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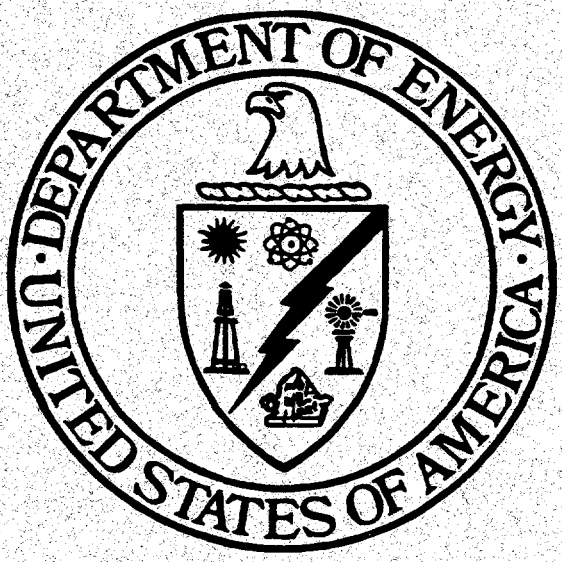
Revision 0

United States Department of Energy

Office of Environmental Restoration and Waste Management

DOE-Owned Spent Nuclear Fuel Program Plan



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Assignment Page

DOE-Owned Spent Nuclear Fuel Program Plan

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CONTENTS

FIGURES

TABLES

ACRONYMS

ACT	alternative comparison tool
ADS	Activity Data Sheet
ALARA	as low as reasonably achievable
BEMR	Baseline Environmental Management Report
CCB	Change Control Board
CERLA	Comprehensive Environmental Response, Compensation, and Liability Act
CM	configuration management
CTS	Commitment Tracking System
DNFSB	Defense Nuclear Facilities Safety Board
DOE	Department of Energy
EA	environmental assessment
EIS	environmental impact statement
EM	Office of Environmental Management
EM-1	Office of the Assistant Secretary of Environmental Management
EM-30	Office of Waste Management
EM-37	Office of Technical Services
EM-60	Office of Nuclear Material and Facility Stabilization
EM-62	Program Integration Office
EM-63	Savannah River Office
EM-65	Northwestern/Oak Ridge/Chicago Office
EM-66	Nuclear Material Stabilization Office
EM-67	Spent Fuel Management Office
ES&H	environment, safety, and health
FFTF	Fast Flux Test Facility
FIS	Financial Information System
FOIA	Freedom of Information Act
FONSI	Finding of No Significant Impact
FRR	Foreign Research Reactor
FTE	full-time equivalent
FY	fiscal year
HEU	highly enriched uranium
HQ	Headquarters
ID	DOE Idaho Operations Office
INEL	Idaho National Engineering Laboratory
IRB	internal review budget
ISNFDS	Integrated Spent Nuclear Fuel Database System
MOA	Memorandum of Agreement
MPC	multi-purpose canisters
MTHM	metric tons of heavy metal

NEPA	National Environmental Policy Act of 1969
NQA-1	Quality Assurance Requirements for Nuclear Facilities
NRC	Nuclear Regulatory Commission
OMB	Office of Management and Budget
OR	DOE Oak Ridge Operations Office
ORNL	Oak Ridge National Laboratory
PEG	Program Execution Guidance
POC	point of contact
PSC	Public Service Company of Colorado
PTS	Progress Tracking System
QA	quality assurance
QAPD	Quality Assurance Program Description
QAPM	Quality Assurance Program Manager
QARD	Quality Assurance Requirements and Description
QMP	Quality Management Plan
RCRA	Resource Conservation and Recovery Act
RL	DOE Richland Operations Office
ROD	Record of Decision
RW	Office of Civilian Radioactive Waste Management
SNF	spent nuclear fuel
SR	DOE Savannah River Operations Office
SRS	Savannah River Site
TWG	Technical Working Group
WBS	work breakdown structure

DOE-Owned Spent Nuclear Fuel Program Program Plan

1. INTRODUCTION

1.1 Background

The Department of Energy (DOE) has produced spent nuclear fuel (SNF) for many years as part of its various missions and programs. The historical process for managing this SNF was to reprocess it whereby valuable material such as uranium or plutonium was chemically separated from the wastes. These fuels were not intended for long-term storage. As the need for uranium and plutonium decreased, it became necessary to store the SNF for extended lengths of time. This necessity resulted from a 1992 DOE decision to discontinue reprocessing SNF to recover strategic materials (although limited processing of SNF to meet repository acceptance criteria remains under consideration, no plutonium or uranium extraction for other uses is planned). Both the facilities used for storage, and the fuel itself, began experiencing "aging" from this extended storage. New efforts are now necessary to assure suitable fuel and facility management until long-term decisions for spent fuel disposition are made and implemented. [Note: As per the *DOE-Owned Spent Nuclear Fuel Strategic Plan*, (DOE 1994 a), the term "DOE SNF" will be used throughout this document to represent all DOE-owned SNF that has been (or will be) generated in the past, present, and future by research reactors, production reactors, Navy, etc., as well as SNF returned from domestic research reactors and possibly from Foreign Research Reactors (FRR) for management 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 that would consolidate, under EM management, all DOE SNF and associated facilities not addressed by the Office of Civilian Radioactive Waste Management (RW). RW's mission is to manage and dispose (in a geologic repository) commercial SNF, DOE-owned SNF, and high-level radioactive waste. Currently, EM is responsible for the DOE-owned SNF Program's policy, while overall coordination is assigned to the Office of Spent Fuel Management (EM-67).

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 Programs Environmental Impact Statement* (Programmatic SNF EIS) (DOE 1995a). The *Department of Energy's Record of Decision for Programmatic Spent Nuclear Fuel and Idaho National Engineering Laboratory, Environmental Restoration and Waste Management Programs* (DOE 1995b) stated "Alternative 4a, Regionalization by Fuel Type" is the chosen option. This ROD is being modified to agree with the Consent Order (PSC 1995) issued on October 17, 1995, modifying the SNF shipments to and from the state of Idaho. This ROD is also pending resolution with the State of Idaho and the Sho-Ban nation.

The most current 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 FFTF fuel will be shipped to INEL for treatment

- Naval fuel will be shipped to INEL for examination and interim storage

- Non-aluminum clad fuels will be consolidated at INEL, excluding Fort St. Vrain fuel, which will remain in Colorado

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

Implementation of this modified ROD is assigned to the EM-67 as part of its responsibility to coordinate and manage DOE SNF until ultimate disposition.

1.2 The SNF Program Plan

The Office of Spent Fuel Management prepared this SNF Program Plan consistent with the *DOE-Owned Spent Nuclear Fuel Strategic Plan* (DOE 1994a), DOE policies, decisions made through the NEPA process, and with system engineering and analysis processes. Two major DOE complex-wide environmental impact statements [Programmatic SNF EIS and *Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel* (DOE 1995c)] and numerous site-specific National Environmental Policy Act (NEPA) documents evaluate the various options for dealing with DOE SNF management over the next 40 years of interim storage. Each EIS results in a ROD affecting DOE's overall SNF Strategic Plan. To guide an implementation plan of these RODs, this Program Plan was prepared as the top-level document within EM-67 for explaining, planning, and conducting the SNF Program. Updates to this plan will reflect the outcome of each ROD, as well as explain any changes to the policy basis of the SNF Program. Finally, this provides the DOE SNF Program's organization, management, and plans for implementation for the DOE operations organizations.

1.2.1 Components and Organization of the Program Plan. Objectives of the SNF Program Plan are:

- Define the Program's organizational structure, decisionmaking processes and procedures, including system engineering, lines of authority, schedules, milestones, and budgeting process

- Implement the objectives of the SNF Strategic Plan

- Define an integrated path forward for the ultimate disposition of DOE SNF based on the various NEPA RODs and FONSI documents

- Provide guidance for evaluating the progress and performance of the SNF Program as it proceeds so that corrective measures to ensure implementation can be taken in a timely manner

- Coordinate the efforts of participants, managers, and officials responsible for oversight and implementation of the SNF Program.

The DOE SNF Program requires the integrated efforts of DOE Headquarters (HQ) offices, DOE field or operations offices, and contractors at various sites across the country. Many individuals take part in the Program, and the Program Plan provides a uniform set of requirements, assumptions, and expectations for all participants. The DOE SNF Program Plan also fulfills the requirements set forth by DOE program planning drivers, primarily the *Defense Nuclear Facilities Safety Board Recommendations 94-1 Implementation Plan (DOE 1995d)* which states that an SNF Program Plan will be issued November 1995, the *Office of Waste Management's Program Manager's Guidance* (DOE, 1994b) along with DOE's

Strategic Planning Initiative (SEN-25A) (DOE 1991), and DOE Order 4700.1 on *Project Management Systems* (DOE 1992) [being phased out and replaced by DOE Order 430.1 (DOE 1995e)]. The Program Plan also adheres to the established principles of effective planning and administration.

The Program Plan consists of 14 sections as follows: Sections 2-6 describe objectives, management, the work plan, the work breakdown structure, and the responsibility assignment matrix. Sections 7-9 describe the program summary schedules, site logic diagram, SNF Program resource and support requirements. Sections 10-14 present various supplemental management requirements and quality assurance guidelines.

1.2.2 Planned Updates of the Program Plan. This Program Plan is a living document that reflects the current status of the Program. It will change as decisions are made, progress is made, and additional data become available. The Program Plan will be updated at least annually to embody the latest information and policies. All participants and subtier documents shall be consistent with the Program Plan. Updated versions of the Plan will provide greater detail as the various site-specific plans are finalized and implemented. As subsequent decisions are made and additional information becomes available, EM-67 will also revise and refine its estimates on costs and schedules.

1.2.3 The SNF Program Family of Documents. The SNF Program Plan also serves as the organizing framework for the plans used by the SNF Program participants. Figure 1-1 depicts the hierarchy of the SNF planning documents.

The SNF document hierarchy has three levels:

Level I: Program policy, guidance, directives, e.g., SNF Strategic Plan

Level II: SNF programmatic guidance and requirements, e.g. Program Plan, HLW/SNF Quality Management Plan, Program Requirements Document. As the Program Plan provides the overview of how DOE SNF decisions will be implemented, supporting documents, such as, the Interim Storage Plan, Technology Integration Plan, SNF Characterization Plan, and Stakeholder Involvement Plan, will provide greater detail on these specific areas.

Level III: Site-specific requirement documents and plans

Within each level, a number of implementing documents will provide the details on the conduct of business on the Program. Documents prepared for Levels I and II are issued and controlled by the Office of Spent Fuel Management. Level III documents are issued and controlled by each SNF site, yet coordinated through EM-67 to ensure a consistent approach between the various sites and the National Program. Level III documents shall be coordinated with the line organizations within EM-60, specifically EM-63 and EM-65, having responsibility for the sites, facilities, and the spent fuel. The HLW/SNF Quality Management Plan and the HLW/SNF Standard Practice Procedures are applicable to both the HLW and SNF Programs and as such are controlled by the HLW/SNF Quality Assurance Program Manager. These documents are discussed further in later sections.

The SNF Strategic Plan was prepared to articulate the mission, vision, objectives, and strategies for the management of DOE-owned SNF. The plan describes the issues facing the SNF Program, lays out strategies for addressing these issues, and provides "success criteria" by which the program progress can be assessed and measured.

The Program Plan provides the organizational approach that is being used by the SNF Program to meet the SNF Strategic Plan's objectives. The *DOE-Owned Spent Nuclear Fuel Interim Storage Plan*

(ISP) (DOE 1995f) is considered a subpart of the SNF Program Plan, though it is published separately. It provides the detailed planning of integrated activities by the DOE to support the interim management of DOE SNF. The ISP is a compilation of the site-specific plans prepared by the major DOE sites having responsibility for the day-to-day management of SNF. The ISP also provides an overview of the programmatic issues associated with interim storage.

