0.00
DOC Staff[1]	0	0	0	0	0	4,827,733	4,827,733	0	0	0	0.00
Regulatory Costs[2]	0	0	0	0	0	357,330	357,330	0	0	0	0.00
Special Tools and Equipment[3]	0	0	0	0	0	3,322,575	3,322,575	0	0	0	0.00
Totals	0	0	0	0	0	9,107,715	9,107,715	0	0	0	0.00
Totals for PERIOD 1	0	0	0	0	0	9,107,715	9,107,715	0	0	0	0.00

PERIOD 2: Defuel and Layup (Year 0.0000 to Year .6200)

	Costs (dollars)										
Removal of NSSS[4]	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Removal of RPV Internals	0	473,160	92,970	1,101,830	2,787,273	0	4,455,233	3,454	1,456	13,107	63.99
Chemical Decontamination	13,250,000	0	0	0	466,302	0	13,716,302	4,600	1,408	8,448	45.70
Disposal of Concentrated Boron Sol.	1,074,600	0	1,725	0	23,278	0	1,099,602	480	3,936	11,808	12.00
Totals	14,324,600	473,160	94,695	1,101,830	3,276,852	0	19,271,137	8,534	6,800	33,363	121.69

	Costs (dollars)										
Dry Active Waste Costs for this Period[5]	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Dry Active Waste	0	0	11,454	7,448	154,586	0	173,488	3,188	0	0	0.00

	Costs (dollars)										
Undistributed Costs	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Utility Staff[1]	0	0	0	0	0	6,008,571	6,008,571	0	0	87,069	87.07
Regulatory Costs[2]	0	0	0	0	0	370,800	370,800	0	0	0	0.00
Environmental Monitoring Costs[2]	0	0	0	0	0	30,134	30,134	0	0	0	0.00
Laundry Services[6]	0	0	0	0	0	316,134	316,134	0	0	0	0.00
Small Tools and Minor Equipment[7]	0	0	0	0	0	9,463	9,463	0	0	0	0.00
Chemical Decon/Deboration Energy[4]	0	0	0	0	0	302,900	302,900	0	0	0	0.00
Plant Power Usage[2]	0	0	0	0	0	738,643	738,643	0	0	0	0.00
Nuclear Liability Insurance[2]	0	0	0	0	0	1,716,532	1,716,532	0	0	0	0.00
Totals	0	0	0	0	0	9,493,178	9,493,178	0	0	87,069	87.07
Totals for PERIOD 2	14,324,600	473,160	106,149	1,109,278	3,431,437	9,493,178	28,937,802	11,722	6,800	120,432	208.76

TABLE A.5. Contents of File TEST.PRI (contd)

PERIOD 3: Spent Fuel Pool Operations (Year 0.6200 to Year 6.9200)

	Costs (dollars)										
Undistributed Costs	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Utility Staff[1]	0	0	0	0	0	1,905,743	1,905,743	0	0	22,277	20.53
DOC Staff[1]	0	0	0	0	0	965,545	965,545	0	0	0	0.00
Regulatory Costs[2]	0	0	0	0	0	22,579	22,579	0	0	0	0.00
Environmental Monitoring Costs[2]	0	0	0	0	0	30,618	30,618	0	0	0	0.00
Laundry Services[6]	0	0	0	0	0	58,477	58,477	0	0	0	0.00
Plant Power Usage[2]	0	0	0	0	0	42,842	42,842	0	0	0	0.00
Property Taxes[2]	0	0	0	0	0	56,700	56,700	0	0	0	0.00
Nuclear Liability Insurance[2]	0	0	0	0	0	3,780,000	3,780,000	0	0	0	0.00
Totals	0	0	0	0	0	6,862,503	6,862,503	0	0	22,277	20.53
Totals for PERIOD 3	0	0	0	0	0	6,862,503	6,862,503	0	0	22,277	20.53

PERIOD 4: Deferred Dismantlement (Year 6.9200 to Year 8.6200

	Costs (dollars)										
Removal of NSSS[4]	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Removal of Reactor Pressure Vessel	0	161,739	118,015	201,545	520,924	0	1,002,223	2,924	498	4,480	17.68
Steam Generator--Direct Removal Cost	1,070,711	5,165,032	437,363	1,575,067	3,349,743	0	11,597,916	64,524	1,443	86,557	60.00
Steam Generator--Cascading Costs	0	141,736	0	0	0	0	141,736	0	0	0	0.00
RCS Piping	0	22,144	30,336	8,137	254,706	0	315,323	3,910	115	634	4.87
Large Miscellaneous RCS Piping	0	22,862	3,794	1,018	33,638	0	61,311	489	119	653	5.01
Small Miscellaneous RCS Piping	0	42,714	421	113	3,786	0	47,034	54	222	1,220	9.36
RCS Insulation	0	0	39,720	5,327	248,293	0	293,341	5,120	0	0	0.00
Pressurizer	0	8,112	0	172,294	118,327	0	298,733	2,440	16	90	0.69
Pressurizer Relief Tank	0	5,868	3,650	979	30,645	0	41,142	470	30	166	1.27
Primary Pumps	0	32,448	0	689,175	203,678	0	925,301	4,200	65	360	2.76
Spent Fuel Racks	0	661,500	63,680	16,601	1,006,162	0	1,747,944	18,113	267	2,400	1.20
Biological Shield	0	173,519	86,917	44,867	699,105	0	1,004,407	12,936	518	3,365	31.22
Totals	1,070,711	6,437,673	783,896	2,715,124	6,469,007	0	17,476,411	115,181	3,293	99,926	134.06

	Costs (dollars)										
Removal of Contaminated Plant Systems[8]	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Component Cooling Water System	0	63,324	63,800	17,114	535,670	0	679,908	8,224	338	1,802	10.59
Clean Radioactive Waste Treatment System	0	49,471	16,765	4,504	140,751	0	211,492	2,162	266	1,405	5.46
Containment Spray System	0	17,489	8,656	2,322	72,679	0	101,146	1,116	98	500	1.98
Chemical and Volume Control System	0	137,558	44,844	12,076	378,432	0	572,909	5,871	725	3,919	22.00
Dirty Radioactive Waste Treatment System	0	19,994	3,706	994	31,112	0	55,806	478	113	574	1.44
Main Steam System (Within Containment)	0	53,567	26,440	7,092	221,994	0	309,094	3,408	281	1,529	7.70
Radioactive Gaseous Waste System	0	26,785	11,316	3,025	94,641	0	135,767	1,480	147	762	0.57

TABLE A.5. Contents of File TEST.PRI (contd)

Residual Heat Removal System	0	23,984	8,505	3,820	102,619	0	138,927	1,568	138	685	4.63
Safety Injection System	0	75,098	88,257	23,674	741,019	0	928,049	11,377	395	2,113	8.00
Spent Fuel Cooling System	0	30,872	5,834	1,571	48,669	0	86,947	770	166	884	6.39
Stainless Steel Piping (3 - 24 Inches)	0	799,941	64,028	17,175	568,652	0	1,449,796	8,253	4,153	22,842	230.67
Stainless Steel Piping (1/2 - 2 Inches)	0	637,902	9,634	2,584	88,658	0	738,778	1,242	3,313	18,224	228.36
Retrofit Materials	0	17,741	1,059	284	8,921	0	28,006	137	95	508	4.01
Electrical Components and Annunciators	0	14,365	55,366	14,852	464,863	0	549,446	7,137	94	378	0.03
Control Rod Drive	0	2,156	141	38	1,183	0	3,517	18	16	63	0.00
Small Hangers (4" pipe or less)	0	1,281,639	181,259	52,479	891,795	0	2,407,172	12,609	6,678	36,728	0.94
Large Hangers (> 4" pipe)	0	800,070	139,190	40,299	684,816	0	1,664,375	9,683	4,162	22,893	0.59
Totals	0	4,051,957	728,800	203,903	5,076,474	0	10,061,134	75,531	21,179	115,807	533.36

