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National Spent Nuclear Fuel Program

Program Management Plan

December 2006

U.S. Department of Energy
Assistant Secretary for Environmental Management
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Program Management Plan

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National Spent Nuclear Fuel Program
Program Management Plan

December 2006

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ABSTRACT

This program management plan is the document that sets forth the mission, objectives, plan, organization, and responsibilities for those managing the U.S. Department of Energy (DOE) National Spent Nuclear Fuel Program (NSNFP). This plan is consistent with the spent nuclear fuel agreement between the State of Idaho, and the U.S. Navy and the DOE; and *The Memorandum of Agreement for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste*. This program management plan will be reviewed at least annually and revised when necessary to reflect any changes in program strategy, budget, organization, responsibility, or other change that might affect the mission and objectives of the NSNFP.

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ACRONYMS

DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy Idaho Operations Office
EM	Office of Environmental Management
HLW	high-level radioactive waste
ICP	Idaho Completion Project
INEEL	Idaho National Engineering and Environmental Laboratory
INL	Idaho National Laboratory
M&O	Management and Operating Contractor
MCO	Multi-Canister Overpack
MOA	Memorandum of Agreement
NEPA	National Environmental Policy Act
NRC	U.S. Nuclear Regulatory Commission
NSNFP	National Spent Nuclear Fuel Program
OCRWM	Office of Civilian Radioactive Waste Management
OQA	Office of Quality Assurance
PSO	Program Support Organization
QA	quality assurance
QAPP	Quality Assurance Program Plan
QARD	OCRWM Quality Assurance Requirements and Description
QAS	Quality Assurance Staff
QASM	Quality Assurance Staff Manager
QE	Quality Engineer
RW	Office of Civilian Radioactive Waste Management
SNF	spent nuclear fuel
WBS	work breakdown structure

Program Management Plan

1. INTRODUCTION

This document is the program management plan for the U.S. Department of Energy (DOE) National Spent Nuclear Fuel Program (NSNFP*)*. This plan is consistent with the spent nuclear fuel (SNF) agreement between the State of Idaho, and the U.S. Navy and the DOE; and the *Memorandum of Agreement* (MOA) *for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste*[1] (as amended by the July 2001 Action Memorandum[2]). It is also consistent with DOE policies and the decisions made through the National Environmental Policy Act (NEPA) process. This document provides the NSNFP organization, management, and plans for achieving its role in the management and disposition of DOE SNF. In addition to its role with DOE SNF, this plan discusses the evolving NSNFP role in supporting DOE high-level radioactive waste (HLW) disposition activities.[3]

1.1 Background

For many years the DOE has managed SNF to support various missions and programs. A process DOE used to manage this material was to chemically separate strategic material, such as uranium or plutonium, from the waste. DOE stored about 100 million gallons of HLW by-product as a result of these reprocessing operations. As the need for uranium and plutonium decreased, however, it became necessary to store the unprocessed DOE SNF for extended periods. DOE had not intended for SNF to be in long-term storage.

In 1992, DOE discontinued the reprocessing of SNF to recover strategic materials. Both the facilities used for storage and the SNF itself began experiencing the effects of “aging” from this extended storage. New efforts are now necessary to ensure fuel stabilization and facility management until decisions for long-term disposition are made and implemented.

Some of the HLW tanks that store the reprocessing by-product were designed for as little as 25 years of service and began to experience the affects of aging, and in some cases, began to pose an environmental threat. In addition to the liquid HLW, DOE produced other forms of HLW including sodium-bearing liquid waste from decontamination and maintenance of reprocessing equipment. In preparation for long-term disposal, much of these liquid wastes were converted into more stable forms such as calcine or vitrified logs.

The term “DOE SNF” will be used throughout this document to represent DOE-managed fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing. The fuel comes from research reactors, production reactors, naval reactors, etc., as well as SNF returned from domestic and foreign research reactors to be managed by DOE. The HLW referred to in this plan is the acid and chemical by-product from reprocessing irradiated fuel and target elements to separate out plutonium and uranium and its treated products. This HLW is stored at DOE facilities that performed reprocessing operations, i.e., the Hanford site, the Savannah River site, and Idaho National Laboratory (INL).

In 1992, the Secretary of Energy directed the Assistant Secretary for the Office of Environmental Management (EM) to develop an integrated, long-term SNF management program. The program would consolidate under EM all DOE SNF and associated facilities not addressed by the DOE Office of Civilian Radioactive Waste Management (OCRWM). The OCRWM mission is to develop and manage a federal system for disposing of all commercial SNF, DOE SNF, and HLW. EM is responsible for the management policy and process to prepare DOE SNF and HLW for transport and repository acceptance.

In June 1995, DOE issued the Record of Decision on the *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Program's Environmental Impact Statement*.[4] The Record of Decision selected "Alternative 4A, Regionalization by Fuel Type" as the chosen option. This Record of Decision was modified to agree with the Consent Order (PSC 1995)[5] issued on October 17, 1995, modifying the SNF shipments to and from the State of Idaho. The amended version of the Record of Decision mandates consolidation of all existing and newly generated SNF at three DOE sites prior to shipment for disposal as indicated below:

- Hanford production reactor fuel and fuel not requiring treatment will remain at Hanford; sodium-bonded Fast Flux Test Facility fuel will be shipped for treatment to INL, formerly the Idaho National Engineering and Environmental Laboratory (INEEL).[a]
- Naval fuel will be shipped to INL for examination and interim storage.
- Nonaluminum-clad fuels will be consolidated at INL, except Fort St. Vrain fuel, which is in Colorado and will remain there.
- Aluminum-clad fuels will be consolidated at the Savannah River Site.

In September 2002, the *Idaho High-Level Waste & Facilities Disposition Final Environmental Impact Statement*[6] further clarified the handling of HLW as follows:

- Treat and store HLW until disposal
- Develop technologies for final disposition of HLW including support for treatment of sodium-bearing waste.

1.2 Purpose of the NSNFP

In October 1995, the settlement agreement (Consent Order PSC 1995) between the State of Idaho, and DOE and the U.S. Navy designated INL (INEEL) as the DOE lead laboratory for SNF. The NSNFP is performing this role as stated in the agreement, "DOE shall direct the research, development and testing of treatment, shipment and disposal technologies for all DOE spent fuel, and all such DOE activities shall be coordinated and integrated under the direction of the Manager, DOE-Idaho Operations Office." In May of 2005, DOE expanded the focus of the NSNFP to activities required to disposition DOE SNF and HLW in the geologic repository at Yucca Mountain (See Reference 3).

In this role, the NSNFP works with OCRWM, DOE-EM, the Savannah River Site, INL, and the Hanford Site. The activities include:

- Providing ongoing technical support to review pertinent sections of the license application for the Yucca Mountain repository to ensure that DOE SNF is reflected appropriately in the license application.

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a. On February 1, 2005, the INEEL contract split forming INL, a consolidation of INEEL laboratory activities and Argonne National Laboratory-West, and the Idaho Completion Project (ICP). The NSNFP is part of the INL contract. The SNF disposition work at INL will be performed under a separate ICP contract. Throughout this plan, these two contractors will be referred to as INL, since both contractors reside on the INL site.

- Supporting EM in coordinating and facilitating the review of the pertinent license application sections by the DOE offices and local SNF programs at INL, Hanford, and Savannah River
- Preparing information to be included in the license application, and preparing responses to information requests from the Nuclear Regulatory Commission (NRC)
- Developing and evaluating the DOE SNF packaging and handling requirements and capabilities. Focus is being placed on ensuring that the interfaces between the DOE SNF packages and the OCRWM receiving facilities are well defined, controlled, and optimized.
- Preparing information about DOE SNF in support of the OCRWM acquisition of the transportation system to move the DOE SNF to the repository
- Supporting EM in discussions with OCRWM related to the information that OCRWM needs and emphasizing a cost-effective approach to meet the OCRWM information requirements
- Supporting EM in the continuing analysis and development of interim SNF storage and packaging plans
- Maintaining the NSNFP Quality Assurance (QA) Program in compliance with DOE/RW-0333P, Quality Assurance Requirements and Description
- Fulfilling other waste acceptance obligations as specified in the EM/OCRWM Memorandum of Agreement.

In addition to the above work on SNF, DOE directed the NSNFP to use its centralized resources to support the EM HLW programs. The NSNFP will support the following HLW activities:

- Coordinating communications between DOE HLW organizations and the OCRWM-managed repository program to ensure HLW is reflected appropriately in the Yucca Mountain license application
- Assisting EM as it interfaces with OCRWM regarding HLW and disposition issues
- Supporting analysis of the vitrified plutonium waste form, Cesium/Strontium capsules, and other potential waste forms that may be accepted at the Yucca Mountain Repository
- Developing plans for optimizing the production of the HLW forms and efficient use of the repository based on insights into the performance needs at the repository
- As requested, supporting other EM HLW disposition activities.

