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PROJECT PLAN

REV. 0

FOR

DECOMMISSIONING

THE

PLUTONIUM RECYCLE CRITICAL FACILITY (PRCF)

MARCH 1988

WESTINGHOUSE HANFORD COMPANY
P.O. BOX 1970
RICHLAND, WASHINGTON 99352

PROJECT PLAN

PLUTONIUM RECYCLE CRITICAL FACILITY (PRCF)

DECOMMISSIONING

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PROJECT PLAN
PLUTONIUM RECYCLE CRITICAL FACILITY (PRCF) DECOMMISSIONING

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PROJECT PLAN

PLUTONIUM RECYCLE CRITICAL FACILITY (PRCF) DECOMMISSIONING

1.0 INTRODUCTION

1.1 BACKGROUND

The Plutonium Recycle Critical Facility (PRCF), along with the Plutonium Research Test Reactor (PRTR), is located in the 309 Building in the 300 Area at the Hanford Site near Richland, Washington. The 309 Building was originally used to develop technology for using plutonium as a fuel in thermal heterogeneous power reactors. The PRCF is located on the south side of the 309 Building's east wing (Figure 1) and was operated by Pacific Northwest Laboratories (PNL) as a Nuclear Regulatory Commission (NRC) licensed test facility. The PRCF cell has had various reactors (1960 through 1976) using heavy and light water as moderators. The PRCF was shut down in March 1976. The reactor fuel and neutron sources were removed and water was drained from the system. It has been declared surplus by the Department of Energy (DOE), and the NRC license for operation of the PRCF was terminated in 1982.

Westinghouse Hanford Company (WHC) is presently modifying the 309 Building for the SP-100 GES test program. The SP-100 test reactor will be located in the hemispherical dome and hemiellipsoidal bottom section of the 309 Building, near the cell containing the Plutonium Research Test Reactor (PRTR).

The entire 309 Building became the responsibility of WHC when the PRCF was transferred from PNL at the beginning of FY 1989. In October 1989, the Department of Energy - Nuclear Energy (DOE-NE) provided funding for WHC to initiate preliminary engineering for the Decontamination and Decommissioning (D&D) of the PRCF. Westinghouse Hanford Company prepared an Action Description Memorandum (ADM) for the Department of Energy - Headquarters (DOE-HQ) in compliance with the National Environmental Policy Act (NEPA).

1.2 PURPOSE AND JUSTIFICATION

The decommissioning of the PRCF will involve the removal of the reactor vessel and associated components from the reactor cell, control room, room 404, and exhaust fan pit. This includes the removal of PRCF components and hazardous wastes, decontamination of the reactor cell, and isolation of the low-level residual contamination in the exhaust ventilation duct and effluent lines in the structural cell walls in a manner that will minimize environmental impacts. No future long-term use of any of the PRCF equipment or cell structure has been identified. This project will complete the DOE-NE test reactor decommissioning responsibilities for the PRCF in the 309 Building.

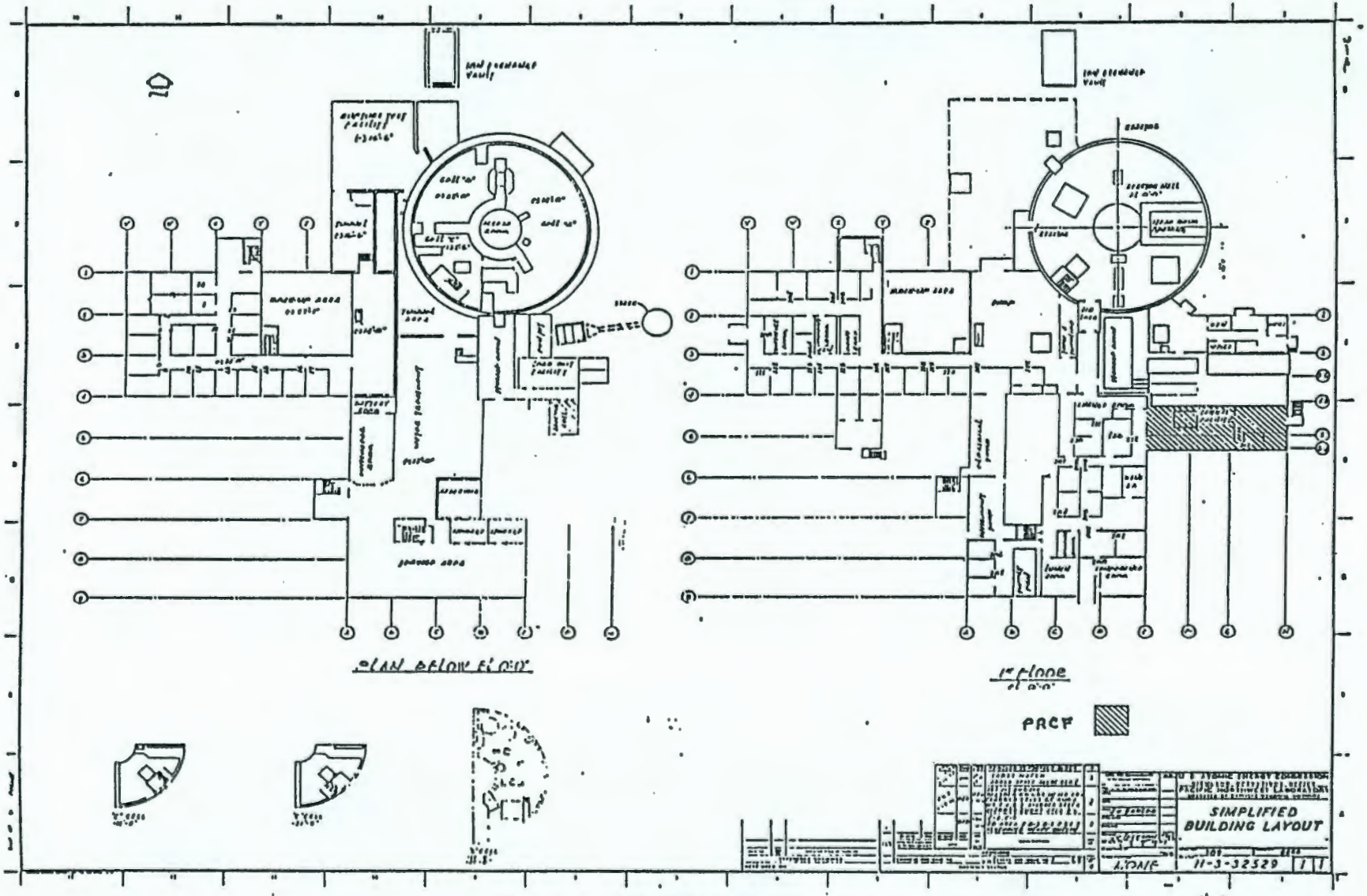


Figure 1. 309 Building Layout

2.0 OBJECTIVES

2.1 PROJECT

The objective on the project is to remove PRCF components, decontaminate the reactor cell, and seal the cell entrance with a concrete cap. The project will remove the reactor vessel and associated components dedicated to the PRCF that are located in the reactor cell, control room, room 404, and exhaust fan pit. The cell interior surfaces will be decontaminated to levels as low as reasonably achievable with an objective of meeting unconditional release criteria shown in Table 1. The capped underground exhaust air and liquid effluent lines in the structural walls will remain with low-level residual contamination. The exhaust duct and effluent lines will be surveyed and sampled for radiological characterization prior to capping.

2.2 RELEASE CRITERIA AND CELL DECONTAMINATION CRITERIA

The U.S. Department of Energy recently adopted the release limits defined in Regulatory Guide 1.86. These limits, in some cases, are less restrictive than the criterion of being less-than-detectable with portable survey instruments. In the spirit of the ALARA philosophy, the less-than-detectable criterion will be used whenever practicable. However, in all cases, material released for offsite use will, as a minimum, meet the limits defined in Regulatory Guide 1.86. Use of Regulatory Guide 1.86 release limits requires the prior approval of Westinghouse Hanford Environmental and Occupational Safety.

In the event that the PRCF cell interior cannot be decontaminated to unrestrictive release levels with reasonable effort, the following criteria will be met:

- less than 200 cpm beta-gamma fixed contamination per detector probe area using a pancake type of GM probe,
- smearable contamination on accessible surfaces in accordance with WHC-CM-4-13, Section 11.1.1, "Smear Survey Release Criteria", (See Appendix A),
- radiation exposure rate fields of less than 0.5 mR/hr, and
- airborne contamination levels of no more than 50% Derived Concentration Guide (DCG) in Appendix A of WHC-CM-7-5.

