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Project W-443 Cask/Transportation Project Management Plan

LC Byrd

Westinghouse Hanford Company, Richland, WA 99352
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Abstract: This document has been prepared and is being released for Project W-443 participants to use in the performance of project activities. This PMP establishes the organizational responsibilities and baseline controls to be used to manage Spent Nuclear Fuel Subproject W-443.

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Barbara Nuckley *7/2/96*
Release Approval Date

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Project W-443
CASK/TRANSPORTATION SUBPROJECT
PROJECT MANAGEMENT PLAN
JUNE 28, 1996

WHC-SD-W443-PMP-001, Rev. 0

Project W-443, Cask/Transportation Subproject Project Management Plan Approval.

6/28/96

W. D. GALLO, MANAGER,

Date

MCO, CASK/TRANSPORTATION AND CONDITIONING PROJECTS

WHC-SD-W443-PMP-001, Rev. 0

**Project W-443, Cask/Transportation Subproject Project Management Plan DOE
Approval.**

DOE SPENT NUCLEAR FUELS PROJECT DIVISION 6/28/96
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ACRONYMS

ALARA	As Low As Reasonably Achievable
ASME	American Society of Mechanical Engineers
BA	Budget Authorization
BO	Budget Obligated
BTR	Buyer's Technical Representative
CCB	Change Control Board
CD	Critical Decision
CENRTC	Capital Equipment Not Related to Construction
CSB	Canister Storage Building
CTS	Cask/Transportation Subproject
CVD	Cold Vacuum Drying
CWA	Clean Water Act
CWBS	Contractor Work Breakdown Structure
DBA	Design Basis Accident
DOE	U.S. Department of Energy
ECN	Engineering Change Notice
EIS	Environmental Impact Statement
EP	Engineering Practice
ETC	Estimates to Complete
FY	Fiscal Year
ICF KH	ICF Kaiser Hanford Company
MCO	Multi-Canister Overpack
MRM	Management Review Meeting
MYPP	Multi-Year Program Plan
NEPA	National Environmental Protection
NRC	Nuclear Regulatory Commission
ORR	Operational Readiness Review
PMP	Project Management Plan
PSWBS	Project Summary Work Breakdown Structure
QA	Quality Assurance
RL	U.S. Department of Energy, Richland Operations Office
SAR	Safety Analysis Report
SARP	Safety Analysis Report for Packaging
SEMP	Systems Engineering Management Plan
SNF	Spent Nuclear Fuel
SFD	Spent Nuclear Fuel Project Division
T&E	Testing and Evaluation
TPA	Tri-Party Agreement
TPC	Total Project Cost
WAC	Washington Administrative Code
WBS	Work Breakdown Structure
WHC	Westinghouse Hanford Company

1.0 INTRODUCTION

The K Basin Spent Nuclear Fuel (SNF) Project consists of the safe packaging and removal, vacuum drying, transport to the Canister Storage Building (CSB) in the 200 East Area, staging (short-term storage) in the CSB, hot conditioning, and interim storage in the CSB of fuel currently stored at the KE and KW basins. The strategy developed by the Westinghouse Hanford Company (WHC) to implement this mission is documented in WHC-SD-SNF-SP-005, *Integrated Process Strategy for K Basin Spent Nuclear Fuel*, and the functional requirements baseline is documented in the *Spent Nuclear Fuel Project Technical Baseline Document Fiscal Year 1995*. To implement this strategy the WHC has established several subprojects that are responsible for the acquisition of the essential structures, systems, and components. One of these is the SNF Cask/Transportation Subproject (CTS).

The SNF CTS includes the transportation and packaging (cask) system capable of safely and economically transporting Multi-Canister Overpacks (MCOs) containing the spent nuclear fuel currently stored in the KE and KW Basins. The SNF CTS also includes the systems and equipment necessary to load MCOs with fuel baskets, and the basins modifications which will prepare the K Basins for cask handling activities. The functional requirements baseline for the SNF CTS is documented in WHC-S-0396, *Specification for SNF Path Forward Cask and Transportation System*. The basin modifications scope of work, work breakdown structure (WBS) element 1.4.1.06.01.08, is being managed under a separate project management plan, WHC-SD-SNF-PMP-015, *Project Management Plan for K Basins Facility Upgrades for Transport Project A.5/A.6*.

2.0 OBJECTIVES

2.1 Technical Objectives

The technical objective of the CTS is to load and deliver the spent fuel contained in baskets in MCOs from the K Basin areas to the CSB. The transportation cask will be a reusable cask system capable of carrying one MCO and of being loaded and unloaded under water. The transport system is to be capable of loading full or empty casks onto the transport medium at either the K Basins or the CSB, securing them for transportation loads, and transporting the cask from either the K Basins to the CSB or vice versa.

The scope of the CTS includes the design and fabrication of the casks that will hold, shield, and provide structural support for the MCOs; the components necessary to facilitate lifting the loaded cask assembly onto the conveyance at the K Basin loadout area; the conveyance equipment necessary to transport the loaded cask and ancillary equipment to the CVD and CSB; the design and installation of the equipment to load baskets of fuel into the MCOs; and the special equipment or tools required to preclude contamination of the cask package and to check the package for contamination. The subproject also includes the modifications necessary to the K Basins to accommodate the transportation system equipment.

The equipment to load fuel into the baskets, however, is not part of the scope of this subproject; it is the responsibility of the Fuel Retrieval Subproject. The Cask/Transportation operations are also not part of this subproject, but are included under the Fuel Retrieval Subproject as well.

2.2 Schedule Objectives

The schedule objective is to have the Cask/Transportation Subproject ready to support start of fuel retrieval activities on December 31, 1997. Key milestones to support this objective are listed below in Table 2-1.

