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National Spent Nuclear Fuel Program

Program Management Plan

December 2000

U.S. Department of Energy
Assistant Secretary for Environmental Management
Office of Nuclear Material and Spent Fuel

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Rev. 0

Program Management Plan

December 2000

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Manager

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National Spent Nuclear Fuel Program
EM-21 Team Lead

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 *DOE-Owned Spent Nuclear Fuel Strategic Plan*; the spent nuclear fuel agreement among the State of Idaho, 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 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

AM-EM	Assistant Manager for Environmental Management
AM-OTS	Assistant Manager for Technical Support
CRWM	Civilian Radioactive Waste Management
DOE	U.S. Department of Energy
DOE-HQ	U.S. Department of Energy – Headquarters
DOE-ID	U.S. Department of Energy – Idaho Operations Office
DOE-OR	U.S. Department of Energy – Oak Ridge Office
DOE-RL	U.S. Department of Energy – Richland Office
DOE-SR	U.S. Department of Energy – Savannah River Office
DOT	U.S. Department of Transportation
EM	Office of Environmental Management
FRR	foreign research reactor
GTCC	Greater-than-Class C
INEEL	Idaho National Engineering and Environmental Laboratory
M&O	Management and Operations Contractor
MOA	Memorandum of Agreement
MOX	mixed oxide
NEPA	National Environmental Policy Act
NMFA	Nuclear Materials Focus Area
NPD	National Spent Nuclear Fuel Program Director
NRC	U.S. Nuclear Regulatory Commission
NSNFP	National Spent Nuclear Fuel Program
OCRWM	Office of Civilian Radioactive Waste Management
QA	quality assurance

QARD	Quality Assurance Requirements Description
ROD	record of decision
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 *DOE-Owned Spent Nuclear Fuel Strategic Plan*,[1] the spent nuclear fuel (SNF) agreement among the State of Idaho, 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*.[2] It is also consistent with DOE policies and the decisions made through the National Environmental Policy Act (NEPA) process. This document provides NSNFP's organization, management, and plans for achieving its role in the ultimate disposition of DOE SNF.

1.1 Background

For many years the DOE produced SNF to support its various missions and programs. The process DOE used to manage this material was to chemically separate strategic material such as uranium or plutonium from the waste. As the need for uranium and plutonium decreased, however, it became necessary to store the DOE SNF, which was not easily reprocessed, for extended periods of time. DOE had not intended for these SNFs to be in long-term storage.

In 1992, DOE decided to discontinue reprocessing SNF to recover strategic materials. Both the facilities used for storage, and the fuel 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 SNF long-term disposition are made and implemented (per the *DOE-Owned Spent Nuclear Fuel Strategic Plan*).

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 research reactors and from foreign research reactors (FRRs) to be managed by DOE.

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 management all DOE SNF and associated facilities not addressed by the DOE Office of Civilian Radioactive Waste Management (OCRWM). OCRWM's mission is to develop and manage a federal system for disposing of all commercial SNF, DOE SNF, and high-level radioactive waste resulting from atomic energy defense activities. EM is responsible for the management policy and process to prepare DOE SNF for transport and repository acceptance.

In June 1995, DOE issued the Record of Decision (ROD) 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*.[3] The ROD selected "Alternative 4A, Regionalization by Fuel Type" as the chosen option. This ROD was modified to agree with the Consent Order (PSC 1995)[4] issued on October 17, 1995, modifying the SNF shipments to and from the State of Idaho.

The amended version of the ROD mandates consolidation of all existing and newly generated SNF at three DOE sites 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 to the Idaho National Engineering and Environmental Laboratory (INEEL) for treatment.

- Naval fuel will be shipped to the INEEL for examination and interim storage.

- Nonaluminum-clad fuels will be consolidated at the INEEL, except Fort St. Vrain fuel, which is in Colorado and will remain there.

- Aluminum-clad fuels will be consolidated at the Savannah River Site.

1.2 Purpose of the NSNFP

In October 1995, the SNF settlement agreement (Consent Order PSC 1995) among the State of Idaho, the DOE, and the U.S. Navy designated the 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 this role, the NSNFP works with OCRWM, the Savannah River Site, the INEEL, the Hanford Site, and the Oak Ridge National Laboratory to:

- Achieve safe and timely disposal of DOE SNF

- Address national DOE SNF issues by identifying data needs, interfaces, and acceptance criteria and developing compliance procedures

- Support OCRWM during the license application process to the U.S. Nuclear Regulatory Commission (NRC)

- Develop a transportation system necessary to transfer DOE SNF to an OCRWM facility.

The MOA for repository acceptance of DOE SNF further defined the role of the NSNFP. Through the MOA, the NSNFP works with OCRWM to seek to achieve safe and timely disposal of DOE SNF by identifying data needs, interfaces, and acceptance criteria. In addition, NSNFP and OCRWM work to develop compliance procedures needed to support both the geologic repository construction authorization and license application to the NRC and the transportation system necessary to transfer DOE SNF to an OCRWM repository.

1.2.1 Purpose of the Program Management Plan

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

- Defines the mission and objectives of the NSNFP

- Defines the organization of the NSNFP including its management and structure

- Explains the interfaces among DOE-Headquarters (DOE-HQ), the DOE field sites, OCRWM, and related projects

- Summarizes the planning process including schedules, milestones, and the budget process

- Addresses the management strategies for key projects within the NSNFP.