Allowable Residual Contamination Levels (ARCL) calculations are not required for the PRCF Decommissioning Project. The project is a decommissioning phase for the 309 Building. The project does not prejudice selection of any decommissioning alternate (Alternative Assessment SD-WM-IT-283) for the eventual decommissioning of the 309 Building when it also no longer serves research needs. At that time, the required calculations will be performed to support selection of a decommissioning method as required by the NEPA process.

TABLE 1

ACCEPTABLE SURFACE CONTAMINATION LEVELS
FOR MATERIALS REMOVED FROM THE SITE

Nuclide[a]	Average[b,c]	Maximum[b,d]	Removable[b,e]
U-nat. U-235, U-238 associated decay products	5,000 dpm a/100 cm^2	15,000 dpm a/100 cm^2	1,000 dpm a/100 cm^2
Transuranics, Ra-226, Ra-228, Th-230, Th-228, Pa-231, Ac-227, I-125, I-129	100 dpm/ 100 cm^2	300 dpm/ 100 cm^2	20 dpm/ 100 cm^2
Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	1,000 dpm/ 100 cm^2	3,000 dpm/ 100 cm^2	200 dpm/ 100 cm^2
Beta-gamma emitters (nuclides with decay modes other than alpha emission or spontaneous fission except Sr-90 and others noted above.	5,000 dpm/ B-Y/100 cm^2	15,000 dpm B-Y/100 cm^2	1,000 dpm B-Y/100 cm^2

[a]Where surface contamination by both alpha- and beta-gamma emitting nuclides exists, the limits established for alpha- and beta-gamma emitting nuclides should apply independently.

[b]As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive materials as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[c]Measurements of average contaminant should not be averaged over more than 1 square meter. For objects of less surface area, the average should be derived for each such object.

[d]The maximum contamination level applies to an area of not more than 100 cm^2.

[e]The amount of removable radioactive material per 100 cm^2 surface area should be determined by wiping that area with dry filter or soft, absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. When removable contamination on objects of less surface is determined, the pertinent levels should be reduced proportionally and the entire surface should be wiped.

2.0 OBJECTIVES (Cont'd)

2.3 ASSUMPTIONS

In order to proceed with the planning of this work prior to system characterization, it is necessary to make the following assumptions:

- The soil under the PRCF cell/sump does not require characterization, based on operations history. If sump/floor decontamination requires penetrating the floor or identifies possible avenues to the subsoil zone, soil characterization shall be performed.
- No or very little non-radioactive hazardous material will require disposal and the majority of the asbestos can be buried in the asbestos trench in the central landfill.
- It is assumed that all radioactive material can be disposed of as low-level waste (LLW).

3.0 FACILITY DESCRIPTION

3.1 PLUTONIUM RECYCLE CRITICAL FACILITY (PRCF)

The PRCF is located on the south side of the 309 Building's east wing (Figure 1, 2, and 3). The single story PRCF control room is a welded steel frame structure with fluted steel, insulated exterior panels. The control room level is approximately 14 ft-3 in. wide by 36 ft long by 11 ft-6 in. high. The roof has a steel deck with tar and gravel finish. There is a roof hatch approximately 6 ft wide by 14 ft long located over the reactor cell access plugs in the control room floor. The roof hatch steel frame has a 20-gauge steel cover with four welded lifting pad eyes located in each corner. The control room floor has six reactor cell shielding blocks which seal the 8 ft by 10 ft cell opening. The rectangular cell shielding blocks are of an interlocking step plug design with the largest ones being approximately 8 ft long by 2 ft wide by 4 ft deep. The step plugs are constructed of steel and concrete (270 lbs/cf) which makes the four full-size plugs approximately 8-1/2 tons each. A small manway plug reduces the length of the adjoining plug by about 66%. The below-grade level reactor cell is approximately 13 ft by 10 ft wide and long and 32 ft deep. The cell is constructed of reinforced concrete (270 lbs/cf) with the lower walls ranging from approximately 2 ft-3 in. to 1 ft-6 in. thick with hatchway walls up to 6 ft-3 in. thick and the floor slab approximately 2 ft-8 in. in thickness. The cell north wall has a lock transfer door approximately 1 ft-6 in. wide by 14 ft high which opened to a load out canal and storage basin extending the full height of the cell. Ladders connect the three cell working levels at the minus 17 ft steel grating deck level, minus 26 ft steel grating deck level and the minus 23 ft concrete bottom.