The role of the NSNFP continues to evolve to better meet the needs of EM and OCRWM while continuing its stewardship role for DOE SNF and HLW. The NSNFP also maintains historical and reference material supporting Yucca Mountain Project licensing and SNF management by EM.

1.2.1 Purpose of the Program Management Plan

This program management plan defines the NSNFP's current role and establishes the process to plan and implement research, development, testing, and DOE site integration and coordination as part of the EM SNF and HLW mission. This plan performs the following functions:

- Defines the mission and objectives of the NSNFP

- Describes the organization of the NSNFP, including its management and structure as it relates to external organizations
- Explains the interfaces among DOE-Headquarters, the DOE field sites, OCRWM, and related projects
- Summarizes the planning process including schedules, milestones, and the budget
- Addresses the management strategies for key projects within the NSNFP
- Defines the scope of the QA responsibility.

The NSNFP requires the integrated efforts of DOE-Headquarters, DOE field or operations offices, and contractors at various sites across the country to meet its objectives. This program management plan provides a uniform set of requirements and expectations for the NSNFP and also adheres to the established principles and guidelines for effective program planning and administration.

1.2.2 Plan Revisions

This program management plan is a living document that reflects the current status of the NSNFP. The document is controlled and will be revised as strategic decisions are made, progress is achieved, and additional information becomes available. At a minimum, limited revisions will be performed annually to embody the latest detailed work plan information.

2. MISSION AND OBJECTIVES

2.1 Mission

The NSNFP has the mission of being the DOE centralized technical resource for spent nuclear fuel and high-level waste management. The program supports policy development and provides technical analyses for the management, technology development, treatment, storage, and disposition of SNF and HLW.

2.2 Objectives

The NSNFP provides technology solutions and guidance for safe, efficient management of DOE SNF and HLW at operating sites. In addition, it supports OCRWM in formulating a licensing strategy and by providing the analyses and research needed to consider all DOE SNF and HLW during the repository license application process. The following subsections describe the NSNFP objectives listed below:

- Objective 1—Address research, development, and testing needs
- Objective 2—Ensure DOE SNF acceptance criteria are established
- Objective 3—Ensure repository license includes DOE SNF and HLW
- Objective 4—Provide management, integration, and communication
- Objective 5—Address HLW handling and management needs.

2.2.1 Objective 1—Address Research, Development, and Testing Needs

The NSNFP directs the research, development, and testing of treatment, shipment, storage, and disposal technologies for all DOE SNF. The NSNFP is challenged to help ensure safe, effective management of SNF generated from DOE, university, and other domestic sites, and foreign research reactors. With more than 200 types of fuel that must be managed, information and technology are vital to ensuring safe and efficient interim and long-term storage and transportation processes for all the DOE SNF.

The NSNFP collaborates with DOE laboratories to develop and deploy technologies. By coordinating common needs for research, technology development, and testing programs, the NSNFP can achieve cost efficiencies and eliminate redundant activities across all the DOE SNF sites. The NSNFP will address needs in four distinct areas of SNF management:

- Solutions for safe, efficient packaging and shipment technologies
- Solutions for safe, interim storage, and ultimate disposition at a repository
- Solutions for obtaining adequate SNF information
- Compliance with safety and regulatory requirements.

2.2.1.1 Safe, Efficient Packaging and Shipment. According to the *Memorandum of Agreement for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste*, EM will design and fabricate a standardized DOE SNF canister to accommodate the more than 200 types of DOE

SNF. The NSNFP will support the development of the preliminary design, and DOE sites will be responsible for procurement of the canister and shipment.

The NSNFP will also perform research and technology development to support the SNF canister and DOE SNF shipments as needed. A remote welding and nondestructive examination process for closure welds is a technology needs example for safe packaging.

The NSNFP will prepare information about DOE SNF in support of the OCRWM acquisition of a transportation system to move DOE SNF to the repository. NSNFP will support EM in providing OCRWM information on DOE SNF critical to the acquisition of the transportation system.

Based on the robustness of the DOE Standardized Canister the NSNFP will prepare a topical report as a means to obtain Nuclear Regulatory Commission review and approval for crediting the DOE Standardized Canister as a leak-tight boundary in the criticality analyses prescribed by 10CFR71.55 for both normal transport and hypothetical accident conditions.

2.2.1.2 Safe, Interim Storage and Repository Disposal. The NSNFP will perform materials science research to address the common materials-related risks of interim storage at DOE SNF sites and repository disposal for the DOE SNF. At the present, these include:

- Developing a long-term corrosion-resistant advanced neutron absorber for components such as canister baskets
- Evaluating canister performance through materials aging, corrosion, degradations, and chemical reactivity testing.

2.2.1.3 SNF Information. Consistent with the licensing strategy, the NSNFP must collect and evaluate DOE SNF information to increase confidence and minimize risk during the management of that fuel. The NSNFP will maintain a single source of technical information for all DOE SNF. The technical information will include isotopic information along with other information about mode of storage and physical location.

2.2.1.4 Compliance with Safety and Regulatory Requirements. The NSNFP will facilitate or perform research and contribute analysis in the following areas. This will minimize the risks associated with DOE SNF handling, transport, and disposal at the repository and will include:

- Design basis event analysis to identify possible accident scenarios associated with the handling and management of SNF at the repository and propose appropriate protection for those events
- Total system performance assessment to forecast the behavior of DOE SNF at the proposed repository and for the regulatory time periods
- Criticality analysis to examine criticality safety of DOE SNF and to establish control methods.

2.2.2 Objective 2—Ensure DOE SNF Acceptance Criteria Are Established

The NSNFP will provide a unified approach to the DOE SNF sites to prepare their fuel for transport to a repository. The NSNFP will provide guidance to DOE SNF sites to prepare fuel for transport and repository acceptance that is consistent with OCRWM requirements. It will also define the form and contents of the information package being shipped to the repository. The NSNFP will work with OCRWM to establish an acceptable information package for DOE SNF.

The program will provide the planning and integration to execute and conduct the necessary repository analyses and activities required to support the final disposal of DOE SNF. The NSNFP will support OCRWM information needs in the following areas to address repository acceptance requirements as they apply to DOE SNF:

- Postclosure performance
- Preclosure safety analysis
- Criticality analysis.

2.2.3 Objective 3—Ensure Repository License Includes DOE SNF and HLW

The NSNFP will closely support the needs of the repository program to achieve safe and timely disposal of DOE SNF and HLW. The NSNFP will support OCRWM in identifying the needed information, interfaces, acceptance criteria, and compliance procedures for license application and construction authorization of the repository and for the transportation system necessary to transfer DOE SNF and HLW. Specific goals to meet this objective include:

- Ensuring that DOE SNF and HLW are included in the repository design and documents
  - Environmental Impact Statement (1997–2000)
  - Viability Assessment (1998)
  - Site Recommendation (2001)
  - License Application (2008)
- Supporting EM in coordinating and facilitating the repository document reviews
- Ensuring that DOE SNF and HLW are acceptable for repository receipt
- Simplifying and minimizing characterization requirements for geological disposition of DOE SNF and HLW
- Ensuring SNF and HLW information meets requirements
- Assisting DOE SNF and HLW sites with repository-ready interim storage issues
- Codisposing highly enriched uranium SNF with HLW as a base case
- Supporting activities related to the shipment technologies for DOE SNF and HLW
- Ensuring OCRWM acceptance for a standardized DOE SNF canister to package fuel during transport and storage
- Establishing a licensing basis considering bounding analyses and performance-based criteria.

2.2.4 Objective 4—Provide Management, Integration, and Communication

The NSNFP will provide the policies, strategies, and programs for management of DOE SNF. It will coordinate DOE SNF program activities to establish the safest, most cost-effective path for interim storage and treatment while awaiting transportation to a geological repository.

The NSNFP will provide for the management direction and integration of NSNFP activities. The NSNFP will provide the planning, measurements, controls, and reporting needed to ensure its objectives are accomplished. NSNFP will maintain an OCRWM-accepted QA program.

The NSNFP will support the development of an integrated acceptance schedule for SNF and HLW receipt at the repository. It will also work with OCRWM to perform total system modeling of SNF and HLW shipment and receipt at the repository to establish the most cost effective and efficient receipt schedule.

The NSNFP will establish mechanisms to facilitate communication with DOE-EM, OCRWM, DOE SNF sites, and the stakeholders. Teleconferences, technical exchange meetings, Web pages, integrated schedules, the DOE SNF database, and other mechanisms will be used to prompt effective communication to address DOE SNF issues.