The NSNFP requires the integrated efforts of DOE-HQ, 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 and DOE Order 430.1A, *Life Cycle Asset Management*.[5]

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 mission is to provide the technology and guidance needed to ensure safe, efficient handling, characterization, and disposition of DOE-owned SNF.

2.2 Objectives

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

- Objective 1 – Address research, development, and testing needs
- Objective 2 – Ensure DOE SNF acceptance criteria is established
- Objective 3 – Ensure repository license includes DOE SNF
- Objective 4 – Provide management, integration, and communication.

2.2.1 Objective 1¾ Address Research, Development, and Testing Needs

The NSNFP directs the research, development, and testing of treatment, shipment, and disposal technologies for all DOE SNF. The NSNFP is challenged to help ensure safe, effective management of SNF generated from 55 DOE, university, and other domestic sites, and FRRs. With more than 250 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 of the DOE SNF.

The NSNFP collaborates with other 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 of the DOE SNF sites. The NSNFP will address needs in four distinct areas of SNF management:

- Solutions for safe, efficient packaging and transportation
- Solutions for safe, interim, and long-term storage
- Solutions for accurate characterization
- Compliance with safety and regulatory requirements.

2.2.1.1 Safe, Efficient Packaging and Transportation

Per the *Memorandum of Agreement for Acceptance of Department of Energy Spent Nuclear Fuel and High-Level Radioactive Waste*, EM will subcontract and manage design, obtain NRC certification, and fabricate a transportation cask system to transport DOE SNF. The NSNFP will complete this task for EM and support the DOE SNF sites transportation needs.

In addition, this same MOA requires EM to design and fabricate a standardized DOE SNF canister to accommodate the more than 250 types of DOE SNF. The NSNFP will subcontract and manage the preliminary design, and DOE sites will be responsible for procurement of the canister.

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

2.2.1.2 Safe, Interim and Long-term Storage

The NSNFP will perform materials science research to address the common materials-related risks of interim and long-term storage for the DOE SNF sites. Immediate issues requiring materials science research include:

- Research on SNF degradation and release rate testing
- Development of a long-term corrosion-resistant advanced neutron absorbers for components such as canister baskets
- Materials aging, corrosion, degradations, and chemical reactivity testing to maximize canister performance.

2.2.1.3 Accurate Characterization

The NSNFP must refine DOE SNF data to increase confidence and minimize risk during the management of that fuel. The NSNFP will maintain an accurate and verifiable single source of data for all DOE SNF. The data will include isotopic information along with other information about mode of storage and physical location.

The NSNFP will develop technology to refine DOE SNF characterization data using advanced nondestructive analysis. This technology will enhance existing data by providing fissile mass, radiation source term, and fissile isotopic content without disturbing the fuel.

2.2.1.4 Compliance with Safety and Regulatory Requirements

The NSNFP will perform research and analysis in the following areas to minimize the risks associated with DOE SNF handling, transport, and storage :

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

Predictive analyses provide necessary data to support repository license application and safe SNF operations.

2.2.2 Objective 2¾ Ensure DOE SNF Acceptance Criteria are Established

The NSNFP will provide a unified approach to the DOE SNF sites to prepare their fuel for acceptance to a repository. The NSNFP will provide guidance to DOE SNF sites to prepare fuel for transport and acceptance that is consistent with OCRWM requirements. It will also define the form and contents of the data package being shipped to the repository. The NSNFP will work with OCRWM to establish an acceptable data 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 data needs in the following areas to address repository acceptance requirements as they apply to DOE SNF:

- Postclosure performance
- Preclosure integrated safety assessment
- Criticality analysis.

2.2.3 Objective 3¾ Ensure Repository License Includes DOE SNF

The NSNFP will closely support the needs of the repository program. This interaction is necessary to achieve safe and timely disposal of DOE SNF. The NSNFP will support OCRWM in identifying the needed data, 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. Specific goals to meet this objective include:

- Ensure the DOE SNF is included in the repository design and documents
  - Environmental Impact Statement (1997-2000)
  - Viability assessment (1998)
  - Site Recommendation (2001)
  - License Application (2002)
- Ensure DOE SNF is acceptable for repository receipt
- Simplify and minimize characterization requirements for geological disposition of DOE SNF
- Ensure characterization data meet requirements
- Provide repository-ready interim storage where feasible
- Codispose highly enriched uranium SNF with high-level waste as a base case
- Design, certify, and fabricate a transportation cask system for DOE SNF
- Design a standardized DOE SNF canister to package fuel during transport and storage

- Establish a licensing basis with fuel groupings, bounding analyses, and performance-based criteria.

2.2.4 Objective 4¾ 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, treatment, and transportation to a geological repository.

The NSNFP will provide for the management direction and integration NSNFP activities. The NSNFP will provide the planning, measurements, controls, and reporting needed to ensure its objectives are accomplished.