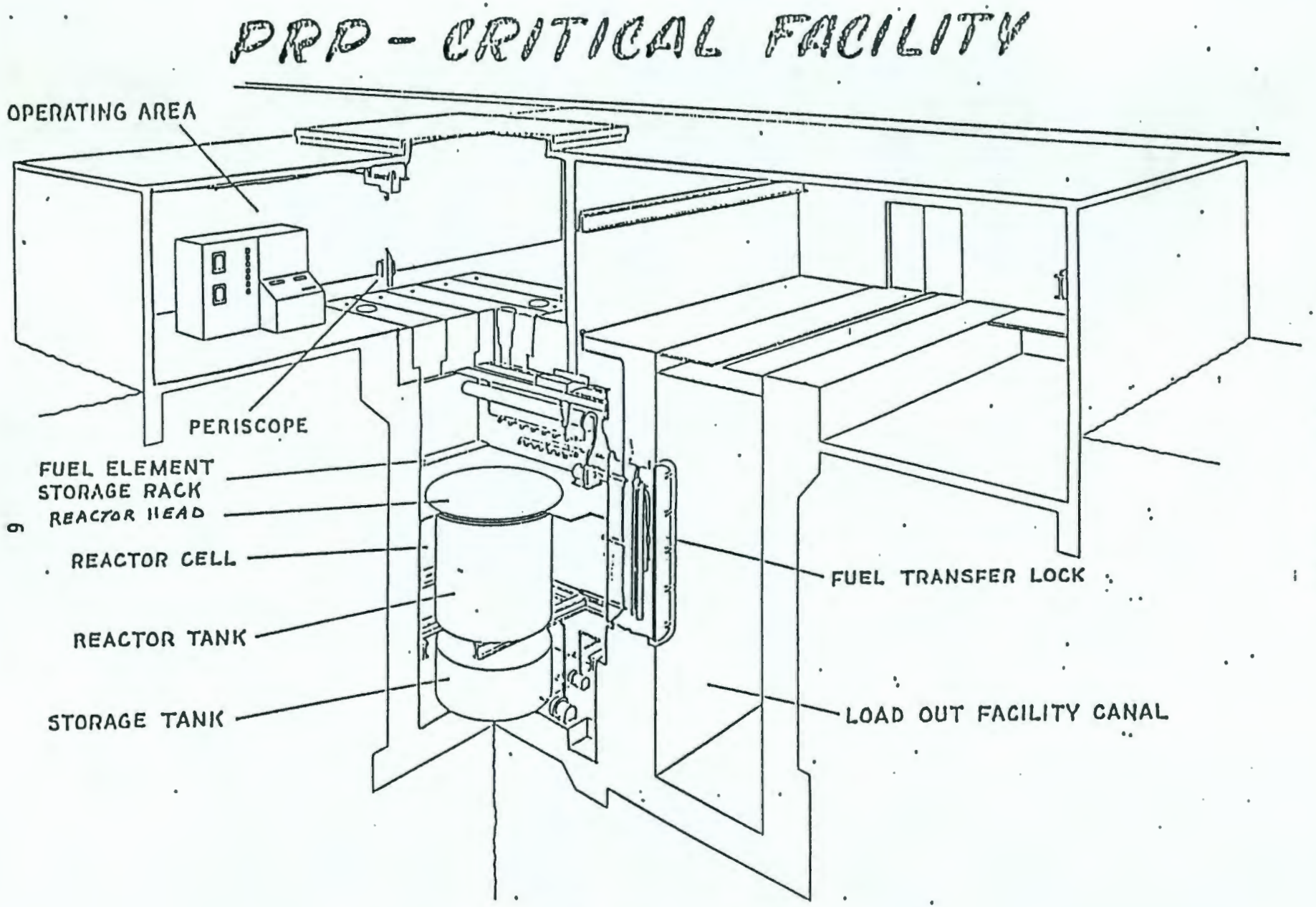


Figure 2. Artist's View of PRCF

PLUTONIUM RECYCLE CRITICAL FACILITY

PROCESS FLOW DIAGRAM

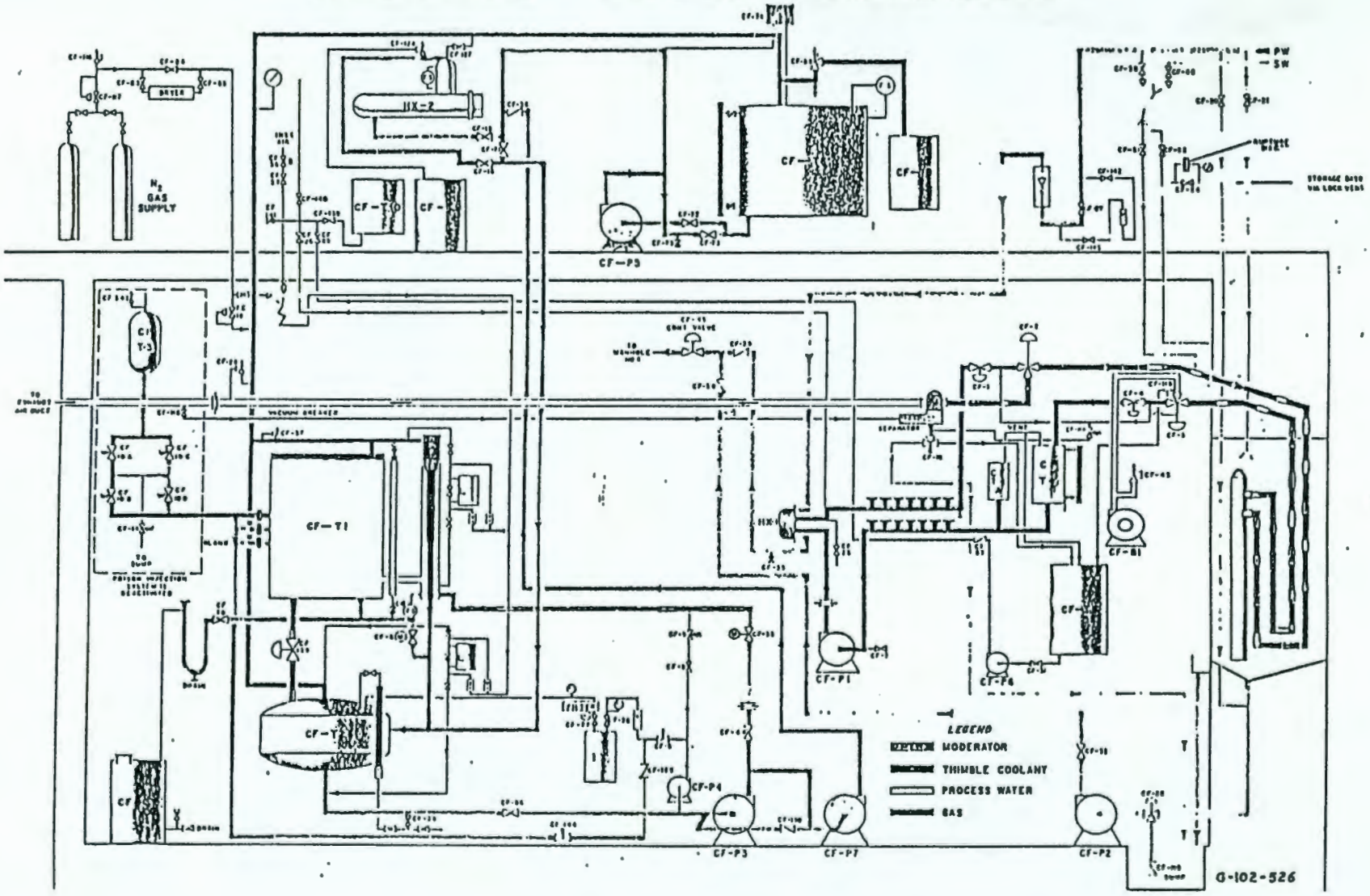


Figure 3. PRCF Process Flow Diagram

3.0 FACILITY DESCRIPTION (Cont'd)

Some of the major equipment presently located in the cell are the bridge crane, reactor vessel (1,900 gal), moderator storage tank (850 gal), ion exchanger, 55 gal dump drum, pump/motor and the connecting piping/valves, ducting, and conduit/wiring. The reactor cell bridge crane is located about 4 ft below the control room floor level. The control room contains two cranes, a control panel console (motor control), instrument panel, cable tray, conduit/wire, piping, etc. Adjoining the control room on the north is room 404 which has a heat exchanger and insulated 1-1/2 in. piping. The exhaust fan pit contains three iodine filters approximately 43 in. long and 7 in. in diameter with approximately 40 ft of 3 in. schedule-40 steel pipe connecting the filter assembly into the 309 Facility exhaust system.

3.1.1 Radiological Description

The cell north wall near the transfer lock has fixed contamination (fission products) on a 2 ft wide strip down all three levels to the cell floor. Contamination has been painted over and is marked with signs. A survey of the strip in 1981 reported less than 200 cpm to 10,000 cpm fixed contamination, exposure rates less than 0.5 mR/hr and less than 200 cpm to 1,500 cpm smearable contamination at the sump level. The bottom level has smearable contamination on the floor in the vicinity of the sump of approximately 4,500 cpm/100 cm^2.

It is not anticipated that a high level of contamination exists in the reactor vessel nor in the associated piping, valves, pumps, etc., because of the system flushes performed during final shutdown.

3.1.2 Hazardous Nonradioactive Materials

The PRCF will be thoroughly surveyed for both radiological and nonradiological hazardous materials as the first step in the decommissioning process. Some reactor configurations used a 0.020 in. cadmium (Cd) liner on the outside of the CF-T1 vessel and beryllium (Be) reflectors. The insulation covers on the reactor vessel, moderator storage tank, ion exchanger, heat exchanger, piping, etc., shall be analyzed for friable asbestos. These materials will be dispositioned at the start of decommissioning. The asbestos coverings will either be stripped from the equipment or left intact for removal with the component. All asbestos will be handled and disposed in accordance with procedure number DD-026-016, Remove Asbestos. The Decommissioning Work Plan (DWP) prepared for this project will provide explicit instructions for the handling of any hazardous material during decommissioning work.

4.0 PROJECT ORGANIZATION AND RESPONSIBILITIES

4.1 GENERAL

4.1.1 The Department of Energy

The U.S. Department of Energy (DOE) reorganization of 1982 divided the responsibility for managing decommissioning projects between the Assistant Secretary for Nuclear Energy (NE) and the Assistant Secretary for Defense Programs (DP). The Surplus Facilities Management Program (SFMP) was retained in NE with jurisdiction over activities at those surplus facilities related to the development of civilian nuclear power and energy technology. Other remedial action activities related to facilities that were primarily used for defense-related purposes were placed under the jurisdiction of Defense Programs.

(1) The Department of Energy - Richland Office

The Department of Energy - Richland Office (DOE-RL) Environmental Restoration Division oversees the Hanford Environmental Restoration Program.

(2) Surplus Facilities Management Program (SFMP)/ Department of Energy - Nuclear Energy

The PRCF project is part of the DOE's Surplus Facility Management Program. The Department of Energy - Nuclear Energy (DOE-NE)/SFMP Program, Facility and Site Decommissioning Projects Office oversees the PRCF decommissioning program functions.

4.1.2 The Westinghouse Hanford - Environmental Restoration Function

The Environmental Restoration Function of Westinghouse Hanford Operations has overall responsibility for this program which is divided into two main missions:

(1) Provide technical and administrative guidance to other contractors and field offices in the National Defense Facilities Decommissioning Program through the lead field office at DOE-RL.

(2) Provide for the surveillance/maintenance and decommissioning of surplus defense facilities and contaminated soil sites at Hanford.

4.1.3 Hanford Surplus Facilities Programs

The Hanford Surplus Facilities Program (HSFP) has the programmatic responsibility within the Environmental Restoration Function for the surveillance, maintenance, and decommissioning of surplus facilities at Hanford. The HSFP establishes the cost, schedule, and technical baselines for individual projects like the PRCF and provides the project management for

4.0 PROJECT ORGANIZATION AND RESPONSIBILITIES (Cont'd)

completing the work. The work activities relative to projects are completed by various functional organizations via a matrix management system. Performing organizations are assigned work by the Program Office using Cost Account Authorizations and Cost Account Plans. Project status is reported to the Program Office using an Earned-Value System (Section 5.2). The majority of decommissioning field work and engineering at Hanford is performed by Hanford Restoration Operations. Subcontracted work is managed also through HSFP. The organization structure is shown in Figure 4.

4.1.4 Hanford Restoration Operations

Hanford Restoration Operations (HRO) performs the necessary surveillance and maintenance, decommissioning and environmental restoration field operations on the Hanford Site, including the engineering activities in support of these operations. The HRO also functions as landlord and plant manager for all contaminated surplus facilities and all inactive waste disposal sites.