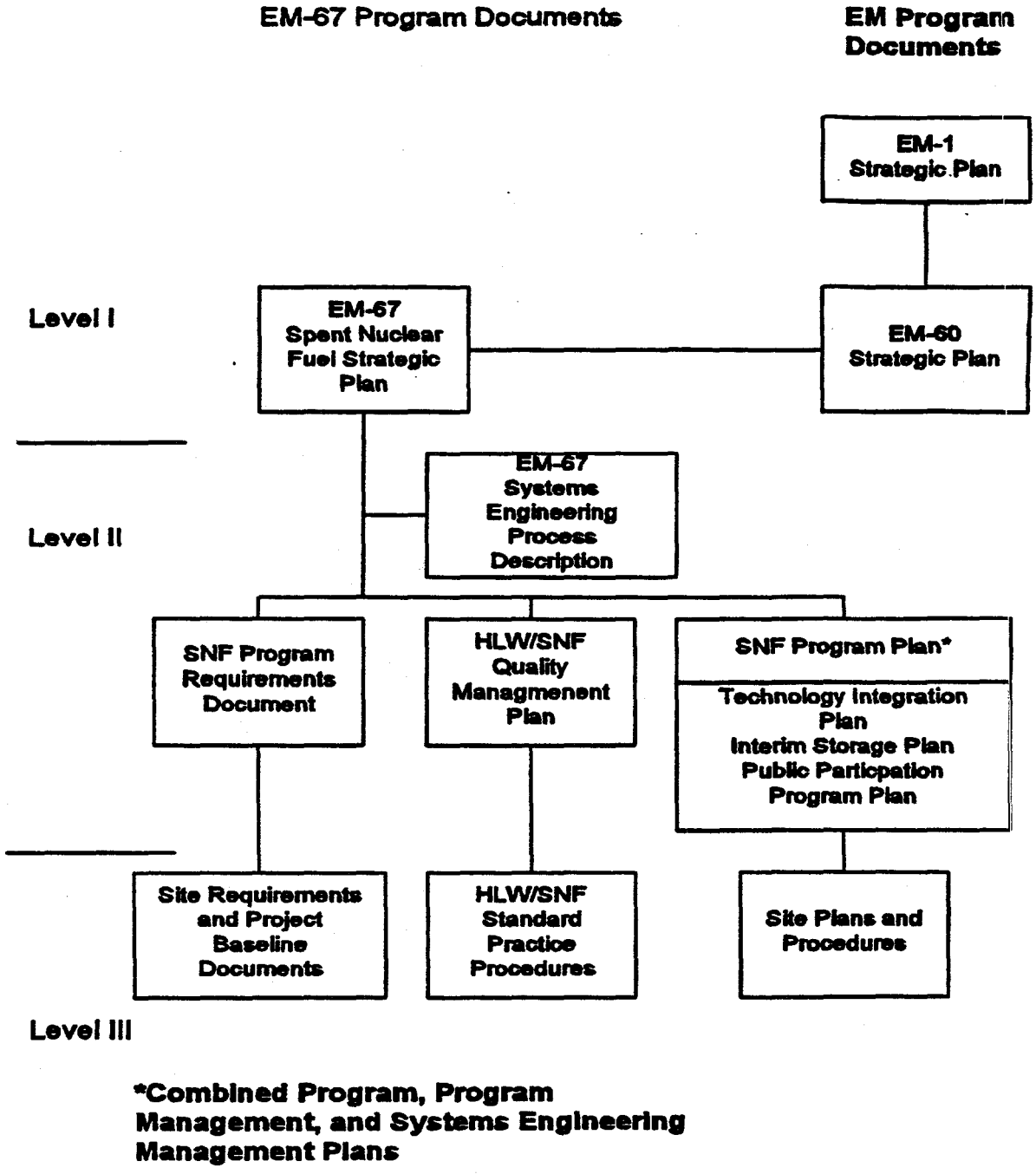


Figure 1-1. Spent Nuclear Fuel program interfaces and document structure.

2. OBJECTIVES

To achieve the SNF Program vision, the *DOE-Owned SNF Program Strategic Plan* established five top-level program objectives for the SNF management program, which constitute the overall program strategy. These objectives are the broad goals the program strives to meet on the way to achieving its mission, and their attainment constitutes the successful implementation of the SNF program. These programmatic objectives are interrelated: attainment of one affects, and is affected by, the attainment of the other objectives. They also are dependent upon actions taken outside the DOE SNF Program. Further, changing conditions (e.g., the regulatory requirements or funding) may require revisiting and perhaps modifying the objectives. The top-level program objectives are listed in the following sections.

2.1 Establish an Effective Decisionmaking Process Involving Stakeholders

Because the DOE SNF Program is not expected to complete its mission until well into the next century, it must establish an effective decisionmaking process to ensure program goals can be achieved safely, efficiently, cost-effectively, and fully compliant with all applicable environmental laws and regulations. An effective decisionmaking process identifies the decisions to be made, compiles and analyzes the information needed to develop a full range of alternatives, and empowers the right people to make informed decisions. The SNF Program uses a systems engineering approach to identify requirements, define alternatives, recommend solutions, and promote communication within the DOE SNF Program and between the Program and its stakeholders.

The Office of Spent Fuel Management is implementing this objective by working closely with its stakeholders in planning and implementing its management efforts across the country. The DOE SNF Program, with EM, is preparing the policies and methods by which stakeholders will assist the SNF Program in defining the nature and scope of its activities, establishing short- and long-term goals, strategies, and priorities, and participating in defining budget needs and allocations. By establishing an agreed upon set of decision criteria (see Section 4.3) and through an open and communicative relationship with its stakeholders, the DOE SNF Program can help ensure that its decisions and activities reflect the needs and desires of affected communities and organizations.

As noted in the EM *Public Participation Program Plan* (DOE 1994c), stakeholder involvement programs are being tailored to the needs of the associated stakeholders. The Headquarters program for involving the public in stakeholder activities is being coordinated with local DOE Operations Offices, which have primary responsibility for development of local public participation programs and plans in their areas.

2.2 Assure Safe Existing Storage and Resolve Vulnerabilities for DOE-Owned SNF

As part of its spent nuclear fuel management program, DOE will (a) stabilize the SNF as needed to ensure safe interim storage, (b) characterize the existing SNF inventory to access compliance with the repository acceptance criteria as they are developed, and (c) determine what processing (i.e., applying a chemical or physical process designed to alter the characteristics of the spent fuel matrix), if any, is required to meet the criteria. Decisions regarding the actual disposition of DOE's spent nuclear fuel would follow appropriate review under the National Environmental Policy Act, and would be subject to licensing by the U.S. Nuclear Regulatory Commission.

The activities conducted as part of the Phase I, Phase II, and Phase III Action Plans (see Section 3.1) implement this objective. In addition, DOE's responses to the Defense Nuclear Facilities Safety Board (DNFSB) report 94-1 also ensure this objective is met.

2.3 Achieve Safe, Secure Interim Storage of DOE-Owned SNF

EM must establish, operate, and maintain interim storage facilities to safely store the fuel until final disposition. This will require determining and implementing a safe, cost-effective, and technologically appropriate approach to interim storage. The SNF Program will develop safe interim storage utilizing a systems approach that interrelates principal functions of the program. The SNF Program will use innovative contracting and procurement strategies to provide new facilities in an expeditious and cost-effective manner. DOE must address a number of issues, including the form in which the SNF will be stored, planning and constructing modular facilities to lessen budgetary impacts in a given year, and the most effective methods of packaging and transportation. EM must coordinate interim storage with known requirements for disposal to ensure that stored fuel is in an acceptable form for disposal or can be configured to meet the acceptance criteria. EM also is reviewing the potential role and extent of external regulators. In addition, EM must design, construct, and establish interim storage facilities in a manner that anticipates and facilitates the eventual decommissioning and transition to other uses of these facilities.

The DOE SNF Program is preparing *DOE-Owned Spent Nuclear Fuel Interim Storage Plan* to document methods of compliance with this objective.

2.4 Prepare DOE-Owned SNF for Geologic Disposal

DOE is planning for the ultimate disposition of DOE-owned SNF in a geologic repository. However, decisions have yet to be made regarding a final disposal site and the form in which the fuel will be disposed. These decisions are essential to achieving the SNF Program's mission. Detailed technical acceptance criteria for DOE-owned SNF are also needed in order for the SNF to be prepared for ultimate disposition. Currently, only preliminary requirements for DOE-owned SNF exist, and the current RW technical baseline only includes commercial SNF and vitrified high-level radioactive waste. EM and RW have formed a steering group to address these repository issues and to define the disposal requirements. Recent agreements between RW and EM have also been made to incorporate DOE SNF into the RW technical baseline. RW has established QA requirements in their Quality Assurance Requirements and Description (DOE-0333P). The SNF Program must comply with these QA requirements to ensure RW acceptance of SNF for ultimate disposition. The detailed acceptance criteria for the DOE SNF for disposal in the first repository have not yet been established; however, the first repository will not accept RCRA-regulated waste. Some DOE-owned SNF exhibits RCRA characteristics and should this SNF be deemed unacceptable for emplacement in its current condition, the DOE SNF Program will establish a path forward for ultimate disposition. Several studies are currently underway to resolve all Resource Conservation and Recovery Act (RCRA)-related issues concerning DOE-owned SNF prior to disposal.

The DOE SNF Program has also prepared the DOE *Spent Nuclear Fuel Technology Integration Plan* (DOE 1994d) that includes an SNF Characterization Plan for DOE-owned SNF. This plan, when updated to include the disposal requirements addressed above, will provide the basis for documenting compliance with this objective. The *Interim Storage Plan* will also be updated as necessary to reflect any changes that may arise as the disposal requirements are finalized.

2.5 Transfer Surplus Storage Facilities

During and after the shipment of DOE-owned SNF from existing storage facilities to interim facilities and then to a disposal site, EM must plan and prepare for the transition of storage facilities no longer needed for SNF management to other uses or decontaminate and decommission such facilities. These activities have not been scheduled as part of the current planning; however as facilities are released from the SNF Program they will be available for reuse or decontamination and decommissioning, as needed.

3. MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

DOE established a central organization responsible for the integration, long-term planning and coordination of the SNF management program activities in 1992. This resulting SNF management program was originally organized under the Deputy Assistant Secretary for Waste Management (EM-30) to provide clear lines of communication and authority; integrate the SNF activities of many field offices, agencies, laboratories, and contractors taking part in the program; and coordinate the programmatic and budgetary authority and responsibility. To further define the SNF roles and responsibilities of the various offices and organizations comprising EM-30, an MOA was signed within EM-30 on April 24, 1994. This MOA stated that the Assistant Secretary for Environmental Management (EM-1) and EM-30 would provide SNF policy development and program oversight, while the Office of Spent Fuel Management would undertake high-level strategic planning and be responsible for integrating and coordinating cross-cutting DOE complex-wide SNF issues. The Office of Spent Fuel Management is being transferred to the Office of Nuclear Material and Facility Stabilization (EM-60), effective December 1995. The Office of Spent Fuel Management has been redesignated EM-67. A new MOA is being prepared for the EM-30 and EM-60 participants to redefine their roles and responsibilities. Little change in those roles from the April 24, 1994, MOA is expected except for the redesignation of office titles.

Figure 3-1 provides the current organizational alignment for the SNF Program within EM-60 and with EM-30, as agreed-upon as part of the MOA. This agreement, along with other interoffice agreements, also identifies the roles and responsibilities of the Savannah River Office (EM-63), Northwestern/Oak Ridge/Chicago Office (EM-65) and the Nuclear Materials Stabilization Office (EM-66) work with the local Operations Offices and retain day-to-day management and basic program execution for their respective sites, including budget formulation and management as well as the operations safety of the existing and planned new facilities. These HQ organizations have the line management responsibility for the safe, environmentally acceptable operation of the facilities used for the storage and processing of SNF, including budget and policy development. Quality Assurance management and oversight of the SNF Program will continue to be provided by the Office of Technical Services (EM-37) (formerly EM-33). To ensure that planning and implementation of SNF activities are fully integrated, EM-67 (with EM-63, EM-65, EM-66, and other EM-60 organizations) will coordinate the development of DOE policy positions and the formation of budgets, and formally document such concurrences. The Program Integration Office (EM-62) also provides integration of the various EM-60 organizational activities.

The following sections, along with Section 10, describe the authorities and responsibilities of each of the major national SNF participants in the National SNF Program.

3.1 The Office of Spent Fuel Management (EM-67)

The Office of Spent Fuel Management is directly responsible to the Deputy Assistant Secretary of Nuclear Material and Facility Stabilization. EM-67 is located in Washington, D.C., and is supported by DOE-ID and the Idaho National Engineering Laboratory (INEL) Support Office in Idaho Falls, Idaho. EM-67 develops and implements policies, strategies, and programs to safely, effectively, and efficiently manage current and future inventories of DOE-owned SNF and FRR SNF. EM-67 identifies and integrates requirements to assure safe existing storage and resolve vulnerabilities, achieve safe, secure interim storage, and prepare for ultimate disposition in a geologic repository. EM-67 will also integrate program activities including the conduct of assessments, evaluations, and technical studies. It will participate in providing the program resources needed to assist in implementing the national program. General functions of EM-67 include:

- Develops and implements policies, strategies, and programs for management of DOE-owned SNF (excluding commercial SNF) and FRR SNF for interim storage, conditioning, and eventual transportation to RW's managed, geologic repository

- Coordinates DOE SNF Program activities with other DOE elements, including operations offices; Defense Programs (DP); Office of Field Management (FM); Environment, Safety and Health (EH); Nuclear Energy (NE); RW; Office of Nonproliferation and National Security (NN); and associated technical research organizations and contractors

- Establishes and maintains liaison external to the DOE, including the Department of State; Environmental Protection Agency (EPA); Nuclear Regulatory Commission (NRC); state and local regulatory agencies; and industry to ensure compliance with applicable Federal, state, and local laws and regulations

- Coordinates with RW in the development of acceptance criteria for DOE-owned SNF for disposal in a geologic repository

- Establishes DOE technology integration plans to identify, prioritize, and develop technologies to support the SNF Program; establishes DOE and industry cooperative ventures to maximize technology transfer among DOE operations offices, national laboratories, international entities, and the private sector

- Develops policies for receipt, storage, and conditioning of FRR SNF and eventual transfer to RW for permanent disposal in a mined, geologic repository; manages the development of the environmental analysis for acceptance of FRR SNF

- Establishes a structured information base having comprehensive data for locating, identifying, and characterizing DOE-owned SNF and FRR SNF eligible for return to the U.S. to support decisions involving interim storage, conditioning, and handling facilities, and assessing the adequacy of current storage, conditioning and handling facilities

- Develops and/or supports National Environmental Policy Act (NEPA) documents, data, and analysis for DOE SNF programs and initiatives.