The NSNFP will establish mechanisms to facilitate communication with DOE-EM, OCRWM, DOE SNF sites, the National SNF Quality Assurance (QA) Program, and the stakeholders. Teleconferences, strategy meetings, web pages integrated schedules, the DOE SNF database, and other mechanisms will be used to prompt effective communication to address DOE SNF acceptance issues.

3. MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

The NSNFP is organized under the Deputy Assistant Secretary for the Office of Integration and Disposition (EM-20) within the Office of Environmental Management (EM-1). Figure 1 illustrates the NSNFP management hierarchy and organization.

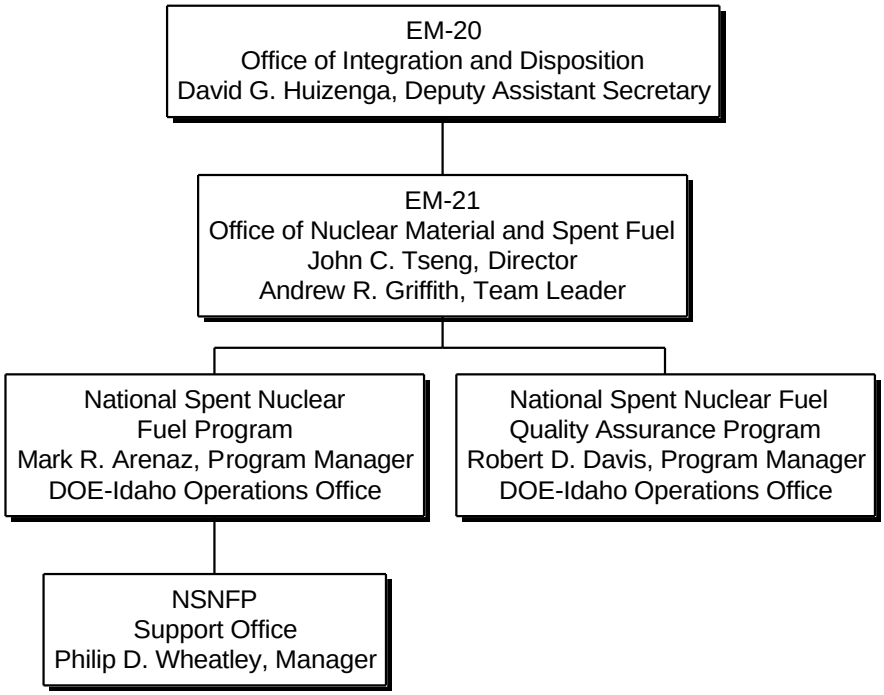

Figure 1. NSNFP management and organization.

3.1 Office of Integration and Disposition (EM-20)

The Office of Integration and Disposition (EM-20) is responsible for promoting, enabling, and expediting site closure and project completion. EM-20 conducts and provides multi-site services that facilitate the timely, coordinated, safe, and cost-effective disposition of nuclear materials and waste, and the deactivation and decommissioning of excess contaminated facilities. Because interdependencies exist between DOE sites and between EM and other DOE programs, EM-20 conducts technical integration activities to develop integrated policy, planning, and technical and analytical guidance and assistance for the EM program. These activities include disposition strategies for nuclear materials and waste as well as provide services that promote, enable, and expedite disposition and closure. EM-20 identifies disposition pathways for excess nuclear materials, SNFs, legacy and remediation wastes; analyses options with stakeholder input and facilitates decision-making between offices and programs. EM-20 also implements multi-site services such as support for pollution prevention/waste management analyses, deactivation and decommissioning efforts, lessons learned and technology transfer activities, transportation, transuranic waste disposal at the Waste Isolation Pilot Plant, and the FRR SNF acceptance program.

3.2 Office of Nuclear Material and Spent Fuel (EM-21)

The Office of Nuclear Material and Spent Fuel (EM-21) directly reports to the Office of Integration and Disposition (EM-20). The EM-21 office integrates DOE's activities relating to nuclear materials stewardship in order to achieve safe, stable states for interim and long-term storage pending disposition. The EM-21 office also provides guidance and assistance to other EM organizations with site operations responsibilities for safe and efficient management of the current and future inventory of DOE SNF and preparation of the SNF for disposal. The EM-21 office performs the following functions specifically related to the NSNFP:

- Develops and helps to implement policies, strategies, and programs for management of DOE SNF for interim storage, treatment, and eventual transportation to a geologic repository
- Coordinates DOE SNF program activities with other DOE elements; including Operations Offices; Defense Programs; Environment, Safety, and Health; Materials Disposition; Nuclear Energy, Science, and Technology; and Arms Control and Nonproliferation
- Coordinates with the OCRWM on behalf of the NSNFP, Headquarters Program Offices, and Operations Offices, on issues and activities related to the acceptance of DOE SNF for repository disposal
- Provides liaison with national regulatory agencies and review bodies such as the NRC, National Academy of Sciences, and Nuclear Waste Technical Review Board on issues directly related to DOE SNF
- Provides technical assistance to senior management in dealing with day-to-day issues on SNF, in particular, responding to action items and inquiries from throughout DOE, Congress, and national organizations.