2.2.5 Objective 5—Address DOE HLW Handling and Management Needs

The NSNFP will develop a FY 2007 budget to support EM in coordinating the interface between the DOE HLW organizations, EM HQ, and OCRWM. NSNFP will incorporate into existing activities, as described in the above objectives, or add new activities as appropriate to support DOE HLW needs that are more effectively performed using the centralized resources available within the NSNFP. NSNFP will perform activities to coordinate communications and support EM interfaces with OCRWM, provide analyses requested by EM, and develop plans to optimize DOE HLW handling performance.

The NSNFP will perform analyses supporting the management of HLW and other waste forms for DOE sites and headquarters. The program will provide coordination of HLW issues through bi-monthly teleconferences and interactions with sites managing HLW. To ensure consistent, traceable information for repository design, the NSNFP will continue to be the single point of contact for information requests from the Yucca Mountain repository program.

The NSNFP has analyzed the impact of EM-waste forms, such as HLW calcine and Cs/Sr capsules, for direct disposal in the repository. Additional work will be needed in the area of waste form and waste optimization to support efficient disposal of HLW.

3. MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

Operating from the DOE Idaho Operations Office (DOE-ID), the NSNFP organization supports the SNF and HLW Program missions through the Office of Regulatory Compliance (EM-10) and the Office of Planning and Budget (EM-30) within the Office of Environmental Management (EM-1). Figure 1 illustrates the NSNFP management hierarchy and organization.

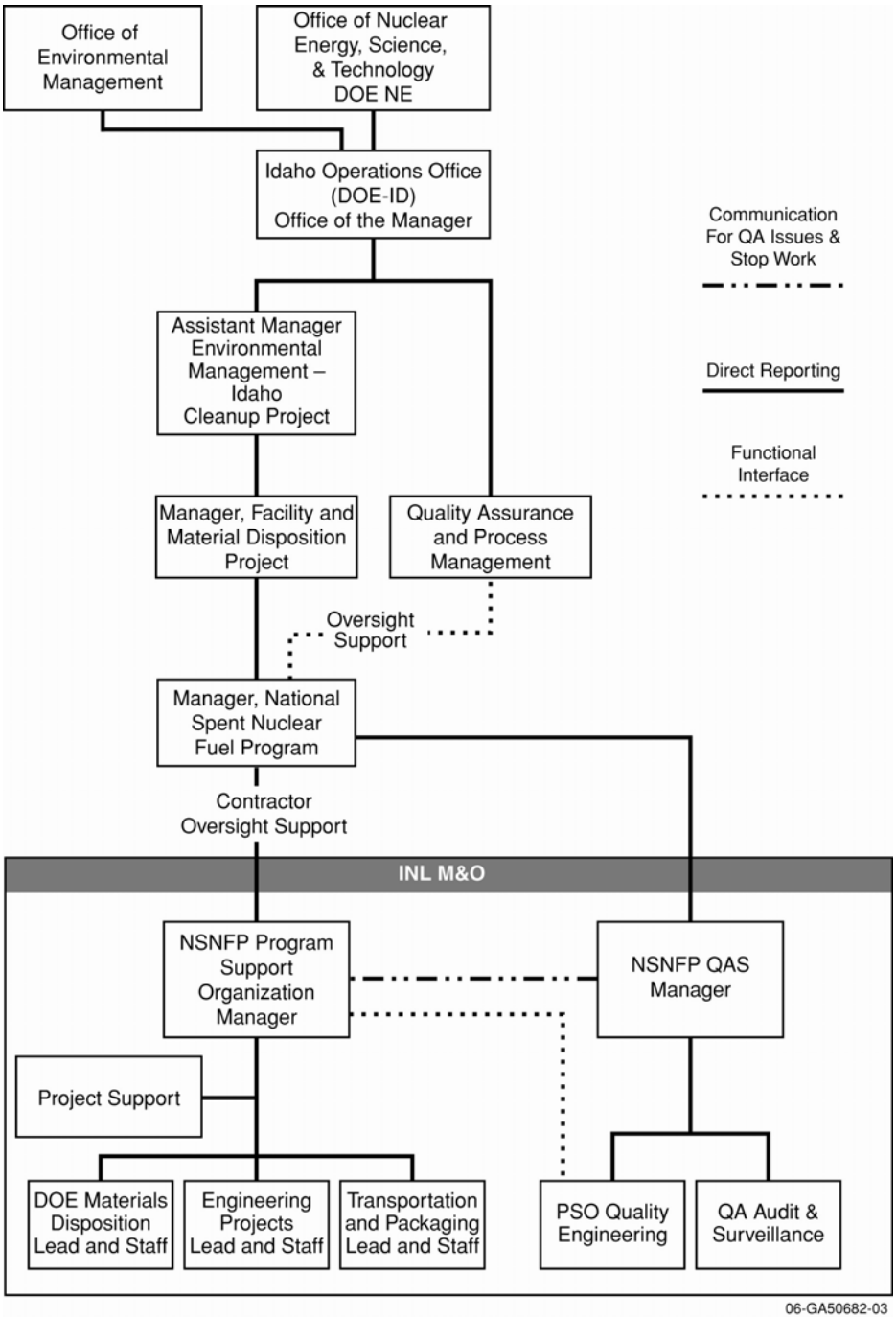


Figure 1. NSNFP management and organization.

3.1 National Spent Nuclear Fuel Program Manager, DOE-ID

The NSNFP Manager resides at the DOE-ID office and interfaces with the Manager of DOE-ID, DOE-EM, DOE sites, and OCRWM representatives for overall policy and direction. The NSNFP Manager establishes the responsibilities and authorities of the NSNFP organizations and management and oversees the implementation of the NSNFP technical work tasks through approved detailed work plans and performance indicators. The NSNFP Manager establishes and maintains an organizational structure to implement the NSNFP QA Program described by the Quality Assurance Program Plan (QAPP). The NSNFP Manager uses the NSNFP Quality Assurance Staff (QAS) and other appropriate resources to oversee effectively the activities of the NSNFP Program Support Organization (PSO).

Through DOE-ID, the NSNFP Manager requests funding from DOE-EM to support its program plan. The NSNFP Manager integrates and coordinates activities with the DOE SNF sites, with other DOE Operations Offices, and OCRWM. The NSNFP Manager oversees research and technology development that provides solutions for DOE SNF management. The NSNFP Manager:

1. Approves the NSNFP QAPP and the Program Management Plan including:
   - The management and structure of the NSNFP organization
   - The NSNFP QA Program Policy directing mandatory compliance with the NSNFP QA Program.
2. Establishes and maintains an organizational structure to implement the NSNFP
3. Establishes the responsibilities and authorities of the NSNFP organizations and management
4. Ensures a QA organization for program assessments is established and maintained and is sufficiently independent from cost and schedule
5. Directs the preparation of controlled QA program implementing documents for acceptance by the OCRWM Office of Quality Assurance (OQA). The documents describe the internal and external organizational interfaces, organizational structures, requirements, and responsibilities.
6. Assigns NSNFP technical work tasks to the PSO through approved budget and contract documents
7. Periodically monitors assignments made to the NSNFP QAS Manager (QASM) to ensure that the QASM has no other assigned responsibilities that would prevent full attention to QA matters
8. Establishes methods to escalate differences of opinion involving the NSNFP QA Program through the NSNFP management chain to obtain resolution
9. Participates in the development and approval of MOAs between the DOE EM Program and OCRWM
10. Approves NSNFP QA program implementing procedures
11. Interfaces with other DOE and federal organizations
12. Is responsible for the flow down of Licensing Support Network requirements and certification of NSNFP compliance.

3.2 NSNFP Program Support Organization Manager (Management and Operating [M&O] Contractor)

The NSNFP PSO Manager directs program activities of the NSNFP to implement the policy and direction provided by the NSNFP Manager. By direct action or through assignment, the NSNFP PSO Manager:

1. Actively interfaces with the NSNFP Manager regarding program policy, and performance and QA matters

2. Approves program management documentation and detailed work plans, life-cycle plans, and schedules

3. Establishes and maintains the organizational structure to implement the NSNFP

4. Assists in the establishment and maintenance of the NSNFP QAPP

5. Creates NSNFP Program QA documents including procedure drafts and provides support for processing those documents for approval and use by the NSNFP

6. Creates procedures with integrated quality engineering functions

7. Establishes processes for training coordination, document control, records management for use by the NSNFP, and staffs those functions

8. Determines training and qualification needs of the PSO staff

9. Adheres to and requires all PSO staff to adhere to the NSNFP Program Policy directing mandatory compliance with the NSNFP QA Program

10. Establishes the internal responsibilities and authorities of the PSO staff

11. Assigns NSNFP technical work tasks to PSO technical leads

12. Approves procurement requisitions for items and services from the private sector that are within the PSO scope established by budget baseline documents