Decontamination of Site Buildings[9]	Costs (dollars)										
	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Fuel Bldg	23,577	110,767	14,324	5,736	137,690	0	292,095	2,362	905	3,510	2.21
Containment Bldg	125,020	106,706	19,888	6,875	181,299	0	439,787	2,988	1,846	6,789	3.39
Auxiliary Bldg	64,318	135,203	8,156	5,062	95,065	0	307,804	1,839	1,583	5,458	3.23
Waste Water Solidification Costs	293,300	0	54,775	55,592	86,524	0	490,192	1,414	875	2,624	0.71
Spent Fuel Pool Water Treatment	794,211	0	65,375	0	67,590	0	887,176	1,010	720	4,320	2.00
Cascading Costs--Concrete Cutting	0	48,168	0	0	0	0	48,168	0	392	980	0.75
Cascading Costs--Asbestos Removal	0	165,000	0	0	0	0	165,000	0	0	0	0.00
Removal of HVAC Ducts	0	107,355	24,662	6,615	167,390	0	306,023	3,179	1,275	3,826	1.62
Removal of HVAC Equipment	0	37,708	346,541	92,957	2,166,263	0	2,643,469	44,670	200	1,000	0.51
Removal of HVAC Coolers	0	33,754	76,623	20,554	643,336	0	774,267	9,877	179	895	0.46
Bridge Crane	7,542	75,780	3,650	1,315	76,603	0	164,889	1,360	216	1,176	0.00
Polar Crane	7,542	237,020	3,650	1,522	76,603	0	326,336	1,360	304	2,104	0.00
Refueling Cranes	0	4,309	9,930	2,664	67,398	0	84,301	1,280	23	125	0.31
Floor Drains	0	248,660	7,925	4,091	63,746	0	324,423	1,180	1,715	5,145	1.09
Totals	1,275,509	1,310,430	635,500	202,982	3,829,507	0	7,253,928	72,518	10,234	37,952	16.28

Dry Active Waste Costs for this Period[5]	Costs (dollars)										
	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Dry Active Waste	0	0	58,456	38,011	788,913	0	885,380	16,268	0	0	0.00

Site Termination Survey[10]	Costs (dollars)										
	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Termination Survey Costs	0	0	0	0	0	1,220,187	1,220,187	0	0	0	0.00

Undistributed Costs	Costs (dollars)										
	Decon	Remove	Package	Ship	Bury	Undist	Total	Cu Ft	C-Hrs	Pers-Hrs	Pers-Rem
Utility Staff[1]	0	0	0	0	0	3,390,649	3,390,649	0	0	29,744	11.97
DOC Staff[1]	0	0	0	0	0	11,935,886	11,935,886	0	0	69,888	28.13
Consultant/Other Staff[1]	0	0	0	0	0	121,100	121,100	0	0	0	0.00
DOC Mobilization/Demobilization Costs[2]	0	0	0	0	0	2,640,000	2,640,000	0	0	0	0.00

Table A.5. Contents of File TEST.PRI (contd)

Regulatory Costs[2]	0	0	0	0	0	1,024,335	1,024,335	0	0	0	0.00
Environmental Monitoring Costs[2]	0	0	0	0	0	82,625	82,625	0	0	0	0.00
Laundry Services[6]	0	0	0	0	0	927,457	927,457	0	0	0	0.00
Small Tools and Minor Equipment[7]	0	0	0	0	0	261,975	261,975	0	0	0	0.00
Steam Generator--Undistributed Costs[4]	0	0	0	0	0	208,885	208,885	0	0	0	0.00
Plant Power Usage[2]	0	0	0	0	0	2,025,312	2,025,312	0	0	0	0.00
Property Taxes[2]	0	0	0	0	0	153,000	153,000	0	0	0	0.00
Nuclear Liability Insurance[2]	0	0	0	0	0	2,037,620	2,037,620	0	0	0	0.00
Totals	0	0	0	0	0	24,808,844	24,808,844	0	0	99,632	40.10
Totals for PERIOD 4	2,346,220	11,800,060	2,206,652	3,160,019	16,163,902	26,029,031	61,705,884	279,498	34,705	353,317	723.80
GRAND TOTALS	16,670,820	12,273,220	2,312,801	4,269,297	19,595,339	51,492,427	106,613,904	291,220	41,505	496,026	953.09
GRAND TOTALS with 25% contingency	20,838,525	15,341,525	2,891,001	5,336,622	24,494,174	64,365,534	133,267,380	291,220	41,505	496,026	953.09

Listed below are the fractions of the total cost that are attributable to labor and materials (A), energy and transportation (B), and waste burial (C). Property taxes and nuclear liability insurance are not included.

Cost Category	Cost Fraction	Costs (Dollars) w/o Contingency	Costs (Dollars) with 25% Contingency
A (labor and materials):	0.727	71,895,719	89,869,649
B (energy and transportation):	0.075	7,378,994	9,223,743
C (waste burial):	0.198	19,595,339	24,494,174
A + B + C ($)		98,870,052	123,587,565
Taxes and Insurance ($)		7,743,852	9,679,815
Grand Totals ($)		106,613,904	133,267,380

TABLE A.5. Contents of File TEST.PRI (contd)

---- Burial Volumes by Waste Class -----

	Vol. (ft3)	Per Cent
Class A Waste:	280,934	96.47
Class B&C Waste:	9,900	3.40
GTCC Waste:	386	0.13
	291,220	100.00

(1) From Menu Item G. A summary of TEST.PRG.
(2) From Menu Item H. Adjusted for the length of each decommissioning period, where applicable.
(3) From Menu Item C. Total costs of special equipment entered in Menu Item C.
(4) From Menu Item F. A summary of the NSSS costs shown in TEST.PRF.
(5) From Menu Item I. Based on lines 40 and 51 of Menu Item 1.
(6) From Menu Item I. Based on total person-hours for all activities in each period and on line 39 of Menu Item 1.
(7) From Menu Item I. Equal to direct labor costs (exclusive of any contractor costs) times the factor on line 42 of Menu Item 1.
(8) From Menu Item E. A summary of the system costs shown in TEST.PRE.
(9) From Menu Item D. A summary of the building decon costs shown in TEST.PRD. Also includes waste water disposal costs and large equipment costs calculated from the data entered in Menu Item 2.
(10) From Menu Item D. Calculated from line 21 of Menu Item 1.

In addition to the 5 output files discussed above, the CECP also produces a file containing a list of all the user-supplied input parameters from all applicable menu items. This input listing (**PIN** file) is created in Menu Itme I, just after the CECP produces the **PRI** file. Table A.6 is **TEST.PIN**.

TABLE A.6. Contents of File TEST.PIN

DECON.PIN Page 1

This file contains the input parameters used to create DECON.PRI. The parameters are listed by menu item. Note that there are no input parameters for Menu Items D and E. Inputs for Menu Item G are obvious from DECON.PRG and are not included here.

