

Project Baseline Summary Report

Data Source: **EM CDB**

Operations/Field Office: **Savannah River**

Site Summary Level: **Savannah River Site**

Project **SR-SF03 / RBOF Spent Nuclear Fuel Project**

Report Number: **GEN-01b**

Print Date: **3/9/2000**

HQ ID: **0496**

General Project Information

Project Description Narratives

Purpose, Scope, and Technical Approach:

In 1992, the Secretary of Energy directed the development of an integrated, long-term Spent Nuclear Fuel (SNF) management program. In response, a DOE-owned SNF program was initiated to define and ensure resolution of all associated issues starting with the quantification of DOE SNF inventories and fuel storage facilities. The purpose of the DOE-owned SNF program is to integrate DOE's existing SNF activities into one program to better control/manage this material, and to ensure that all issues associated with SNF are resolved in a safe and cost effective manner. The Receiving Basin for Offsite Fuels (RBOF) Facility at the Savannah River Site (SRS) plays a crucial role in this program.

The Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel Environmental Impact Statement (EIS) Record of Decision (ROD) was issued in May 1996. Key impacts from this document include a provision to return about 17,800 FRR SNF elements to SRS, including RBOF, between 1996 and 2009, although that number has since been reduced due to some foreign countries electing not to participate as originally thought.

The Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs final EIS ROD was issued on May 30, 1995. Key impacts from this document include a provision to consolidate aluminum clad SNF at SRS by means of shipping FRR SNF elements, as well as those from US Universities, other DOE sites, and other US Government sites. RBOF plays a crucial role in this ROD vis-à-vis fuel receipts.

SNF will be received at SRS from off-site domestic research reactors (DRR), government, and foreign research reactor (FRR) sources. The plan is based on the use of L-Reactor Basin as the primary receipt and storage facility for off-site SNF. RBOF will only receive oversized casks until such time that they are no longer utilized. The plan is intended to resolve the vulnerabilities of existing wet storage of SNF to minimize health and safety risks. Activities at RBOF will help manage wet basin storage SNF inventories and water quality to allow receipt of projected shipments and provide safe storage until a dry transfer and storage service becomes available in 2005.

RBOF, which went into operation in 1963, receives and stores reactor fuel elements in oversized casks from offsite reactors. RBOF receives cask shipments, unloads the cask underwater, inspects and prepares fuel for processing and then stores and/or transships the fuels from the facility. RBOF consists principally of a 0.5 million gallon, concrete fuel storage pool with a stainless steel bottom and Pheoline resin-coated walls, and associated cask handling and fuel handling facilities. Also contained in RBOF is a large deionizer resin regeneration facility. This facility services both the deionizers at RBOF and deionizers for the Reactor areas.

The RBOF Project scope includes basin operations in RBOF to control the water quality where fuel rods are stored, reactor deionizer regeneration, and all activities that apply to fuel receipt, handling, storage, and shipping to other facilities. The fuel rods have been irradiated and are being stored until a final disposition is approved. There are certain casks that RBOF can handle directly that L-Basin cannot, such as the TN7. Due to the limited shift coverage at RBOF, only a minimal number of on-site shipments from RBOF to L-Basin will take place, on a fill-in-work basis. Nevertheless, with one-shift coverage, deinventory of the RBOF Facility is expected to be completed in the year 2007, assuming that the new Transfer & Storage Facility is available for receipts in 2005.

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A scrap disposition plan is being developed that will determine the schedule for scrap materials currently located in RBOF, including Mk18 shipments to F-Canyon for repackaging and Mk 51 and other fuels to Oak Ridge.

Basin management at RBOF includes support operation, cleanup, basin equipment maintenance, procedure maintenance, sample analysis, and surveillance and maintenance (S&M) associated with the normal basin operations including deionizer regeneration, monitoring wells and chemistry control. S&M ensures the facility continues to pose acceptable risk to the environment, site workers, and the general public; maintaining the facility in accordance with the safety basis requirements; and activities necessary for cost effective management, planning, and oversight.

SFSD Conduct of Operations Improvements necessary to achieve site safety standards may require alternative funding including some program sacrifices in FY00 and FY01 in order to pay for these items. These include Configuration Management, Linking Document, Increased Rad Con, and the Asset Information Management system (AIMS).

Project Status in FY 2006:

Deinventory of the RBOF Facility is planned to be in progress in the year 2006, assuming that the new Transfer & Storage Facility is available for receipts at the end of FY05. Basin Management and S&M activities described above will continue during 2006 and until deinventory is complete in 2007.