Table 2-1. Cask/Transportation Subproject Key Milestones

Milestone Number	Title	Date
S06-96-001	Award Cask/Transport Design Purchase Order	01/08/96
S06-96-005	Complete Cask Preliminary Design	04/25/96
S06-96-007	Complete Draft SARP	05/16/96
S06-96-013	Obtain Critical Decision 1/2	04/25/96
S06-96-010	Complete Cask/Transport Performance Testing	09/19/96
S06-97-001	Complete Basin Modifications Design	10/07/96
S06-97-002	Complete Cask Transporter Design	01/15/97
S06-97-003	Complete Cask Final Design	01/22/97
S06-97-005	Issue Cask/Transport SARP	03/11/97
S06-97-006	Complete Initial Transporter Fabrication	07/11/97
S06-97-010	Receive Cask/Transport for Training	07/31/97
S06-97-009	Complete Basin Mods Installation	08/28/97
S06-97-011	Obtain Critical Decision 3	01/22/97
S06-98-005	Complete Training/ORR	12/02/97
S06-98-006	Complete Cask/Transportation Fabrication	12/09/97
S06-98-009	Obtain Critical Decision 4	12/02/97

2.3 Cost Objectives

The cost objective is to complete the scheduled K Basin spent nuclear fuel remediation activities within the fiscal constraints presented in the subproject baseline. The detailed cost baseline is documented in the SNF Project MYPP. Table 2-2 displays the fiscal year budget profile by major WBS element.

Table 2-2. Cask/Transportation Subproject Budget Profile (\$ in 000s)

WBS Element	Fiscal Year				
	1995	1996	1997	1998	Total
1.4.1.06.01 Acquisition Definition	1,232	586	0	0	1,818
1.4.1.06.02 Project Management	0	612	993	211	1,816
1.4.1.06.03 Cask & Trans System Design	0	0	159	0	159
1.4.1.06.05 Testing/Qual of Cask	0	381	0	241	622
1.4.1.06.06 Testing & ORR of Transport	0	0	270	0	270
1.4.1.06.07 Regulatory Compliance	0	591	308	0	899
1.4.1.06.08 Basin Upgrades	0	782	4	0	786
Expense Total	1,232	2,952	1,734	452	6,370
1.4.1.06.03 Cask & Trans System Design	0	1,871	753	0	2,624
1.4.1.06.04 Cask & Trans System Fabrication	0	770	7,761	1,600	10,131
1.4.1.06.08 Basin Upgrades	0	0	2,115	0	2,115
CENRTC Total	0	2,641	10,629	1,600	14,870
Total Project Cost	1,232	5,593	12,363	2,052	21,240

Figure 2-1. Cask/Transportation Subproject Summary Schedule

3.0 MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

3.1 Organization

The SNF CTS team consists of the DOE Spent Nuclear Fuels Project Division (SFD), Westinghouse Hanford Company/ICF Kaiser Hanford Company (WHC/ICF KH), Transnuclear, Inc., and other subcontractors. The organizational relationship of the SNF CTS is shown in Figure 3-1. The overall Responsibility Matrix is in Appendix A. References to subproject participants include the full subproject team: DOE SFD, WHC/ICF KH, and other subcontractors. References to contractor participants include the subproject participants except DOE SFD.

3.2 Responsibilities

3.2.1 DOE Spent Nuclear Fuel Project Division

The DOE SFD is responsible for the overall management and administration of the SNF CTS activities, as well as to assess subproject performance and maintain the subproject baselines. The DOE SFD is also to ensure required levels of quality, safety, and environmental compliance are achieved within established technical, cost, and schedule baselines.

The Manager of the U.S. Department of Energy, Richland Operations Office (RL) has been assigned the authority of the Acquisition Executive for the SNF Project. Critical decision authority for the CTS has been delegated to the appropriate management level within DOE SFD. Specific responsibilities and authorities of the DOE SFD are:

- Provide review and approval of SNF CTS documents including required environmental and safety documentation (see Appendix B - DOE Approved Documents);
- Approve overall scope, cost, and schedule baselines for the subproject;
- Monitor and maintain overview of subproject activities, cost, schedules, and status to ensure subproject performance, quality, cost, and schedule objectives are met;
- Provide direction to SNF Projects that is consistent with national program and policy direction.

Figure 3-1. SNF Cask/Transportation Subproject Organization

3.2.2 Westinghouse Hanford Company - ICF Kaiser Hanford Company

The WHC/ICF KH team is responsible for establishing and implementing the SNF CTS project management system by ensuring matrix support for quality assurance (QA), safety oversight and integration, procurement, project control, technical integration, regulatory compliance, startup, and operations is coordinated with the efforts of all contractor participants. The SNF CTS organization is shown in Figure 3-2. Specific activities in the successful completion and implementation of the SNF CTS include, but are not limited to, the following:

- Assure subproject activities are completed on schedule, within budget, and meet the intended mission/scope;
- Coordinate contractor participant and matrix support as required;
- Establish quality subproject objectives that meet SNF Project goals;
- Develop, implement, and maintain the baseline documentation;
- Identify and apply quality, safety, and environmental requirements;
- Develop, coordinate and maintain the overall SNF CTS cost estimate and schedule; coordinate all budget and financial planning activity; prepare and submit budget planning documents consistent with the DOE budget cycle;
- Prepare Statements of Work for non-DOE contractor participants including subcontractors;
- Prepare subproject related reports. Keep the DOE SFD informed of technical, cost and schedule status and issues;
- Act as Owners Agent. The Owners Agent acts for or as the representative of DOE within the contractual requirements. WHC/ICF KH is the contracting organization for the DOE;
- Act as Design Authority for SNF CTS. The Design Authority's responsibility includes establishing and interpreting facility requirements. The Design Authority is uniquely responsible and accountable for final acceptability of a structure, system, subsystem or component, including its technical baseline and safe operation. The Design Authority may delegate the design work but does not delegate the design authority responsibility and approves the designs prepared by the Design Agent;

- Provide coordination and integration of subcontractors; conduct design reviews to assess adequacy; overview design optimization efforts from the standpoint of cost, personnel and public safety, reliability, maintainability, accuracy, and compliance with applicable codes, standards, and regulations. Provide approvals as required by subcontractors;
- Serve as Buyer's Technical Representative (BTR) for facility and systems contracts and provide contractual direction to contractor participants. The BTR is a person specifically identified by WHC to act as the company technical advisor/authority responsible for successful completion of a WHC subcontract or purchase order by an outside source;
- Responsible for the approval of design and final acceptance of fabrication;
- Ensures that safety requirements are implemented that fully reflect established DOE and industry codes, standards, requirements and statutory regulations;
- Ensures the application of ALARA principles to design and operations activities;
- Responsible for procurement of government owned or furnished equipment;
- Provide DOE SFD with copies of all subproject statements of work and subcontracts;
- Prepare and submit critical decision and Acquisition Advisory Board documentation as required;
- Prepare cost and performance report data;
- Support monthly SNF Project meetings with DOE SFD.