- Obtain RW acceptance of the SNF Quality Assurance Program and qualify SNF sites' quality assurance programs.

More specific responsibilities of EM-67 are described in the following sections.

3.1.1 Strategic SNF Program Planning. EM-67 is responsible for establishing the overall guidance and top-level program direction for managing DOE SNF. Policy, strategy, and program guidance are provided within the DOE SNF Program document hierarchy and are prepared by EM-67 with inputs, reviews, and concurrence solicited from DOE HQ organizations. The DOE SNF Program document hierarchy is defined in Section 1.2. The *DOE-Owned Spent Nuclear Fuel Strategic Plan* is prepared and maintained by EM-67 and issued by EM-60 as the top-level strategic planning document. The *DOE-Owned Spent Nuclear Fuel Program Plan* derives its direction from this strategic plan and the results of the NEPA actions discussed earlier. The *Spent Nuclear Fuel Program Requirements Document* (DOE 1994e) documents the requirements guiding the DOE SNF Program.

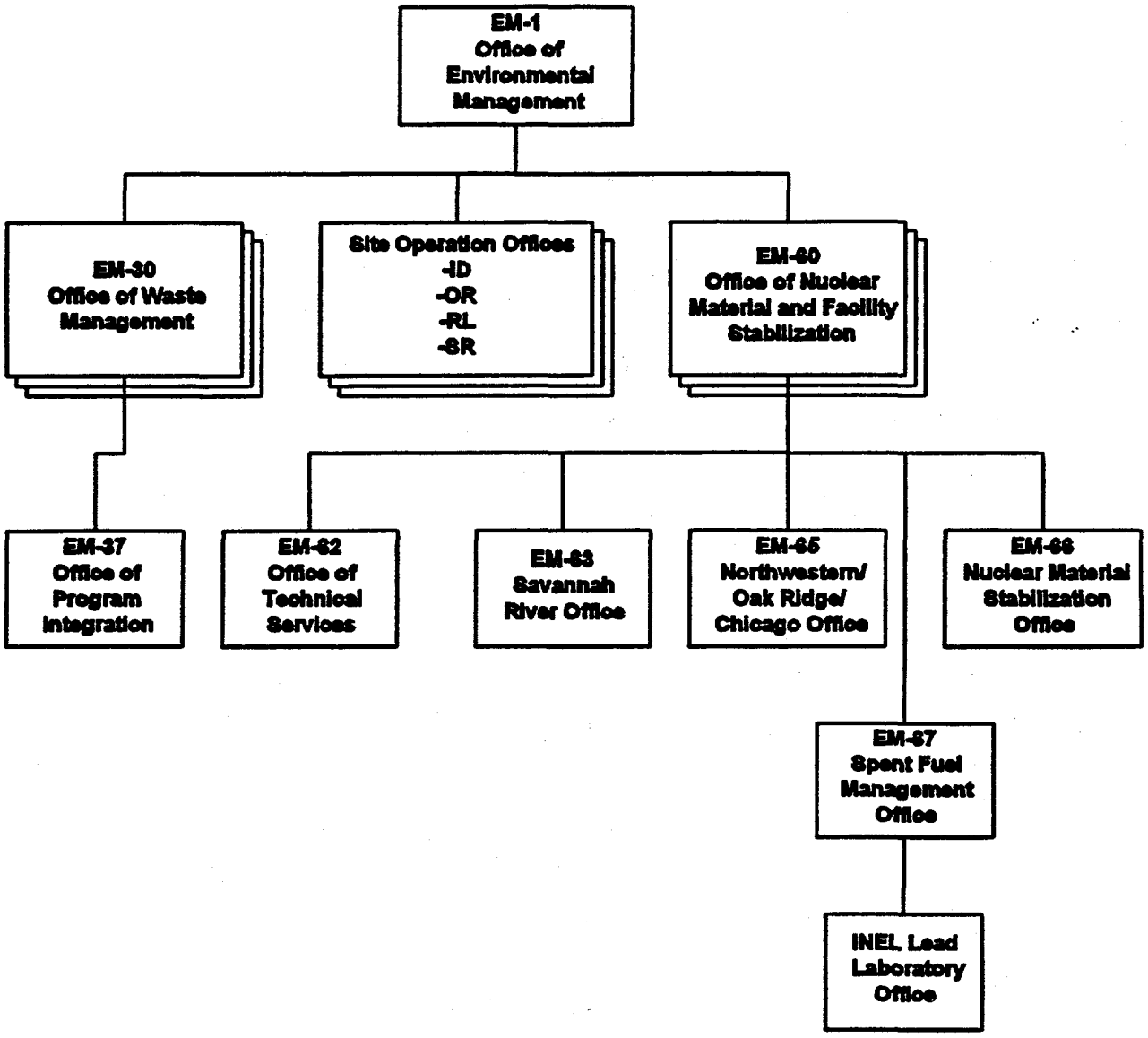


Figure 3-1. Spent Nuclear Fuel Program organizational alignment.

3.1.2 Budget Formulation and Implementation. EM-67 participates in the budget formulation process for management of DOE-owned SNF to ensure that budget activities, program direction, and project documentation are consistent with SNF policies. As part of the annual budget planning process (see Section 4 for details on EM-67 involvement in the budget process), EM-60 issues an SNF Program Directive, prepared by EM-67 and concurred with by the affected EM organizations, that defines priorities and recommends funding levels for SNF management that have been integrated by EM organizations on a site-specific basis. The SNF Program Directive is issued to the Operations Office managers with copies to all EM operations organizations. As part of the EM-30/EM-60 MOA, the funds for the spent fuel work being transferred from EM-30 to EM-60 are included in the appropriations for the Waste Management program. For FY 1996, this funding will be managed by EM-60 as identified on the appropriate Activity Data Sheets and Financial Plans, contingent upon Congressional action on the FY

1996 budget proposal. Changes resulting from Congressional actions will be mutually agreed upon between EM-30 and EM-60. For FY 1997 and beyond, the appropriations request will be aligned with the new EM organizations.

3.1.3 Vulnerabilities and Safety Assessments. EM-67 works with EM-66 in preparing updates to the *Plan of Action to Resolve Spent Nuclear Fuel Vulnerabilities, Phase III* (DOE 1994f); maintains liaison with the Office of Environment, Safety, and Health and other organizations concerned with SNF safety issues; and is responsible for tracking to closure the facility action plans.

3.1.4 Safe Interim Storage. Safe interim storage of SNF is being accomplished by implementing a national *DOE-Owned Spent Nuclear Fuel Interim Storage Plan (ISP)* that summarizes complex-wide plans for safe interim management of DOE-Owned SNF over the next 40 years (1995 to 2035). The 40-year interim storage period is based on having a permanent, long range repository ready for accepting DOE-owned SNF by 2015, and having all of the DOE-Owned SNF transferred to the repository by 2035. EM-67 maintains the ISP that is used by the EM operations organizations for site-specific fuel management over the next 40 years. EM-67 coordinates interaction with other Federal agencies, as needed.

3.1.5 National Environmental Policy Act (NEPA) Compliance. EM-67 is responsible for integrating SNF activities in conjunction with programmatic NEPA actions being undertaken within DOE. These actions include insuring the implementation plans, i.e. the ISP, are consistent with the DOE Programmatic SNF EIS ROD. EM-67 coordinates with EM operations organizations the inputs to, and review of, the FRR NEPA documents.

3.1.6 Technology Integration Program. EM-67 is responsible for preparing an integrated technology development program related to SNF, including interim storage demonstration activities, which form the basis for regulatory acceptance of new storage and conditioning facilities. The *DOE Spent Nuclear Fuel Technology Integration Plan* (DOE 1995f) documents the technologies being considered for conditioning and storing DOE-owned SNF. This plan also includes the technical prioritization of DOE technologies for implementation. EM-67 also coordinates the SNF activities with those of the Office of Technology Development (EM-50).

3.1.7 Systems Engineering Implementation. EM-67 is responsible for establishing systems engineering throughout the DOE SNF Program. This includes providing methods and processes to (a) manage and communicate program requirements, (b) evaluate SNF management alternatives, (c) coordinate Program activities, and (d) identify and manage Program interfaces and functions among the sites, as well as those interfaces external to the Program.

3.2 EM-67/INEL Lead Support Office

The INEL was designated the lead support laboratory (DOE 1994g) for the Office of Spent Fuel Management. This position was further defined as part of the Consent Order between the state of Idaho, DOE, and the Navy, where the INEL was specifically designated the DOE SNF Lead Laboratory. In that role, the INEL supports the EM-67 functions described above as requested through integrating and coordinating activities within INEL and with other DOE Operation Offices and national laboratories. These supporting activities include:

- Assisting in preparing and reviewing program management documentation, assisting with budgeting DOE SNF Program activities, assisting with planning and scheduling program activities, tracking program commitments, supporting the Program's system engineering approach, providing general technical support, and supporting technical working group activities

- Supporting activities related to identifying and recommending implementation strategies for NEPA, NRC, and other regulatory requirements; assisting with technical preparation and review of NEPA documents; and assisting with the complex-wide programmatic review of NEPA documents

- Providing support on complex-wide SNF vulnerabilities and safety issues by researching, assisting in preparing, reviewing, and recommending approval/concurrence with such studies and documents

- Implementing and maintaining an SNF complex-wide planning database that contains information on the quantity, condition, type, location, origin, and enrichment of all fuels within the DOE-owned inventory

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

- Preparing technology integration plans; supporting waste analysis activities; assisting with performance assessments, acceptance criteria; and developing stabilization technologies.

- Recommending safe, cost-effective, and technologically appropriate interim storage approaches and budgetary strategies; supporting assessments on existing storage facilities; assisting in the preparation of detailed transportation plans on how SNF is to be moved and the routes to be used

- Providing QA support to the Office of Spent Fuel Management (EM-67) and to SNF Program managers.

3.3 Advisory Groups

The National SNF Program has established a Technology Integration Working Group (TIWG) to support its program. This TIWG is organized and chartered as an advisory function to line management to perform specific, budgeted tasks as needed under the direction and approval of EM-67. The working group has a chairperson; nominations to the group may be handled by appropriate individuals such as operations offices' point of contact (POC), the working group chairperson, or others. TIWG exists only as long as it is needed to accomplish its defined tasks as specified in its charter.

Working group members include qualified individuals from DOE-EM, Operations Offices, contractors, consultants, laboratories, and other organizations as needed to accomplish the desired work. Tasks performed by the TIWG include the following:

- Provide technical recommendations for grouping of fuels for applicability with various technologies
- Review existing and potential technologies for application to SNF and provide recommendations
- Review progress in evaluation of technologies against storage and dispositioning criteria and provide recommendations
- Provide recommendations for prioritization of technology efforts commensurate with programmatic and safety issues
- Perform periodic self-evaluations of the progress and accomplishments of this technical working group and define or take corrective actions as appropriate
- Review existing technologies, assess requirements, establish criteria, and provide recommendations for interim dry storage of SNF
- Perform miscellaneous other actions if directed by EM-67.

4. WORK PLAN

The DOE SNF Program has four distinct roles in the management of SNF: (a) develop and set SNF policy, (b) provide strategic planning and NEPA compliance that crosscuts the sites, (c) integrate technology development planning, and (d) provide safety assessments and liaison with the DNFSB, NRC, DOE-EH, and DOE-NS. These activities are defined in detail for the near-term and are more broadly defined for the future effort. The major milestones scheduled in FY 1996 and beyond are identified in the Schedules and Milestones section (see Section 7). Each year the participants in the DOE SNF Program prepare Activity Data Sheets (ADSs) that define activities and baseline funding for those activities. Concurrence with the proposed work scope in the ADSs is documented in Program Execution Guidance (PEG) to each of the sites to perform the work activities describe therein. Activity, schedule and cost performance is tracked throughout the year through the Progress Tracking System (PTS). The overall funding profile as defined by the FY 1997 ADSs is shown in Section 9. Planned activities in FY 1996 and FY 1997 are listed below. Key to the scheduled events being performed by EM-67 is the interface with RW. Figure 7-3 shows the interface of scheduled events with RW. The work plan for FY 1996 and beyond supports this schedule. In addition, site summary schedules are included as part of Section 7. Detailed schedules for each of the deliverables are in the approved ADSs and also shown in the ISP.