Post-2006 Project Scope:

Deinventory of the RBOF Facility will be completed in the year 2007, assuming that the new Transfer & Storage Service is available for receipts in 2005. Basin Management and S&M activities will continue until deinventory is complete. Prior to RBOF shutdown, an alternative for management of the Reactor deionization resins must be provided (new system in L-Area, once through and burial, procurement of portable skid-mounted unit, etc.) Demobilization activities will commence after deinventory is complete, followed by long-term monitoring. Demobilization should be completed in about 2008, assuming deinventory is on schedule, at which time RBOF will be turned over for decommissioning. Decommissioning activities will be covered in separate projects (RBOF Deactivation Project - SR-FA13 and RBOF Monitoring Project - SR-FA22).

Project End State

RBOF will be deinventoried in 2007 and demobilization should be completed in about 2008, at which time RBOF will be ready for decommissioning. RBOF will be decommissioned to the extent necessary to meet the guidelines for a nuclear industrial zone. Decommissioning activities will be covered in separate projects (RBOF Deactivation Project - SR-FA13 and RBOF Monitoring Project - SR-FA22).

Cost Baseline Comments:

The financial figures for the Path to Closure (PtC) were derived using the SRS FY99 Annual Operating Plan (AOP) as the beginning basis. Outyear budget (OYB) requirements were estimated by factoring Detailed Information Input Forms (DIIFs) and outyear program planning assumptions/schedules against this AOP baseline. The OYB process utilizes the program requirements contained in the DOE Strategic Execution Guidance (SEG) as the formulation basis of detailed program/operating assumptions and Program Planning Packages used to communicate scope of work requirements to other SRS divisions, e.g. Construction, Waste Management, Environment, Safety & Health, etc. Financial estimates are

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generated by the line and support organizations using the DIIF system. Estimates were escalated for anticipated inflation using a 3.6% factor for FY00 and 01, and 2.7% for FY02 and beyond - per the guidance from the site.

The full cost of PBS work scope may change based on the authorized funding and priorities in any given year due to changes in site overhead assumptions. For planning and budgeting purposes, work scope costs were estimated using site overhead rates sized for clearance at a funding target of \$1,222.5 million. For FY2001 (the budget year), the site overhead is applied and cleared at the funding target, while the work scope below the funding target (planning level) is incremental direct cost. For FY2002, the site overhead is applied and cleared over the total planning level of scope.

Safety & Health Hazards:

Hazards at RBOF are described in Safety Analysis document "Receiving Basin For Off-site Fuels and The Resin Analysis, WSRC-SA-11, Chapter 3 Hazard and Accident Analysis." The Safety Analysis Report documents the safety authorization basis for managing these activities in a way that poses no unacceptable radiological or chemical danger to the offsite public, site workers, or the environment. Potential initiating events for environmental release and worker exposure are fire, explosion, loss of confinement, direct radiological exposure, nuclear criticality, external hazards (such as vehicle or handling accidents), and natural phenomena (seismic and wind). The results of postulated accident scenarios are discussed in Chapter 3 of the SAR.

The Receiving Basin for Offsite Fuels (RBOF / Resin Regeneration Facility (RRF) (Buildings 244-H and 245-H) are classified as a Hazard Category 2 facility. Hazard Category 2 facilities have the potential for significant on-site radiological or chemical consequences. The criteria for determining the radiological hazard categories are provided in DOE-STD-1027-92, Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23, Nuclear Safety Analysis Report, and the criteria for determining the chemical hazard categorization are provided in WSRC-MS-92-206.

Chemical inventory are controlled in accordance with RDP 14.1 "Chemical Management Program," and "Chemicals and Non-radioactive Hazardous Materials Control (U), DPSOL 105-1845-K." RBOF/RRF chemical hazards were addressed quantitatively in the RBOF/RRF Hazards Assessment Document, Hazard Analysis, and Safety Analysis Report. These analyses indicated that chemical hazards present in the RBOF/RRF may affect facility workers, but do not present a risk to the offsite public.

Hazards present in the RBOF will vary during the accelerated cleanup of the facility. Basin operations will continue in RBOF until deinventory of irradiated nuclear materials is completed (FY07). Surveillance and maintenance activities will continue until FY08, at which point FDD will assume custodianship of the facility. The facility demobilization/deinventory is scheduled to start in FY07 and be completed by the end of FY08, at which time the facility will be available for decommission. The demobilization plan will contain provisions for ensuring adequate surveillance and maintenance is performed during transition phase. Surveillance and maintenance requirements that will be addressed are: radiation protection, hazardous chemical safety, physical safety and security, and potential public and environmental hazards.