3.3 National Spent Nuclear Fuel Program

The DOE-Idaho Operations Office (DOE-ID) at the INEEL manages the NSNFP and requests funding to support the program consistent with life cycle plans. The INEEL was designated the lead support laboratory reporting to the Office of Nuclear Material and Spent Fuel. This position is further defined as part of the Consent Order between the State of Idaho, DOE, and the Navy. The NSNFP performs the EM-21 functions related to DOE SNF listed above. The NSNFP integrates and coordinates activities with the DOE SNF sites and with other DOE Operations Offices, and OCRWM. The NSNFP also performs a significant research and technology development role to provide solutions for DOE SNF management.

3.4 NSNFP Support Office

The NSNFP Support Office works with the NSNFP to achieve its mission. The NSNFP supports the NSNFP functions described above. It directs the research and technology development activities and performs the coordination and integration functions with the DOE SNF sites, OCRWM, and other DOE organizations as requested by the NSNFP. The functions of the NSNFP Support Office are as follows:

- Prepares program management documentation and NSNFP detailed work plans, plans and schedules integrated DOE SNF activities, tracks program commitments, supports the Program's systems engineering approach, provides general technical support, and participates in technical working group activities

- Prepares life cycle planning documentation and funding request documents consistent with site schedules and repository planning documents

- Supports the development and recommendation of implementation strategies for NEPA, NRC, and other regulatory requirements; assists with the technical preparation and review of NEPA documents; and assists with the complexwide programmatic review of NEPA documents

- Addresses complexwide SNF vulnerabilities and safety issues by researching, assisting in preparing, reviewing, and recommending approval/concurrence with such studies and documents

- Implements and maintains a complexwide SNF database that contains information on the quantity, condition, type, location, origin, and enrichment of all SNFs within the DOE inventory

- Directs the research, development and testing of treatment, shipment, and disposal technologies for all DOE SNF

- Prepares technology integration plans, supports waste analysis activities, assists with performance assessments and acceptance criteria, and develops stabilization technologies

- Recommends safe, cost-effective, and technologically appropriate interim storage approaches and budgetary strategies, supports assessments on existing storage facilities, integrates detailed transportation plans on how DOE SNF is to be moved and the routes to be used

- Provides technical quality assistance to meet and resolve NSNFP issues related to the QA requirements

- Establishes and maintains quality record documents and quality training records.

3.5 National Spent Nuclear Fuel Quality Assurance Program

The National SNF QA Program is also managed by DOE-ID for EM-21. This program maintains an independent position from the NSNFP and was established to ensure OCRWM quality requirements are consistently implemented within the NSNFP and the DOE SNF sites. The National SNF QA Program functions include:

- Obtaining OCRWM acceptance of the National SNF QA Program

- Maintaining National SNF QA Program documents

- Interfacing with the OCRWM QA staff to address SNF QA issues

- Performing internal audits and surveillances, and ensuring that quality related technical activities meet the requirements of the National SNF QA Program

- Reviewing and acceptance of DOE SNF site QA programs for the characterization, conditioning, storage, and packaging of SNF.

4. NSNFP INTERFACES

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

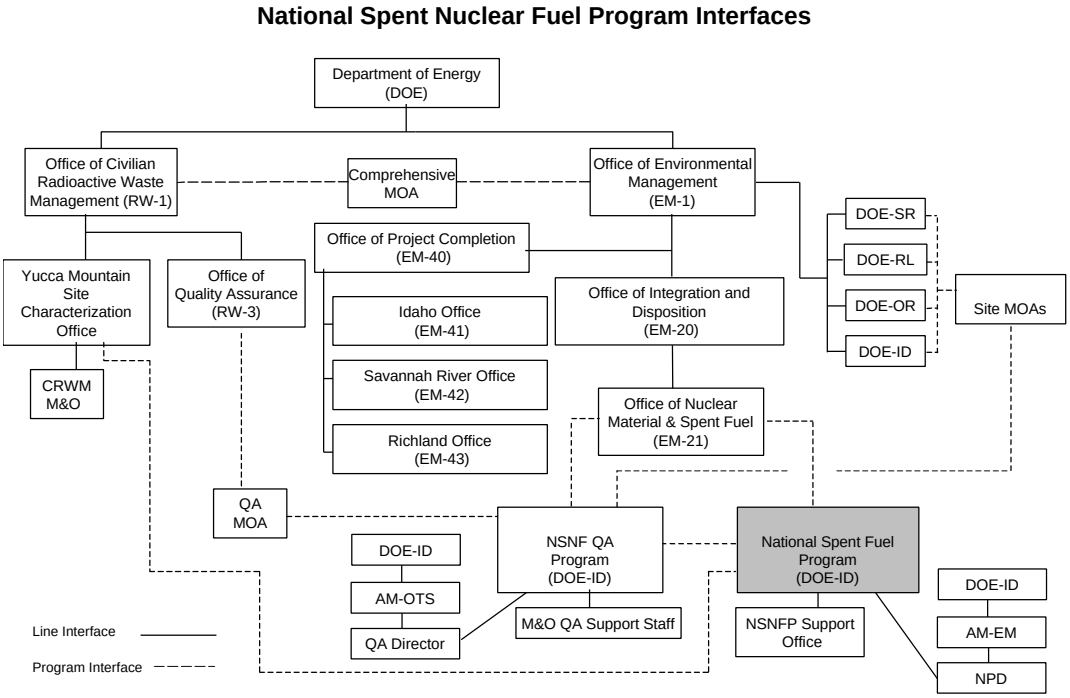

Figure 2. NSNFP interfaces.