13. Generates responses to deficiencies identified during independent assessments in accordance with approved processes

14. Supports the performance of assessments in accordance with NSNFP procedures

15. Interfaces with the PSO Quality Engineer (QE), NSNFP QASM, or the NSNFP Manager to resolve QA issues

16. Ensures that staff is aware of and complies with Licensing Support Network requirements.

3.2.1 The PSO Technical Lead

As represented by the work breakdown structure (WBS), support tasks that contribute to the objectives of the NSNFP are grouped by work package. The PSO Manager assigns a group of tasks to a

PSO technical lead, who in turn delegates individual tasks to PSO staff members. The PSO technical staff interfaces with PSO support staff to perform the technical work in accordance with approved NSNFP procedures. The PSO Technical Lead:

1. Provides guidance and direction to the PSO staff for assigned tasks

2. Participates in document reviews as stipulated by NSNFP procedures

3. Performs work in accordance with NSNFP procedures

4. Oversees development and maintenance of NSNFP Work Planning/Quality Program Applicability Evaluations for the group of assigned tasks

5. Approves NSNFP-generated Task Management Agreements associated with the group of assigned tasks

6. Approves NSNFP-generated technical documents associated with the group of assigned tasks

7. Coordinates annual performance evaluations of active suppliers.

3.2.2 The PSO Technical Staff

The NSNFP PSO staff works under the direction of the NSNFP PSO Manager. The organization supports the NSNFP mission by directing the research and technology development activities, and coordinating and integrating crosscutting functions with the DOE SNF and HLW sites, OCRWM, and other DOE organizations as requested by the NSNFP Manager. The functions of the NSNFP PSO technical staff are as follows:

1. Prepare program management documentation and detailed work plans, plan and schedule integrated DOE SNF and HLW activities, track program commitments, support the program's systems engineering approach, provide general technical support, and participate in technical working group activities

2. Prepare life-cycle planning documentation and funding request documents consistent with site schedules and repository planning documents

3. Perform work in accordance with NSNFP procedures

4. Prepare documents in accordance with NSNFP procedures and interface with the PSO support staff and PSO Manager or the appropriate technical lead to issue approved documents

5. Participate in formal reviews of documents prepared by others

6. Prepare Task Management Agreements associated with assigned tasks

7. Prepare procurement requisitions for items and services from the private sector that are within the scope of the assigned task

8. Interface with the approved procurement service to facilitate or perform actions within the NSNFP-approved processes established by the procurement service

9. Provide day-to-day internal and external coordination for NSNFP/supplier interactions and formal communication to suppliers supporting assigned tasks

10. Participate in the initial acceptance of suppliers to the NSNFP and annual supplier performance reviews of each active supplier associated with assigned tasks

11. Accept the products of suppliers on behalf of the PSO based on internal PSO reviews

12. Prepare and submit records stipulated by NSNFP procedures, including records submittal to the Licensing Support Network when required

13. Support the development and recommendation of implementation strategies for NEPA, NRC, and other regulatory requirements; assist with the technical preparation and review of NEPA documents; and assist with the complex-wide programmatic review of NEPA documents

14. Address complex-wide SNF and HLW vulnerabilities and safety issues by researching, assisting in preparing, reviewing, and recommending approval and concurrence with such studies and documents

15. Implement and maintain a complex-wide SNF database that contains information on the quantity, condition, type, location, origin, and enrichment of all SNF within the DOE inventory.

16. Direct the research, development, and testing of treatment, shipment, and disposal technologies for all DOE SNF and HLW

17. Prepare technology integration plans, support waste analysis activities, assist with performance assessments and acceptance criteria, and develop stabilization technologies

18. Recommend safe, cost-effective, and technologically appropriate interim storage approaches and budgetary strategies; support assessments on existing storage facilities; and integrate detailed transportation plans on how DOE SNF and HLW is to be moved and the routes to be used

19. Provide technical assistance to meet and resolve NSNFP issues related to the QA requirements.

3.2.3 The PSO Quality Engineer

1. Participates in the establishment of procedures and processes

2. Assists in the generation of responses to deficiencies identified during independent assessments in accordance with processes established or approved by the NSNFP and as, applicable, implements the approved responses

3. Plans and performs assessments as assigned by the NSNFP QASM in accordance with NSNFP procedures when independent of the activity being assessed

4. Interfaces with the PSO staff, PSO Manager, or QASM to resolve QA issues

5. Provides guidance to the PSO staff for QA Program implementation and seeks interpretations from the NSNFP QASM as necessary to support the PSO

6. Participates in document reviews as stipulated by NSNFP procedures

7. Performs work in accordance with NSNFP procedures

8. Participates in the development and maintenance of NSNFP Work Planning/Quality Program Applicability Evaluations

9. Reviews NSNFP-generated task management agreements

10. Reviews NSNFP-generated technical documents

11. Participates in annual performance evaluations of active suppliers

12. Prepares draft implementing documents in accordance with NSNFP procedures and interfaces with the PSO support staff and PSO Manager during document development

13. Interfaces with the approved procurement service to facilitate or perform QE-related actions within the NSNFP-approved processes established by the procurement service

14. Coordinates with NSNFP QAS during the initial acceptance of NSNFP suppliers and annual supplier performance reviews of each active supplier

15. Participates in reviews for acceptance of the products from suppliers as stipulated by NSNFP procedures

16. Prepares QA records or reviews QA records prepared by others.

3.2.4 The PSO Support Staff

3.2.4.1 NSNFP Training Coordinator.

1. Performs work in accordance with NSNFP procedures

2. Interfaces with the NSNFP Manager; the NSNFP QASM; and the PSO Manager to establish training and qualification needs for their respective staffs

3. Facilitates verification of experience for NSNFP personnel and NSNFP staff augmentation personnel

4. Tracks training and qualification status and reports delinquencies or omissions to the respective managers

5. Interfaces with document preparers/requesters to confirm applicable training has been accomplished prior to entering a document into the review cycle

6. Interfaces with NSNFP personnel to confirm applicable training requirements are met prior to releasing a new or revised document or adding personnel to existing distribution lists.

3.2.4.2 NSNFP Document Control Coordinator.

1. Performs work in accordance with NSNFP procedures

2. Interfaces with the NSNFP Manager, the NSNFP QASM, and the PSO Manager and their staffs to establish controlled document distribution for their respective documents

3. Prepares tables of content for the *NSNFP Documents Manual*

4. Coordinates placement of NSNFP documents on NSNFP Web sites and makes hard copy distribution of selected documents

5. Controls document numbering to provide a unique numbering scheme for NSNFP documents

6. Provides records management support to the NSNFP in accordance with procedures

7. Safeguards NSNFP records and supports records turnover to others as authorized by the NSNFP Manager

8. Enforces limits and controls for access to NSNFP records

9. Maintains a NSNFP file guide list for NSNFP records, including QA records, and makes the list available to NSNFP personnel.

3.3 NSNFP Quality Assurance Staff Manager (M&O Contractor)

The NSNFP QASM directly supports the NSNFP Manager, DOE-ID. The NSNFP QASM assigns work tasks to the QAS and performs the following functions:

1. Participates in the development of the NSNFP QA program implementing documents including the NSNFP QAPP, the NSNFP Quality Assurance Requirements and Description (QARD) Requirements Matrix, and NSNFP procedures

2. Adheres to and requires all QAS personnel to adhere to the NSNFP policy directing mandatory compliance with the NSNFP QA Program

3. Freely communicates with senior management positions within the NSNFP

4. Determines training and qualification needs of QAS personnel and provides confirmation that the needs have been met

5. Provides QA program assessments (internal audits and surveillances)

6. Establishes internal controls and external interfaces for QA program oversight

7. Assigns tasks to the NSNFP QAS and monitors the NSNFP QAS for performance to baseline documents

8. Maintains a process to evaluate significant conditions adverse to quality and administer stop work actions if required.

3.3.1 NSNFP QAS Personnel

1. Performs assigned work in accordance with NSNFP procedures

2. Provides draft procedures and processes for approval

3. Adheres to the NSNFP policy directing mandatory compliance with the NSNFP QA Program

4. Generates responses to deficiencies identified during independent assessments in accordance with approved processes and implements the approved responses

5. Interfaces with PSO QE, the PSO Manager, and the NSNFP Manager, as applicable to resolve QA issues

6. Participates in assigned document reviews

7. Prepares QA records or reviews QA records prepared by others

8. Performs assigned audits and surveillances.

4. NSNFP INTERFACES

The NSNFP interfaces with a number of key participants to perform the DOE SNF and HLW mission. Each participant provides an important function in the success of the NSNFP mission and the ultimate disposition of DOE SNF and HLW. Figure 2 illustrates the primary NSNFP interfaces.