Figure 3-2. SNF Cask/Transportation Subproject & Performing Organizations

3.2.3 Matrix Organizational Support

WHC/ICF KH provide matrix support to the subproject through various organizations. Following is a list of each function and their responsibilities.

- Quality Assurance. Quality Assurance support is provided by the WHC SNF Projects Quality Assurance organization. Responsibilities are:
 - Provides oversight activities including audits, surveillances and appraisals of organizations performing safety, environmental, or quality-affecting activities;
 - Provides formal independent review of subproject criteria documents, safety analysis reports, and environmental permits;
 - Develops the WHC SNF Project QA plan;
 - Reviews and approves subproject participant QA plans;
 - Concurs with selected participant implementing procedures;
 - Ensures QA integration.
- Procurement. Procurement support is provided by the WHC Procurement and Materials Management organization. Responsibilities are:
 - Assists the subproject in establishing acquisition objectives and contracting processes;
 - Responsible for implementing the approved acquisition strategy;
 - Ensures request for proposals and specifications meet guidelines and directives;
 - Assists the subproject leads in the procurement of goods and services.
- Project Control. Project Control support will be provided by the SNF Path Forward Projects Business Management and SNF Project Integration organizations. Responsibilities are:
 - Implements management systems to ensure cost effective performance and implementation of activities;
 - Provides resources to plan, manage, allocate, and report subproject funding;
 - Prepares and coordinates subproject status reporting of scope, cost and schedule;

- Maintains subproject-level schedule and milestone control including preparation, compilation, integration and analysis;
- Maintains effective change control for all subproject baselines;
- Interfaces with overall SNF budget and schedule organization.
- Permitting & Regulatory Program. Permitting and regulatory activities will be performed by the WHC SNF Regulatory Integration/Public Involvement and the WHC Transportation and Packaging organizations. Responsibilities are:
 - Identifies/interprets applicable DOE Directives, Federal, Washington State, local laws and regulations, industry codes and standards, management good practices, and assures proper requirements documents are prepared;
 - Assure performance of self assessments for compliance against applicable requirements and the development of follow-on compensatory measures and corrective actions;
 - Perform public involvement activities and community relations related to the SNF Project. Manage daily external interfaces with regulatory and oversight agencies;
 - Assure performance of applicable NEPA activities;
 - Assure development and adequacy of the CTS Safety Analysis Report for Packaging (SARP) in accordance with WHC-SD-SNF-PLN-003, *K Basins Spent Nuclear Fuel Safety Analysis Report for Packaging (SARP) Approval Plan*;
 - Assure preparation of applicable permits;
 - Provide guidance and coordination for applicable operational readiness reviews and for conduct of operations;
 - Act as the subproject focal point with the regulators and stakeholders.
- SNF Engineering Integration. Engineering and safety integration will be provided by the SNF Engineering Integration organization. Responsibilities are:
 - Acts as SNF Project Design Authority and ensures adherence to technical baselines;
 - Coordinates systems engineering, process engineering, and other SNF CTS technical interfaces with other systems and subprojects;

- Represents SNF CTS in overall SNF technical studies and technical decision making;
 - Manages interfaces in accordance with WHC-SD-SNF-CM-003, *Spent Nuclear Fuel Project Interface Control Plan*;
 - Maintains technical oversight for potential interfaces with the national repository program and Multi-Purpose Canister shipping system;
 - Perform review and analysis of safety-related documentation and activities;
 - Interpret safety requirements and standards as they apply to the subproject;
- Project Files. The establishment and maintenance of the HCS project file is overseen by the BCSR Document Control Services (DCS) organization. Responsibilities are:
- Maintain a current copy of the HCS Subproject Record Index.
 - Monitor and control project file access; ensuring protection of records from the effects of casual use, the environment, or disaster.
 - Ensure that the completed project file is transmitted to the Records Holding Area within the established time frame as required by WHC-CM-4-2, Quality Assurance Manual, QR 17.0, "Quality Assurance Records" and in accordance with WHC-CM-3-5 upon completion of the project and turnover/closeout.
 - Provide assistance and guidance to the project manager and the project team with respect to project files procedures, activities, requirements, etc.
- Operations. Operations activities will be provided by the K Basin Operations organization. Responsibilities are:
- Performs reviews of designs for operability and maintainability;
 - Develops and controls plant training manuals and material to ensure they are correct and up to date;
 - Ensures all operations staff training requirements are met and records are current;
 - Accepts turnover of SNF CTS components from the procurement organization.

3.2.4 Design/Fabrication Agent, Transnuclear, Inc.

Transnuclear is serving as the Design/Fabrication Agent for the SNF CTS. As the Design/Fabrication Agent, Transnuclear will produce the preliminary and final designs using engineering analysis and calculations. The preliminary and final design for the SNF CTS will be produced in accordance with the SNF CTS performance specification WHC-S-0396.

As the design/fabrication agent, Transnuclear will be responsible for providing technical adequacy in the development of the engineering baseline definition through production of a design requirements document, interface control diagrams, detailed fabrication drawings, and fabrication specifications. They will also be responsible for fabrication, as well as testing and verification of all components and equipment of the packaging and transport systems as designed. Direction on work scope detail will be transmitted via Engineering Change Notice (ECN) to the CTS Performance Specification.

3.3 Project Staffing

Subproject staffing is included as part of the resource loaded, overall SNF Project integrated schedule prepared for the MYPP.