4.1 DOE-HQ

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

4.1.1 Office of Environmental Management

The Assistant Secretary for EM assigned the responsibilities for the NSNFP to the Office of Nuclear Material and Spent Fuel (EM-21) who reports directly to the Deputy Assistant Secretary of Integration and Disposition (EM-20).

The Assistant Secretary for EM also has the authority over the site field offices responsible for final disposition of their SNF.

The Office of Project Completion (EM-40) is responsible for funding the NSNFP. The NSNFP interfaces with EM-40 by providing budget request documentation. EM-40 allocates their funding authorization based on the priority of the work defined in the budget request documents.

4.1.1.1 NSNFP

The NSNFP Program Manager, DOE-ID Operations Office, is delegated responsibility for the NSNFP. The NSNFP Program Manager reports to EM-21 Spent Fuel Team Lead on matters related to the NSNFP. The NSNFP Program Manager provides functional direction to the NSNFP Support Manager. In addition, the NSNFP Program Manager directly interfaces with the Yucca Mountain Site Characterization Office with regard to the terms and conditions listed in the MOA mentioned above and all matters related to DOE SNF inclusion in the repository.

4.1.1.2 National SNF Quality Assurance Program

The OCRWM Director of Quality Assurance (RW-3) delegates authority to the National SNF QA Program to execute the QA function as described in Section 1.2.2 of the *Quality Assurance Requirements and Description* (QARD), DOE/RW-0333P[6] via a QA MOA. The manager of the National SNF QA Program functionally reports to the Office of Nuclear Material and Spent Fuel.

The National SNF QA Program must maintain independence from the NSNFP to address its functional requirements. It interfaces with the DOE field offices through QA MOAs established with each site. It also interfaces with the NSNFP in an independent oversight function.

4.1.2 Office of Civilian Radioactive Waste Management

The Director of OCRWM assigned to the manager of the Yucca Mountain Site Characterization Office the responsibility of determining if Yucca Mountain, Nevada, is a suitable site for a SNF and high-level radioactive waste repository.

4.1.2.1 Yucca Mountain Site Characterization Office

The manager of the Yucca Mountain Site Characterization Office is delegated responsibility of determining if Yucca Mountain, Nevada is a suitable site for a SNF and high-level radioactive waste repository. The manager of the Yucca Mountain Site Characterization Office directly interfaces with the NSNFP Manager with regard to the terms and conditions listed in the EM/RW MOA.

4.1.2.2 Office of Quality Assurance (RW-3)

The Director of the Office of Quality Assurance (RW-3) oversees the implementation of the QARD, DOE/RW-0333P by the National SNF QA Program.

4.2 DOE Field Offices

Four DOE field offices interface with the NSNFP on matters of coordination and integration of DOE SNF activities. The sites include the Savannah River Site, the Hanford Site, the Oak Ridge National Laboratory, and the INEEL. Interfaces with the NSNFP specifically address:

- The coordination and facilitation DOE sites' SNF disposal effort
- Identifying and addressing national DOE SNF issues
- Establishing successful SNF disposal strategies.

The DOE SNF operating programs interface with the National SNF QA Program via individual MOAs. The MOAs document the coordination of the National SNF QA Program with each of the sites. The MOAs also address the flow-down of technical requirements to the DOE operating sites and the implementation of those technical requirements.

4.3 External Interfaces

The NSNFP interfaces with numerous external organizations to ensure successful completion of the NSNFP mission and to establish opportunities to apply SNF solutions to address other waste issues.

4.3.1 Other Federal Agencies

The NSNFP interfaces with the NRC on matters related to the licensing and certification of the DOE SNF transportation cask system and the standardized DOE SNF canister. Early interfaces with the NRC help the NSNFP to fully understand licensing requirements and fully address those requirements. In addition, the NSNFP supports OCRWM as it interfaces with the NRC for repository licensing and certification. This support to OCRWM provides the means to ensure DOE SNF is fully incorporated in the license application documents.

The NSNFP also interfaces with the U.S. Department of Transportation (DOT) on matters concerning cask transportation. NSNFP personnel working on the DOE SNF transportation cask maintain DOT certification and constantly review DOT requirements and how they may affect the use of the SNF cask.

4.3.2 Industrial Standards Organizations

The NSNFP has people 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 expertise to address national issues while working to ensure these standards address the material science and canister needs of the program.

4.3.3 Other DOE National and Waste Programs

The NSNFP is initiating interfaces with other waste and national programs to find integrated solutions to the common needs of these programs. EM has many overlapping issues with its high-level waste program activities and the SNF activities. Interfaces are being established between these two programs to share solutions and find efficient ways to address their common issues.

The Greater-than-Class C Program (GTCC) may also benefit from technology solutions being applied to DOE SNF. The NSNFP and GTCC are exploring packaging options for GTCC waste. One option may be that the GTCC program uses the standardized DOE SNF canister.