The primary interface for the disposition of DOE SNF and HLW occurs through the *Memorandum of Agreement for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste*. This document defines this interface along with the responsibilities of EM and OCRWM with regard to SNF and HLW. The MOA establishes the terms and conditions under which OCRWM will make available disposal services to EM for all DOE SNF and HLW. The MOA was established between two main offices of DOE, the Office of Environmental Management (EM-1) and the Office of Civilian Radioactive Waste Management (RW-1).

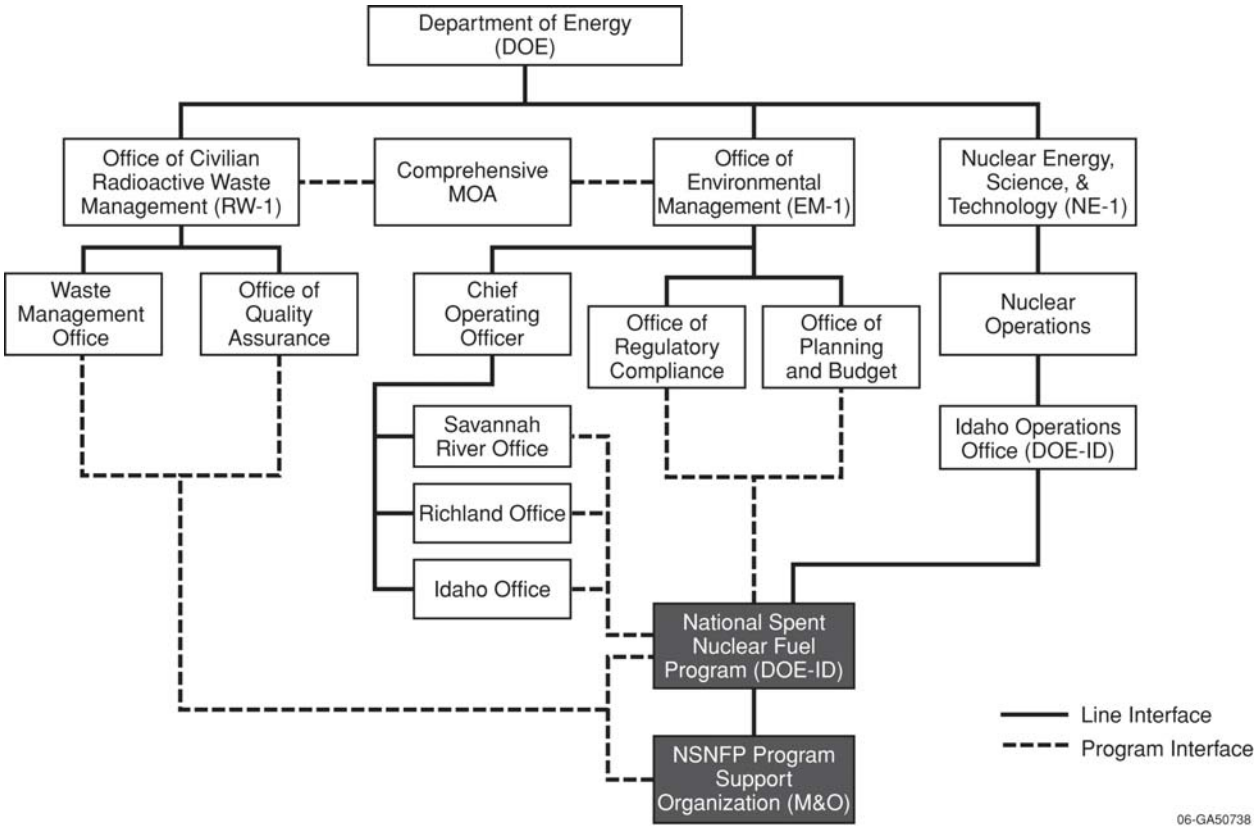


Figure 2. NSNFP interfaces.

4.1 NSNFP and Supporting Organizations

4.1.1 NSNFP

The NSNFP Manager interfaces with several organizations to effectively achieve the NSNFP mission. The NSNFP defines its responsibilities and authorities through a technical interface with the Office of Regulatory Compliance (EM-10), the Office of Planning and Budget (EM-30), and a direct line management interface with DOE-ID. The NSNFP also plans and negotiates budget allocation through DOE-ID. The NSNFP provides strategic direction and oversight to the NSNFP PSO to be formalized in

detailed work planning. It provides guidance to all DOE SNF and HLW sites for technical matters related to repository acceptance.

In addition, the NSNFP interfaces with OCRWM regarding matters related to the terms and conditions listed in the MOA mentioned above and all matters related to DOE SNF inclusion in the repository. The NSNFP QAPP defines the interfaces of the NSNFP for quality-related matters.

4.1.2 NSNFP Program Support Organization

The NSNFP PSO is accountable to the DOE-ID NSNFP Manager for implementing work scope defined through the Detailed Work Plan. The WBS of the Detailed Work Plan is described in Section 5 of this document. The NSNFP PSO interfaces with OCRWM, its M&O Contractor, and the OCRWM lead laboratory on technical matters related to the acceptance of DOE SNF as agreed to with the NSNFP Manager.

The NSNFP PSO also interfaces with the DOE SNF and HLW sites on technical matters regarding characterization, packaging, storage, and shipment of SNF and HLW. Issues are addressed through strategic meetings, conference calls, and topical meetings and calls. Interfaces related to quality matters are defined in detail in the NSNFP QAPP.

4.1.3 NSNFP Quality Assurance Staff

The NSNFP QASM communicates with senior management positions within the NSNFP and DOE-ID. The QASM interfaces with the OCRWM Office of Quality Assurance to clarify QA program requirements and maintains approval of the NSNFP QA Program. Detailed interfaces related to QA are defined in the NSNFP QAPP.

4.2 Office of Environmental Management

The Assistant Secretary for EM originally assigned the interface for the NSNFP to the Office of Nuclear Material and Spent Fuel (EM-21). This is now a shared responsibility with the Office of Regulatory Compliance (EM-10) and the Office of Planning and Budget (EM-30).

4.3 Office of Civilian Radioactive Waste Management

The OCRWM Office of the Director has been delegated overall responsibility for carrying out the functions of the Secretary of Energy as prescribed in the Nuclear Waste Policy Act, as amended. The Office of the Director is responsible for providing leadership in developing and implementing strategies to accomplish the program's mission in a manner that ensures public and worker health and safety, protects the environment, merits public confidence, and is economically viable. The OCRWM Director delegates to OQA the responsibility of the QA functions for the OCRWM program.

4.3.1 Office of Quality Assurance

The OQA has the responsibility of the QA functions for the OCRWM program and oversees the implementation of the QARD, DOE/RW-0333P. In conjunction with EM, OQA oversees QA activities for the NSNFP by:

- Ensuring that a QA program that meets regulatory and management requirements is established, maintained, and effectively executed

- Verifying that activities subject to the QARD have been correctly performed by reviews, surveillance, and audits (compliance and performance based), or other means of verification, as appropriate.

The OQA relies upon the DOE EM/RW QA Oversight Team to perform activities to ensure that EM contractor QA programs are in compliance with QARD requirements. The Oversight Team is normally led by an EM representative. The Oversight Team is responsible for audits, surveillances, site QA program qualification, corrective action tracking, corrective action closure verification, and functioning as the OCRWM OQA interface with DOE SNF sites.

4.4 DOE SNF Field Offices

The DOE field offices and their contractors interface with the NSNFP on matters of coordination and integration of DOE SNF activities. The field offices/sites include the Savannah River Site, the Hanford Site, and INL. Site contractors implement the actions that result from the coordination activities. Interfaces with the NSNFP specifically address:

- Coordinating and establishing DOE sites' SNF and HLW disposal effort using an integrated shipping schedule
- Identifying and addressing national DOE SNF and HLW issues such as characterization and packaging
- Establishing successful SNF and HLW disposal strategies.

4.5 External Interfaces

In addition to the external interfaces already discussed above, the NSNFP interfaces with numerous organizations external to the DOE SNF and HLW Program to ensure successful completion of the NSNFP mission and to establish opportunities to apply SNF and HLW solutions to address other waste issues.

4.5.1 Other Federal Agencies

The NSNFP supports OCRWM as it interfaces with the NRC for repository licensing. This support to OCRWM provides the means to ensure DOE SNF and HLW are fully incorporated in the license application documents.

4.5.2 Industrial Standards Organizations

The NSNFP has technical experts participating on committees for both the American Society of Mechanical Engineers and the American Society for Testing and Materials. Through these committee members, the NSNFP is applying SNF and HLW expertise to address national issues while working to ensure these standards address the material science and canister needs of the program.

4.5.3 Other DOE National and Waste Programs

The NSNFP has established interfaces with other waste and national programs to find integrated solutions to the common needs of these programs. The NSNFP management coordination of both DOE SNF and HLW programs due to their many overlapping issues has resulted from such interfaces. Other interfaces are being established with other programs to share solutions and find efficient ways to address their common issues (e.g., transportation and packaging and the transuranic waste program activities).