4.1 Accomplishments

During the past year, the DOE SNF Program has accomplished numerous key tasks related to the Program Objectives. These accomplishments are summarized below:

- DOE issued the FRR SNF Environmental Assessment in April 1994 and a draft FRR SNF EIS in July 1995. The complete FRR SNF EIS and ROD are scheduled for release in late 1995.
- DOE issued a draft Programmatic SNF EIS in June 1994, Final Programmatic SNF EIS in April 1995, and the ROD in June 1995.
- EM and RW established a formal steering group to coordinate DOE SNF requirements and other protocols.
- K-Basin's seismic isolation barriers were installed in April 1995 to resolve significant vulnerabilities.
- Completed two major court-mandated milestones involving the transfer of 378 fuel units out of INEL CPP-603.
- Negotiated the Idaho Consent Order/Settlement Agreement on Spent Nuclear Fuel and Nuclear Waste of October 17, 1995, between Idaho, DOE, and the Navy.
- Completed vacuum consolidation of Savannah River L-Reactor Disassembly Basin sludge.
- A Memorandum of Agreement was established between EM-30 and RW to include the DOE-owned SNF in the QA Program.
- The *DOE-Owned SNF Program Strategic Plan*, Revision 0, was issued in December 1994. The plan will be updated to be consistent with decisions from the NEPA process and stakeholder input.

- The *Spent Nuclear Fuel Program Requirements Document*, Revision 0, was issued in October 1994.

- The *DOE-Owned Spent Nuclear Fuel Program Systems Engineering Process Summary* (DOE 1994h) of November 22, 1994 establishes the systems engineering approach for the SNF Program. The process described therein will be implemented via this Program Plan.

- The *DOE-Owned Spent Nuclear Fuel Technology Integration Plan*, Revision 0, was issued in December 1994. This plan is used to define and develop the treatment alternatives for SNF.

- The DOE SNF Program developed a path forward for Hanford N-Reactor SNF in November 1994 and redefined it in July 1995.

- The *DOE-Owned Spent Nuclear Fuel Interim Storage Plan*, Revision 0, was issued in November 1995.

- The DOE Standard Practice Procedures were completed and issued in May 1995 after they were substantially revised to convert them from HLW procedures to HLW and SNF procedures.

- The DOE *Quality Management Plan* (QMP) (DOE 1995g) was competed to address SNF concerns and was issued in May 1995.

4.2 Planned Activities

4.2.1 Work Plan. The SNF Program has several key activities that it must perform to meet the objectives stated in the *SNF Strategic Plan* and also satisfy the four roles defined above. To accomplish these activities, the SNF Program prepares ADSs for its activities and review and concurs with the ADSs prepared by the SNF Program participants. Listed below are the key activities performed by the SNF Program to accomplish the program objectives.

4.2.1.1 Program Management Activities. The SNF Program's primary responsibility in accomplishing its objective is providing program management direction to the DOE-Owned SNF activities. These activities were described in Section 3. Key to success is the implementation of performance measurement metrics to the SNF Program so that measurable progress can be demonstrated to the program's stakeholders. Establishing this Program Plan, the ISP, TIP and other program planning documents define the program's direction. The SNF Program has developed a Program Site Logic Diagram (see Section 8), Summary Schedules (see Section 7) and a Work Breakdown Structure (see Section 5).

As part of the transition of EM-67, the budget process will be aligned with Work Breakdown Structure and the Summary Schedules. For the current FY 1996 budget year, this clear one-to-one relationship is under development. It is anticipated that for the FY 1997 budget year, the scope, budget, and schedule will be tied together with the Work Breakdown Structure. Pending completion of this activity, the PTS will be used to manage site activities without an integrated performance measurement system.

4.2.1.2 Budget Process Activities. In order for the SNF Program to be successful, the program must be properly funded and the funds directed at the most critical issues. EM-67 is directly involved in the budgeting process to ensure that the SNF Program receives the appropriate level of support. The schedule for budget development and EM-67 involvement is identified in Table 4-1. EM-67 works

closely with the SNF Program participants to ensure that the program objectives are being met. The review process also evaluates the program funding requests for compliance with plans defined in the ISP and the TIP.

Table 4-1. DOE budget process.

Date	Activity
October	EM-67 prepares draft guidance to program participants for CY*+2 budget formulation EM-67 begin tracking CY program execution
November	EM-67 provide final guidance for CY+2 to the SNF Program participants
December	EM-67 evaluate initial passback from Office of Budget (OMB) for CY+1 budget EM-67 participates in reviewing CY+1 ADS submittals
January	CY+2 Field Budget Call issued to the field
February	EM-67 participates in preparing CY+1 ADSs for release
April	CY+2 ADSs submitted by field to HQ organizations
May	CY+2 Internal Review Budget (IRB) guidance issued to HQ organizations EM-67 begins participation in the IRB request
June	CY+2 IRB submitted to the Chief Financial Officer (CFO)
August	Secretary makes final budget decision on CY+2 EM-67 participates in CY+2 ADSs updates
September	DOE submits CY+2 request to OMB
	*CY current year

4.2.1.3 Planning for Ultimate Disposition. Planning for ultimate disposition requires working closely with RW in defining the acceptance criteria for SNF as well as submittal of license application data for SNF proposed for disposal in the first repository. A steering group has been formed between EM and RW to ensure close cooperation. Continued high-level support of this steering group will ensure favorable positioning of DOE SNF in the repository. Another required activity is the establishment of a Memorandum of Agreement (MOA) between EM and RW. The MOA is a contractual document that includes the definition of EM/RW responsibilities regarding the review and approval of the waste acceptance baseline, integration of technical issues, transportation and waste acceptance procedures, specifications for the fee and payment schedule to be paid to the Nuclear Waste Fund for waste disposal, as well as other agreements, such as communication and data transmission protocols, inter-organizational technical document relationships, safeguards and security requirements, and auditing procedures.

Also, to successfully achieve near- and long-term goals, the DOE SNF Program may require new technologies for each program element (i.e., stabilization, interim storage, preparation for disposal). The Technology Integration Program exists to integrate DOE complex-wide efforts to establish common and consistent technical criteria and develop timely, cost-effective solutions to DOE SNF materials management. At the same time, it will also identify future (between 10 and 40 years from now) technology needs so that efforts can be made today to address tomorrow's SNF management challenges. To ensure that SNF characterization, conditioning, treatment, storage, and disposal activities are performed in an effective, logical and cost-efficient manner, the DOE SNF Program has developed

strategies for integrating and coordinating technology development throughout the program. These strategies are documented in the *DOE Spent Nuclear Fuel Technology Integration Plan* (TIP).

4.2.1.4 Vulnerability Resolution. Approximately 2,100 Metric Tons of Heavy Metal (MTHM) of uranium SNF are stored in the Hanford K-Basins, an old facility located near the Columbia River and vulnerable to seismic damage. The K-Basins were not intended, and are not suitable, for extended SNF storage. DOE, the DNFSB, and stakeholders have recognized that this SNF storage problem requires prompt resolution. After consultations with stakeholders, DOE approved an integrated K-Basins SNF process strategy in August 1995. Plans call for repackaging the SNF in multi-canister overpacks, perform initial cold vacuum drying, and transport the SNF dry from the K-Basin and stage the SNF in a new storage facility, referred to as the Canister Storage Building (CSB). The fuel would then be conditioned into a dry-state form at a new conditioning facility adjacent to the CSB and returned it to the new interim storage facility for dry storage pending its ultimate disposition. These activities are to be conducted under a K-Basins EIS; the Record of Decision is scheduled to be issued in December 1995. This EIS is being prepared to acquire, startup, and operate the systems/facilities for removal of SNF from the K-Basins and subsequently manage SNF until ultimate disposition. This would include fuel removal systems at the K-Basins, the Canister Storage Building, the conditioning systems/facilities, the transportation system, and the multi-canister overpacks. The revised strategy involves vacuum drying at the K-Basins and subsequent dry staging/storage at the Canister Storage Building. Additional conditioning for interim dry storage may be performed in a new conditioning system or facility at, or adjacent, to the Canister Storage Building. Preliminary schedule projections include the start of fuel removal in December 1997, complete fuel removal by November 1999, initial placement of SNF into dry storage in late 1998, and complete placement in 2000.

4.2.1.5 Interim Storage. The proposed plan for SNF calls for the majority of DOE's SNF to remain in interim storage until a geologic disposal site is ready to accept the fuel. However, a number of questions regarding interim storage must be resolved before the path forward for SNF can be finalized. Specifically, decisions must be made regarding the siting, design criteria, and expected/necessary life-span of existing and/or new SNF storage facilities. These decisions are being addressed through the production of a series of issue papers that are intended to provide necessary information and options on this matter, thereby facilitating the development of a strategy for interim storage. The strategy for providing interim storage of the DOE SNF is stated in the *DOE-Owned Spent Nuclear Fuel Interim Storage Plan.*

Dry storage of SNF is considered superior to wet storage in many applications, as it alleviates concerns related to the continued degradation of the fuel in a wet storage environment. The recent vulnerability assessment determined that continued long-term wet storage of most DOE SNF in existing facilities may be undesirable. In some instances, wet storage may result in fuel degrading to such a condition that future handling or disposal is more difficult to accomplish. To avoid potential future handling and disposal problems, alternatives to interim wet storage are being evaluated. Dry, passive, cost-effective storage facilities that meet current regulatory requirements are needed to store SNF for a prudent interim period until a geologic repository becomes available. Such facilities would reduce both environmental impact and waste generation. In addition, DOE must develop the technical safety basis to stabilize and transfer some of the SNF to these new facilities in a manner consistent with programmatic SNF management decisions.

4.2.1.6 Litigation Resolution. The SNF Program has issued one ROD on the Programmatic SNF EIS and that ROD resulted in litigation with the state of Idaho. The SNF Program resolved that litigation through a mutually acceptable solution. If future RODs result in litigation, the SNF Program will work to find acceptable solutions.

4.2.1.7 On-going NEPA Activities. Since some existing SRS SNF is degrading at a rate that could, without near-term conditioning, preclude its continued safe storage and inhibit its transfer to interim storage, this issue requires near-term resolution. The specific approach(es) to be taken for these "at-risk" fuels is being evaluated in an EIS on interim (10 years) management of nuclear materials at SRS. A range of possible approaches is being evaluated for different fuel types, and includes processing to metal or metal oxides, blending down the HEU, vitrification, or continued storage. The EIS will determine the appropriate technical or management approach for these fuels, and a decision will need to be made in the near-term to ensure the availability of SNF conditioning facilities such as the F- and H-Canyons at SRS. In addition, it may be determined that it is desirable to process a significant quantity of Al-clad SNF that is considered stable near-term. The EIS will determine the appropriate technical or management approach for these fuels, and a decision will need to be made in the near-term to ensure the availability of needed SNF facilities.

4.2.1.8 Non-Proliferation Activities. In addition to the existing inventory of SNF, DOE is considering accepting responsibility for storing SNF of U.S. origin from foreign research reactors. A decision to accept such fuel would directly support the United States' nuclear weapons nonproliferation policy by seeking to minimize the use of highly enriched uranium (HEU), which can be diverted into nuclear weapons production. Beginning in the 1950s, the United States provided HEU for use as fuel in research and materials testing reactors and in special purpose nuclear reactors around the world. This program supported U.S. nonproliferation efforts by encouraging other countries to forego development of nuclear weapons in return for U.S. assistance in peaceful applications of nuclear technologies. The United States accepted HEU SNF under the Reduced Enrichment for Research and Test Reactors Program from 1978 until the expiration of the program in 1988. Several foreign research reactor operators have exhausted storage capacity for their spent fuel and, if unable to return the fuel to the United States, will be forced to shut down their reactors or dispose of the SNF through other, less-desirable options. DOE completed an EA on foreign research reactor SNF in April 1994, and based on that assessment decided to accept from eight research reactors a limited number of SNF elements containing uranium enriched in the U.S. DOE is currently preparing an FRR SNF EIS to establish and implement policy in this area over the next 10 to 15 years. A draft of this document was released to the public in July 1995.

4.2.2 Specific FY 1996 Planned Activities.

Plan Program (WBS 1.2.1)—The activities associated with this task are:

- Update Strategic Plan, Program Plan, and other Program documents
- Prepare and update policy and guidance documents
- Update the Technology Integration Plan to include prioritization of technologies
- Establish guidance for SNF characterization based on RW License Application Annotated Outline
- Maintain Master Logic Schedule
- Support systems engineering analysis
- Implement QA requirements.

Establish Requirements (WBS 1.2.2)—The activities associated with this task are:

- Implement the Interim Storage Plan
- Identify first round of DOE SNF for Repository
- Complete Performance Assessment and Vulnerability Assessments.

Integrate Program Activities (WBS 1.2.3)—The activities associated with this task are:

- Support Foreign Research Reactor EIS and shipments to the US
- Resolve the state of Idaho litigation
- Support stakeholder involvement programs on SNF
- Provide interfaces with NRC, EPA, DNFSB, RW
- Provide oversight to ensure nationally uniform implementation of the SNF program.

Provide Program Resources (WBS 1.2.4)—The activity associated with this task is:

- Provide resources for advanced R&D technologies
- Track SNF data in the Integrated SNF Database System.

Assure Existing Storage (WBS 1.1.1)—The activities associated with this task are:

- Coordinate and report status on activities to resolve SNF storage vulnerabilities identified by DOE working groups and the DNFSB
- Complete SRS and Hanford DNFSB 94-1 recommendations.

Achieve Interim Storage (WBS 1.1.2)—The activities associated with this task are:

- Coordinate the implementation of the Interim Storage Plan
- Hanford 400 Area Interim Storage Area online.