The NSNFP manager is currently named the SNF product line manager for the Nuclear Materials Focus Area (NMFA). In this position, the NSNFP manager is able to identify and direct the SNF needs and perform a key role in the evaluations of NMFA proposals to meet those needs. In addition, the

NSNFP manager can provide long-lead information to the DOE SNF sites about requests for proposals. This position provides opportunities to the NSNFP and DOE SNF sites to leverage NMFA research funds (e.g., $3-5 million in FY 2003) to address SNF needs. The NMFA provides the gateway for NSNFP to participate in all Office of Science and Technology (EM-50) programs.

The NSNFP is also interfacing with EM Integration to establish a schedule for the transportation of DOE SNF to the repository.

5. SUMMARY WORK SCOPE

5.1 Work Breakdown Structure (WBS)

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

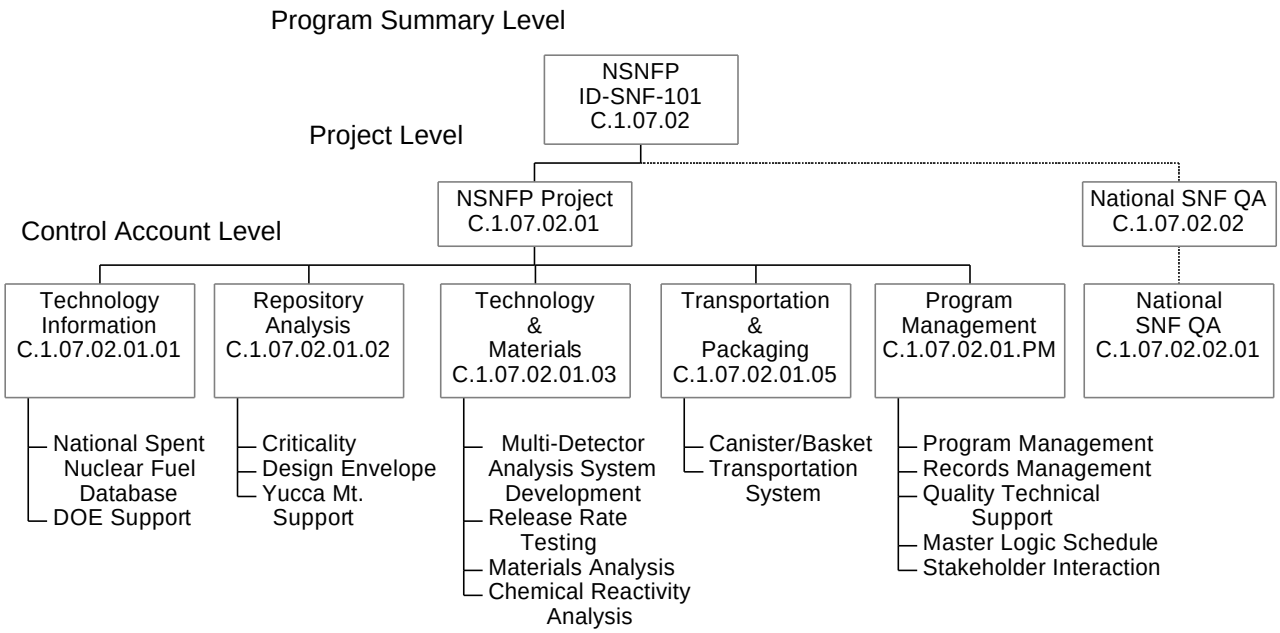

Figure 3. NSNFP work breakdown structure.

5.2 Work Breakdown Structure Dictionary

This section provides a brief description of each of the elements defined in the work breakdown structures.

5.2.1 Project Baseline Summary Level

C.1.07.02–National SNF Program - The NSNFP defines and ensures resolution of all associated issues for the characterization, safe interim storage, and proper final disposition of all DOE SNF. With the DOE SNF sites, OCRWM, and their Management and Operations (M&O) contractor, the NSNFP plans, integrates, and executes the analysis and activities required to safely prepare DOE SNF for interim storage and its ultimate transfer to and final disposal in the proposed Monitored Geologic Repository. In addition, a quality program that is compliant with the RW QARD provides QA oversight of the NSNFP and DOE SNF sites.

5.2.2 Project Level

C.1.07.02.01—National Spent Nuclear Fuel Program—The NSNFP performs all NSNFP functions described at the Project Baseline Summary Level excluding the QA oversight functions.

C.1.07.02.01—National SNF QA Program—Performs the QA oversight functions listed in the Project Baseline Summary Level definition.

5.2.3 Control Account Level

C.1.07.02.01.01—Technology Information—Provides DOE SNF information to support planning and analyses necessary to ensure DOE SNF is disposed in the repository. Develops, updates, and maintains the Spent Fuel Database used to support DOE strategies for ultimate disposition of DOE SNF. This includes developing new coding, maintaining existing coding, updating records of all DOE-owned SNF, analyses of data, correlating SNF transportation cask data, and the preparation of reports to support planning and analyses. Interfaces with DOE SNF sites and Yucca Mountain Site Characterization Office to support planning and analyses necessary to ensure DOE SNF is disposed in the repository. Supports DOE in identification and resolution of complexwide issues related to disposal of DOE SNF.