3.3.1 Qualification and Training

The SNF CTS will implement qualification and training through a systematic approach to performance based training as defined in WHC-CM-2-15, *Training Standards*.

SNF CTS contractor participants, including subcontractors, will be required to submit their Qualification and Training Plans to WHC upon request for review and approval.

4.0 PROJECT MANAGEMENT AND CONTROL

4.1 Project Planning

The intent of the project management system and project planning is to ensure the successful execution of the design, procurement, fabrication, testing, and start up of the SNF CTS within the subproject's baseline cost, schedule, and technical criteria.

The following sections provide descriptions of the management system(s) to be used.

The SNF CTS Project Control function shall perform an annual assessment of the participant's management systems. The assessment scope and content will be tailored to an evaluation of implementation or execution and relate to some or all the management system elements listed in the following subsections.

4.1.1 Work Breakdown Structure

For planning, execution, and control of the work, the SNF CTS WBS was established. The WBS represents the way in which work will be estimated, scheduled, budgeted, performed, and managed. The WBS defines all authorized subproject work regardless of funding source by relating elements of work to each other and to the end product. Since it describes all of the work to be done on the subproject, the WBS provides the basis for technical, schedule, and cost control. Each active element is statused at regular intervals to determine if the planned work is being accomplished on schedule and within budget.

The SNF CTS WBS is organized in discrete packages for performance tracking and reporting purposes. Major work activities for the SNF CTS have been defined as shown in the WBS, Figure 4-1, and are detailed in the Activity Planning Forms to the WHC Task Package level. The Activity Planning Forms are held as backup to the MYPP and are available from the subproject files.

Each significant contractor subproject participant is responsible for preparation of a Contractor Work Breakdown Structure (CWBS) and CWBS Dictionary which supports the SNF CTS WBS. Each CWBS Dictionary will specify the work to be performed, how the work will be accomplished, who will do the work, and other significant data such as identification of technical work scope/planning documents which further describe the work activities.

Figure 4-1. Cask/Transportation Subproject Work Breakdown Structure

1.4.1.06	Cask/Transportation Subproject
1.4.1.06.01	Cask/Transportation Subproject
1.4.1.06.01.01	CTS Acquisition Definition
1.4.1.06.01.02	CTS Project Management
1.4.1.06.01.03	CTS Design
1.4.1.06.01.04	CTS Fabrication
1.4.1.06.01.05	Testing/Qualification of Cask
1.4.1.06.01.06	Testing/ORR of Transportation
1.4.1.06.01.07	CTS Regulatory Compliance
1.4.1.06.01.08	Basin Facility Upgrades for Transport

4.1.2 Project Plan

The SNF CTS falls under the SNF Project Plan, WHC-EP-0830, *Hanford Spent Nuclear Fuel Project Recommended Path Forward Document*, which has been approved by the DOE SFD organization.

4.1.3 Project Management Plan

The SNF CTS PMP identifies the plans, organizational interfaces, management control systems, and reporting requirements that will be used by those responsible for managing the subproject. The SNF CTS PMP is part of the subproject baseline and is a controlled document subject to configuration management. Documents to be developed subsequent to and in support of, this PMP are also considered controlled documents and must be subject to disciplined Configuration Management Procedures. The PMP is updated annually and will be supplemented to meet the requirements of the RL Site Management System and Multi-Year Program Plan. The SNF CTS PMP is a lower-tier document to the SNF Project PMP, WHC-SD-SNF-PMP-011, *Spent Nuclear Fuel Project Management Plan*, but in the case of a contradiction takes precedence over the SNF Project PMP.

4.1.4 System Engineering Management

The SNF CTS will use the SNF Project Systems Engineering Management Plan (SEMP) as a basis for the systems engineering process to be followed by the subproject. The SNF SEMP, WHC-SD-SNF-SEMP-001, *Spent Nuclear Fuel Project Systems Engineering Management Plan*, describes the process to be used to ensure that the technical requirements and basic design criteria of the SNF Project and associated subprojects are clearly defined and are traceable throughout the design, acquisition, construction and operation.

The SNF Project Systems Engineering Process conforms to the DOE requirements as well as the Hanford Site Systems Engineering Management Plan and the Hanford Systems Engineering Manual. SNF Project systems engineering activities will be coordinated with those of the DOE EM-37 and the Hanford Site Systems Engineering Center of Excellence. Figure 4-2 shows the flow of the Systems Engineering process on the SNF CTS and its relationship to Project Design Documentation.

4.1.5 Configuration Management

Configuration Management maintains and controls changes to the technical baseline once the baseline is placed under change control. Configuration Management will be consistent with WHC-SD-SNF-CM-001, *Spent Nuclear Fuel Projects Configuration Management Plan*.

Figure 4-2. Systems Engineering Process

4.1.6 Project Files

The subproject files are developed and maintained to ensure that information is available to support the SNF CTS and that the information product is complete and accurate for the staging and interim storage of spent nuclear fuel. Information resources are managed throughout the information life-cycle, including information creation, collection, processing, distribution, management, and disposition/retirement. Management of life-cycle activities shall be targeted toward making information useful, available, and effective in accomplishing the SNF CTS.

Subproject files are developed and maintained per WHC-SD-SNF-CM-001, *Spent Nuclear Fuel Project Configuration Management Plan*, and WHC-SD-SNF-MP-001, *Spent Nuclear Fuel Project Document Management Plan*.

4.2 Baseline Management

A total SNF CTS baseline has been established for all activities to the completion of the subproject. The technical baseline is the basis for the schedule and cost baselines which are reflected in the MYPP. Effective control of the subproject baseline is essential and changes to the baseline will be managed in a disciplined fashion. The SNF CTS approach to managing subproject changes is based on maintaining an accurate description of the subproject baseline, methodically evaluating proposals to alter it, and maintaining configuration to the technical baseline. This will be done through the establishment of change class levels (level of approval authority) and a Subproject Change Control Board (CCB).