4.1.5 Environmental Programs

The Environmental Programs manages retired wastes sites and other contaminated outdoor areas just as HSFP manages surplus facilities at Hanford. They are included in this plan for completeness only, as they have no direct responsibilities relating to the decommissioning of the PRCF.

4.1.6 Defense Waste Administration

This office provides a full range of business management services for the Defense Waste Management and Environmental Divisions. A detailed description of its responsibilities is in procedure GA-1.4 Rev 0 of WHC-CM-5-5, Operations General Administration Manual Volume 1. Some of the direct support services provided to HSFP are detailed budget development and the associated monitoring, analysis, and reporting relative to cost and schedule.

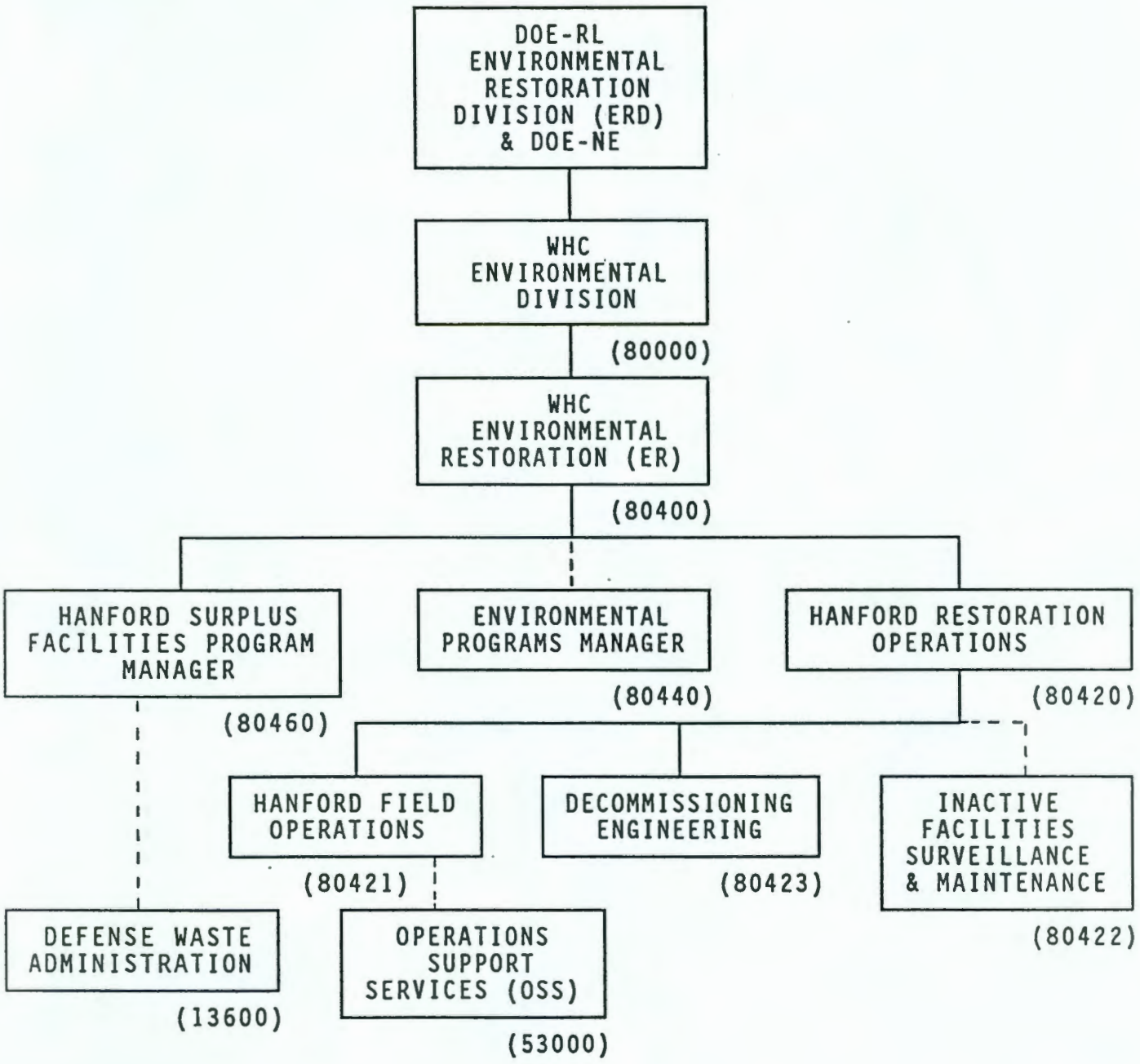


Figure 4. Block Diagram of the Organization Structure

5.0 PROJECT MANAGEMENT AND CONTROL

5.1 GENERAL

This section sets forth the administration controls for tracking costs and schedules, the requirements for project reports, defines the work breakdown structure, provides the budget baseline and the system used for appraisals and change controls, and discusses safety responsibilities.

Work on the project will be performed by Hanford Restoration Operations (HRO) forces and Operations Support Services (OSS) maintenance crafts under the supervision of HR Operations. The OSS work is controlled by the Job Control System, WHC-CM-8-8 (JCS) for disconnecting or modifying activated utilities.

5.2 COST AND SCHEDULE PERFORMANCE MONITORING

Defense Waste Administration will track cost and schedule using Westinghouse Hanford Management Control System as described in WHC-CM-2-5.

This earned-value system tracks cost, schedule, and performance on a monthly and year-to-date basis of all decommissioning projects as they progress toward completion. Cost performance reports will be prepared through the Financial Data System (FDS) on a monthly basis. The reports use the Cost Account Plans (CAP) to establish a fiscal year performance baseline. The reports include scheduled work [Budget Cost of Work Scheduled (BCWS)], work performed [Budget Cost of Work Performed (BCWP)], and Actual Cost of Work Performed (ACWP). Any deviations from the planned schedules or spending is reported as a Schedule Variance (SV) or a Cost Variance (CV). If the variances exceed the thresholds of both 10% and $10K, the Cost Account Manager (CAM) is required to complete a Variance Analysis Report (VAR), which is to be returned to the Activity Manager by the tenth working day of the following month. The VAR will explain cause for the SV and/or CV's, along with corrective action/impacts. Additionally, a current fiscal year and future year's Estimate At Completion (EAC), along with a Total Estimate Cost (TEC) will be calculated. The VAR information is reviewed by the Activity Manager and Environmental Program Control Analyst, and approved by Function Manager, Activity Manager, and HSFP Manager.

The WHC Change Control Procedure is used to manage the cost and schedule baseline for the project. The Change Request form and users guide are in Appendix B. All class one changes that involve an increase in the total estimated cost (TEC) require DOE-HQ approval.

5.3 WORK BREAKDOWN STRUCTURE (WBS)

Figure 5.A shows the WHC Work Breakdown schedule for this project. The Work Breakdown Structure (WBS) for the project major elements are listed in Figure 5.B. The WBS elements definitions and expanded breakdown of costs by WBS elements are in Appendix C.

PRCF D&D

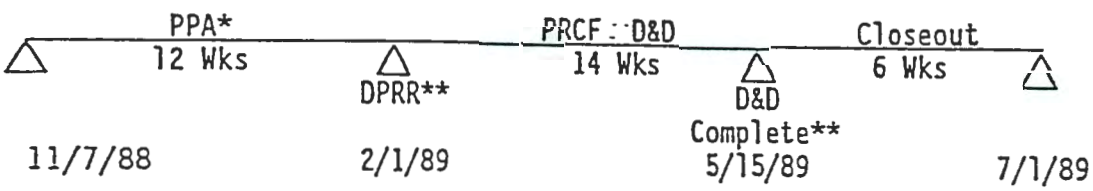
WBS

1.0 Preproject Activities

2.0 DPRR

3.0 PRCF D&D

4.0 Project closeout



* Starting with WBS No. 1.7
** Milestone

Figure 5.A Work Breakdown Schedule PRCF Project

PRCF D&D

WBS

1.0 Preproject Activities

- 1.1 Obtain/Assemble Existing Data
- 1.2 Walkthroughs
- 1.3 Develop WBS
- 1.4 Prepare Scoping Document
- 1.5 Prepare WHC Preliminary Estimate/Schedule
- 1.6 Secure Funding
- 1.7 Initiate CAA/CAP
- 1.8 Develop Sampling/Characterization Plan
- 1.9 Inspect Cell
- 1.10 Engineering
- 1.11 Pre-DPRR Activities (Operations Readiness)
- 1.12 Initiate Procurement (If Required)
- 1.13 Finalize Estimate/Schedule

2.0 DPRR (Milestone)

3.0 PRCF D&D

- 3.1 Disconnect Building Services (As required, existing ventilation, lights, etc., may be utilized.)
- 3.2 0' Level D&D
- 3.3 Vessel/Tank Removal
- 3.4 Vessel/Tank Packaging & Transportation
- 3.5 Cell D&D
- 3.6 Site Restoration (Milestone)

NOTE 3.0 Activities will be phased work; therefore, the given sequence may not be in order.