C.1.07.02.01.02—Repository Analysis—Works with the DOE SNF sites, OCRWM, and their M&O contractor to provide the planning and integration needed to execute and conduct the necessary repository analyses. These activities are required to support the final disposal of DOE SNF in the proposed Monitored Geologic Repository.

C.1.07.02.01.03—Technology and Materials—Provides the engineering and technical development in support of the NSNFP goals. This element includes nondestructive examination technology (Multi-Detector Analysis System), materials analysis, SNF release rate studies, and chemical reactivity evaluations of uranium metal SNF.

C.1.07.02.01.05—Packaging and Transportation—The NSNFP in accordance with the MOA between EM and RW provides a standardized canister design for the packaging, interim storage, shipment, and disposal of SNF. This includes development of the loading requirements, standardization of internal components, closure methods and requirements, and inspection methods and requirements. Testing is performed to ensure validation of codes and compliance with established requirements. Developments affecting the design, loading, and handling aspects are communicated to user organizations.

In addition, the NSNFP in accordance with the MOA between EM and RW provides a standard transportation cask system for the shipment of DOE SNF to the proposed repository. A conceptual design of the system has been completed, and the NSNFP will be procuring the design, license, and fabrication of eight casks and the associated auxiliary equipment. The contracted vendor will design, license, and fabricate the transportation cask system in accordance with the design specifications, procurement specifications, and 10 CFR Part 71. The NSNFP will manage this procurement.

C.1.07.02.01.PM—Project Management—Provides for the management direction and integration of the NSNFP. Ensures that the NSNFP mission is documented in an orderly and structured fashion, that current program-controlling documents and information are available for use by program personnel, and ensures that program activities are guided by implementing procedures. Provides QA staff support for the quality affecting activities performed by the NSNFP and ensures that those activities are performed in accordance with the National SNF QA manual. Provides NSNFP with a Master Logic Schedule describing the interfaces and key milestones among NSNFP, the DOE sites and OCRWM. Ensures that the NSNFP provides effective liaison with stakeholders.

C.1.07.02.02.01—National SNF QA—Provides trained and qualified QA staff to support the DOE National SNF QA Program Manager to develop and maintain the National SNF QA Program. Provides QA oversight of the NSNFP and the DOE SNF sites.

5.3 Detailed Work Plan

The Detailed Work Plan is enclosed in Appendix A. This plan provides the scope, schedule, milestones and cost profile of the NSNFP. This plan is revised annually and reflects the latest strategic thinking of the NSNFP. Budgets are also revised annually to the most recent target budget availability.

Funding for the NSNFP is obtained through INEEL funding requests for SNF. Work scope is prioritized against all EM work performed at the INEEL.

5.4 Change Control

The NSNFP baseline is subject to the configuration management program as delineated at the INEEL for EM projects.

6. QUALITY ASSURANCE

The baseline QA Program requirements document is the QARD, DOE/RW-0333P. EM has adopted the QARD, DOE/RW-0333P for SNF activities (including NSNFP) to address repository acceptance requirements for DOE SNF. The NSNFP implements QA requirements by complying with the *Quality Management Plan for the National Spent Nuclear Fuel Program* [7] and performing quality-affecting activities per the *NSNFP Program Management Procedures.*

7. REFERENCES

1. DOE (U.S. Department of Energy), September 1996, *DOE-Owned Spent Nuclear Fuel Strategic Plan*, Revision 1, Office of Environmental Management, Washington, D.C.

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

3. DOE, March 1996, *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.

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

5. DOE, October 14, 1998, *Life Cycle Asset Management*, DOE O 430.1A.

6. DOE, April 28, 2000, *Quality Assurance Requirements and Description*, Revision 10, Office of Civilian Radioactive Waste Management DOE/RW-0333P.

7. DOE, December 17, 1998, *Quality Management Plan for the National Spent Nuclear Fuel Program*, Revision 2, DOE/SNF/QMP-001.

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Appendix A

NSNFP Budgets, Schedule, Milestones

- Work Breakdown Structure
- Milestones
- Baseline Budget by Project and Control Account