For the SNF CTS, the CCB is comprised of the DOE SFD Project Manager or a delegate (Class 1 changes only), the DOE SFD CTS Project Engineer, the WHC SNF CTS Subproject Manager, the SNF Path Forward Project Control Manager (CCB secretary), and support staff as required. The manager of the SNF Project Baseline Control will serve as an ex officio board member. CCB meetings will not be held on a regular basis but rather on an as needed basis.

Changes to the controlled baseline documents will be through submittal of change requests that justify the proposed changes. Specific baseline change control requirements will be managed in accordance with Hanford Site change control procedures and thresholds established for this subproject as shown in Table 4-1.

4.2.1 Technical Baseline Control

The technical baseline is the reference set of technical data. It includes the subproject functions and requirements, Level 1 process flow diagrams, performance specifications, interface control documentation, and design packages including specifications and drawings, QA provisions, and test and inspection requirements. WHC will ensure that configuration management activities and systems engineering activities are performed while better defining and controlling the subproject baseline and associated documentation.

These activities will be applied to all systems and subsystems necessary to achieve all functional requirements and deliver all products to satisfy the integrated technical baseline and overall subproject objectives. At all times during the life of the subproject, current configuration of the subproject will be maintained in orderly and auditable subproject files. These records/files will include, but not be limited to system descriptions, system specifications, preliminary and definitive system designs, system and material inspection reports, test reports, operating/surveillance procedures and vendor documentation.

Table 4-1 defines the approval authority for changes to the defined technical baseline.

4.2.2 Schedule Baseline Control

The SNF CTS baseline schedule is reflected in the MYPP.

For each WBS element identified in the subproject WBS, a separate detail schedule will be prepared which identifies the activities necessary to successfully complete that phase of the subproject work scope. Each detail schedule will identify the logic ties and interfaces necessary to coordinate the completion of that phase of the work scope with the other elements of the subproject summary schedule, and will contain sufficient detail to allow integration of all detail schedules into the subproject summary schedule.

All detail schedules will be resource loaded with staff hours associated with the particular skills mix that is identified for each activity and other direct costs. Schedule control of this subproject will be implemented through critical path schedule analyses (resulting in the identification of schedule float), the establishment of milestones, and corrective actions for schedule variances (determined by Earned Value methodology). Contractors will analyze schedule variances and evaluate trends on schedule performance using acceptable methodologies on their WHC approved contractor master schedule. Performance reporting and variance analyses will be reported to the DOE SFD cognizant Project Manager as specified in Section 4.6. When variance analyses reveal problems, WHC will ensure that appropriate corrective actions are taken by the affected participants. Changes to the subproject schedule baseline will be processed through change control in accordance with established thresholds.

Table 4-1 defines the approval authority for changes to the defined schedule baseline.

4.2.3 Cost Baseline Control

The subproject cost baseline is the subproject cost estimate and is established and controlled in the MYPP. The cost estimate level of detail is specified in the general guidance for the preparation of program plans issued annually by RL. The BA requirement will consider the requirements of contract commitments and phase funding allowances. Carryover of expense and CENRTC funds to support the BA/BO profile will be required.

Cost control will be implemented by WHC through corrective action in response to cost variances reflected in the routine Earned Value analysis of the established cost performance baseline. Cost control is based on a subproject scale, not on an annual scale. WHC will prepare estimates to complete (ETC) the subproject, taking into account the Cost Performance Index (CPI). WHC and other subproject contractors will prepare, and seek appropriate approval for, documentation of corrective action for any cost estimate change impact that exceeds the established thresholds shown in Table 4-1.

WHC has the primary responsibility for preparing and reporting cost performance data to DOE SFD as specified in Section 4.6. Significant variances, corresponding variance analyses and recommended corrective action will be included in the reporting to the DOE SFD.

Changes to the subproject cost baseline will be processed through change control in accordance with established thresholds. WHC will ensure that all subproject cost estimates and revised estimates are based on current schedules and that the basis for cost estimates is consistent with the documented subproject scope baseline.

4.3 Work Authorization

Overall work authorization occurs by contractual arrangements between the RL contracting officer and WHC. In addition to the contractual authorization, specific authority to proceed with subproject work will be provided from the DOE SFD to WHC, and from WHC to subproject participants. Written work authority will be provided from DOE SFD to WHC based on a multi-year technical, schedule, and cost baseline.

Since all SNF CTS funding is expense and CENRTC, work will be authorized in the RL financial plan to WHC. Appropriate work performed by ICF KH will be authorized by letter of instruction.

Table 4-1. Change Classification Thresholds

Change Class	Approval Authority	Technical	Schedule	Cost
(RL) I	DOE SFD	RL Approved Baseline Documents	Changes to RL Milestones	Change Impacts > \$0.5M to \$50M
(IC) II	CTS Subproject CCB	WHC Approved Baseline Documents	Changes to WHC Milestones	Change Impacts > \$50K to \$0.5M
(INTERNAL) III	WHC CTS PM	Baseline Documentation Controlled below WHC	Changes to Internal Milestones	Change impacts < \$50K

4.4 Funds Management

Control of fiscal year (FY) cost ceilings and appropriations will be accomplished in accordance with DOE-HQ approved funding plan requirements and existing DOE SFD funds control policies and procedures. Subproject funding that is authorized but not spent (i.e., carry-over) within an FY will remain with the SNF CTS for use in the next FY in accordance with the subproject's cost, schedule, and technical baselines. Funds associated with incomplete work will be carried over as Budget Obligated (BO). Uncosted commitments will be carried over either as BO if costed in the next FY, or as BA if beyond the next FY.

Cost, commitment, and fund authority information will be provided by WHC in the monthly status review meeting, as requested by the DOE SFD. This information will be used to keep the DOE SFD and management advised of current cost and commitment levels and potential funding impacts. Controls will be established to ensure costs and commitments do not exceed available funding.

4.5 Performance Measurement and Reporting

Work planning, scheduling, budgeting and authorization will be integrated to provide a realistic baseline against which performance can be measured. Earned value methodology will be utilized to measure performance on this subproject. Each contractor will utilize and maintain internal cost and schedule performance measurement information which provides responsible managers with timely, accurate, and objective performance data. Performance measurement will be performed on the TPC.