MENU 1 INPUTS --

1	Laborer hourly rate ($/hr)	26.370
2	Craft hourly rate ($/hr)	49.700
3	Crew leader hourly rate ($/hr)	54.840
4	Radiation operator hourly rate ($/hr)	36.820
5	Engineer hourly rate ($/hr)	59.090
6	Average shift differential (%)	5.000
7	Profit on equipment and material (%)	15.000
8	Utility overhead (%)	42.000
9	DOC overhead (%)	110.000
10	DOC profit (%)	15.000
11	Density of poured concrete (lb/ft3)	144.000
12	Density of reinforced conc (lb/ft3)	200.000
13	Density of stainless steel (lb/ft3)	500.000
14	DOT 17-H steel drum, 55-gal ($/ea)	26.950
15	Plastic sheets/bags ($/ft2)	0.040
16	Blotting paper ($/ft2)	0.320
17	Gas torch consumables ($/hr)	6.750
18	Burial costs/ft3 at geologic repos ($)	6500.000
19	Transportation escalation factor	1.000
20	Waste burial escalation factor	1.000
21	License termination survey cost ($)	1220187.000
22	Effective standard box width (ft)	4.000
23	Effective standard box depth (ft)	4.000
24	Effective standard box length (ft)	6.000
25	Standard box 4 x 4 x 6 cost ($)	645.000
26	Maritime container 8 x 4 x 20 cost ($)	4965.000
27	Maritime container weight (lb)	3000.000
28	Maritime container volume (ft3)	640.000
29	Pipe hanger container cost ($)	4600.000
30	Pipe hanger container weight (lb)	2500.000
31	Pipe hanger container volume (ft3)	320.000
32	Cask liner for 8-120B cask ($)	4695.000
33	Special u-shaped container ($)	1565.000
34	Canister for GTCC material ($)	520.000
35	Spec. container, inner-wall shaped ($)	470.000
36	Cask liner for 8-120B cask, oval ($)	4695.000
37	High integrity container (HIC) ($)	7825.000
38	NuPac 14/210H cask rental ($/day)	1250.000
39	CNS 8-120B cask rental ($/day)	1250.000
40	NAC LWT cask rental ($/day)	3130.000
41	TN-8 cask rental ($/day)	3340.000
42	Laundry services ($/person-shift)	21.000
43	Uncompacted drums of waste (drums/day)	5.000

TABLE A.6. Contents of File TEST.PIN (contd)

44	Dry waste compaction ratio	5.000
45	Small tools (% of direct labor costs)	2.000
46	Piping/equip/HXs (curies/ft2)	0.006
47	SG vessel & internals (curies/ft2)	0.021
48	RCS piping (curies/ft2)	0.080
49	Pressurizer & relief tank (curies/ft2)	0.004
50	Maint. allow. ($/yr) (SAFSTOR only)	17379.000
51	Length (ft) to which pipes will be cut	15.000

MENU 2 INPUTS --

1	Surf Wash:	Suit-up time (minutes)	120.000
2	Surf Wash:	Breaks (minutes)	30.000
3	Surf Wash:	ALARA (minutes)	25.000
4	Surf Wash:	Warmup (minutes)	15.000
5	Surf Wash:	Cleanup (minutes)	50.000
6	Surf Wash:	Number of laborers	2.000
7	Surf Wash:	Number of crafts	1.000
8	Surf Wash:	Number of crew leaders	0.500
9	Surf Wash:	Number of rad monitors	0.500
10	Surf Wash:	Crew dose rate (millirem/hr)	3.000
11	Surf Wash:	Cleansing rate (ft2/min)	8.000
12	Surf Wash:	Vacuum hose replacement ($)	1180.000
13	Surf Wash:	HEPA filter replacement ($)	300.000
14	Surf Wash:	Misc. parts ($)	2000.000
15	Surf Wash:	Waste water process. ($/gal)	10.000
16	Surf Wash:	Mob/demob costs ($)	20000.000
17	Conc Rmvl:	Suit-up time (minutes)	120.000
18	Conc Rmvl:	Breaks (minutes)	30.000
19	Conc Rmvl:	ALARA (minutes)	10.000
20	Conc Rmvl:	Number of laborers	3.000
21	Conc Rmvl:	Number of crafts	0.000
22	Conc Rmvl:	Number of crew leaders	0.250
23	Conc Rmvl:	Number of rad monitors	0.250
24	Conc Rmvl:	Crew dose rate (millirem/hr)	3.000
25	Conc Rmvl:	Cleansing rate (ft2/hr)	130.000
26	Conc Rmvl:	Cutting bits ($/hr)	13.000
27	Conc Rmvl:	Filters ($/hr)	2.500
28	Conc Rmvl:	Cleaning sys. rental ($/wk)	2300.000
29	Conc Rmvl:	Compressor rental ($/month)	2025.000
30	Mtl Rmvl:	Staging (in minutes)	60.000
31	Mtl Rmvl:	Height adjustment (%)	10.000
32	Mtl Rmvl:	Respiratory prot. adj. (%)	20.000
33	Mtl Rmvl:	ALARA (minutes)	25.000
34	Mtl Rmvl:	Suit-up time (minutes)	120.000
35	Mtl Rmvl:	Breaks (minutes)	30.000
36	Mtl Rmvl:	Number of laborers	3.000
37	Mtl Rmvl:	Number of crafts	1.500
38	Mtl Rmvl:	Number of crew leaders	0.500
39	Mtl Rmvl:	Number of rad monitors	0.500
40	Mtl Rmvl:	Crew dose rate (millirem/hr)	3.000

TABLE A.6. Contents of File TEST.PIN (contd)

41 Conc Cttg:	Staging (in minutes)	60.000
42 Conc Cttg:	Height adjustment (%)	10.000
43 Conc Cttg:	Respiratory prot. adj. (%)	10.000
44 Conc Cttg:	ALARA (minutes)	25.000
45 Conc Cttg:	Suit-up time (minutes)	120.000
46 Conc Cttg:	Breaks (minutes)	30.000
47 Conc Cttg:	Number of laborers	1.000
48 Conc Cttg:	Number of crafts	1.000
49 Conc Cttg:	Number of crew leaders	0.500
50 Conc Cttg:	Dose rate (millirem/hr)	3.000
51 Conc Cttg:	Cutting rate (inch-feet/min)	1.000
52 Conc Cttg:	Blade costs ($/in-ft of cut)	0.440
53 Handrails:	Cleansing rate (ft/hr)	20.000
54 Handrails:	Suit-up time (minutes)	120.000
55 Handrails:	Breaks (minutes)	30.000
56 Handrails:	ALARA (minutes)	10.000
57 Handrails:	Number of laborers	2.000
58 Handrails:	Number of crafts	0.000
59 Handrails:	Number of crew leaders	0.500
60 Handrails:	Number of rad monitors	0.500
61 Handrails:	Dose rate (millirem/hr)	3.000
62 Handrails:	Industrial wipes ($/ft2)	0.070
63 Handrails:	Wipe usage rate (ft2/ft)	1.350
64 Handrails:	Washing fluid ($/gal)	15.000
65 Handrails:	Washing fluid usage (ft/gal)	430.000
66 Gratings:	Removal rate (ft2/hr)	68.750
67 Gratings:	Suit-up time (minutes)	120.000
68 Gratings:	Breaks (minutes)	30.000
69 Gratings:	ALARA (minutes)	25.000
70 Gratings:	Respiratory prot. adj. (%)	20.000
71 Gratings:	Number of laborers	3.000
72 Gratings:	Number of crafts	0.000
73 Gratings:	Number of crew leaders	0.500
74 Gratings:	Number of rad monitors	0.500
75 Gratings:	Dose rate (millirem/hr)	3.000
76 Gratings:	Grating wgt. (lb/ft2)	10.400
77 P. Crane:	Number of polar cranes	1.000
78 P. Crane:	Number of crafts	2.000
79 P. Crane:	Number of laborers	2.000
80 P. Crane:	Number of rad monitors	0.500
81 P. Crane:	Number of crew leaders	0.500
82 P. Crane:	Vendor person-hr required	1904.000
83 P. Crane:	Cost of vendor person-hr ($)	55.000
84 P. Crane:	Removal time (hours)	264.000
85 P. Crane:	Cleanup time (hours)	40.000
86 P. Crane:	Equip. & mob/demob costs ($)	132300.000
87 P. Crane:	Cost of burial container ($)	3650.000
88 P. Crane:	Burial weight w/container (lb)	45000.000
89 P. Crane:	Burial volume (ft3)	1360.000
90 B. Crane:	Number of bridge cranes	1.000
91 B. Crane:	Number of crafts	2.000

TABLE A.6. Contents of File TEST.PIN (contd)