5. SUMMARY WORK SCOPE

5.1 Work Breakdown Structure

Figure 3 is the NSNFP Project WBS, a product-oriented hierarchy of the work and products.

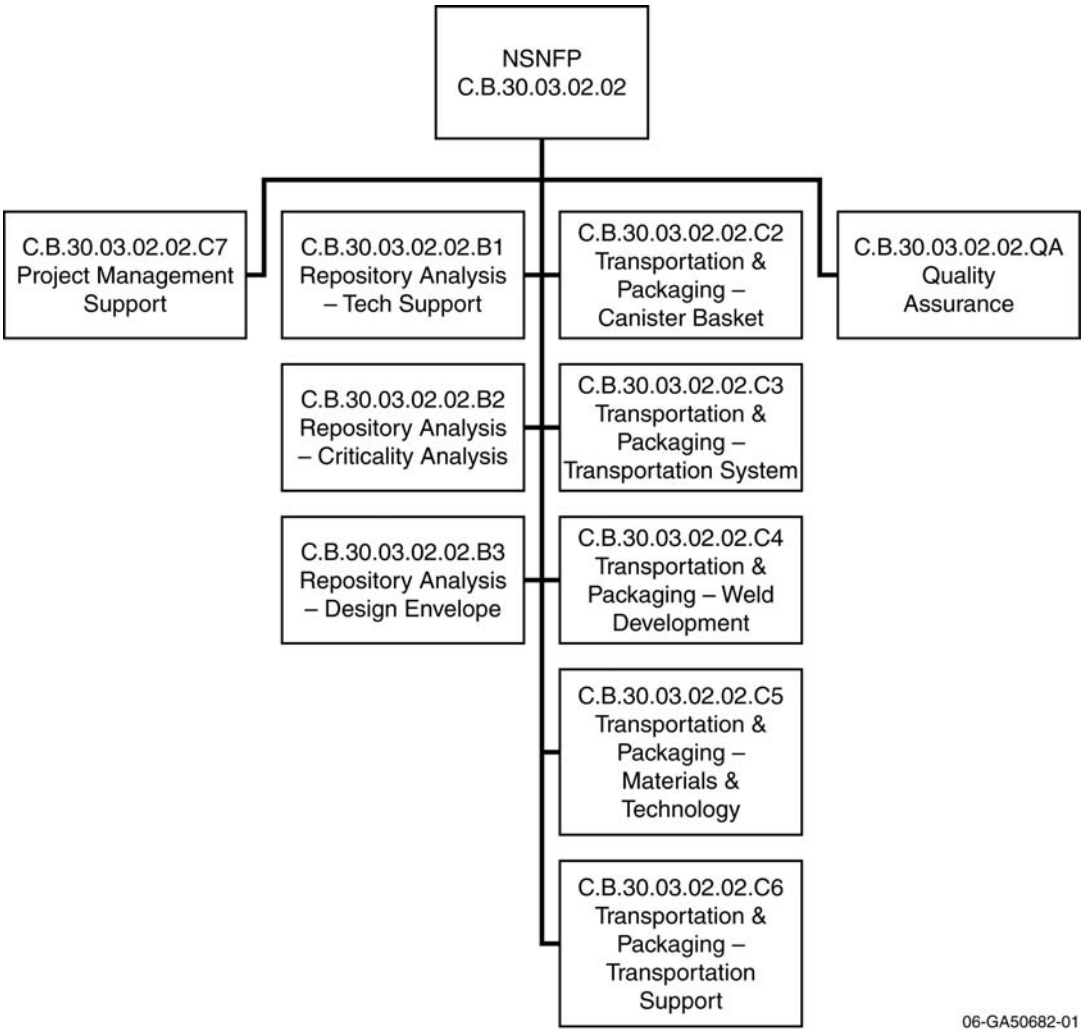


Figure 3. NSNFP work breakdown structure.

5.2 Work Breakdown Structure Dictionary

This section provides a brief description of each of the elements defined in the WBS. A summary of the Fiscal Year 2007 Detailed Work Plan budget, schedule, and milestones is provided in Appendix A of this document.

5.2.1 Control Account Level

C.B.30.03.02.02—National Spent Nuclear Fuel Program. The objective of the NSNFP is to define and ensure resolution of all associated issues for the characterization, safe interim storage, and proper final disposition of all DOE SNF and HLW. The technical strategy of the NSNFP is to develop

innovative approaches and products designed to move DOE SNF and HLW closer to final disposition. The following work scope comprises the NSNFP.

The NSNFP work scope includes program management for the NSNFP for the inclusion of DOE SNF and HLW in the repository programs site evaluation, design, and licensing activities. This work directly supports commitments made between DOE-EM and OCRWM regarding the scope of activities that are required under the repository licensing criteria in 10 CFR Part 63. The program management effort includes the preparation of program planning documentation, management and integration planning, development and conduct of strategic planning meetings, monthly budget and schedule reports, funding documentation, program tracking systems inputs, monthly program performance reviews, interactions with an independent QAS, records management processes and systems, maintenance of reference libraries, and program control documentation. Particular focus is given to coordinating and facilitating DOE sites SNF and HLW disposal efforts, managing national DOE SNF and HLW issues, and interfacing with the Yucca Mountain Repository Program.

Repository Analysis performs specific analyses for DOE SNF and HLW to support inclusion in the repository programs licensing activities including waste acceptance. This work directly supports commitments made between DOE-EM and OCRWM regarding the scope of analyses that are required under the repository licensing criteria in 10 CRF Part 63. The types of analyses to be performed support preclosure and postclosure criticality safety; waste package thermal, structural, and radiation shielding analyses; compatibility with the repository environment; preclosure safety analysis; and postclosure total system performance assessment for DOE SNF and HLW. Work planning and documentation under this activity requires close interface with DOE's OCRWM Yucca Mountain Repository Program, which defines the requirements to be satisfied and serves as the primary outside customer for the work performed. Additional tasks include modeling, analysis, and experimentation to evaluate any unique characteristics of DOE SNF and HLW waste forms. Additionally, evaluation and modeling of the chemical reactivity potential of sodium-bonded SNF will be performed. Under this work, a detailed SNF database is maintained and updated to support DOE plans for ultimate disposition of DOE SNF.

Transportation and Packaging directly supports commitments made between DOE-EM and OCRWM regarding the scope activities that are required under the repository licensing criteria in 10 CFR Part 63. The NSNFP will provide standardized canister design input data for the packaging, interim storage, shipment, and disposal of SNF in accordance with the MOA between the Office of EM and the OCRWM. (Note: Others are providing the design of the standardized canister). Material testing will be performed to validate material properties used in the analysis. Additional testing will be performed to ensure the analytical models are valid for canister performance during preclosure events. Developments affecting the design, loading, and handling aspects will be communicated to user organizations. Support will be provided to OCWRM to defend the canister design to the NRC, particularly in the area of low probability of breach during a drop event. Based on the robustness of the DOE Standardized Canister, the NSNFP will prepare a topical report as a means to obtain Nuclear Regulatory Commission review and approval for crediting the DOE Standardized Canister as a leak-tight boundary in the criticality analyses prescribed by 10CFR71.55 for both normal transport and hypothetical accident conditions. An evaluation of the transportability of the multi-canister overpack (MCO) will continue. The MCO was originally designed for transportation in the vertical position at the Hanford site. Disposal in the repository will require its transportation in the horizontal position to meet highway and rail overhead restriction. Support will be provided to OCRWM for the acquisition of a cask transportation system to ship DOE SNF and HLW from the DOE custodial sites to the repository. An interface between OCRWM and the sites on transportation issues will be provided. Remote welding and nondestructive examination will be pursued to perform the final closure weld of the standardized canister. Advanced Neutron Absorber development in support of packaging, transportation, and disposal is performed as part of the materials work scope.

NSNFP QA provides a trained and qualified QAS to support the NSNFP to develop and maintain the NSNFP QA Program and provide QA oversight and quality engineering support for the NSNFP organization. It provides a QE to support the quality affecting activities performed by NSNFP technical staff and ensure that those activities are performed in accordance with the NSNFP QA program implementation documents and the OCRWM QARD, DOE/RW-0333P.[7] The NSNFP QA program is approved by OCRWM. OCRWM mandates that the NSNFP maintain compliance with the QARD to ensure compliance with the regulatory requirements. Maintaining compliance with regulatory requirements will allow the ultimate acceptance and disposal of DOE SNF at the licensed repository.