The SNF CTS management reporting will be completed monthly and will support the SNF Project monthly reporting needs. Reporting formats and content will comply with the intent of DOE Order 4700.1. The Progress Tracking System and the Site Management System will be used for reporting on a monthly basis. Reporting will be coordinated with the overall SNF Project reporting. The SNF

CTS will support the overall SNF Plan of the Week and other reporting systems and meetings.

4.6 Meetings and Reviews

The SNF CTS will participate in the SNF Project Management Review Meetings (MRM) held monthly with the DOE SFD. Subproject team members and appropriate subproject participant personnel will support the MRM. The SNF CTS Subproject Manager is responsible for recording SNF CTS action items, agreements, and commitments resulting from the meeting. Monthly reviews will focus on immediate decisions, critical issues, cost and schedule variances and assessments, corrective actions, and general status of work in progress. Status data from the monthly status report should be used as much as possible. The review is intended to be exception oriented and focused on major significant issues that require management decisions.

An additional weekly meeting will be held between the CTS Subproject Manager and the RL CTS representative(s), along with other CTS team members as needed. The meetings will focus on reviewing schedule status and issues, with the intent of keeping both parties informed of the subproject status and concerns.

4.7 Project Validations and Key Decisions

Current planning calls for fiscal year work authorization to be granted via the RL financial plan to WHC. As the SNF CTS consists of a CENRTC funded engineered procurement, annual project validations will not be required. Similarly, because the CTS TPC is below the DOE 4700.1 threshold for a Major Project, the key decision process will not be applicable. However, critical decisions (CD) will be conducted in a manner similar to the key decision process. For the CTS, CD-1/2 will authorize initiation of final design and long lead procurements. CD-3 will grant authorization to begin CTS fabrication and CD-4 will indicate completion of readiness activities for this subproject. The MYPP outlines the scope and cost basis for the subproject and regularly scheduled meetings to review performance will provide sufficient RL oversight.

5.0 QUALITY ASSURANCE

Public safety, on-site worker safety and protection of the environment are overriding considerations for the SNF CTS. The commitment to safety by the DOE management dictates management and verification activities to ensure safety and environmental considerations are reflected in the design, procurement, construction and operation of the SNF CTS. For purposes of this document, QA will be considered to be all of those planned and systematic actions necessary to provide adequate confidence that a structure, system, or component will perform satisfactorily in service.

The SNF CTS shall adhere to the applicable requirements of 10 CFR 830, *Nuclear Safety Management*, Subpart A, "General Provisions" and Section 830.120, "Quality Assurance Requirements", 10 CFR 71, *Packaging and Transportation of Radioactive Materials*, Subpart H, "Quality Assurance" (CFR 1996), and 10 CFR 72, *Licensing Requirements For the Independent Storage of Spent Nuclear Fuel and High Level Radioactive Waste*, Subpart G, "Quality Assurance".

A graded approach to QA requirements shall be implemented in accordance with the following criteria.

- As specified in WHC-S-0396, for the cask, a comprehensive 10 CFR 71, Subpart H, program shall be applied in addition to the quality requirements from applicable industry codes and standards.
- For Safety Significant structures, systems and components, select quality requirements that would enhance the reliability of the structures, systems and components performing their safety function (if any) shall be applied in addition to the quality requirements from applicable industry codes and standards.
- For non-safety structures, systems and components, the quality requirements from applicable industry codes and standards shall be applied.

Upgraded QA requirements shall be applied to items critical to safety, consistent with the graded approach to safety classification prescribed in WHC-CM-4-46, *Safety Analysis Manual (WHC 1996)*, and to items identified as having high technical risk. Items critical to safety and the actions to prevent or mitigate their failure shall be identified by a comprehensive, systematic, documented evaluation of the requirements and the design. Items critical to safety include Safety Class and Safety Significant items, as defined in WHC-CM-4-46, and items whose failure could cause failure of a Safety Class item. Items identified as having high technical risk include those items whose failure could result in significant delays, or high recovery cost.

The SNF CTS QA program is structured to minimize or eliminate any structures, systems, and/or components which are procured, designed, fabricated, installed, constructed, tested and operated that may cause the following conditions:

- Cause undue risk to the health and safety of the public;
- Violations of regulations and standards;
- Prejudice the operability and reliability of systems; and,
- Cause the Waste Form to be unacceptable for long-term interim storage.

All participants supplying safety class structures, systems, and components, as well as testing services, shall be required to develop a QA plan compatible with the requirements of 10 CFR 830.120 and 10 CFR 71, Subpart H, as specific to the participants area of responsibility. As long as the program is compatible with the above-referenced requirements, its bases can be founded in existing consensus standards, such as: ASME NQA-1, 10 CFR 50 Appendix B, and the ISO 9000 series. All participant QA plans shall be submitted to the SNF CTS QA organization for review and approval.

6.0 ENVIRONMENTAL ASSURANCE/SAFETY

6.1 Environmental Management

The subproject will cooperate with DOE and other federal, state and local agencies and stakeholders at large as appropriate, to ensure that its activities comply with environmental protection regulations and requirements. The necessary environmental permits and approvals will be procured at the appropriate times. Regulatory Integration/Public Involvement (RIPI) is the SNF Project organization charged with coordinating regulatory requirements and activities.

Applicable environmental regulations include the following. Which permits/approvals are needed depends upon the nature and extent of the specific subproject activities and will be identified as the activities are defined.

1. Clean Water Act (CWA)
2. Clean Air Act (CAA) and state radiation protection regulations
3. National Environmental Policy Act (NEPA)
4. Columbia Reach Study Act
5. DOE Order 5400.5, *Radiation Protection of the Public and the Environment*.
6. Hanford Federal Facility Agreement and Consent Order (TPA)
7. Hanford Environmental Compliance Manual (WHC-CM-7-5)
8. Ecology industrial wastewater disposal regulations (WAC 173-216, 218,240)
9. Ecology dangerous waste regulations (WAC 173-303)
10. Ecology sanitary waste regulations (WAC 256-272)

6.2 Safety Classification

The CTS shall be capable of withstanding the effects of a design basis accident (DBA) in accordance with WHC-S-0396, and confinement of radioactive materials within allowable limits. The DBAs shall be based on the Concept of Operations contained in Appendix A of the performance specification. All Safety Class items, as well as Safety Significant, and Non-safety related items required to prevent failure of Safety Class items, shall withstand the DBAs in a manner that preserves the intended safety function. Simultaneous occurrences of more than one DBA shall be considered for common cause events.