92	B. Crane:	Number of laborers	2.000
93	B. Crane:	Number of rad monitors	0.500
94	B. Crane:	Number of crew leaders	0.500
95	B. Crane:	Vendor person-hr required	976.000
96	B. Crane:	Cost of vendor person-hr ($)	55.000
97	B. Crane:	Removal time (hours)	176.000
98	B. Crane:	Cleanup time (hours)	40.000
99	B. Crane:	Equip. & mob/demob costs ($)	22100.000
100	B. Crane:	Cost of burial container ($)	3650.000
101	B. Crane:	Burial weight w/container (lb)	40000.000
102	B. Crane:	Burial volume (ft3)	1360.000
103	R. Cranes:	Number of refueling cranes	2.000
104	R. Cranes:	Duration (in minutes)	720.000
105	R. Cranes:	Height adjustment (%)	0.000
106	R. Cranes:	Respiratory prot. adj. (%)	20.000
107	R. Cranes:	ALARA (minutes)	25.000
108	R. Cranes:	Suit-up time (minutes)	120.000
109	R. Cranes:	Breaks (minutes)	30.000
110	R. Cranes:	Number of laborers	3.000
111	R. Cranes:	Number of crafts	1.500
112	R. Cranes:	Number of rad monitors	0.500
113	R. Cranes:	Number of crew leaders	0.500
114	R. Cranes:	Dose rate (millirem/hr)	12.000
115	Fuel Pool:	Specialty contractor ($)	750000.000
116	Fuel Pool:	Number of HICs	5.000
117	Fuel Pool:	Days of cask rental	21.000
118	Fuel Pool:	Duration (days)	30.000
119	HVAC Duct:	Suit-up time (minutes)	120.000
120	HVAC Duct:	Breaks (minutes)	30.000
121	HVAC Duct:	ALARA (minutes)	25.000
122	HVAC Duct:	Resp. protection (%)	20.000
123	HVAC Duct:	Rmvl time (minute/ft)	8.875
124	HVAC Duct:	Number of laborers	2.000
125	HVAC Duct:	Number of crafts	0.000
126	HVAC Duct:	Number of crew leaders	0.500
127	HVAC Duct:	Number of rad monitors	0.500
128	HVAC Duct:	Crew dose rate (millirem/hr)	1.000
129	HVAC Duct:	Linear feet of ductwork	4566.000
130	HVAC Duct:	Wgt of assoc. eqpt. (lb)	129700.000
131	Air Coolers:	Suit-up time (minutes)	120.000
132	Air Coolers:	Breaks (minutes)	30.000
133	Air Coolers:	ALARA (minutes)	25.000
134	Air Coolers:	Height adjustment (%)	20.000
135	Air Coolers:	Number of laborers	2.000
136	Air Coolers:	Number of crafts	2.000
137	Air Coolers:	Number of crew leaders	0.500
138	Air Coolers:	Number of rad monitors	0.500
139	Air Coolers:	Dose rate (millirem/hr)	1.000
140	Air Coolers:	Rmvl time/cooler (min)	1442.000
141	Air Coolers:	Number of coolers	4.000
142	Air Coolers:	Weight per cooler (lb)	142752.000

TABLE A.6. Contents of File TEST.PIN (contd)

143 Drains:	Number of drains	210.000
144 Drains:	Removal time (in minutes)	291.000
145 Drains:	Height adjustment (%)	7.000
146 Drains:	Respiratory prot. adj. (%)	0.000
147 Drains:	ALARA (minutes)	25.000
148 Drains:	Suit-up time (minutes)	120.000
149 Drains:	Breaks (minutes)	30.000
150 Drains:	Number of laborers	1.000
151 Drains:	Number of crafts	1.000
152 Drains:	Number of crew leaders	0.500
153 Drains:	Number of rad monitors	0.500
154 Drains:	Dose rate (millirem/hr)	0.500
155 Drains:	Drilling rate (inches/hr)	7.000
156 Drains:	Floor thickness (inches)	24.000
157 Drains:	Bit replacement costs ($/in)	4.600
158 Drains:	Power unit rental ($/week)	1035.000
159 Drains:	Drain puller rental ($/week)	138.000
160 Drains:	Absorbant material (ft2)	11.875
161 Drains:	Plastic (ft2)	50.000
162 Asbestos:	Total Cost ($)	165000.000

MENU 3 INPUTS --

1 Lg Pipe:	Duration (in minutes)	87.000
2 Lg Pipe:	Height adjustment (%)	10.000
3 Lg Pipe:	Respiratory prot. adjust. (%)	20.000
4 Lg Pipe:	Rad/ALARA activities (min)	25.000
5 Lg Pipe:	Suit-up and unsuit time (min)	120.000
6 Lg Pipe:	Work break time (min)	30.000
7 Lg Pipe:	Number of laborers	3.000
8 Lg Pipe:	Number of crafts	1.500
9 Lg Pipe:	Number of crew leaders	0.500
10 Lg Pipe:	Number of rad monitors	0.500
11 Lg Pipe:	Absorbent material (ft2)	15.000
12 Lg Pipe:	Plastic (ft2)	37.500
13 Lg Pipe:	Gases (hours)	0.033
14 Sm Pipe:	Duration (in minutes)	61.000
15 Sm Pipe:	Height adjustment (%)	10.000
16 Sm Pipe:	Respiratory prot. adjust. (%)	20.000
17 Sm Pipe:	Rad/ALARA activities (min)	25.000
18 Sm Pipe:	Suit-up and unsuit time (min)	120.000
19 Sm Pipe:	Work break time (min)	30.000
20 Sm Pipe:	Number of laborers	3.000
21 Sm Pipe:	Number of crafts	1.500
22 Sm Pipe:	Number of crew leaders	0.500
23 Sm Pipe:	Number of rad monitors	0.500
24 Sm Pipe:	Absorbent material (ft2)	10.000
25 Sm Pipe:	Plastic (ft2)	25.000
26 Sm Pipe:	Gases (hours)	0.017
27 Lg Valve:	Duration (in minutes)	87.000
28 Lg Valve:	Height adjustment (%)	10.000

TABLE A.6. Contents of File TEST.PIN (contd)

29	Lg Valve: Respiratory prot. adjust. (%)	20.000
30	Lg Valve: Rad/ALARA activities (min)	25.000
31	Lg Valve: Suit-up and unsuit time (min)	120.000
32	Lg Valve: Work break time (min)	30.000
33	Lg Valve: Number of laborers	3.000
34	Lg Valve: Number of crafts	1.500
35	Lg Valve: Number of crew leaders	0.500
36	Lg Valve: Number of rad monitors	0.500
37	Lg Valve: Absorbent material (ft2)	15.000
38	Lg Valve: Plastic (ft2)	37.500
39	Lg Valve: Gases (hours)	0.033
40	Sm Valve: Duration (in minutes)	0.000
41	Sm Valve: Height adjustment (%)	0.000
42	Sm Valve: Respiratory prot. adjust. (%)	0.000
43	Sm Valve: Rad/ALARA activities (min)	0.000
44	Sm Valve: Suit-up and unsuit time (min)	0.000
45	Sm Valve: Work break time (min)	0.000
46	Sm Valve: Number of laborers	0.000
47	Sm Valve: Number of crafts	0.000
48	Sm Valve: Number of crew leaders	0.000
49	Sm Valve: Number of rad monitors	0.000
50	Sm Valve: Absorbent material (ft2)	0.000
51	Sm Valve: Plastic (ft2)	0.000
52	Sm Valve: Gases (hours)	0.000
53	Tanks: Staging (in minutes)	90.000
54	Tanks: Height adjustment (%)	10.000
55	Tanks: Respiratory prot. adjust. (%)	20.000
56	Tanks: Rad/ALARA activities (min)	25.000
57	Tanks: Suit-up and unsuit time (min)	120.000
58	Tanks: Work break time (min)	30.000
59	Tanks: Number of laborers	3.000
60	Tanks: Number of crafts	1.500
61	Tanks: Number of crew leaders	0.500
62	Tanks: Number of rad monitors	0.500
63	Lg Pump: Duration (in minutes)	90.000
64	Lg Pump: Height adjustment (%)	10.000
65	Lg Pump: Respiratory prot. adjust. (%)	20.000
66	Lg Pump: Rad/ALARA activities (min)	25.000
67	Lg Pump: Suit-up and unsuit time (min)	120.000
68	Lg Pump: Work break time (min)	30.000
69	Lg Pump: Number of laborers	2.000
70	Lg Pump: Number of crafts	1.000
71	Lg Pump: Number of crew leaders	0.500
72	Lg Pump: Number of rad monitors	0.500
73	Lg Pump: Gases (hours)	0.017
74	Sm Pump: Duration (in minutes)	40.000
75	Sm Pump: Height adjustment (%)	0.000
76	Sm Pump: Respiratory prot. adjust. (%)	20.000
77	Sm Pump: Rad/ALARA activities (min)	25.000
78	Sm Pump: Suit-up and unsuit time (min)	120.000
79	Sm Pump: Work break time (min)	30.000