Safety & Health Work Performance:

As described in DOE's, "Safety Management System Policy," P450.4, there are six primary components that must be implemented: Objective, Principles, Functions, Implementation, Responsibilities, and Mechanisms. In adopting these components into the WSRC program, WSRC developed the Safety Management System Policy MP1.22, "Integrated Standards Based Safety Management Program," and submitted to the DOE (WSRC letter

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ESH-97-0004, F. B. Davis to L. C. Sjoström, "Schedules for Implementation of a Safety Management System (SMS) (U)," dated March 17, 1997)
WSRC-IM-97-10, Rev. 0, "Safety Management System Description (U)." These documents describe the Safety Management System used to ensure safety is integrated into work performed under WSRC's Contract No. DE-AC09-96SR1850.

The Department of Energy has determined (Authorization Agreement for RBOF/RRF, 5480.23.15-RBOF-AA, Revision 0) through a series of comprehensive reviews, that the Receiving Basin for Offsite Fuels Facility (RBOF) and the Resin Regeneration Facility (RRF) will be operated in compliance with the Standards/Requirements Identification Document (S/RID).

The Basis for Interim Operation for the RBOF/RRF (WSRC-TR-94-0287, Revision 1, as amended) documents the analysis of the facility hazards, specifies the controls necessary to prevent and mitigate the hazards, and defines a safety management program which affords an acceptable level of safety to the public, the workers, and the environment.

Through the performance of a Readiness Assessment and continuing operational assessments, there is reasonable assurance the facility can be operated without endangering the health and safety of the public, the workers, or the environment.

Activities and checkpoints are described by the Integrated Management System Description. The conditions and requirements are clearly established and agreed upon prior to the starting of any project and those requirements are contractually binding upon WSRC. The key elements of the WSRC Integrated Safety Program are to define the scope of work, identify and analyze hazards associated with the work, develop and implement hazard controls, perform work within controls, and provide feedback on adequacy of controls and continue to improve safety management. The WSRC Integrated Procedures Management System is the primary mechanism for implementing the objective, principles and functions of the Safety Management System. This system establishes Company-Level, Division-level, and Program-specific procedures consistent with organizational roles, and ensures a consistent, discipline site-wide approach to safety while performing work.

PBS Comments:

The Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel Environmental Impact Statement (EIS) Record of Decision (ROD) was issued in May 1996. Key impacts from this document include a provision to return about 17,800 FRR SNF elements to SRS, including RBOF, between 1996 and 2009, although that number has since been reduced due to some foreign countries electing not to participate as originally thought.

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Baseline Validation Narrative:

Independent validation efforts were done at SFSD in Fiscal Year 1998. These efforts were completed by an organization external to SFSD in a focused manner. The validation included a representative sample of programmatic operations, maintenance activities, and crosscutting overhead and service activities. As a result of this validation effort, the SFSD received the "validated" concurrence from the team.

General PBS Information

Project Validated?	Yes	Date Validated:	10/30/1998
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General PBS Information

Has Headquarters reviewed and approved project? No

Date Project was Added: 12/1/1997

Baseline Submission Date: 7/3/1999

FEDPLAN Project? Yes

Drivers:	CERCLA	RCRA	DNFSB	AEA	UMTRCA	State	DOE Orders	Other
	N	N	Y	N	N	N	Y	Y

Project Identification Information

DOE Project Manager: Sandra L. Johnson

DOE Project Manager Phone Number: 803-557-3828

DOE Project Manager Fax Number: 803-557-3996

DOE Project Manager e-mail address: sandra-l.johnson@srs.gov

Is this a High Visibility Project (Y/N):

Planning Section

Baseline Costs (in thousands of dollars)

	1997-2006 Total	2007-2070 Total	1997-2070 Total	1997	Actual 1997	1998	Actual 1998	1999	2000	2001	2002	2003	2004	2005	2006
PBS Baseline (current year dollars)	159,144	16,665	175,809	19,521	19,521	16,832	16,832	17,921	11,773	14,849	15,082	15,754	15,385	15,800	16,227
PBS Baseline (constant 1999 dollars)	146,772	13,233	160,005	19,521	19,521	16,832	16,832	17,921	11,364	13,835	13,683	13,917	13,233	13,233	13,233
PBS EM Baseline (current year dollars)	159,144	16,665	175,809	19,521	19,521	16,832	16,832	17,921	11,773	14,849	15,082	15,754	15,385	15,800	16,227
PBS EM Baseline (constant 1999 dollars)	146,772	13,233	160,005	19,521	19,521	16,832	16,832	17,921	11,364	13,835	13,683	13,917	13,233	13,233	13,233