Prepare for Ultimate Disposition (WBS 1.1.3)—The activities associated with this task are:

- Issue data needs to support RW repository licensing
- Complete RCRA recommendation for DOE SNF
- Formally issue the EM-RW MOA
- Coordinate the acceptance criteria for storage, transportation, and disposal.

4.2.3 FY 1997 Planned Activities.

Plan Program (WBS 1.2.1)—The activities associated with this task are:

- Update Program documents
- Prepare and update policy and guidance documents
- Status Master Logic Schedule
- Support systems engineering analysis.

Establish Requirements (WBS 1.2.2)—The activities associated with this task are:

- Update and implement the Interim Storage Plan, as needed
- Complete Performance Assessments for DOE SNF
- Support ES&H vulnerability assessments.

Integrate Program Activities (WBS 1.2.3)—The activities associated with this task are:

- Support Foreign Research Reactor shipments to the US
- Support stakeholder involvement programs on SNF
- Provide interfaces with NRC, EPA, DNFSB, RW
- Provide national QA program for SNF.

Provide Program Resources (WBS 1.2.4)—The activity associated with this task is:

- Support advanced R&D technologies
- Track SNF data in the Integrated SNF Database System.

Assure Existing Storage (WBS 1.1.1)—The activity associated with this task is:

- Coordinate and report status on activities to resolve SNF storage vulnerabilities identified by DOE working groups and the DNFSB.

Achieve Interim Storage (WBS 1.1.2)—The activities associated with this task are:

- Coordinate the implementation of the Interim Storage Plan
- Coordinate transportation.

Prepare for Ultimate Disposition (WBS 1.1.3)—The activities associated with this task are:

- Coordinate the acceptance criteria for long-term storage

- Coordinate and provide NRC licensing input to RW for DOE SNF
- Coordinate and provide EIS input for DOE SNF.

4.3 Priorities and Criteria

The process used to perform the National SNF Program trade-off studies was based on DOE Order 4700.1 which requires these studies to be performed as part of the system engineering process. These trade-off studies are performed to determine the SNF management alternatives that best meet the Program mission and are used as the basis for establishing priorities. The National SNF Program, in an effort to perform consistent trade-off studies across the complex, has developed criteria to be used for decisionmaking and prioritization across the complex. When lower level criteria are necessary, it should be derived from criteria defined below.

The following criteria are listed in random order, with no significance or weighting related to the order in which they are listed. Alternatives or activities receive a higher comparative rating depending on how well they meet the minimization or maximization criteria.

Cost—The cost decision criterion is focused on minimizing initial and life cycle cost while maximizing conformance to disposal acceptance criteria and maximizing operational flexibility. These considerations also minimize duplication of efforts between sites in several key areas, i.e., technology development, construction, research, characterization.

Technology—The technology decision criterion maximizes conformance to national consensus standards and private/commercial technologies while minimizing new technology and technology development. This will provide maximum compatibility with civilian SNF operations while also maintaining maximum flexibility for disposition.

Stakeholder Acceptance—The stakeholder acceptance decision criteria maximize conformance to prior DOE commitments while maximizing near-term tangible progress. Decisions will consider minimizing the duration of interim storage and negative economic impact to communities.

Environment, Safety, and Health—The decision criteria involving environmental, health and safety are all centered on minimizing radiological risk to public, minimizing radiological risk to workers, minimizing occupational safety risk to workers, minimizing transportation risk to public, and minimizing handling and intra-site shipments

Safeguards and Security (S&S)—The safeguards and security decision criteria maximize passive S&S controls while minimizing proliferation risks and the need for physical inventory.

These criteria are considered when establishing priorities for the SNF Program.

5. WORK BREAKDOWN STRUCTURE

5.1 Work Breakdown Structure and Responsibility Assignment Matrix

The Work Breakdown Structure (WBS) was developed based upon the systems engineering technical and programmatic functions being performed by the SNF Program. In accordance with DOE Order 4700.1, the Project Summary WBS is decomposed to three levels as shown in Figure 5-1. Although only the first three levels are shown here, the complex has decomposed the WBS through four levels. These upper levels of the WBS hierarchy are further shown in the Responsibility Assignment Matrix (RAM), defined in Section 6.

Depending on the scope and level of complexity at the individual site, these WBS elements will be decomposed to meet the level of control required.

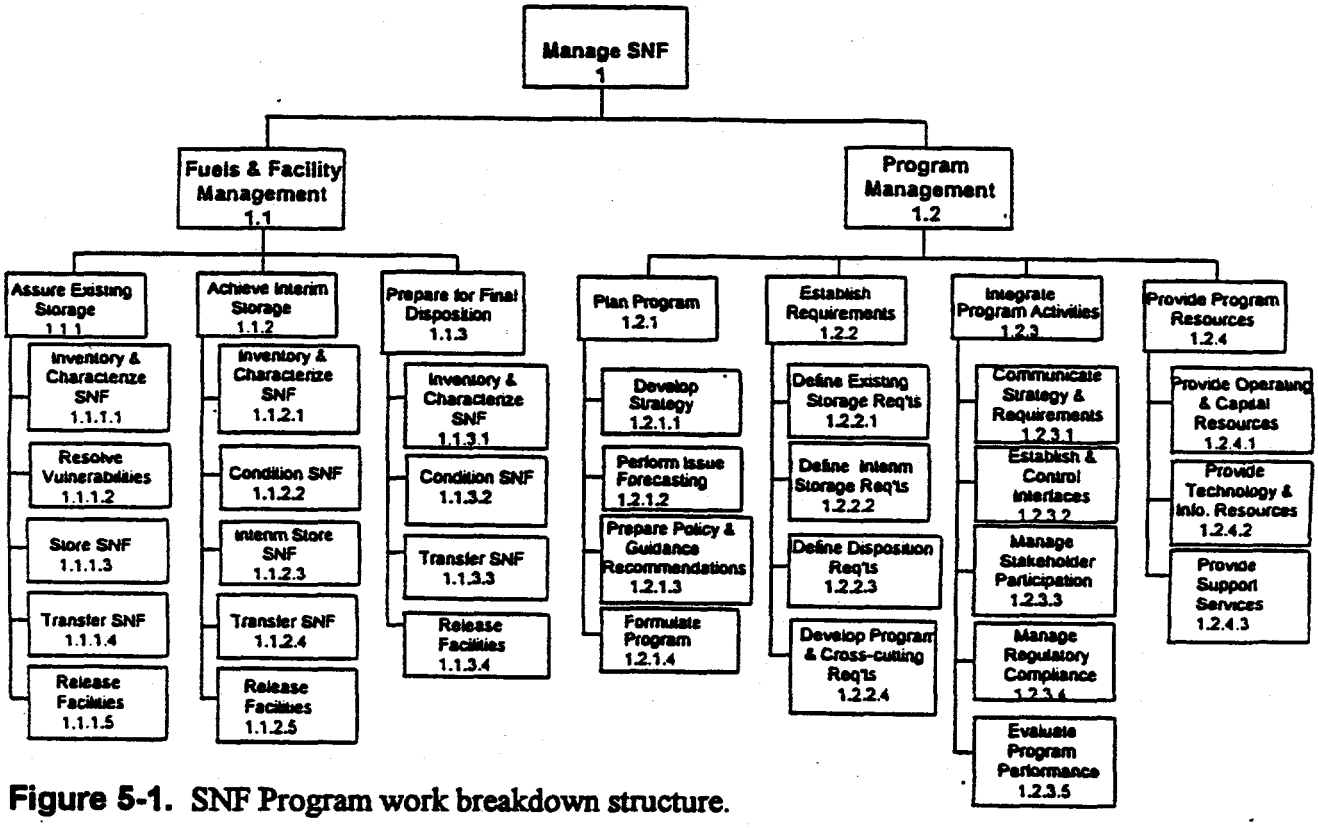


Figure 5-1. SNF Program work breakdown structure.

5.2 WBS Dictionary

The WBS Dictionary (See Table 5-1) is defined to Level 3. The RAM, defined in Section 6, is used to define areas of responsibility for each of the participants in the SNF Program. General descriptions of each group's responsibilities were provided in Section 3.

Table 5-1. WBS dictionary.

PWBS Numbers	Description	Definition
1	National SNF Program	The safe, reliable, and efficient storage of the current and future inventory of Department of Energy-owned SNF and foreign research reactor SNF until a disposal facility is available.
1.1	Fuel and facility management	The management of the DOE-owned SNF and related facilities until their release for disposal.
1.1.1	Assure existing storage	Operate and maintain facilities within acceptable safety requirements. Accommodate new fuel receipts. Resolve identified vulnerabilities, minimize introduction of new problems. Characterize and stabilize SNF as necessary for near-term storage in existing facilities, transfer SNF, transfer waste to a waste disposal custodian, and release facilities.
1.1.2	Achieve interim storage	Acquire, operate, and maintain interim storage facilities. Receive fuel from existing facilities and external sources. Characterize and condition SNF for long-term interim storage. Transfer waste to a waste disposal custodian. Develop technologies to achieve safe interim storage. Transfer SNF to prepare it for disposition and release excess facilities.
1.1.3	Prepare for final disposal	Receive, characterize, condition, package, stage, and transfer SNF for final disposition in accordance with disposition facility requirements. Develop technology to prepare SNF for final disposition. Transfer waste to a waste disposal custodian. Release excess facilities.
1.2	Program management	The SNF Program support and administrative support activities for the National SNF Program.
1.2.1	Plan program	Formulate national and site specific strategies and priorities for accomplishing the SNF Program mission in accordance with national and DOE policies and guidance. Identify and resolve potentially inhibiting issues. Develop an effective program structure, processes, plans, and guidance to effect the mission.
1.2.2	Establish requirements	Identify, evaluate, integrate, define, document, issue, and maintain programmatic and technical. requirements and specifications to control the implementation of SNF Program activities and resources. Clarify requirements and specifications as required.
1.2.3	Integrate program activities	Ensure a nationally uniform implementation of the SNF Program by communicating Program strategies, plans, guidance, and requirements to program participants and to internal and external stakeholders. Ensure effective stakeholder involvement in Program planning and execution. Ensure efficient utilization of existing DOE and contractor personnel, organizations, and physical resources in implementing the Program. Ensure uniform interpretation of applicable laws, orders, regulations, and other requirements. Evaluate Program performance against planned and expected budgets, schedules and documented Program requirements.
1.2.4	Provide program resources	Provide and allocate fiscal, physical, technical, capital and operating, and information resources, and provide support services, to enable and facilitate the Program mission.

6. RESPONSIBILITY MATRIX

The organizational responsibility and the individual responsible for each activity on the WBS are defined in the Responsibility Assignment Matrix. The responsibility assignment matrix is broken down to level 4 of the WBS. Further breakdown of this WBS RAM to level 5 will be developed in conjunction with the site contractors.

PWBS Numbers	Description	EM-67 Manager	EM-63 Manager	EM-65 Manager	EM-66 Manager	Contractor Lead
1	National SNF Program	**Cole**				
1.1	Fuel and facility management	*Cole*				
1.1.1	Assure safe, existing storage	*Cole*	**Director**	**Director**	**Director**	*Sites*
1.1.1.1	Inventory and characterize fuel	*Baker*				**Sites**
1.1.1.2	Resolve vulnerabilities	*Eckert*				**Sites**
1.1.1.3	Store SNF	*Eckert*				**Sites**
1.1.1.4	Transfer SNF	*Eckert*				**Sites**
1.1.1.5	Release facilities	*Eckert*				**Sites**
1.1.2	Achieve interim storage	*Cole*	**Director**	**Director**		*Sites*
1.1.2.1	Inventory and characterize SNF	*Baker*				**Sites**
1.1.2.3	Condition SNF	*Baker*				**Sites**
1.1.2.3	New facilities	*Hansen*				**Sites**
1.1.2.3	Interim store SNF	*Eckert*				**Sites**
1.1.2.4	Transfer SNF	*Eckert*				**Sites**
1.1.2.5	Release facilities	*Eckert*				**Sites**
1.1.3	Prepare for final disposal	*Cole*	**Director**	**Director**		*Sites*
1.1.3.1	Inventory and characterize	*Baker*				**Sites**
1.1.3.2	Condition SNF	*Baker*				**Sites**
1.1.3.3	Transfer SNF	*Eckert*				**Sites**
1.1.3.4	Release facilities	*Eckert*				**Sites**
1.2	Program management	**Cole**	*Director*	*Director*		*Sites*
1.2.1	Plan program	**Cole**				*INEL*
1.2.1.1	Develop strategy	**Baum**				*INEL*
1.2.1.2	Perform issue forecasting	**Chacey**				*INEL*
1.2.1.3	Prepare policy and guidance	**Chacey**				*INEL*
1.2.1.4	Formulate program	**Chacey**				*INEL*
1.2.2	Establish requirements	**Cole**	*Director*	*Director*		*INEL*
1.2.2.1	Define requirements for existing storage	**Eckert**				*INEL*
1.2.2.2	Define interim storage requirements	**Eckert**				*INEL*
1.2.2.3	Define final storage requirements	**Thompson**				*INEL*
1.2.2.4	Develop program and cross-cut requirements	**Hanson**				*INEL*
1.2.3	Integrate program activities	**Cole**	*Director*	*Director*		*INEL*
1.2.3.1	Communicate strategy and requirements	**Thompson**				*INEL*
1.2.3.2	Manage program interface	**Thompson**				*INEL*
1.2.3.3	Manage stakeholder participation	**Fleming**				*INEL*
1.2.3.4	Manage regulatory compliance	**Head**				*INEL*
1.2.3.5	Evaluate program performance	**Chacey**				*INEL*
1.2.4	Provide program resources	**Cole**	*Director*	*Director*		*INEL*
1.2.4.1	Provide operational and capital resources	**Baum**				*INEL*
1.2.4.2	Provide information resources	**Baker**				*INEL*
1.2.4.3	Provide support services	**Baum**				*INEL*

Bold identifies primary approval responsibility
Italic identifies support or reviewing responsibility

Figure 6-1. WBS responsibility assignment matrix.