TABLE A.6. Contents of File TEST.PIN (contd)

80	Sm Pump:	Number of laborers	2.000
81	Sm Pump:	Number of crafts	1.000
82	Sm Pump:	Number of crew leaders	0.500
83	Sm Pump:	Number of rad monitors	0.500
84	Sm Pump:	Gases (hours)	0.017
85	Lg HX:	Duration (in minutes)	90.000
86	Lg HX:	Height adjustment (%)	0.000
87	Lg HX:	Respiratory prot. adjust. (%)	20.000
88	Lg HX:	Rad/ALARA activities (min)	25.000
89	Lg HX:	Suit-up and unsuit time (min)	120.000
90	Lg HX:	Work break time (min)	30.000
91	Lg HX:	Number of laborers	2.000
92	Lg HX:	Number of crafts	1.000
93	Lg HX:	Number of crew leaders	0.500
94	Lg HX:	Number of rad monitors	0.500
95	Lg HX:	Gases (hours)	0.017
96	Sm HX:	Duration (in minutes)	40.000
97	Sm HX:	Height adjustment (%)	0.000
98	Sm HX:	Respiratory prot. adjust. (%)	20.000
99	Sm HX:	Rad/ALARA activities (min)	25.000
100	Sm HX:	Suit-up and unsuit time (min)	120.000
101	Sm HX:	Work break time (min)	30.000
102	Sm HX:	Number of laborers	2.000
103	Sm HX:	Number of crafts	1.000
104	Sm HX:	Number of crew leaders	0.500
105	Sm HX:	Number of rad monitors	0.500
106	Sm HX:	Gases (hours)	0.017
107	Lg Elec:	Duration (in minutes)	60.000
108	Lg Elec:	Height adjustment (%)	0.000
109	Lg Elec:	Respiratory prot. adjust. (%)	20.000
110	Lg Elec:	Rad/ALARA activities (min)	25.000
111	Lg Elec:	Suit-up and unsuit time (min)	120.000
112	Lg Elec:	Work break time (min)	30.000
113	Lg Elec:	Number of laborers	2.000
114	Lg Elec:	Number of crafts	1.000
115	Lg Elec:	Number of crew leaders	0.500
116	Lg Elec:	Number of rad monitors	0.500
117	Lg Elec:	Gases (hours)	0.017
118	Sm Elec:	Duration (in minutes)	40.000
119	Sm Elec:	Height adjustment (%)	0.000
120	Sm Elec:	Respiratory prot. adjust. (%)	20.000
121	Sm Elec:	Rad/ALARA activities (min)	25.000
122	Sm Elec:	Suit-up and unsuit time (min)	120.000
123	Sm Elec:	Work break time (min)	30.000
124	Sm Elec:	Number of laborers	2.000
125	Sm Elec:	Number of crafts	1.000
126	Sm Elec:	Number of crew leaders	0.500
127	Sm Elec:	Number of rad monitors	0.500
128	Sm Elec:	Gases (hours)	0.017
129	Lg Misc:	Duration (in minutes)	90.000
130	Lg Misc:	Height adjustment (%)	10.000

TABLE A.6. Contents of File TEST.PIN (contd)

131 Lg Misc:	Respiratory prot. adjust. (%)	20.000
132 Lg Misc:	Rad/ALARA activities (min)	25.000
133 Lg Misc:	Suit-up and unsuit time (min)	120.000
134 Lg Misc:	Work break time (min)	30.000
135 Lg Misc:	Number of laborers	2.000
136 Lg Misc:	Number of crafts	1.000
137 Lg Misc:	Number of crew leaders	0.500
138 Lg Misc:	Number of rad monitors	0.500
139 Lg Misc:	Gases (hours)	0.017
140 Sm Misc:	Duration (in minutes)	40.000
141 Sm Misc:	Height adjustment (%)	0.000
142 Sm Misc:	Respiratory prot. adjust. (%)	20.000
143 Sm Misc:	Rad/ALARA activities (min)	25.000
144 Sm Misc:	Suit-up and unsuit time (min)	120.000
145 Sm Misc:	Work break time (min)	30.000
146 Sm Misc:	Number of laborers	2.000
147 Sm Misc:	Number of crafts	1.000
148 Sm Misc:	Number of crew leaders	0.500
149 Sm Misc:	Number of rad monitors	0.500
150 Sm Misc:	Gases (hours)	0.017
151 Lg Hanger:	Duration (in minutes)	60.000
152 Lg Hanger:	Height adjustment (%)	0.000
153 Lg Hanger:	Respiratory prot. adjust. (%)	20.000
154 Lg Hanger:	Rad/ALARA activities (min)	25.000
155 Lg Hanger:	Suit-up and unsuit time (min)	120.000
156 Lg Hanger:	Work break time (min)	30.000
157 Lg Hanger:	Number of laborers	3.000
158 Lg Hanger:	Number of crafts	1.500
159 Lg Hanger:	Number of crew leaders	0.500
160 Lg Hanger:	Number of rad monitors	0.500
161 Lg Hanger:	Gases (hours)	0.583
162 Sm Hanger:	Duration (in minutes)	20.000
163 Sm Hanger:	Height adjustment (%)	0.000
164 Sm Hanger:	Respiratory prot. adjust. (%)	20.000
165 Sm Hanger:	Rad/ALARA activities (min)	25.000
166 Sm Hanger:	Suit-up and unsuit time (min)	120.000
167 Sm Hanger:	Work break time (min)	30.000
168 Sm Hanger:	Number of laborers	3.000
169 Sm Hanger:	Number of crafts	1.500
170 Sm Hanger:	Number of crew leaders	0.500
171 Sm Hanger:	Number of rad monitors	0.500
172 Sm Hanger:	Gases (hours)	0.167

TABLE A.6. Contents of File TEST.PIN (contd)

MENU A INPUTS --

1	Reactor Site Name	TROJAN
2	Area of Site (km2)	4.7
3	Electrical Consumption at Shutdown (MW)	4
4	Cost of Electricity ($/kwh)	0.034
5	Distance from Reactor Site to Low-Level Burial Site (miles)	297
6	Distance from Reactor Site to Geologic Repository (miles)	907
7	Distance from Reactor Site to Supplier (miles)	2799
8	Distance from Low-Level Burial Site to Supplier (miles)	2674
9	Distance from Geologic Repository to Supplier (miles)	2070
10	Low-Level Burial Site Selected	HANFORD
11	Out-of-Compact Burial Fee Applies	NO

MENU B INPUTS --

Schedule

	Period Name	Start	Stop
1	Planning and Preparation	-2.5	0
2	Defuel and Layup	0	0.62
3	Spent Fuel Pool Operations	0.62	6.92
4	Deferred Dismantlement	6.92	8.62
5	UNDEFINED	8.62	8.62