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	2007	2008	2009	2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
PBS Baseline (current year dollars)	16,665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS Baseline (constant 1999 dollars)	13,233	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (current year dollars)	16,665	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PBS EM Baseline (constant 1999 dollars)	13,233	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Baseline Escalation Rates

1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
0.00%	0.00%	0.00%	3.60%	3.60%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%
2010	2011-2015	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2045	2046-2050	2051-2055	2056-2060	2061-2065	2066-2070
2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%	2.70%

Project Reconciliation

Project Completion Date Changes:

Previously Projected End Date of Project: 9/1/2012

Current Projected End Date of Project: 9/30/2007

Explanation of Project Completion Date Difference (if applicable):

Change deinventory sequence with TSF in L. RBOF 1st instead of 2nd. Began 1 shift operations in FY99. RBOF will be demobilized and turned over for final disposition after the basins have been deinventoried.

Project Cost Estimates (in thousands of dollars)

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Project Reconciliation

Previously Estimated Lifecycle Cost (1997 - 2070, 1998 Dollars):	317,039	Actual 1997 Cost:	19,521	Actual 1998 Cost:	16,832
Previously Estimated Lifecycle Cost of Project (1999 - 2070, 1998 Dollars):	280,686	Inflation Adjustment (2.7% to convert 1998 to 1999 dollars):			7,579
Previously Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	288,265				

Project Cost Changes

	Cost Adjustments	Reconciliation Narratives
Cost Change Due to Scope Deletions (-):	164,613	Change deinventory sequence with TSF in L. RBOF 1st instead of 2nd. Began 1 shift operations in FY99
Cost Reductions Due to Efficiencies (-):		
Cost Associated with New Scope (+):		
Cost Growth Associated with Scope Previously Reported (+):		
Cost Reductions Due to Science & Technology Efficiencies (-):		
Subtotal:	123,652	
Additional Amount to Reconcile (+):	0	
Current Estimated Lifecycle Cost (1999 - 2070, 1999 Dollars):	123,652	

Milestones

Milestone/Activity	Field Milestone Code	Original Date	Baseline Date	Legal Date	Forecast Date	Actual Date	EA	DNFSB	Mgmt. Commit.	Key Decision	Intersite
Deinventory RBOF	SR-SF03-2		10/1/2011							Y	
Project Mission Complete	SR-SF03-3		9/1/2012								
Ship TRR and EBR fuel from RBOF to 200 Areas	SR-SF03-1		10/1/2001					Y			
Project Start	SR-SF03-001		10/1/1996								
Complete shipments of "at-risk" legacy materials	SR-SF03-002		12/31/2001					Y			
Complete deinventory of RBOF	SR-SF03-003		3/31/2007								
Project Complete	SR-SF03-004		9/30/2007								

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Milestones - Part II

Milestone/Activity	Field Milestone Code	Critical Decision	Critical Closure Path	Project Start	Project End	Mission Complete	Tech Risk	Work Scope Risk	Intersite Risk	Cancelled	Milestone Description
Deinventory RBOF	SR-SF03-2									Y	
Project Mission Complete	SR-SF03-3									Y	
Ship TRR and EBR fuel from RBOF to 200 Areas	SR-SF03-1									Y	
Project Start	SR-SF03-001			Y							This date represents the beginning date for the planning document currently being employed by the Department of Energy. The actual start date for the facility covered in this PBS is in the early 1960's.
Complete shipments of "at-risk" legacy materials	SR-SF03-002										All legacy materials identified as being "at-risk" in the DNFSB 94-1 report and the subsequent recommendation in the Interim Management of Nuclear Materials Record of Decision will be transferred to the SRS canyon facilities for stabilization processing.
Complete deinventory of RBOF	SR-SF03-003										It will be possible to deinventory RBOF by 3/31/2007 provided the Additional Basin Storage racks are installed in L Basin, in a timely manner, and an alternative to the RBOF provided deionizer resin regeneration function is acquired.
Project Complete	SR-SF03-004				Y						The RBOF facility will turned over for deactivation and a final disposition decision. These activities are within the scope of another SRS PBS.

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