4.0 Project Closeout

- 4.1 Report Preparation

Figure 5.B Work Breakdown Structure PRCF Project

5.0 PROJECT MANAGEMENT AND CONTROL (Cont'd)

5.4 BASELINE REPORT

The preliminary baseline report is provided in Figure 6 (pages 1 through 3). Cost and schedule baseline is integrated in the Cost Account Plans (CAPs) and Cost Account Authorization (CAA). The detail CAP will be finalized prior to initiating project activities. A detailed cost estimate will also be prepared prior to finalization of the CAP.

The final site cleanup progress and costs are tracked and reported/monitored through weekly highlights, monthly status reports, monthly schedule statusing, and FDS. Weekly scheduled meetings are held as required to discuss problem areas, progress, and assign action item responsibilities.

5.5 FACILITY DECOMMISSIONING REPORT (FDR)

A Facility Decommissioning Report (FDR) will be written to document the significant PRCF decommissioning data for incorporation into the eventual 309 Building final decommissioning report. The FDR is intended to be an internal document and is not intended to be released outside DOE and the contractors organization unless specifically requested. The FDR is intended to be brief as possible, but still accurately document what was done, the schedule (estimated/actual), the cost (estimated/actual), and the significant decommissioning data.

5.6 INDUSTRIAL AND RADIOLOGICAL SAFETY

5.6.1 Industrial Safety

When a facility is targeted for decommissioning, a detailed engineering package is developed that includes a safety hazards analysis and a start-up readiness review. Prior to starting work, the start-up readiness review is completed. That review evaluates the safety preparedness of the workers, adequacy of procedures to cope with potential hazards, and the safety conditions of the facility and/or site. The readiness review also ensures that all environmental and safety documentation is in place. During the process of work, regular safety meetings and safety inspections are made. The personnel assigned to the project participate in all ongoing safety programs. At the completion of the project, a facility decommissioning report is issued. This report identifies the status of the site at the end of the project and identifies surveillance and maintenance requirements, if needed beyond the closeout.

5.6.1.1 Decommissioning Project Readiness Review (DPRR)

The Decommissioning Project Readiness Review (DPRR) is a systematic approach in the review, verification, and documentation of facility and related equipment, procedure and managerial controls, and personnel training aspects of a project prior to the commencement of any physical work. Based

BASELINE REPORT – FISCAL YEAR 1989

(THOUSANDS OF YEAR-OF-EXPENDITURE DOLLARS, OPERATING AND CAPITAL EQUIPMENT)

FIELD OFFICE Richland STATUS DATE November 1988 PAGE 1 OF 3

PROJECT Plutonium Recycle Critical Facility (PRCF) 309 Building PROJECT COMPLETION DATE July 1989

RESP. INDIV./ ORGAN. R. D. Freeberg DOE-RL TELEPHONE NUMBER 376-7167

CUMULATIVE-THRU-FY 88 BUDGET AUTHORITY (BA)	
OPERATING EXPENSES (OE)	0
CAPITAL EQUIPMENT (CE)	0
TOTAL	0

FY 1989 FINANCIAL PLAN	GSO	BA	BO
OE	0	20	20
CE	0	0	0
TOT	0	20	20

OUT YEAR FUNDING (BA)		FY 1990	FY 1991	TO COMPLETE
HQ TARGET LEVEL	OE			
	CE			
	TOT			
FIELD OFF. REQUEST	OE			
	CE			
	TOT			

TOTAL ESTIMATED COST	
OE	20
CE	0
TOT	20

FISCAL YEAR 1989		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	FY 1990	FY 1991
PERIOD PLANNED	BO	6	0	6	6	2								X	X
ACTIVITIES/MILESTONES (START DATE - END DATE)															
1.0 "Pre" Project Activities															
1.1 Prepare Scoping Document (11.1.88)			▽												
1.2 Initiate CAA/CAP 12/15/88				▽											

BUDGET AUTHORITY (BA) BUDGET OUTLAY (BO) GOVERNMENT SERVICES OR ORDER (GSO)

BLANK1

Figure 6. PRCF Baseline Report

BASELINE REPORT – FISCAL YEAR 1989

(THOUSANDS OF YEAR-OF-EXPENDITURE DOLLARS, OPERATING AND CAPITAL EQUIPMENT)

FIELD OFFICE Richland STATUS DATE November 1988 PAGE 2 OF 3

PROJECT Plutonium Recycle Critical Facility (PRCF) 309 Building PROJECT COMPLETION DATE July 1989

RESP. INDIV./ ORGAN. R. D. Freeberg DOE-RL TELEPHONE NUMBER 376-7167

CUMULATIVE-THRU-FY 88 BUDGET AUTHORITY (BA)	
OPERATING EXPENSES (OE)	0
CAPITAL EQUIPMENT, (CE)	0
TOTAL	0

FY 1989 FINANCIAL PLAN	GSO	BA	BO
OE	0	0	430
CE	0	0	0
TOT	0	0	430

OUT YEAR FUNDING (BA)		FY 1990	FY 1991	TO COMPLETE
HQ TARGET LEVEL	OE			
	CE			
	TOT			0
FIELD OFF. REQUEST	OE			
	CE			
	TOT			0

TOTAL ESTIMATED COST	
OE	430
CE	0
TOT	430

FISCAL YEAR 1989		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	FY 1990	FY 1991
PERIOD PLANNED	BO	0	32	35	43	78	94	87	36	23	2				
ACTIVITIES/MILESTONES (START DATE - END DATE)															
1.0 Pre Project Activities (Cont'd)															
1.3 Inspect Cell (11-28-88)															
1.4 Complete Project Plan (12/16/88)															
2.0 Decommissioning Project Readiness Review (2/1/89)															
3.0 PRCF D&D															
3.1 Asbestos Removal (4/1/89)															
3.2 Complete Reactor Vessel/tank removal (5/15/89)															
4.0 Project Closeout (7/1/89)															

BUDGET AUTHORITY (BA) BUDGET OUTLAY (BO) GOVERNMENT SERVICES ON ORDER (GSO)

BLANK

Figure 6. PRCF Baseline Report (Cont'd)

BASELINE REPORT – FISCAL YEAR 1989

(THOUSANDS OF YEAR-OF-EXPENDITURE DOLLARS, OPERATING AND CAPITAL EQUIPMENT)

FIELD OFFICE Richland STATUS DATE November 1988 PAGE 3 OF 3

PROJECT Plutonium Recycle Critical Facility (PRCF) 309 Building PROJECT COMPLETION DATE July 1989

RESP. INDIV./ ORGAN. R. D. Freeberg DOE-RL TELEPHONE NUMBER 376-7167

CUMULATIVE-THRU-FY 88 BUDGET AUTHORITY (BA)	
OPERATING EXPENSES (OE)	0
CAPITAL EQUIPMENT (CE)	0
TOTAL	0

FY 1989 FINANCIAL PLAN	GSO	BA	BO
OE	0	20	430
CE	0	0	0
TOT	0	20	430

OUT YEAR FUNDING (BA)		FY 1990	FY 1991	TO COMPLETE
HQ TARGET LEVEL	OE			
	CE			
	TOT			0
FIELD OFF. REQUEST	OE			
	CE			
	TOT			0

TOTAL ESTIMATED COST	
OE	450
CE	0
TOT	450

FISCAL YEAR 1989		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	FY 1990	FY 1991
PERIOD PLANNED	BO	6	32	41	49	80	94	87	36	23	2			X	X
ACTIVITIES/MILESTONES (START DATE – END DATE)															

BUDGET AUTHORITY (BA) BUDGET OUTLAY (BO) GOVERNMENT SERVICES ON ORDER (GSO)

BLANK

Figure 6. PRCF Baseline Report (Cont'd)

5.0 PROJECT MANAGEMENT AND CONTROL (Cont'd)

on the tasks identified in the project work scope, comparison to previously performed tasks, the level of National Environmental Policy Act (NEPA) documentation required, and the level of hazard identified during the safety analysis, a level of readiness review is selected and approved by Decommissioning Management. For the subject project, Decommissioning Engineering and Operations determined the PRCF D&D tasks are comparable to past D&D projects and that project readiness review level 2 (Informal Readiness Review) will be performed.