7. SCHEDULE AND MILESTONES

7.1 Schedule

The schedules and milestones are divided into a multi-tier hierarchical structure consisting of the Program Summary Schedule, Fuel Transfer Schedules, and RW Interface Schedules, all based on the Program Site Logic Diagram shown in Section 8. The Site-Specific Summary Schedules and the Site-Specific Detailed Schedules are presented in the ISP. This Program Plan presents the schedules at the top or summary level. This hierarchy and assignment of responsibilities for these schedules are discussed in the following sections. The tie between the WBS and the schedules are being developed.

7.1.1 Program Summary Schedules. The DOE Complex is widespread, with a large number of different SNF types residing at several sites. To manage this SNF and enable the decision-maker to maintain an overall picture of the vast array of ongoing activities over the long term, EM-67 has developed a Site Logic Diagram (see Figure 8-1) and summary schedules presented in this section. These documents serve as integral components of the program implementation strategy by establishing the logic and key milestones for the entire national program and display the paths that lead to ultimate disposition of DOE-Owned SNF.

The SNF Program Summary Schedule (Figure 7-1) was developed from the Site Logic Diagram (Figure 8-1). Figure 7-2 shows the SNF Program Fuel Transfer Schedule as developed for the ISP.

The SNF Program Summary Schedule depicts all key milestones related to fuel movements identified for the national program. Figure 7-2 depicts the SNF fuel transfer at the summary level between the sites, and Figure 7-3 summarizes key repository program interface points.

The SNF Technology Integration Plan, as it matures and identifies technology development paths, will identify activities and milestones for inclusion in the summary and detailed site schedules. To provide for this, the program schedules are accompanied by a database that provides ready revision of the schedules to reflect decisions as well as the schedule status.

7.1.2 Site-Specific Detailed Schedules. The Site Detailed Schedules, prepared and maintained by each of the specific sites, are the intermediate tier of the site-specific scheduling system and provides a capsule summary of the site-specific SNF Program schedule, including all site-specific key events and other program-controlled milestones. These schedules outline the target start and completion dates for all site-specific programs and major phases for the DOE strategy and provides a basis for all lower level schedules. The reader is directed to the ISP for detailed information on the schedule for assuring safe existing conditions, achieving interim storage, and preparing for ultimate disposition.

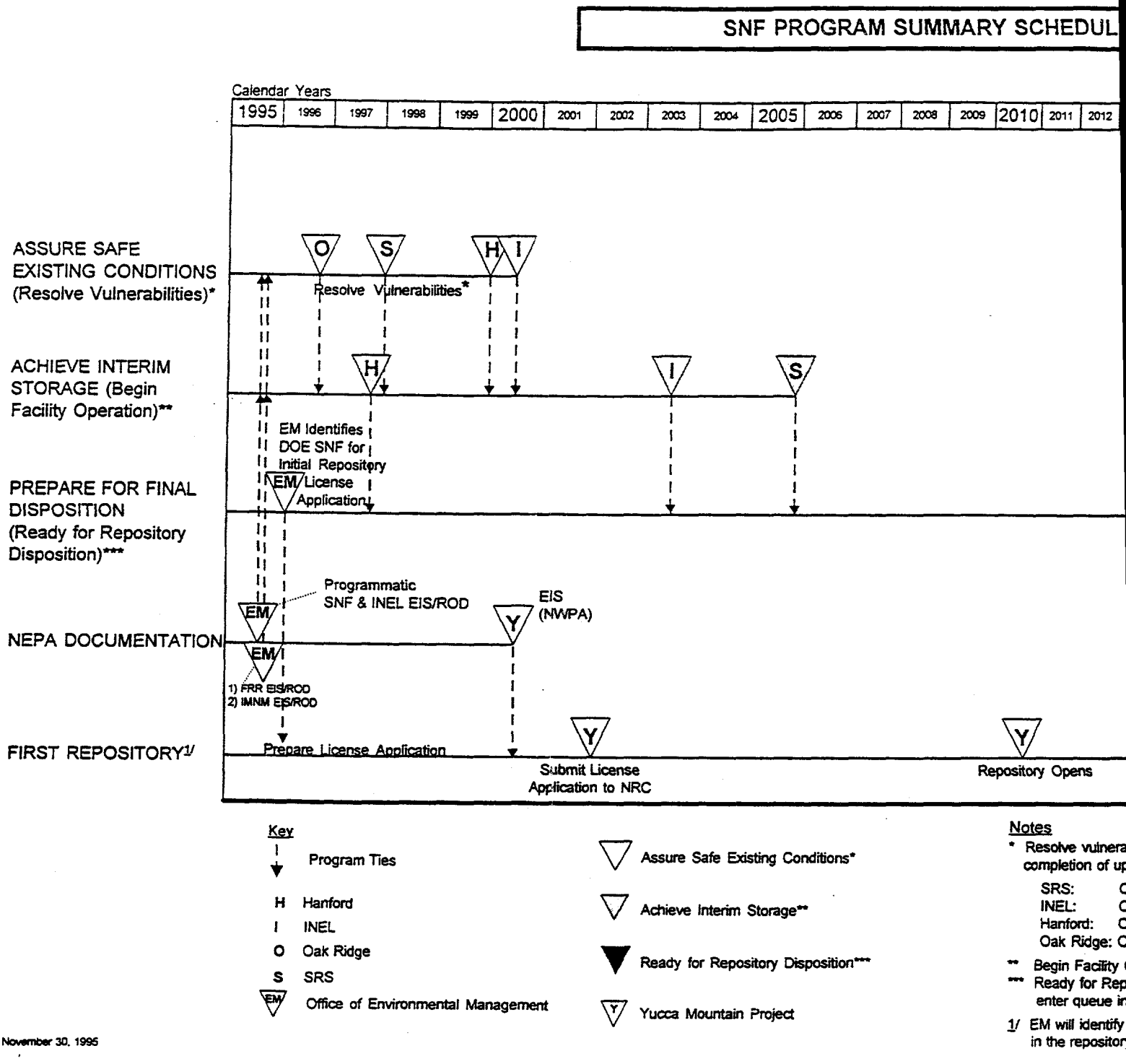
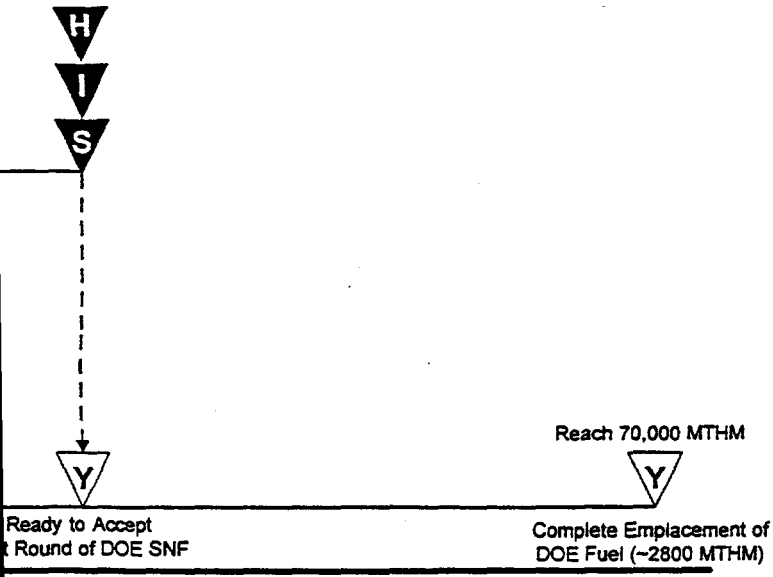


Figure 7-1. SNF Program summary schedule.

2014	2015	2016	2017	2018	2019	2020	2021	2022	...	2034	2035



es – Includes DNFSB 94-1 recommendations for SRS, INEL, and Hanford, and
des at Oak Ridge as follows:

plete processing of production fuel (at-risk) (12/97)
plete SNF Transfers from CPP-603 Wet (12/00)
plete fuel removal from K-Basins (12/99)
plete upgrade of SWSA 5N Dry Storage Facility (9/96)

ration – Begin operation of all new interim storage facilities
ory Disposition – All fuel identified in the License Application will be ready to
15 (first date the repository will accept DOE-owned SNF)

E SNF for repository license amendment, which will enable all fuel to be emplaced
2035, at a time to be determined.

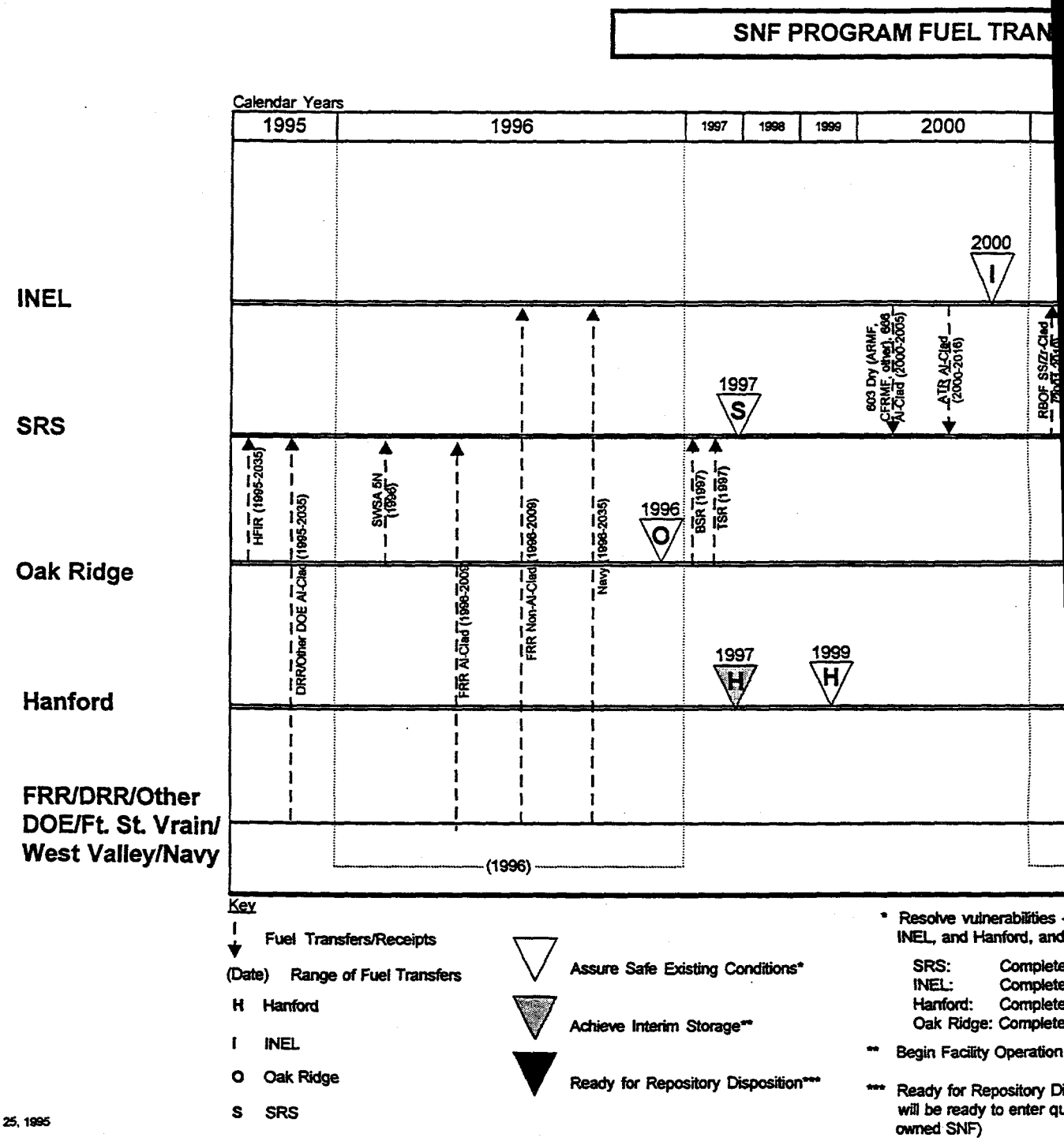
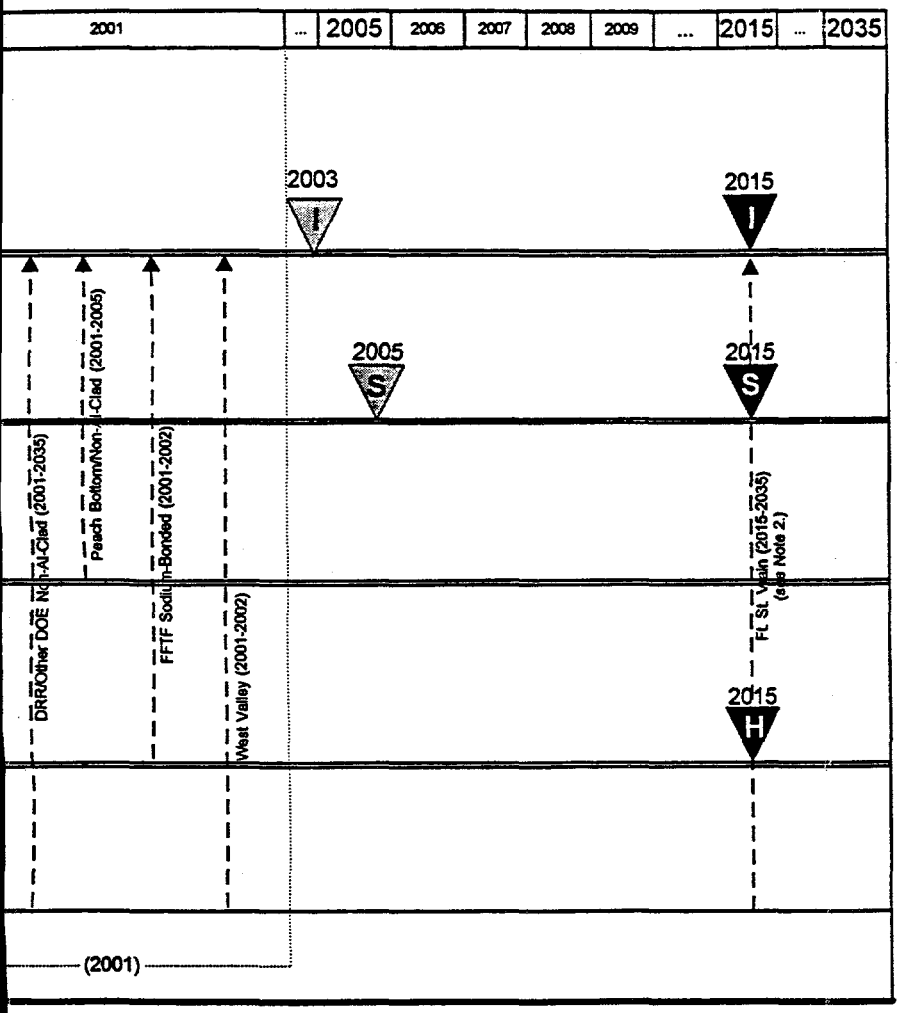