The CTS design shall achieve and maintain a critically safe array throughout the design life of the CTS in accordance with DOE Order 5480.24, *Nuclear Criticality Safety* (DOE 1992) and WHC-CM-4-29, *Nuclear Criticality Safety* (WHC 1988).

NRC Nuclear Safety Equivalency

NRC nuclear safety equivalency for the CTS is established in WHC-SD-SNF-SP-002, *WHC Spent Nuclear Fuel Project Regulatory Strategy*.

Safety Documentation

A Safety Analysis Report (SAR) is not required for the CTS. Individual SARs or SAR updates will be prepared for the facilities in which the cask is handled.

The packaging shall be approved for use within the boundaries of the Hanford Site. It will be authorized to transfer Type B, HRCQ of fissile radioactive material in the form of irradiated fuel assemblies. A SARP will be written to demonstrate the safety of the transfer through a combination of cask performance and administrative controls per WHC-SD-TP-RPT-001, *Report on Equivalent Safety for Transportation and Packaging of Radioactive Materials (WHC 1994)*. The SARP will include the evaluation of the packaging system to provide containment, shielding, and subcriticality for the payload during normal and accident conditions as defined by WHC-SD-TP-PDC-030, *Packaging Design Criteria for the MCO Cask*. Approval of the SARP will be in accordance with the SARP Approval Plan, WHC-SD-SNF-PLN-003 and will provide authorization for onsite transport. The packaging and transportation shall be performed in accordance with the governing SARP and WHC-CM-2-14, *Hazardous Material Shipping and Packaging Manual*.

The preparation strategy for the CTS safety documentation would include considerations of the following:

- NRC Regulatory Guide 3.61, *Standard Format and Content for a Topical Safety Analysis Report for a Spent Fuel Dry Storage Cask*, will be used as guidance for the content of the report for facilities which handle the cask. NRC Regulatory Guide 3.48, *Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation or Monitored Retrievable Storage Installation (Dry Storage)*, DOE Order 5480.23, *Nuclear Safety Analysis Reports*, DOE-STD-3009-94, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Safety Analysis Reports*, and 10 CFR, Part 71, will be used as appropriate for guidance and WHC-SD-TP-PDC-030 for specific requirements for the content of the report.
- The design agent has responsibility for design compliance with applicable requirements of WHC-SD-TP-PDC-030 as delineated in WHC-S-0396 and/or specific requirements, and may be involved in the report preparation and review of the report. WHC Transportation and Packaging will prepare the SARP.
- WHC has safety documentation authority and will be responsible for coordinating approval of the report.
- DOE approves the SNF CTS requirements.

7.0 ACQUISITION PLAN

WHC performed the pre-conceptual engineering for the SNF CTS and developed the performance specification. Based on the performance specification, WHC-S-0396, bids were solicited and a fixed price design/build contract was awarded for preliminary design.

The CTS design/build contract is divided into three parts with preliminary design as the base item. Upon approval of preliminary design and award of Critical Decision 1/2, the first option will be exercised for final design of the cask and conveyance system and fabrication and delivery of two casks and conveyance systems. The second option is for fabrication and delivery of the remaining cask and conveyance systems, which may be exercised after award of Critical Decision 3.

8.0 TEST AND INSPECTION PLAN

The design/fabrication agent will determine the necessary inspection/testing to verify compliance with the specification requirements. A detailed plan will be prepared which defines the scope, the objectives, and the evaluation criteria of the program. The plan must be submitted to WHC for review and approval prior to commencement of the covered activities. The document shall also include the following:

- Traceability to purchase order document number;
- Components, subassemblies and/or assemblies to be fabricated/tested/inspected;
- Identify the sequential steps for fabrication/process;
- Identify the sequential points for inspection and tests to be performed during fabrication/processing;
- Define the methods/procedures to be used during inspection and testing.
- Define the governing acceptance criteria for the required inspections and tests, or identify the document(s) where the criteria are located.

Manadatory source inspection/hold/witness points will be selected by WHC based on the agent's plan and incorporated into the plan by the agent. The agent must also submit all revisions/modifications to the plan to WHC for review and approval prior to implementation of the change.

Prior to shipment of any components or equipment by the agent, all test and inspections must be performed and a complete data package reviewed by WHC.

9.0 REFERENCES

- DOE,1992, *Project Management System*, DOE Order 4700.1, U.S. Department of Energy, Washington, D.C.
- DOE,1993, *Radiation Protection of the Public and the Environment*, DOE Order 5400.5, U.S. Department of Energy, Washington, D.C.
- DOE,1992, *Nuclear Safety Analysis Reports*, DOE Order 5480.23, U.S. Department of Energy, Washington, D.C.
- DOE,1992, *Nuclear Criticality Safety*, DOE Order 5480.24, U.S. Department of Energy, Washington, D.C.
- DOE,1994, *Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Safety Analysis Reports*, DOE-STD-3009-94, U.S. Department of Energy, Washington, D.C.
- 10 CFR 830, *Nuclear Safety Management*, Code of Federal Regulations, as amended.
- 10 CFR 71, *Packaging and Transportation of Radioactive Materials*, Code of Federal Regulations, as amended.
- 10 CFR 72, *Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High Level radioactive Waste*, Code of Federal Regulations, as amended.
- ASME,1989, *Quality Assurance Program Requirements for Nuclear Facilities*, ASME NQA-1-1989 with current addenda, American Society of Mechanical Engineers, New York, New York.
- NRC, *Standard Format and Content for a Topical Safety Analysis Report for a Spent Fuel Dry Storage Cask*, NRC Regulatory Guide 3.61.
- NRC, *Standard Format and Content for the Safety Analysis Report for an Independent Spent Fuel Storage Installation or Monitored Retrievable Storage Installation (Dry Storage)*, NRC Regulatory Guide 3.48.
- WHC-CM-2-14 *Hazardous Materials Packaging and Shipping*, Westinghouse Hanford Company, Richland, Washington.
- WHC-CM-2-15 *Training Standards*, Westinghouse Hanford Company, Richland, Washington.