An Informal Readiness Review (IRR) is warranted when the tasks identified in the work scope are comparable to previously performed tasks and all environmental and occupational safety, and quality assurance considerations are also comparable, but some additional safety and/or quality assurance concerns may exist. A Project Readiness Documentation book will be completed and forwarded to the readiness review meeting members (including DOE-RL and DOE-NE/Roy F. Weston, Inc.) for their review at least one week prior to the readiness review meeting. The readiness review meeting will then be performed with DPRR members and DOE representatives (including DOE-RL and DOE-NE/Roy F. Weston, Inc.) to assure that all is in readiness to safely commence work activities. The Manager, Environmental Restoration, authorizes the start to decommission after satisfactory completion of the IRR. The IRR process is described in detail in WHC-CM-6-6.

5.6.2 Radiological Safety

Monitoring for radiological and environmental safety will be in compliance with established controls as outlined in:

WHC-CM-4-10, Radiation Protection Manual,
WHC-CM-4-12, Operational Health Physics Manual,
WHC-CM-7-5, Environmental Compliance Manual.

Waste disposal will be made in compliance with DOE Order 5480.1B.

5.6.2.1 Waste Removed From Site

Waste is removed, packaged, and transported to the Hanford 200 Area for disposal. Such disposal will comply with the applicable DOE Orders and with the burial site operator regulations. Packaging and transport of the waste will be accomplished in accordance with WHC-CM-2-14, Packaging and Transportation of Radioactive and Hazardous Waste. The manual, WHC-CM-2-14, provides for a degree of safety equal to that required by the Department of Transportation for offsite shipments.

6.0 TECHNICAL PLAN

6.1 PRE-PROJECT

- Program Business Management and Program Manager will establish preliminary cost and schedule estimates by updating previous PNL and JA Jones estimates. The Activity Manager will prepare a preliminary CAA and Operations will prepare a preliminary CAP.

- Engineering will continue to gather preliminary information for developing a radiological and non-radiological hazardous waste sampling/characterization plan and work procedures. Engineering will also initiate a request for the NEPA process and the Safety Hazard Analysis, as well as a confined space entry permit.

NOTE: The D&D effort will <u>not</u> affect items such as the building structure, or building services which include electrical, compressed air, water, drain, steam, fire protection, and HVAC systems.

6.2 PREREQUISITE (AFTER SECURING PROJECT FUNDING)

- The Program Manager and Cost Account Manager finalize the CAA/CAP.

- Decommissioning Engineering will finalize and implement the sampling/characterization plan.

- Hanford Field (HF) Operations will remove the cell manway block by using the boom crane through the roof hatch (replace hatch) and make ready for entry with a step-off pad, SWPs, barrier, etc., and restore cell air quality. Hanford Field Operations will activate all lights and comply with confined space entry permit.

- Engineering, HF Operations, and Radiation Protection Technician (RPT) will inspect cell and other work areas for marking sampling points per the sampling plan. Operations will obtain liquid and solid samples for laboratory analysis. Most generally, the internal surveys will be performed during the component dismantlement for removal to provide data in preparing shipping and burial records. Engineering will assess all liquid systems for presence of liquid and will estimate the volume and method of venting and draining.

- Engineering shall prepare the necessary documents (special procedures, DWPs, JSAs, DPRR, etc.) to accomplish the work. Engineering will purchase shipping/burial containers (est. 5 - 4 x 4 x 8 boxes and 30 - 17-H drums), etc. The 300 Area Support Services Manual, WHC-CM-8-3, shall be referenced to assure appropriate special permits, such as the Facility Modification Permit, Utility Outage Permit, etc., are utilized.

6.0 TECHNICAL PLAN (Cont'd)

6.3 EQUIPMENT REMOVAL AND DECONTAMINATION ACTIVITIES

Hanford Field Operations shall remove and dispose of the reactor vessel and associated PRCF components located in the reactor cell, control room, room 404, and exhaust fan pit. All systems not drained shall be drained and/or solidified. The liquid and all asbestos insulation shall be removed, packaged, and transported for disposal in compliance with the site regulations and requirements.

- Hanford Field Operations shall remove asbestos and/or insulation cover(s) from reactor vessel, moderator storage tank, ion exchanger, heat exchanger, piping, etc.

  - Establish interface with Hanford Environmental Health Foundation (HEHF) for asbestos work monitoring support.

  - Relocate portable showers on site.

  - Establish asbestos work areas and construct one airlock.

  - Construct one stationary greenhouse.

  - Asbestos removal work in accordance with "Remove Asbestos", DD-026-016.

- Hanford Field Operations shall verify and/or drain main systems tanks, drums, vessel, etc. All follow-on pipe work will provide a containment/water collection and transfer enclosure at lowest run of pipe to be removed and then drill a drain hole or disconnect and provide vacuum release hole or vent at the highest point. Survey/analyze any water using WHC-CM-7-5 (Section K) release criteria and properly dispose of it in accordance with results of the radiological evaluation.

- Hanford Field Operations shall remove and dispose of the PRCF System components including cell steel decking and support beams. The contaminated system shall be dismantled using glove bags and/or greenhouse containment. Components open ends shall be capped, removed, packaged, and transported for disposal in compliance with site regulations and requirements. The reactor vessel, moderator storage tank, dump drum, and heat exchanger shall be disposed of intact by filling voids with burial debris and/or diatomaceous earth or other inert void-filling material, and sealing in compliance with the self-contained Storage/Disposal Approval Record, SDAR 3-8C-1J-4, dated December 29, 1988, or other approved method. Other contaminated components will be removed in sections and put into plastic-lined steel burial boxes and drums. Containers shall be filled with waste and diatomaceous earth or other inert void-

6.0 TECHNICAL PLAN (Cont'd)

filling material. Weight of steel boxes is not to exceed 15,500 lbs gross. Install caps, plugs, blind flanges, etc., on all remaining pipe, conduit, and duct stubs. A temporary seal may be attached to remaining facility stubs which will later be permanently sealed by OSS crafts (welders, pipefitters, etc.).

- Component rigging shall secure the sections from uncontrolled movement during dismantlement and allow its safe removal. The component/sections shall be removed in manageable sizes (volume/weight) for the rigging and equipment (hoist, crane, burial containers, etc.) being utilized. The section shall be removed by disconnecting the flange hardware or cutting hardware, or cutting the line at both ends near the component with metal saws, cutting disc, oxyacetylene torch, etc., and remove anchor/support structure. Remove component/section from the system with appropriate lifting method (hoist, crane, etc.) to the hold area for radiological survey and packaging operation.

- Hanford Field Operations shall decontaminate the cell north wall (2 ft wide strip down all three levels). A suitable containment structure shall ensure that there is no release of radioactive or other hazardous airborne contaminants to the environment during this activity. The concrete surface will be removed by grinding and/or using scarifier techniques with a scabbler, jackhammer, etc.

- The 300 Area Operations Support Services (OSS) group shall terminate the control room utility services (electricians, pipefitters, etc.). Utilities permanently disconnected shall be made by Engineering Change Notice (ECN) and all disconnected components shall be properly marked and verified. Note this procedure will be repeated for the cell prior to dismantlement. The HVAC, power, and lights shall be restored in the control room after D&D is completed. The OSS work will be scheduled using JCS.

- Hanford Field Operations shall provide temporary power and lights for follow-on work.

- Hanford Field Operations shall remove the control cabinet, panels, cable trays, conduit, wires, pipes, two cranes, etc. The air handling unit mounted on the ceiling will remain in place. Operations will prepare the area for packaging cell components prior to placing in lay down area or on trucks. Install caps, plugs, blind/flanges, etc., on all remaining pipe/conduit stubs.

- Hanford Field Operations shall remove cell equipment for proper disposal and cap all pipe/conduit stubs. A final radiological survey shall release the structure. The cell entrance shall be capped with a 6 in. reinforced concrete floor slab barrier at the

6.0 TECHNICAL PLAN (Cont'd)

control room level if cell shielding blocks are not replaced. If the cell shielding blocks are unconditionally released, replace them back in floor and provide a 2 in. thick concrete cell cap after sealing with caulking/oakum. If not, dispose of the blocks as LLW (320 cf). Tanks, vessels, and drums shall be disposed of intact by filling void with burial debris and/or vermiculite and wrapping in compliance with approved procedures.

- Hanford Field Operations shall remove the heat exchangers, piping, mountings, and cap or blind flange all pipe stubs (Room 404).

- Hanford Field Operations shall remove the iodine filter assembly, associated 3 in. diameter steel pipe and install pipe plugs (Exhaust Fan Pit).

- Notify DOE-NE for third party review of project status when near completion. The third party review is to be performed by an independent verification contractor (IVC), at the direction of DOE-HQ. This activity is to be coordinated with Andrew Wallo of the NE-23 staff at FTS 233-5439.