Figure 7-2. SNF Program fuel transfer schedule.

ER SCHEDULE



ncludes DNFSB 94-1 recommendations for SRS, mpletion of upgrades at Oak Ridge as follows:

rocessing of production fuel (at-risk) (12/97)
NF Transfers from CPP-603 Wet (12/00)
el removal from K-Basins (12/99)
grade of SWSA 5N Dry Storage Facility (9/96)

Begin operation of all new interim storage facilities

osition – All fuel identified in the License Application e in 2015 (first date the repository will accept DOE

Notes

1. Fuel transfers have been depicted at the earliest date shipping sites could begin transfers. A range of possible dates for transfers is shown in parentheses.

2. No FSV shipments to INEL unless permanent repository or interim storage facility outside ID is opened and accepting SNF from INEL, in which case shipments will be made only for the purpose of treating FSV fuel for disposal or storage elsewhere.

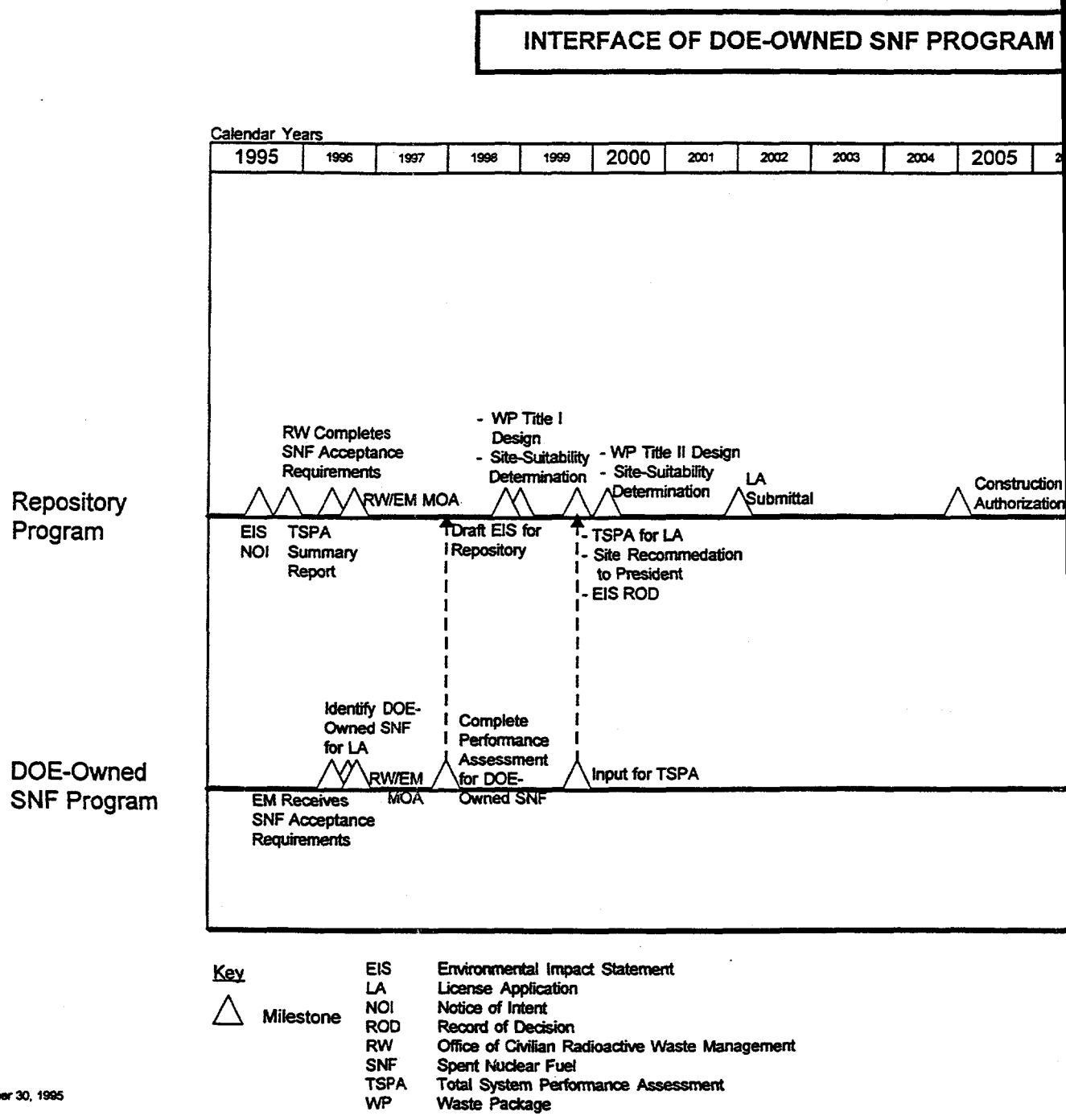
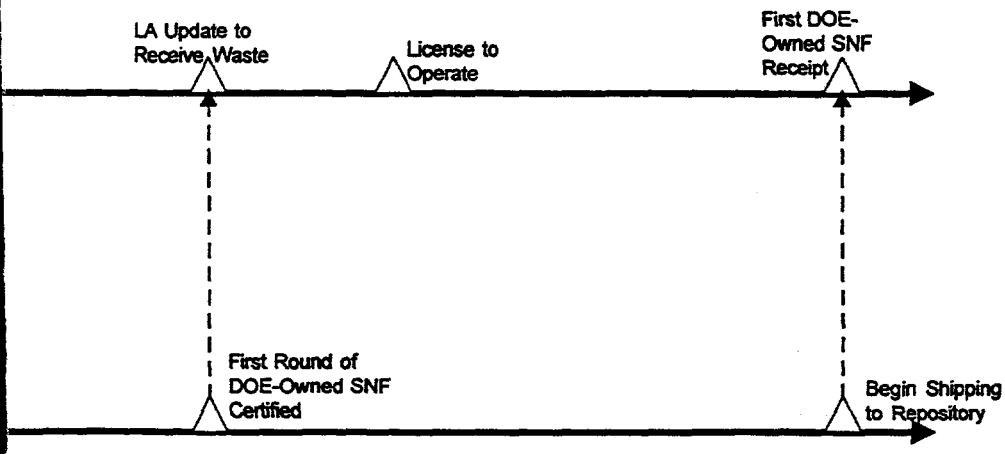


Figure 7-3. Interface of DOE-Owned SNF Program with Repository Program.

ITH REPOSITORY PROGRAM

	2007	2008	2009	2010	2011	2012	2013	2014	2015	...



7.2 Milestones

The Major Milestone for the National SNF Program are listed below. These milestones are listed by Objective Area defined in this program plan. These milestones have been derived from the DOE Program Execution Guidance and the SNF Program Summary Schedule.

7.2.1 Decisionmaking Process.

Issue SNF Program Plan, Rev. 0	November 1995
Issue Final Foreign Research Reactor EIS	December 1995
Issue FRR EIS ROD	January 1996
Issue Technology Integration Plan, Rev. 1	February 1996
Issue SNF Strategic Plan, Rev. 1	March 1996
Issue Technology Integration Plan, Rev. 2	September 1996

7.2.2 Safe Existing Storage and Resolve Vulnerabilities.

Issue Site Specific Management Plans	March 1996
Resolve ORNL Vulnerabilities	September 1996
Resolve SRS Vulnerabilities	December 1997
Resolve Hanford Vulnerabilities	December 1999
Resolve Idaho Vulnerabilities	June 2000

7.2.3 Achieve Interim Storage.

Issue Interim Storage Plan, Rev. 0	November 1995
Issue Interim Storage Plan, Rev. 1	September 1996
Issue final RCRA Applicability Report on SNF	September 1996
Issue Revised SNF Characterization Plan	September 1996
Achieve Safe Interim Storage at Hanford	June 1998
Achieve Safe Interim Storage at SRS	September 2005
Achieve Safe Interim Storage at INEL	June 2006

7.2.4 Prepare for Disposal.

Submit SNF QA documents to RW	May 1996
Identify SNF needs to RW	August 1996
EM Identifies DOE SNF for Repository	June 1997
DOE SNF ready for Disposition	June 2015

8. LOGIC DIAGRAM

The SNF Program Site Logic Diagram can be thought of as a snapshot in time, recognizing that as the NEPA documents are completed, and RODs issued, the planned activities will change. The Logic Diagram was developed using the selected alternative from the Programmatic SNF EIS ROD, Regionalization by Fuel Type, as modified for the Idaho, DOE, and Navy court settlement. The Logic Diagram assumes certain fuel types will be moved to selected DOE sites. Under the selected alternative, chemical processing of the DOE-owned SNF may take place at the Savannah River Site, and possibly the Idaho National Engineering Laboratory, pending final site-specific NEPA evaluations. The Logic Diagram also assumes that certain DOE-owned SNF may require processing to remove RCRA characteristics. However, the Logic Diagram also assumes that RCRA is done during the Major System Acquisition process, if required, thus not impacting the schedule. Delays due to lawsuits, permit acquisitions and various reviews could impact the schedule significantly, and will require schedule modifications.