6. QUALITY ASSURANCE

The NSNFP QAPP describes the NSNFP QA policy, the NSNFP organization structure, the internal and external QA interfaces, the general QA program principles applicable to the scope for the NSNFP mission, and the roles and responsibilities of the NSNFP with respect to QA. The NSNFP adopts QARD principles for engineering and design-related activities intended to guide the development of a path forward for successful disposition of DOE SNF. Work performed by the NSNFP that will be relied on to develop design requirements is subject to the QARD. The NSNFP implements QA requirements by complying with NSNFP implementing procedures. The NSNFP is routinely audited by EM and OCRWM to ensure compliance and program effectiveness.

The NSNFP policy is to institute, implement, and maintain an effective QA program in all aspects of its work that may affect the safety and protection of workers, the public, or the environment. The NSNFP QA Program has been developed with these objectives in mind as defined in the QAPP.

7. REFERENCES

1. DOE, *Memorandum of Agreement for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste*, Rev. 1, between the Assistant Secretary for DOE-EM, Washington, D.C., and the Director of DOE-RW, Washington, D.C., January 1999.

2. DOE, *Action Memorandum to Approve Transfer of Responsibility of the Design, NRC Certification, and Fabrication of the Transportation Cask System*, July 2002.

3. Frank Marcinowski, Deputy Assistant Secretary for Logistics and Waste Disposition enhancements, DOE-HQ letter to Beth Sellers, Manager Idaho Operations Office, DOE-ID, "FY 2005 Guidance for the National Spent Nuclear Fuel Program," May 2, 2005.

4. DOE, *Department of Energy's Record of Decisions for Programmatic Spent Nuclear Fuel and Idaho National Engineering Laboratory, Environmental Restoration and Waste Management Programs*, as amended, March 1996.

5. DOE, Consent Order (PSC 1995) for spent nuclear fuel among the State of Idaho, the U.S. Navy, and the U.S. Department of Energy, October 1995.

6. DOE, *Idaho High-Level Waste & Facilities Disposition Final Environmental Impact Statement*, DEO/EIS-0287, September 2002.

7. DOE, *Quality Assurance Requirements and Description*, Rev. 17, Office of Civilian Radioactive Waste Management DOE/RW-0333P, May 8, 2006.

Appendix A

FY 2007 Detailed Work Plan Summary

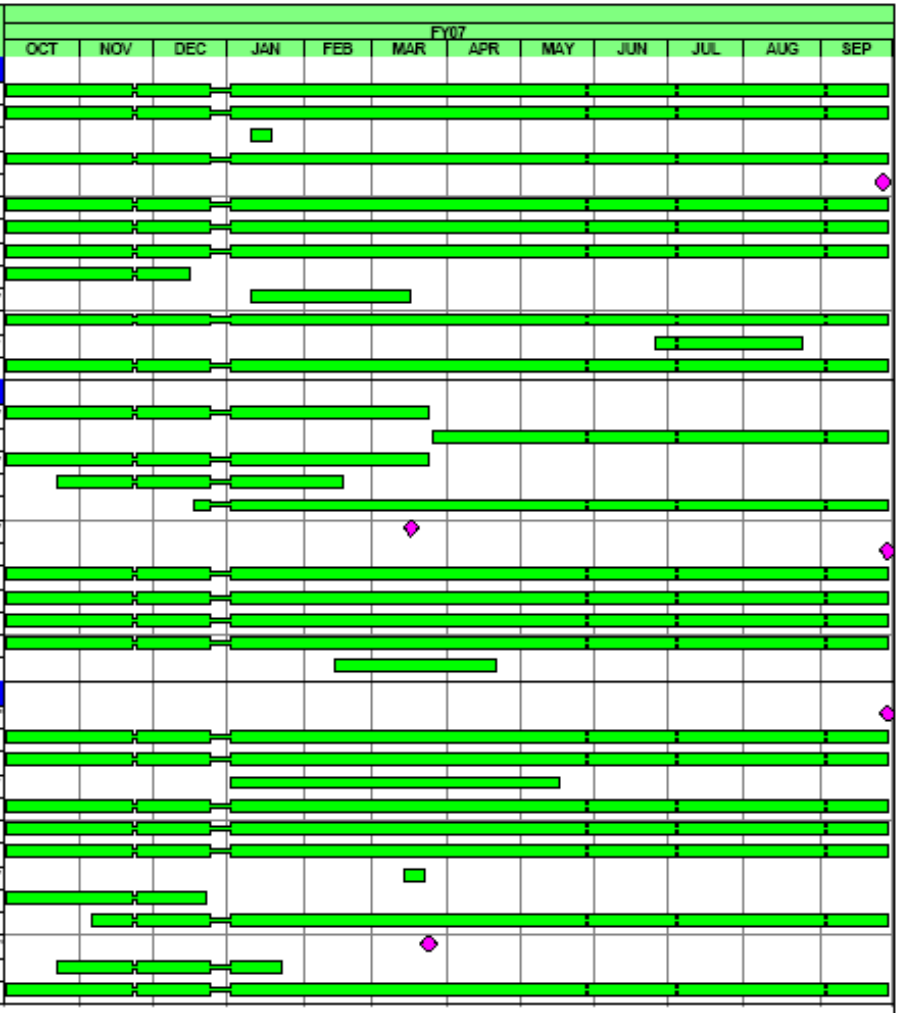
Appendix A

FY 2007 Detailed Work Plan Summary

The following pages provide a summary of the National Spent Nuclear Fuel Program Detailed Work Plan for Fiscal Year 2007. Included are the Project Plan Budget Reports, summary schedules, and milestones. The Detailed Work Plan is a living document with changes documented through a formal change control process. The Detailed Work Plan reflects the planning budget and is subject to change based on actual funding allocated during the fiscal year.

WBS[7]	OCT 2006	NOV 2006	DEC 2006	JAN 2007	FEB 2007	MAR 2007	APR 2007	MAY 2007	JUN 2007	JUL 2007	AUG 2007	SEP 2007	Cumulative
C.B.30.03.02.02.B1 Repository Analysis-Tech Support	101,698	141,246	129,080	131,749	146,814	179,876	147,021	146,620	170,003	127,841	177,910	161,363	1,761,221
C.B.30.03.02.02.B2 Repository Analysis-Criticality Analysis	28,256	75,754	69,349	74,134	78,343	56,661	46,026	43,927	50,933	37,734	52,557	48,958	662,632
C.B.30.03.02.02.B3 Repository Analysis-Design Envelope	87,621	123,580	113,178	117,303	126,522	99,040	82,902	82,232	92,258	68,349	95,199	89,118	1,177,301
C.B.30.03.02.02.C2 Transportation & Packaging-Canister Basket	61,511	88,423	80,947	82,724	89,894	111,218	93,541	93,286	108,168	80,138	111,619	103,976	1,105,446
C.B.30.03.02.02.C3 Transportation & Packaging-Transportation System	8,362	12,021	11,005	11,246	12,221	15,120	12,764	12,729	14,760	10,935	15,230	14,187	150,580
C.B.30.03.02.02.C4 Transportation & Packaging-Weld Development	43,426	62,427	57,149	58,403	63,465	78,520	31,447	23,786	27,579	20,432	28,459	26,510	521,602
C.B.30.03.02.02.C5 Transportation & Packaging-Materials & Technology	75,334	106,215	95,379	99,500	107,527	135,420	108,198	109,930	134,736	103,088	143,583	133,752	1,352,662
C.B.30.03.02.02.C6 Transportation & Packaging-Transportation Support	24,307	33,278	30,464	31,133	33,831	41,856	35,293	35,197	40,810	30,234	42,111	39,228	417,742
C.B.30.03.02.02.C7 Project Management Support	42,441	58,105	53,193	54,360	59,072	73,085	61,473	61,305	71,082	52,661	73,348	68,326	728,452
C.B.30.03.02.02.QA Quality Assurance	41,283	56,520	51,741	52,877	57,460	71,091	60,034	59,870	69,420	51,431	71,634	66,729	710,092
Total	514,240	757,568	691,484	713,430	775,149	861,887	678,701	668,882	779,750	582,843	811,649	752,148	8,587,731