Activities

	Activity Name	Period
1	Remove RPV Internals	Defuel and Layup
2	Perform Chemical Decon	Defuel and Layup
3	Remove Reactor Vessel	Deferred Dismantlement
4	Remove Steam Generators	Deferred Dismantlement
5	Remove Pressurizer	Deferred Dismantlement
6	Remove RCS Piping	Deferred Dismantlement
7	Remove RCS Pumps	Deferred Dismantlement
8	Remove Spent Fuel Racks	Deferred Dismantlement
9	Remove Biological Shield	Deferred Dismantlement
10	Remove Plant Systems	Deferred Dismantlement
11	Decontaminate Buildings	Deferred Dismantlement
12	Layup Spent Fuel Pool	*** Not Scheduled ***

MENU C INPUTS --

1	Remote manipulator for under-water in-vessel cutting	1102500
2	Underwater plasma-arc cutting system (2 each)	154400
3	Cutting table plus jigs	33000
4	Oxyacetylene cutting system	3300
5	Plasma-arc cutting system (2 each)	66000
6	Track-mounted drive unit (4 each)	17600
7	Drum Compactors (2 each)	94800
8	Closed circuit, high-resolution television	55100
9	High-pressure water jet	176400

10	Kelly Decontamination System (3 each)	558000
11	Underwater lights, viewing windows/periscope	11000
12	Submersible pumps with disposable filter (3 each)	19800
13	Mobile scissors-type manlift (Sky Climber Series 47) (4 ea.)	154400
14	Genie Zoom-Boom manlift, 45 ft.	52900
15	Bobcat front-end loader (light-duty) (2 each)	39600
16	6818 kg forklift (3 each)	297600
17	9100 kg mobile hydraulic crane (2 each)	81600
18	Safety nets (as required)	50700
19	Polyurethane foam generator (2 each)	19800
20	Wall-saw, 35 h.p., w/Power unit (2 each)	44200
21	Slab-saw, 35 h.p. (2 each)	8800
22	Concrete drill w/HEPA-filtered dust collection system (4 ea)	17600
23	Concrete surface spaller (4 each)	39600
24	Portable ventilation enclosure (10 each)	33000
25	Vacuum cleaner, HEPA-filtered (3 each)	29700
26	Filtered-exhaust fan unit (4 each)	30800
27	Miscellaneous office supplies	130375

MENU F INPUTS --

1	Reactor pressure vessel height (inches)	515.000
2	Reactor pressure vessel diameter (inches)	190.000
3	Number of steam generators	4.000
4	-- Steam generator height (inches)	782.500
5	-- Steam generator diameter (inches)	156.500
6	Are thermal shields present?	YES
7	Is this a B&W reactor?	NO
8	Use modified maritime containers when appropriate?	YES
9	RPV: Height adjustment (%)	0.000
10	RPV: Respiratory prot. adjust. (%)	20.000
11	RPV: Rad/ALARA activities (min)	25.000
12	RPV: Plasma-arc torch change-out factor (%)	46.000
13	RPV: Suit-up and unsuit time (min)	120.000
14	RPV: Work break time (min)	30.000
15	RPV: Number of laborers	4.000
16	RPV: Number of crafts	3.000
17	RPV: Number of crew leaders	1.000
18	RPV: Number of rad monitors	1.000
19	RPV: Dose rate, for removing int. (millirem/hr)	10.000
20	RPV: Dose rate, for cutting vessel (millirem/hr)	23.500
21	RCS Pipe: Total length of piping (ft)	267.000
22	RCS Pipe: Total weight of piping (lb)	226070.000
23	RCS Pipe: Total volume of piping (ft3)	1758.000
24	RCS Pipe: Rmvl. time (in minutes)	190.000
25	RCS Pipe: Height adjustment (%)	10.000
26	RCS Pipe: Respiratory prot. adjust. (%)	20.000
27	RCS Pipe: Rad/ALARA activities (min)	25.000
28	RCS Pipe: Suit-up and unsuit time (min)	120.000
29	RCS Pipe: Work break time (min)	30.000
30	RCS Pipe: Number of laborers	3.000

TABLE A.6. Contents of File TEST.PIN (contd)

31	RCS Pipe: Number of crafts	1.500
32	RCS Pipe: Number of crew leaders	0.500
33	RCS Pipe: Number of rad monitors	0.500
34	RCS Pipe: Absorbent material (ft2)	20.000
35	RCS Pipe: Plastic (ft2)	50.000
36	RCS Pipe: Gases (hours)	0.330
37	RCS Pipe: Dose rate (millirem/hr)	300.000
38	Lg Pipe: Total length of piping (ft)	600.000
39	Lg Pipe: Total weight of piping (lb)	28270.000
40	Lg Pipe: Total volume of piping (ft3)	306.000
41	Lg Pipe: Rmvl. time (in minutes)	87.000
42	Lg Pipe: Height adjustment (%)	10.000
43	Lg Pipe: Respiratory prot. adjust (%)	20.000
44	Lg Pipe: Rad/ALARA activities (min)	25.000
45	Lg Pipe: Suit-up and unsuit time (min)	120.000
46	Lg Pipe: Work break adjustment time (min)	30.000
47	Lg Pipe: Number of laborers	3.000
48	Lg Pipe: Number of crafts	1.500
49	Lg Pipe: Number of crew leaders	0.500
50	Lg Pipe: Number of rad monitors	0.500
51	Lg Pipe: Absorbent material (ft2)	15.000
52	Lg Pipe: Plastic (ft2)	37.500
53	Lg Pipe: Gases (hours)	0.033
54	Lg Pipe: Dose rate (millirem/hr)	300.000
55	Sm Pipe: Total length of piping (ft)	1600.000
56	Sm Pipe: Total weight of piping (lb)	3140.000
57	Sm Pipe: Total volume of piping (ft3)	34.000
58	Sm Pipe: Rmvl. time (in minutes)	61.000
59	Sm Pipe: Height adjustment (%)	10.000
60	Sm Pipe: Respiratory prot. adjust. (%)	20.000
61	Sm Pipe: Rad/ALARA activities (min)	25.000
62	Sm Pipe: Suit-up and unsuit time (min)	120.000
63	Sm Pipe: Work break time (min)	30.000
64	Sm Pipe: Number of laborers	3.000
65	Sm Pipe: Number of crafts	1.500
66	Sm Pipe: Number of crew leaders	0.500
67	Sm Pipe: Number of rad monitors	0.500
68	Sm Pipe: Absorbent material (ft2)	10.000
69	Sm Pipe: Plastic (ft2)	25.000
70	Sm Pipe: Gases (hours)	0.017
71	Sm Pipe: Dose rate (millirem/hr)	300.000
72	RCS Insulation Volume (ft3)	5120.000
73	RCS Insulation Weight (lb)	3200.000
74	Pressurizer: Weight (lb)	195500.000
75	Pressurizer: Volume (ft3)	2440.000
76	Pressurizer: Rmvl. time (in minutes)	480.000
77	Pressurizer: Height adjustment (%)	10.000
78	Pressurizer: Respiratory prot. adj. (%)	20.000
79	Pressurizer: Rad/ALARA activities (min)	25.000
80	Pressurizer: Suit-up and unsuit time (min)	120.000
81	Pressurizer: Work break time (min)	30.000

TABLE A.6. Contents of File TEST.PIN (contd)