- Hanford Field Operations shall restore the facility to pre-dismantlement conditions by securely sealing roof hatch, clearing all work enclosures, etc.

- Engineering will prepare and issue a final report.

7.0 COSTS AND SCHEDULES

The preliminary cost estimate is summarized in Table 2 but does not include a contingency. The costs are based on earlier estimates prepared by PNL and JA Jones. The schedule of the project network is provided in Figure 7. A detailed final cost estimate will be prepared after the initial cell inspection and sample results are obtained.

8.0 OCCUPATIONAL DOSE ESTIMATES

The estimated occupational dose for the major activity of component removal and decontamination of the PRCF cell is calculated to be 90 person-mrem. On all projects, WHC dosimetry control system limits personnel exposure to 300 mR in a seven day period. On this project the total dose for all personnel for the total duration of the project is estimated to be approximately 90 mrem.

TABLE 2

DECONTAMINATION AND DECOMMISSIONING

OF THE

PLUTONIUM RECYCLE CRITICAL FACILITY, 309 BUILDING

BUDGET COST ESTIMATE

ITEMS	COST
Project Management	25,000
Engineering/Safety Hazard Analysis	80,000
Characterization	10,000
Decontamination	20,000
Dismantlement (includes asbestos)	75,000
Direct Materials	26,000
Waste Disposal	30,000
General Support*	94,000
G&A/CSP (26%)	90,000
TOTAL	$450,000**

*Operations Support Services (crane, trucks, etc.), Crafts (electricians, pipefitters, masons, etc.), Laundry Services, Photography, RPTs, etc.
**Does not include any contingency.

10-24-88

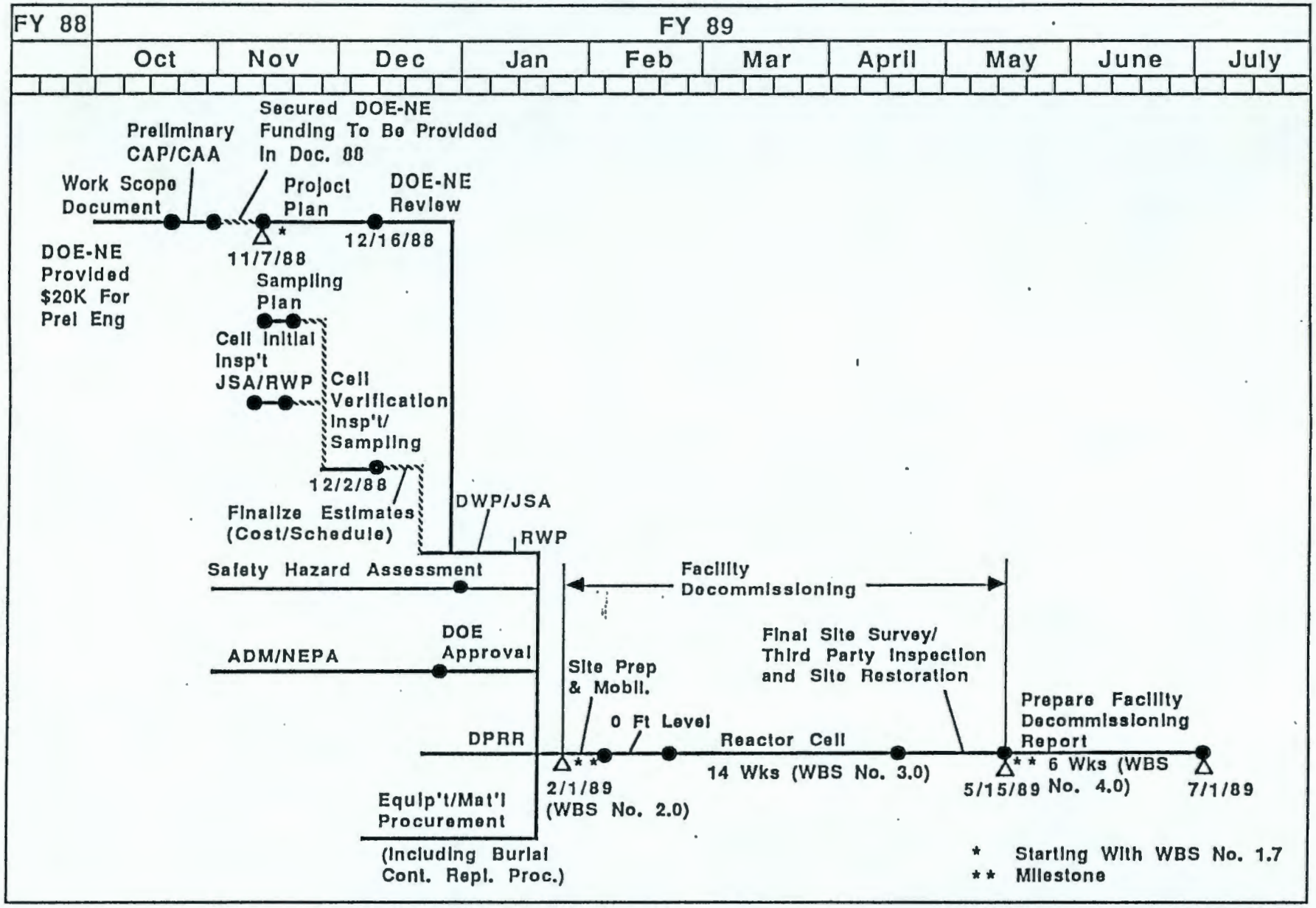


Figure 7. PRCF Project Network Schedule

9.0 WASTE VOLUME

This project is expected to result in an estimated 230 ft^3 of asbestos for disposal. The low-level radioactive contaminated waste volume is estimated to be approximately 2,000 ft^3. The waste volume estimate includes the packaging factors. The actual waste volume shipped for disposal will be reported in the Facility Decommissioning Report.

10.0 QUALITY ASSURANCE (QA) PROGRAM

The quality assurance requirements for this project are defined in WHC-CM-6-7, Environmental Restoration Quality Assurance Program Plan Rev. 2, dated November 15, 1988. WHC-CM-6-7 implements the quality assurance requirements set forth in the Quality Assurance Manual, WHC-CM-4-2.

Decommissioning Engineering and Reactor Safety determined[f] that the PRCF decommissioning Project is an Impact Level 3 as defined by WHC-CM-1-3, MRP 5.43 Rev. 2, Management Requirements and Procedures. Impact Level 3 is determined to be appropriate based on the hazard assessment being judged low for the PRCF decommissioning project using standard proven D&D techniques and equipment. This impact level requires Quality Assurance approval of project documents including the Decommissioning Work Plan (DWP), Work Orders, Purchase Orders, Readiness Review Action Item, Facility Decommissioning Report, etc. During the progress of work, quality control surveillances are made for required documentation or verification of conformance to requirements, including major component dismantling, lifting, packaging, transporting, etc. At the completion of the project, Quality Assurance reviews documentation of completeness, closes the final action item (DPRR), and approves the facility decommissioning report prior to issue.

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[f]Memo (#80423-88-90) from P. W. Griffin, Decommissioning Engineering, to Q. L. Baird, Manager, Reactor Safety, dated December 5, 1988, and concurrence DSI from Q. L. Baird to P. W. Griffin, dated January 17, 1989.

APPENDIX A

SMEAR SURVEY RELEASE CRITERIA

TOTAL PAGE 2

DATE: DECEMBER 22, 1988

Smear Survey Release Criteria

- Material smeared with 100-cm^2 smear is considered free of removable contamination if a measurement by a Smear Counting System is:

  < 20 dpm alpha (transuranics and unknown isotopes)
  < 1000 dpm alpha (U-235, U-232, U-238, Nat U, and associated daughters)
  < Minimum Detectable Activity (MDA) of beta per WHC-CM-4-13, Procedure 7.4.3 (including U-235, U-232, U-238, Nat U, and associated daughter products)
  < 1000 dpm tritium (by liquid scintillation)

- If a Smear Counting System is not readily available, a radiation release may be given if a portable (semi-portable) survey instrument indicates no detectable contamination on the smear.