Activity ID	Activity Description	Early Start	Early Finish
Repository Analysis-Tech Support			
BQ02B110	On Site Engineer FY07 NSNFP Liason	02OCT06*	28SEP07
BQ02B115	SFD FY07 Traceability	02OCT06	28SEP07
BQ02B11T	On Site Engineer FY07 NSNFP Liason-Travel	10JAN07*	18JAN07
BQ02B120	FY07 Spent Fuel Database Software Upgrade	02OCT06	28SEP07
BQ02B122	Issue Revised Version of Spent Fuel Database		26SEP07
BQ02B135	Respond to Data Request-FY07	02OCT06	28SEP07
BQ02B140	Respond to Emerging Issues-FY07	02OCT06	28SEP07
BQ02B145	Licensing Support-FY07 LA Defense	02OCT06	28SEP07
BQ02B146	Licensing Support-FY07 LA Defense Travel	02OCT06	15DEC06
BQ02B14T	Respond to Emerging Issues-FY07-Travel	10JAN07*	16MAR07
BQ02B150	Licensing Support-Dev FY07 WA Criteria	02OCT06	28SEP07
BQ02B15T	Licensing Support-Dev FY07 WA Criteria Travel	25JUN07*	24AUG07
BQ02B160	Licensing Support-FY07 Safeguards Analysis	02OCT06	28SEP07
Repository Analysis-Criticality Analysis			
BQ02B205	Dev Design Specs for Type 1a /Type 5 TRIGA Bskt	02OCT06	23MAR07
BQ02B210	Develop design spec for other basket	26MAR07*	28SEP07
BQ02B211	Identify Bead requirements	02OCT06	23MAR07
BQ02B215	TRIGA Criticality Analysis	23OCT06	16FEB07
BQ02B216	ID Match/Balancing Issues for SNF Loading	18DEC06*	28SEP07
BQ02B217	Complete TRIGA SNF Criticality Analysis		16MAR07
BQ02B218	Complete Revision Report Canister/Basket Loading		28SEP07
BQ02B220	Continue Devlopment for Canister Basket Fisslie	02OCT06	28SEP07
BQ02B225	Support Transportation Criticality Activities	02OCT06	28SEP07
BQ02B230	Identify and Establish Nuclear Paramaters	02OCT06	28SEP07
BQ02B235	Support NRC License Application of DOE SNF	02OCT06	28SEP07
BQ02B23T	Support NRC License Application of DOESNF Travel	14FEB07*	20APR07
Repository Analysis-Design Envelope			
BQ02B305	Complete DOE-SNF Dose Contributions Evaluation		28SEP07*
BQ02B30A	Evaluate DOE-SNF Dose Contributions	02OCT06	28SEP07
BQ02B30B	Source Term-Develop Info Refinements	02OCT06	28SEP07
BQ02B30T	Evaluate DOE-SNF Dose Contributions-Travel	02JAN07*	16MAY07
BQ02B31A	PCSA-RW	02OCT06	28SEP07
BQ02B31C	0PCSA-Respone to RW Inof	02OCT06	28SEP07
BQ02B31D	TSPA-RW	02OCT06	28SEP07
BQ02B31E	Source Term-Develop Info Refinements-Travel	15MAR07*	22MAR07
BQ02B32F	Na Bonded SNF Define Analysis Paramiters	02OCT06	22DEC06
BQ02B32G	PCSA-Respone to RW Inof-Travel	06NOV06	28SEP07
BQ02B332	Complet Installation of Modeling Software		23MAR07
BQ02B33H	Na Bonded SNF Survey Software and Procure	23OCT06	22JAN07
BQ02B34J	Bonded SNF Chemical Reaction	02OCT06	28SEP07



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Finish Date 19NOV07
Data Date 20NOV06
Run Date 27NOV06 13:56

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Progress Bar
Critical Activity

NSNF
Sheet 1 of 2

Nuclear Materials Disp & Eng 07

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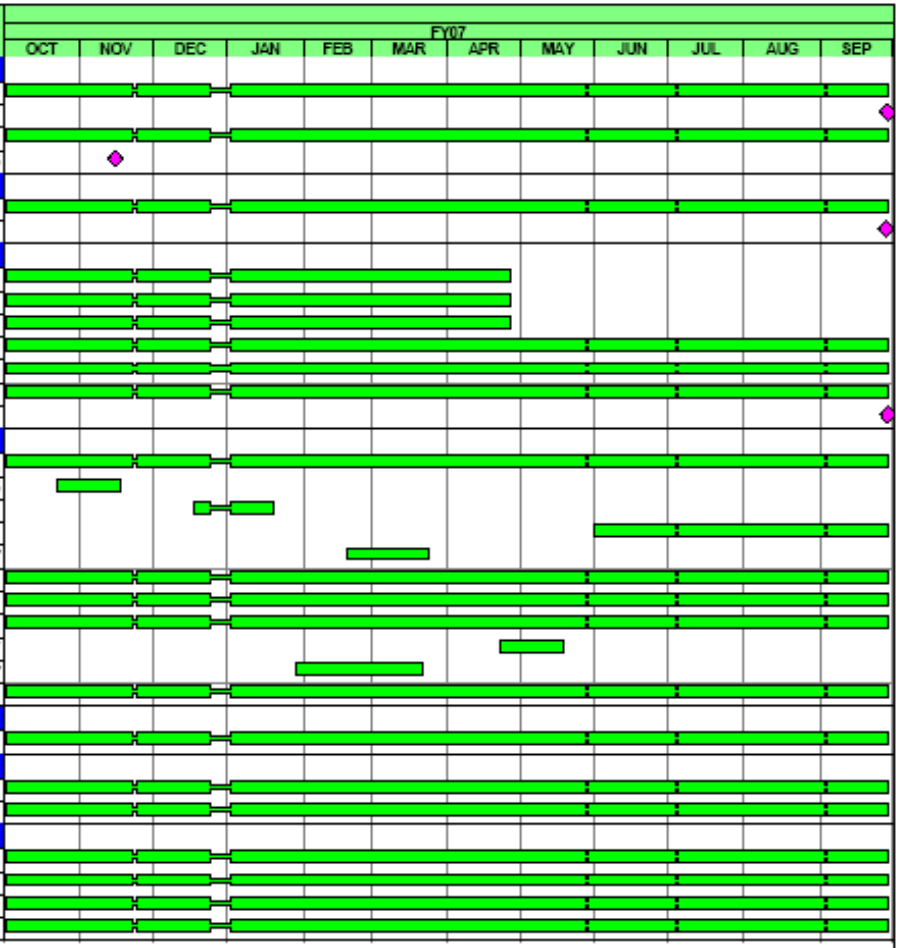
Activity ID	Activity Description	Early Start	Early Finish
Transportation & Packaging-Canister Basket			
BQ02C215	Complete Standardized Canister Topical Rpt	02OCT06A	28SEP07
BQ02C219	Submit NRC Topical Report		28SEP07
BQ02C220	Weld Material Evaluation (Canister)	02OCT06A	28SEP07
BQ02C222	Complete Finite Element Analysis		15NOV06
Transportation & Packaging-Transportation System			
BQ02C320	MCO Transportability-Top Head Fix	02OCT06	28SEP07
BQ02C322	Complete MCO Transportability Analysis		27SEP07
Transportation & Packaging-Weld Development			
BQ02C405	Fabricate and Build Welding End	02OCT06A	26APR07
BQ02C410	Start Software Testing and Deviopment	02OCT06A	26APR07
BQ02C415	Visual Exam Procedure and Development	02OCT06A	26APR07
BQ02C420	Develop Operating Procedures	02OCT06A	28SEP07
BQ02C421	Write System Test Plan	02OCT06A	28SEP07
BQ02C425	Conduct System Tests	02OCT06A	28SEP07
BQ02C427	Demonstrate NDE System for DOE SNF Canister		28SEP07
Transportation & Packaging-Materials & Technolog			
BQ02C505	ASME Code Case	02OCT06	28SEP07
BQ02C50T	ASME Code Case-Travel Nov	23OCT06	17NOV06
BQ02C51T	ASME Code Case-Travel Jan	18DEC06*	19JAN07
BQ02C520	Microstructure Characterization	01JUN07*	28SEP07
BQ02C52T	ASME Code Case-Travel Mar	19FEB07*	23MAR07
BQ02C530	Forming and Welding	02OCT06	28SEP07
BQ02C535	Neutronic Qualification	02OCT06	28SEP07
BQ02C537	Procure Ingot	02OCT06	28SEP07
BQ02C53T	ASME Code Case-Travel May	23APR07*	18MAY07
BQ02C54T	Procure Ingot-Travel	29JAN07*	21MAR07
BQ02C550	Mechanical Process Development	02OCT06	28SEP07
Transportation & Packaging-Transportation Suppor			
BQ02C605	Transportation Integration	02OCT06	28SEP07
Project Management Support			
BQ02C700	Project Management Support	02OCT06	28SEP07
BQ02C710	Records Management and Training	02OCT06	28SEP07
Quality Assurance			
BQ02QA05	QA Oversight	02OCT06	28SEP07
BQ02QA10	Quality Engineering	02OCT06	28SEP07
BQ02QA15	Program Maintenance	02OCT06	28SEP07
BQ02QA20	Regulatory Coordination & Facilitation	02OCT06	28SEP07



Start Date 02OCT06
Finish Date 19NOV07
Data Date 20NOV06
Run Date 27NOV06 13:56

Early Bar
Progress Bar
Critical Activity

NSNF
Sheet 2 of 2

Nuclear Materials Disp & Eng 07

Classic Schedule Layout

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