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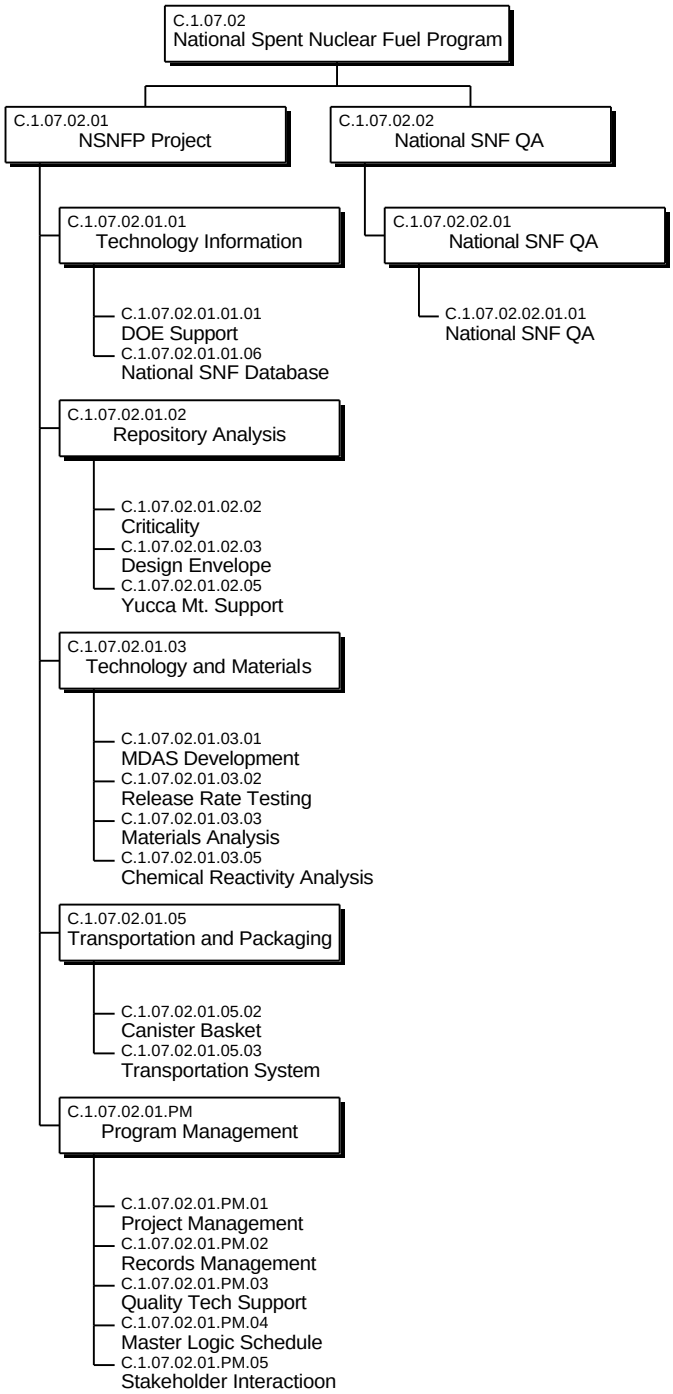
PBS Summary

ID-SNF-101 National Spent Nuclear Fuel Program

October 1, 2000

WORK BREAKDOWN STRUCTURE



Milestones

ID-SNF-101 National Spent Nuclear Fuel Program

October 1, 2000

Activity ID	*Milestone Date*	*Milestone Type*	*Activity Description*
C.1.07.02.01 NSNFP PROJECT			
C.1.07.02.01.01 TECHNOLOGY INFORMATION			
NS16A24M	28SEP01	E3	Issue FY 2001 Update revision to DOE SNF database
C.1.07.02.01.02 REPOSITORY ANALYSIS			
NS22Z13	01APR02	E3	Issue Phase III Summary Reports to support License Application
NS22Z14	10FEB03	E3	Issue Phase I & II Summary Report to support License Application
NS23A06	03JAN01	E3	Provide DOE SNF TSPA input to Site Recommendation Rev. 01
NS23D17	30JAN02	E3	DOE-SNF Source Terms Developed
NS23A17M	25APR02	E3	TSPA-LA Data Report Issued
C.1.07.02.01.03 TECHNOLOGY AND MATERIALS			
NS32J14M	02JUL01	E3	Provide characterization data on colloids – MOX fuel
NS32125M	30SEP02	E3	Complete report on the batch release rate tests – MOX
NS32J38M	30SEP03	E3	Complete report on the colloidal analyses of MOX fuel
NS35E04M	30APR02	E3	Prepare peer review plan for GOTH_SNF computer analysis
NS35E09M	15AUG02	E3	Publish peer review report for GOTH_SNF computer analysis
NS35D05	15SEP03	E3	Complete and issue GOTH_SNF Installation Report
C.1.07.02.01.05 TRANSPORTATION AND PACKAGING			
NS52A10M	30SEP02	E3	Final issue of Standard Canister Internal Reports
NS53A9M	24JUN02	E3	Contractor Award for Design & License of SNF Transportation System
C.1.07.02.02 NATIONAL SNF QA			
C.1.07.02.02.01 NATIONAL SNF QA			
NQ11B281	01MAR01	E3	Issue Annual QA Trending & Status Report
NQ11E281	01MAR02	E3	Issue Annual QA Trending & Status Report
NQ11H281	03MAR03	E3	Issue Annual QA Trending & Status Report

Baseline Budget By Project and Control Account

ID-SNF-101 National Spent Nuclear Fuel Program

October 1, 2000

WBS			FY-01*	Projected FY-02	Projected FY-03
C.1.07.02	National Spent Nuclear Fuel Program				
C.1.07.02.01	NSNFP Project				
C.1.07.02.01.01		Technology Information	994,261	1,392,530	1,449,292
C.1.07.02.01.02		Repository Analysis	3,749,632	3,210,868	1,685,358
C.1.07.02.01.03		Technology and Materials	4,556,858	5,029,627	3,531,257
C.1.07.02.01.05		Transportation and Packaging	1,281,947	3,649,444	944,632
C.1.07.02.01.PM		Program Management	1,799,124	2,096,290	2,025,793
	Project Totals		12,381,822	15,378,759	9,636,332
C.1.07.02.02	National SNF QA Project				
C.1.07.02.02.01		National SNF QA	1,317,941	1,688,672	1,655,498
	PBS Total		13,699,763	17,067,431	11,291,831

*New budget authority