APPENDIX B

CHANGE REQUEST AND USERS GUIDE

TOTAL PAGE 3

DATE: DECEMBER 14, 1988

CHANGE REQUEST
(PROGRAMS AND SITE) PAGE 1 OF _____

CIN (3)
Date
Rev.
Originator (4)
Organization
Phone
Date

Program/Project Title (1) ☐ Program Plan Affected

Change Title (2)

(5) BASELINE IMPACT
☐ Work Scope ☐ Funds
☐ Budget ☐ Contingency
☐ Schedule ☐ Staffing
☐ Technical

(6) PRIORITY
☐ Emergency
☐ Urgent
☐ Routine

(7) CLASS
☐ I
☐ II
☐ III
☐ CRP

Cost Impact * (8) B&R Code

Schedule Impact (9)

Manhours Impact (10) Staffing Plan Affected ☐ Yes ☐ No

DESCRIPTION (Attach pages as necessary)
(11)

COST ACCOUNTS AFFECTED

JUSTIFICATION (Include impact if not implemented. Attach pages as necessary.)
(12) (Reasons for revision)

(13) DISPOSITION
☐ Approved
☐ Approved as Amended
☐ Disapproved
☐ Deferred

ORGANIZATIONAL IMPACT (15)

Org.	Manhours	Dollars	Org.	Manhours	Dollars
☐ Def. Reactor			☐ Projects		
☐ Chem. Process.			☐ Civ. W. M.		
☐ Def. W. M.			☐ Ops. Support		
☐ Def. Prog. Planning			☐ E.S.&S.		
☐ Adv. Reactor Dev.			☐ Resource Alloc.		
☐ Surplus Fac. Mgmt.			☐ Other		
☐ Engineering					

(14) FUNDING SOURCE

	Capital	Expense
Contingency		
Mgmt. Reserve		
Baseline Funds		

Cost Account Mgr./Perf Org. Mgr.	Date	Program Administration	☐ DOE Directed Change Implement Change Prior to DOE Approval
Activity Manager	Date	Date	Program/Project Director Date
End Function Manager	Date	Program Manager Date	DOE-RL APPROVAL Name Date Name Date

54-6100-631 (08/87)

REFERENCE GUIDE TO USERS

CHANGE CONTROL PROCESS – OUTLINE

1) ORIGINATOR – Anyone associated with program/project
   a) Change must impact budget, schedule, scope, or technical baseline
   b) Develop change (impacts/justifications)
   c) Complete documentation
   d) Obtain CN number from Change Control Administrator (CCA)
   e) Forward copy of change request to CCA within two days

2) CHANGE CONTROL ADMINISTRATOR
   a) Assign number and enter into Change Log
   b) Statused logs distributed bi-weekly
   c) Retains final/approved change request for Master File

3)

REVIEWS AND APPROVALS	CLASS I	CLASS II	CLASS III
Performing Organization		X*	X
Cost Account Manager		X*	X
Activity Manager	X	X	
Program Administration	X	X	
End Function Manager	X	X	
Program Manager	X		

*When applicable

   a) Review for completeness, accuracy, and proper classification
   b) Responsibility of originator to obtain all signatures
   c) Only necessary to obtain signatures on one document
      - In most instances this will be the Change Request
      - For Change Requests involving multi-program/function changes it will be necessary to obtain signatures on revised CAPs

4) CHANGE IMPLEMENTATION
   a) Change not implemented until the affected documents (CAAs/CAPs) have been changed (red-lined)
   b) Subsequent mark-up of Program Plan to show change request
   c) Redistribute change CAPs?

5) FLOW TIME
   a) Should take no longer than two seeks to implement with revised CAAs, CAPs, and other applicable baseline documents
   b) Originator follow disposition of CR and make efforts to expedite

6) GENERAL GUIDELINES
   a) Include all data necessary to implement change: i.e.,
      - Affected CAP/work packages and performing organizations
      - Prior budget/schedule compared to revised budget/schedule
      - Legible signatures and corresponding phone numbers may help expedite the process
   b) Originator should ensure thorough coordination/communication of change and subsequent implementation after approval

DEFINITION OF CHANGES

Class I – involves changes to:

- Workscope and Technical requirements of the baseline document at the End Function level
- Total current FY budget as defined in the baseline document at the End Function Level
- Master Program Schedule Major or Key Milestones
- Any work directly negotiated between Westinghouse Hanford Company and Department of Energy-Richland Operations

Class II – involves changes to:

- Workscope and Technical Requirements of the Baseline Document in the Activity Portion
- Schedule of Westinghouse Hanford Company controlled milestones
- Activity level budgets or Function allocations not affecting the total FY End Function Budget
- Any CAA (scope, schedule, budget) which does not impact the total End Function Baseline

Class III – involves changes that:

- Do not meet the requirements of a Class I or Class II and are minor in nature
- Correct obvious errors
- Require re-planning of the CAP:
  - Changing unopened work packages
  - Changing the budget resource mix

NOTE: Class III does not require preparation of a Change Request however, a Change Request may be prepared when strict documentation is necessary.

APPENDIX C

WORK BREAKDOWN STRUCTURE (WBS)

ELEMENT DEFINITION

AND

COST ELEMENT BREAKDOWN

TOTAL PAGE 5

DATE: MARCH 3, 1989

PLUTONIUM RECYCLE CRITICAL FACILITY

WORK BREAKDOWN STRUCTURE

ELEMENT DEFINITION

WBS#

1.0 PREPROJECT ACTIVITIES

1.1 Obtain/assemble existing data

Drawings, operating logs, history, previous D&D estimates

1.2 Walkthroughs

Site tour with operating and D&D personnel to inspect the facility prior to and during the preparation of D&D documents.

1.3 Develop Work Breakdown Structure (WBS)

Development of the WBS necessary to define, plan, and control the work.

1.4-1.5 Prepare Scoping Document and Preliminary Estimate/Schedule

Prepare documentation to describe the project, define the objectives, define the scope and physical limits, and provide preliminary cost and schedule data.

1.6 Secure funding

Initiate documentation necessary to secure funding.

1.7 Initiate Cost Account Authorization (CAA)/Cost Account Plan (CAP)

Define work scope, schedule and milestones, and establish the cost account budget. Authorize planning and work. CAP used for detailed planning, monitoring, and controlling cost account work.

1.8 Develop Characterization/Sampling Plan

Prepare documentation to describe the objectives, methods, and scope for obtaining samples necessary to provide radiological and waste data required to plan the D&D work and document the existing conditions.

1.9 Inspect Cell

Inspect the cell to verify the existing conditions and obtain samples for characterization.

1.10 Engineering

Develop project plan.

1.11 Pre Decommissioning Project Readiness Review (DPRR) activities (Operations Readiness)

Activities done by the Operations Group to plan and prepare for actual D&D.

1.12 Initiate Procurement

Procurement of special tools and supplies as required for the project. Initiate procurement of burial boxes.

1.13 Finalize Estimate/Schedule

Detailed estimate/schedule based on the WBS and decommissioning work procedure.

2.0 DPRR

Develop project plan documents required by the Readiness Review Manual to perform the D&D.

A meeting, as part of the Readiness Review Process, to ensure all necessary documentation and requirements as specified in the Readiness Review Manual are approved and in place prior to starting actual D&D.

3.0 PLUTONIUM RECYCLE CRITICAL FACILITY (PRCF)

3.1 Disconnect building services

Disconnect all utilities to the PRCF cell and control room except lighting and ventilation

3.2 0' level D&D

Remove all components from the PRCF control room.

3.3 Vessel/Tank Removal

Remove the PRCF reactor vessel and moderator storage tank from the reactor cell.

3.4 Vessel/Tank Packaging and Transportation

Prepare, load, and secure the vessels in accordance with applicable procedures, and transport to burial.

3.5 Cell D&D

Remove all equipment, piping, etc. Decontaminate the cell as required. Cap all penetrations.

3.6 Site Restoration

Perform final cell survey, reinstall cell plugs, install concrete floor cap at 0' level. General housekeeping.

4.0 PROJECT CLOSEOUT

4.1 Report Preparation

Complete Facility Decommissioning Report

PLUTONIUM RECYCLE CRITICAL FACILITY

WORK BREAKDOWN STRUCTURE

COST ELEMENT BREAKDOWN

($000)

FISCAL YEAR 1989		OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG
PERIOD PLANNED	DO	6	7	35	72	41	90	104	88	5	2	
ACTIVITIES/MILESTONES (START DATE - END DATE)												
1.0 "Pre" Project Activities												
1.1-Prepare Scoping 1.4 Document (11/1/88)	6	6										
1.5-Initiate CAA/CAP 1.7 12/15/88			1	1								
1.8-Inspect Cell 1.9 (11/28/88)			3									
1.10-Complete Report 1.13 Plan (12/16/88)			2	8								
2.0 Decommissioning Project Readiness Review (2/1/89)				1	26	72						
3.0 PRCF D&D												
3.1-Asbestos Removal 3.2 (4/1/89)						5	20					
3.3-Complete Reactor 3.6 Vessel/tank removal (5/15/89)						36	70	104	82			
4.0 Project Closeout (7/1/89)									6	5	2	
4.1 Reports												
PERIOD PLANNED	DO	6	7	35	72	41	90	104	88	5	2	