82	Pressurizer:	Number of laborers	3.000
83	Pressurizer:	Number of crafts	1.500
84	Pressurizer:	Number of crew leaders	0.500
85	Pressurizer:	Number of rad monitors	0.500
86	Pressurizer:	Absorbent material (ft2)	200.000
87	Pressurizer:	Plastic (ft2)	500.000
88	Pressurizer:	Gases (hours)	0.330
89	Pressurizer:	Dose rate (millirem/hr)	300.000
90	Pressurizer:	Transport cradle ($)	5000.000
91	Pressurizer:	Barge/rail transport ($)	23075.520
92	Pressurizer:	Unloading/misc. trans. ($)	149218.200
93	Pressurizer:	Relief tank diameter (ft)	10.700
94	Pressurizer:	Relief tank height (ft)	27.000
95	Pressurizer:	Relief tank weight (lb)	27200.000
96	RCS Pumps:	Number of pumps	4.000
97	RCS Pumps:	Total weight all pumps (lb)	762400.000
98	RCS Pumps:	Total volume (ft3)	4200.000
99	RCS Pumps:	Rmvl. time (1 pump, minutes)	480.000
100	RCS Pumps:	Height adjustment (%)	10.000
101	RCS Pumps:	Respiratory prot. adj. (%)	20.000
102	RCS Pumps:	Rad/ALARA activities (min)	25.000
103	RCS Pumps:	Suit-up and unsuit time (min)	120.000
104	RCS Pumps:	Work break time (min)	30.000
105	RCS Pumps:	Number of laborers	3.000
106	RCS Pumps:	Number of crafts	1.500
107	RCS Pumps:	Number of crew leaders	0.500
108	RCS Pumps:	Number of rad monitors	0.500
109	RCS Pumps:	Absorbent material (ft2)	200.000
110	RCS Pumps:	Plastic (ft2)	500.000
111	RCS Pumps:	Gases (hours)	0.330
112	RCS Pumps:	Dose rate (millirem/hr)	300.000
113	RCS Pumps:	One shipping cradle ($)	5000.000
114	RCS Pumps:	Barge/rail transport ($/pump)	23075.520
115	RCS Pumps:	Unloading/misc. trans. ($/pump)	149218.200
116	Fuel Racks:	Number of fuel assemblies	1408.000
117	Fuel Racks:	Special container, ea ($)	5273.000
118	Fuel Racks:	Removal contract ($)	661500.000
119	Fuel Racks:	Dose rate (millirem/hr)	1.000
120	Biol Shld:	Height of shield to be removed (ft)	21.000
121	Biol Shld:	Inside diameter of shield (ft)	20.000
122	Biol Shld:	Outside diameter of shield (ft)	28.000
123	Biol Shld:	Initial equipment set up (minutes)	120.000
124	Biol Shld:	Install equipment (minutes/layer)	60.000
125	Biol Shld:	Ins. mats/start fog spray (min/blast)	30.000
126	Biol Shld:	Evac. area/ignite charges (min/blast)	15.000
127	Biol Shld:	Rmv. mats/stop fog spray (min/blast)	30.000
128	Biol Shld:	Remove rubble (minutes/blast)	120.000
129	Biol Shld:	Final cleanup and survey (minutes)	240.000
130	Biol Shld:	Drill 1 hole (minutes)	10.000
131	Biol Shld:	Place charge in 1 hole (minutes)	5.000
132	Biol Shld:	Verify 1 charge has detonated (min)	1.000

TABLE A.6. Contents of File TEST.PIN (contd)

133 Biol Shld:	Cut 1 piece of re-bar w/torch (min)	2.000
134 Biol Shld:	Number of crew leaders	1.000
135 Biol Shld:	Number of laborers	2.000
136 Biol Shld:	Number of skilled workers	2.000
137 Biol Shld:	Number of explosive demolition experts	1.000
138 Biol Shld:	Number of rad monitors	0.500
139 Biol Shld:	Height adjustment (%)	10.000
140 Biol Shld:	Respiratory prot. adj. (%)	20.000
141 Biol Shld:	Rad/ALARA activities (min)	25.000
142 Biol Shld:	Suit-up and unsuit time (min)	120.000
143 Biol Shld:	Work break time (min)	30.000
144 Biol Shld:	Crew dose rate (millirem/hr)	50.000
145 Biol Shld:	Blasting mats ($/day)	22.000
146 Biol Shld:	Blasting caps ($ each)	1.790
147 Biol Shld:	Explosives ($/lb)	1.330
148 Biol Shld:	Track drill bits ($ each)	165.600
149 Biol Shld:	Air compressor, 750 CFM ($/month)	2575.000
150 Biol Shld:	Fog spray system nozzles ($ each)	139.090
151 Steam Gen:	Use items 152 - 160? (See user guide)	1.000
152 Steam Gen:	Decontamination costs per SG ($)	267677.750
153 Steam Gen:	Removal costs per SG ($)	1291258.000
154 Steam Gen:	Packaging costs per SG ($)	109340.750
155 Steam Gen:	Transportation costs per SG ($)	393766.800
156 Steam Gen:	Average shutdown curie content per SG	273.000
157 Steam Gen:	Ave. shutdown dose rate per SG (R/hr)	3.000
158 Steam Gen:	Person-rem at shutdown	149.084
159 Steam Gen:	Cascading costs ($) (See user guide)	141736.000
160 Steam Gen:	Undistributed costs ($) (See guide)	208885.000
161 Chem Decon:	Subcontractor costs ($)	13250000.000
162 Chem Decon:	Energy costs ($)	238000.000
163 Chem Decon:	Time required to perform decon (days)	135.000
164 Chem Decon:	Person-hours	8448.000
165 Chem Decon:	Estimated dose (person-rem)	45.700
166 Chem Decon:	Num of HICs req'd for chem decon	18.000
167 Chem Decon:	Num of HICs req'd for spent IX resin	5.000
168 Boron Disp:	Volume of boric acid solution (gal)	179100.000
169 Boron Disp:	Vendor disposal cost ($/gal)	6.000
170 Boron Disp:	Days required to pelletize above soln	164.000
171 Boron Disp:	Fuel Oil Energy Costs ($)	64900.000

MENU H INPUTS --

Period 1:	Property Taxes ($/year)	0.000
	Insurance ($/year)	0.000
	Regulatory Costs ($/year)	142932.000
	DOC Mobil/Demobil ($)	0.000
	Energy Consumption Fraction	0.000
	Environ. Monitoring ($/year)	0.000
Period 2:	Property Taxes ($/year)	0.000
	Insurance ($/year)	2768600.000
	Regulatory Costs ($/year)	598064.500

TABLE A.6. Contents of File TEST.PIN (contd)

	DOC Mobil/Demobil ($)	0.000
	Energy Consumption Fraction	1.000
	Environ. Monitoring ($/year)	48603.000
Period 3:	Property Taxes ($/year)	9000.000
	Insurance ($/year)	600000.000
	Regulatory Costs ($/year)	3583.970
	DOC Mobil/Demobil ($)	0.000
	Energy Consumption Fraction	0.006
	Environ. Monitoring ($/year)	4860.000
Period 4:	Property Taxes ($/year)	90000.000
	Insurance ($/year)	1198600.000
	Regulatory Costs ($/year)	602550.000
	DOC Mobil/Demobil ($)	2640000.000
	Energy Consumption Fraction	1.000
	Environ. Monitoring ($/year)	48603.000
Period 5:	Property Taxes ($/year)	0.000
	Insurance ($/year)	0.000
	Regulatory Costs ($/year)	0.000
	DOC Mobil/Demobil ($)	0.000
	Energy Consumption Fraction	0.000
	Environ. Monitoring ($/year)	0.000

A.1 REFERENCES

1. Report on Waste Burial Charges - Escalation of Decommissioning Waste Disposal Costs at Low-Level Waste Burial Facilities. NUREG-1307 Revision 4, U.S. Nuclear Regulatory Commission, Office of Nuclear Regulatory Research, Washington, D.C., June 1994.

APPENDIX B

COMMENTS AND RESPONSES ON DRAFT PWR CECP USER'S GUIDE

APPENDIX B

COMMENTS AND RESPONSES ON DRAFT PWR CECP USER'S GUIDE

The NRC expresses its appreciation to all of those who took the time to read the draft User's Guide and to provide the many detailed comments. Those comments have all been carefully reviewed, responses prepared, and changes have been made to the subject guide, where appropriate, to improve the quality of the guide and software.

Nineteen letters were received by the NRC in response to its request for comments on the draft PWR study (NUREG/CR-5884) and the User's Guide. Of those 19 letters, 3 contained specific comments on both the User's Guide and NUREG/CR-5884; the other 16 letters commented only on NUREG/CR-5884.