WHC-CM-4-29,	<i>Nuclear Criticality Safety Manual</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-CM-4-46,	<i>Safety Analysis Manual</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-CM-7-5,	<i>Environmental Compliance</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-EP-0830,	<i>Hanford Spent Nuclear Fuel Project Recommended Path Forward Document</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-S-0396,	<i>Specification for SNF Path Forward Cask and Transportation System</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-CM-001,	<i>Spent Nuclear Fuel Project Configuration Management Plan</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-CM-003,	<i>Spent Nuclear Fuel Project Interface Control Plan</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-MP-001,	<i>Spent Nuclear Fuel Project Document Management Plan</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-PLN-003,	<i>K Basins Spent Nuclear Fuel Safety Analysis Report for Packaging (SARP) Approval Plan</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-PMP-011,	<i>Spent Nuclear Fuel Project Management Plan</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-PMP-015,	<i>Project Management Plan for K Basins Facility Upgrades for Transport Project A.5/A.6</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-SD-003,	<i>Spent Nuclear Fuel Project Technical Baseline Document Fiscal Year 1995</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-SEMP-001,	<i>Spent Nuclear Fuel Project Systems Engineering Management Plan</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-SNF-SP-002,	<i>WHC Spent Nuclear Fuel Project Regulatory Strategy</i> , Westinghouse Hanford Company, Richland, Washington.

WHC-SD-W443-PMP-001, Rev. 0

WHC-SD-SNF-SP-005,	<i>Integrated Process Strategy for K Basins Spent Nuclear Fuel</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-TP-PDC-030,	<i>Packaging Design Criteria for the MCO Cask</i> , Westinghouse Hanford Company, Richland, Washington.
WHC-SD-TP-RPT-001,	<i>Report on Equivalent Safety for Transportation and Packaging of Radioactive Materials</i> , Westinghouse Hanford Company, Richland, Washington.

WHC-SD-W443-PMP-001, Rev. 0

APPENDICES

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APPENDIX A DIVISION OF RESPONSIBILITY MATRIX

ACTIVITY	SNF PROJECT OFFICE (DOE SFD)	WHC SNF PROJECT (Design Authority)	CASK/TRANSP SUBPROJECT (WHC/ICFKH)	DESIGN/FABRICATION AGENT	WHC SNF OPERATIONS
PROJECT DEFINITION ACTIVITIES					
Subproject Functions and Requirements/Performance Specification	A	P/A	P		
Design Authority		P/A (delegated to subproject)	P/A		
Engineering Trade Studies	I	P/A	R		
Integrated Flowsheet & Interfaces	I	P/A	R		
Multi-Year Program Plan	A	P/A	P/I		
Design Statement of Work	I	I/R	P/A		
Packaging Design Criteria Report	A	A	P/A		
PRELIMINARY DESIGN ACTIVITIES					
Subproject Budget Documentation	I	I	P/A	P/I	
Subproject Level 1 Schedule	R	R	P/A	P/I	
Subproject Level 6 Schedule	I	I	P/A	P/I	
Baseline Change Control	A	A	P/A	P/I	
Status Reporting	I		P	P/I	
Subproject Technology Development Needs/Dates.	I	P/I	P/A		
Total Subproject Cost Estimate Details	I		P/A	P/I	
Project Management Plan	A	R	P/A		
Preliminary Design	A	I	A	P	
CTS Preliminary Design Report	A	I	A	P	

ACTIVITY	SNF PROJECT OFFICE (DOE SFD)	WHC SNF PROJECT (Design Authority)	CASK/TRANSP SUBPROJECT (WHC/ICFKH)	DESIGN/FABRICATION AGENT	WHC SNF OPERATIONS
Cask Qualification Test or Analysis	I	P/I	A	P	
Transport Performance Testing	I	P/I	P/A	P	
Critical Decision 1/2	A	I	P		
FINAL DESIGN ACTIVITIES				P	
Final Design	A	I	A	P	
Design Reviews	I		P/A	P/I	
Supplemental Design Requirements		A	P/A	P	
CTS SARP	A	I	P/A		
CTS Final Design Report	A	I	A	P	
Critical Decision 3	A	I	P		
FABRICATION/INSTALLATION ACTIVITIES					
Fabricator Work/QA Plan			A	P	
CTS Fabrication	I		A	P	
Factory Acceptance Test/Inspection Plan	C		A	P	
Fabrication Inspections	I		P/A	I	
Design Changes during Fabrication	I	A	P	P	
Operating & Maintenance Manuals	I		P/A	P/I	I
Certified Vendor Information Files	I		A	P/A	I
As-Built Documentation	I	A	A	P	I
Factory Acceptance Test	I	I	A	P	I
CTS Receipt/Inspection	I	I	P/A		I
Install Basin Mods	I	I	P/A		P/I
Transportation Operational Readiness Review	A	I	P/I		P/A

KEY:

A = Approve; C = Concur; I = Information; P = Prepare/Perform; R = Review

APPENDIX B DOCUMENTS REQUIRING DOE APPROVAL

SNF CTS Performance Specification	WHC-S-0396
SNF CTS Functions & Requirements Document	WHC-SD-SNF-FRD-011
SNF CTS Packaging Design Criteria	WHC-SD-TP-PDC-030
SNF CTS Project Management Plan	WHC-SD-W443-PMP-001
SNF CTS Safety Analysis Report for Packaging	WHC-SD-TP-SARP-017
SNF CTS Level I Process Flow Diagrams	H-1-81168
SNF CTS Preliminary Design Report	
SNF CTS Final Design Report	

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