Only those letters with comments on the User's Guide are listed below. Each letter and its comments were assigned a number based on the chronological sequence of receipt by NRC and on the sequence of the comments in the letter, e.g., 006-1 is the first comment in the sixth letter received. Following the listing of commentors are the individual comments and the responses to those comments. Comments on the User's Guide were received from 006, 008A and 018 only.

006 Union Electric Operating Company. Ten comments.

008A The Nuclear Management and Resources Council. Twelve Comments.

0018 Barry C. Mingst, META. Five Comments.

RESPONSES TO COMMENTOR 006

006-1 Comment: There should be a section for each data entry screen which describes each data entry parameter and how it is used by the CECP (e.g., Menu item A of the CECP asks for site size, apparently using this figure to calculate taxes for a specific plant based on site acreage; menu item H asks for Property Taxes ($/year) for each period. NUREG/CR-5884, Volume 2, Section B.9.2, describes property tax calculation assumptions, but it is not clear how the site size is used in the CECP.) It may be appropriate to incorporate Appendix C from NUREG/CR-5884 into the CECP.

006-1 Response: The CECP does briefly describe each data entry parameter. Incorporating Appendix C material into the user's guide is not considered necessary. Regarding the specific use of site area, the CECP no longer uses this parameter in its

calculations. Site area is now just an "information only" field.

006-2 Comment: When viewing an input file and not changing data, the user should be able to back directly out using the Alt-X combination (or preferably just Esc) without having to go through the "Save Data to a File" box.

006-2 Response: The user can back out easily by pressing "Alt-X", followed by "Enter". It is true that the "Save Data to a File " box will appear after "Alt-X" is pressed, but the "Enter" key will remove this box and return the user to the main menu with no time delay. In fact, the CECP will respond to the "Alt-X, Enter" combination as quickly as the user can type them.

006-3 Comment: The program should provide for an automatic update of all files necessary to reflect changes to input parameters. Currently, only some files are updated automatically; but files related to decommissioning periods and overhead staffing must be updated manually before calculating final cost.

006-3 Response: This update feature would certainly be attractive. Unfortunately, due to the structure of the CECP modules, the cost of providing this feature is prohibitive. However, the new simplified CECP file structure and the discussion of CECP file dependencies (Chapter 2) should help the user minimize time and effort in the manual update process.

006-4 Comment: The schedule start dates for periods after period 1 should be automatically input by the CECP, since this date is by definition the same as the end date for the previous period.

006-4 Response: This suggestion was incorporated. The user now only has to enter the length of each period.

006-5 Comment: Pressing enter for an entry sometimes gives a blank, and other times gives an editable line. It would be more convenient if the line were always editable.

006-5 Response: This suggestion was incorporated. All entry fields are now fully editable.

006-6 Comment: Since staffing is the largest single cost contributor, it may be useful to allow for different overhead values for subsets of utility and DOC staff, such as administrative and general labor.

006-6 Response: This suggestion was incorporated. It is now possible to provide a unique overhead value for each person.

006-7 Comment: On page 4.31 (line 5) there is a typo: "N" should be "D".

006-7 Response: This section was re-written; comment no longer applies.

006-8 Comment: Line items listed as "Other" in the printout of *.PRG files are listed as "DOC" in the summary line. This is correctly addressed in *.PRI files.

006-8 Response: This comment was incorporated. The summary lines in *.PRG files are now broken out into Utility, DOC, and Other, and are now consistent with the *.PRI files.

006-9 Comment: Input screen *.PRE and file *.PDE show volume and weight in opposite order. It would facilitate review if they were consistent.

006-9 Response: This suggestion was incorporated. Both now show volume and weight, in that order.

006-10 Comment: Files *.PDA, *.PDD, *.PDE, and *.PDG may not be read in DOS. It would facilitate review and documentation if they were ASCII text files.

006-10 Response: This suggestion was incorporated. A new ASCII file type (*.PIN) was developed which lists all user input parameters by menu item. The CECP now generates a *.PIN file at the same time it produces a *.PRI file. See Table A.6 for an example *.PIN file.

RESPONSES TO COMMENTOR 008A

008A-1 Comment: Industry review raised the question of the usefulness of the program in NUREG/CR-6054 to determine the validity of cost estimates submitted five years before projected end of operation. If the program is determined by the NRC to be worth further developing because it is judged useful, the

user's manual for the PWR cost estimating computer program (CECP) and the software should be revised to ensure compatibility with the final NUREG/CR-5884 Volume 1 and 2.

008A-1 Response: NUREG/CR-6054 and software were revised to be compatible with the final version of NUREG/CR-5884.

NOTE: Comments 008A-2 through 008A-11 are identical to Comments 006-1 through 006-10 and will not be repeated here.

008A-12 Comment: The draft NUREG/CR-6054 does not provide the user instructions on how to print out the results. A section should be developed that provides instructions for printing.

008A-12 Response: This suggestion was incorporated. Instructions have been provided to allow the user to print results while in the CECP environment.

RESPONSES TO COMMENTOR 018

018-1 Comment: **Page 3.2, Items 19-20:** What do these factors modify? Volume charges only? Surcharges?

018-1 Response: These escalation factors are just multipliers that multiply the entire cost, including volume and surcharges. For example, after the CECP calculates low-level burial costs, it then multiplies this cost by item 20.

018-2 Comment: **Page 3.12, 2nd paragraph:** The time required for other operations that are "accounted for" in algorithms "within the CECP" must be specified. A reference here or a specification is needed for validation.

018-2 Response: NUREG/CR-6054 refers the user to Appendix C of NUREG/CR-5884 for a discussion of the algorithms used by the CECP.

018-3 Comment: **Page 3.18, Large and Small Pumps:** There is no difference in the default items for large and small pumps. This is not self-evident. Is it intentional?

018-3 Response: This was an error. The default times for large and small pumps have been corrected.

018-4 Comment: **Page 4.4, Figure 4.2:** This screen implies an intent by the NRC to maintain detailed information on every PWR. The intended use of this information (such as how the NRC intends to resolve the inevitable discrepancies between detailed studies) needs to be addressed in this report or in NUREG/CR-5884.

018-4 Response: When viewed out of context, this screen may or may not imply such an intent. Any such intent is regretted. As the Foreword indicates, Licensees need not use the CECP, nor does the NRC necessarily approve of or agree with the information contained within NUREG/CR-6054 and the associated software.

018-5 Comment: **Section 5:** One of the unfortunate aspects of the CECP (or any other fixed data base) is that the data base is designed for a specific waste charge structure. The waste cost data structure outlined in this section cannot handle intermediate waste handlers or changes in charge rate structures (which happens occasionally at existing sites, and <u>will</u> happen whenever a new site is opened). This is not a "problem" with the CECP, but it will require the CECP code to be updated frequently, not just the data bases. This would be a significant regulatory and licensing problem if the NRC were to predicate its reviews or regulatory updates on the use of the CECP. This should preclude the requirement of use of the CECP by the utilities or the complete "agreement" of utility estimates with the CECP in future rule changes or licensing proceedings.

018-5 Response: This comment is correct. The CECP code would indeed have to be modified every time changes were made in the waste charge structure.

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11. ABSTRACT (200 words or less)

With the issuance of the Decommissioning Rule(June 27, 1988), nuclear power plant licensees are required to submit to the U.S. Nuclear Regulatory Commission (NRC) for review, decommissioning plans and cost estimates. This user's manual and the accompanying Cost Estimating Computer Program (CECP) software provide a cost-calculating methodology to the NRC staff that will assist them in assessing the adequacy of the licensee submittals. The CECP, designed to be used on a personal computer, provides estimates for the cost of decommissioning PWR power stations to the point of license termination. Such cost estimates include component, piping, and equipment costs; packaging costs;decontamination costs; transportation costs; burial costs; and manpower costs. In addition to costs, the CECP also calculates burial volumes, person-hours, crew-hours, and exposure person-hours associated with decommissioning.

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decommissioning, pressurized water reactor (PWR), cost estimates, user's manual, Cost Estimating Computer Program (CECP), license termination

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