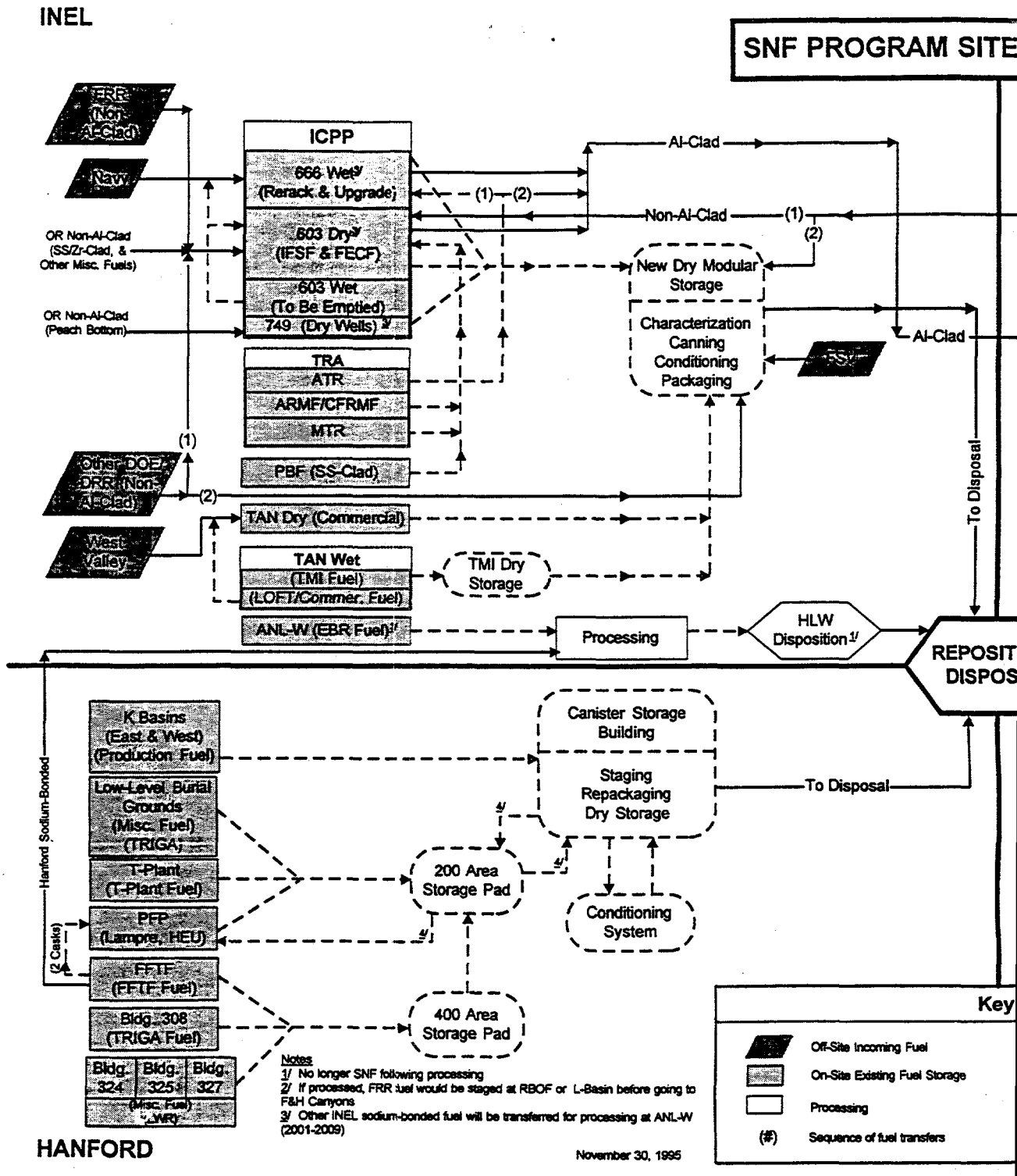
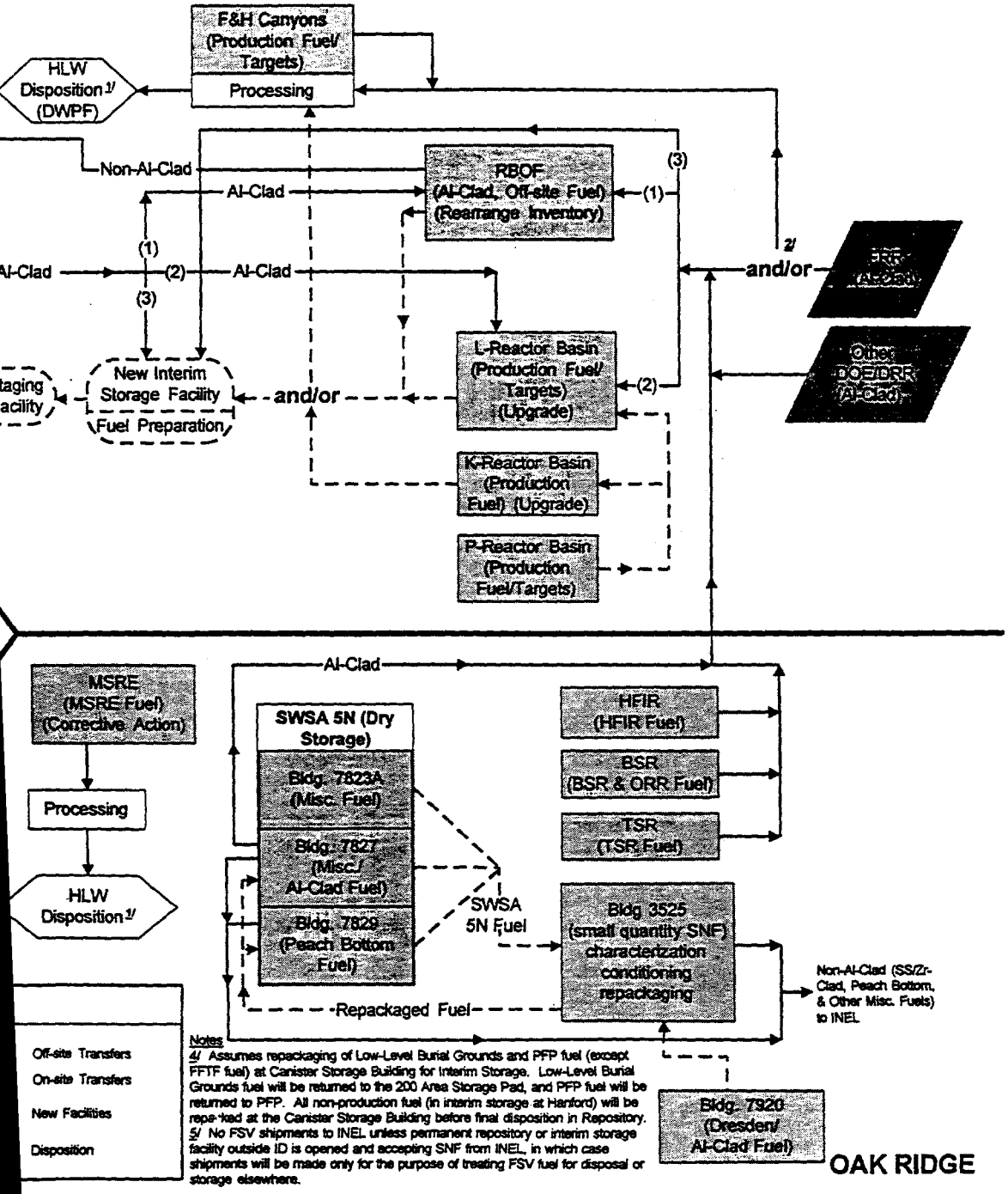


Figure 8-1. SNF Program Site Logic Diagram.

SRS

GIC DIAGRAM



Notes

4/ Assumes repackaging of Low-Level Burial Grounds and PFP fuel (except FFTF fuel) at Canister Storage Building for Interim Storage. Low-Level Burial Grounds fuel will be returned to the 200 Area Storage Pad, and PFP fuel will be returned to PFP. All non-production fuel (in interim storage at Hanford) will be repackaged at the Canister Storage Building before final disposition in Repository.

5/ No FSV shipments to INEL unless permanent repository or interim storage facility outside ID is opened and accepting SNF from INEL, in which case shipments will be made only for the purpose of treating FSV fuel for disposal or storage elsewhere.

OAK RIDGE

9. RESOURCE REQUIREMENTS

The SNF Program resource requirements are developed through detailed planning of the current and out year activities by each of the individual sites, based on the SNF Program Directive issued by EM. This approach is the basis for the annual budget authorities that are used as baselines for program performance assessment. The detailed cost estimating techniques used estimate the labor and nonlabor costs for each discrete activity in the WBS for the national program activities. The site-specific activities in FY 1996 were developed based on the individual sites planning effort. In FY 1997, the budget process will be tied to the WBS for site specific activities and also tied to the Summary Schedule presented earlier. FY 1996 is considered a transition year for the DOE SNF Program. The estimates for FY 1997 and beyond are made by the responsible performing organizations and are based on executing the activities identified in the SNF Program Directive and the schedules presented in Section 7. Table 9-1 shows the resource requirements identified for the SNF Program out to FY-2001 based on the current ADS.

Table 9-1. SNF Program resource requirements.[a]

Site	Title	ADS No.	FY 96	FY 97	FY 98	FY 99	FY 00	FY 01	Total
INEL	Subtotal		64.4	69.4	70.6	70.6	78.5	74.6	428.1
	National SNF Program	ID-1011-WN	6.2	7.3	7.3	7.3	7.3	7.3	
	Tech Development (MPC)	ID-1004-WN	4.2	2.0	2.0	2.0	2.0	2.0	
	Facility Construction	ID-1012-WN	6.5	4.0	8.0	8.0	20.0	25.0	
	Dry Storage	ID-4307-EG	5.2	8.0	0.0	0.0	0.0	0.0	
	SNF Operations	ID-1010-WN	26.4	34.4	40.9	42.6	43.1	34.2	
	National SNF Checkbook	ID-1011-WN	6.0	5.0	5.0	5.0	5.0	5.0	
	Projects	ID-1003-WN	4.9	0.0	0.0	0.0	0.0	0.0	
	Ops & Maintenance (Misc)	ID-6342	2.1	5.7	4.4	2.7	0.0	0.0	
	Nuclear Material Storage	ID-6316	0.8	0.9	0.9	0.9	0.9	0.9	
	Surveillance & Maintenance	ID-6331	2.1	2.1	2.1	2.1	0.2	0.2	
Hanford	Subtotal		177.0	215.4	159.6	136.1	82.8	15.6	786.5
	K-Basins Path Forward	RL-4110-0	136.0	175.0	123.0	103.7	82.0	14.8	
	"T Plant	RL-2320-0	0.8	0.8	0.8	0.8	0.8	0.8	
	200 West Burial	RL-2200-0	0.0	0.0	0.0	0.0	0.0	0.0	
	324/325/327 Buildings	RL-8400-0	1.0	0.0	0.0	0.0	0.0	0.0	
	FFTF/Sodium Bonded Fuel	RL-6640-0	37.7	39.6	35.8	31.6	0.0	0.0	
	Building 308	RL-6641-0	1.4	0.0	0.0	0.0	0.0	0.0	
	N-Reactor Basin	RL-3600-0	0.1	0.0	0.0	0.0	0.0	0.0	
SRS	Subtotal		57.4	59.6	58.5	62.9	77.8	88.1	404.3
	SNF Prog Mgt/FRR Prep	SR-71-AA	5.9	4.1	5.0	5.0	5.0	5.0	
	Dry Storage LI	SR-71-LI	6.3	13.0	12.0	16.0	44.5	55.3	
	RBOF Operations	SR-6920-7	14.0	19.3	14.8	15.2	15.3	14.8	
	K, L, & P Operations	SR-6925-9	0.5	0.0	0.0	0.0	0.0	0.0	
	K-Reactor Basin	SR-6920-1	16.0	16.0	16.0	16.0	0.0	0.0	
	L-Reactor Basin	SR-6920-2	7.2	7.2	10.7	10.7	13.0	13.0	
	P-Reactor Basin	SR-6920-3	7.5	0.0	0.0	0.0	0.0	0.0	
ORNL	Program	OR-3210	1.6	2.0	2.0	1.0	1.0	1.0	8.0
Other			1.8	1.9	1.7	1.7	1.7	1.7	10.6
	Prime Contract Support		1.6	1.7	1.5	1.5	1.5	1.5	
	Travel Allocation		0.1	0.1	0.1	0.1	0.1	0.1	
	Contract Support		0.1	0.1	0.1	0.1	0.1	0.1	
Total			302.2	348.3	292.4	272.3	241.8	181.0	1637.5

a. All numbers are millions of dollars.

10. PROJECT FUNCTIONAL SUPPORT REQUIREMENTS

This section represents the various offices and organizations that work with EM-67 in implementing the DOE SNF Program. A brief description of each office's responsibility is provided in the following sections to define roles and responsibilities. In addition to the specific offices mentioned below, the site operations offices at Hanford, INEL, OR and SRS and contractors have supporting offices managing their local SNF program in accordance with the policies established by this national program and the offices listed below.

10.1 The Office of Nuclear Material and Facility Stabilization (EM-60)

The Office of Nuclear Material and Facility Stabilization is responsible for protecting the public and the environment from the hazards of nuclear materials and to deactivate surplus facilities in a manner which provides savings to the government by providing an effective and efficient system which stabilizes nuclear materials and deactivates facilities as soon as possible. The activities associated with this responsibility are program planning and budgeting, evaluation and intervention, and representation functions associated with the stabilization of nuclear materials and the deactivation of surplus facilities. General functions of this office include, among others:

- Conduct strategic planning, program planning and analysis, and develop policy and program guidance necessary for materials stabilization and facility deactivation activities
- Establish a sound foundation for the business management of the nuclear materials and facility stabilization program
- Evaluate nuclear material and facility stabilization program performance and progress
- Develop program and technical requirements, options, analyses, and recommendations in support of policy development and long-range and strategic planning, including budget requirements and allocations, justifications, and documentation
- Identify technology development requirements and measures of success to enable cost-effective and timely availability of treatment, storage, and disposal capability.

10.2 The Office of Program Integration (EM-62)

The Office of Program Integration provides programmatic guidance; strategic planning; program analysis; program advocacy both internal and external to the DOE; coordination of EM-60 budget planning, preparation, and execution; development of performance measurements; and integration of cross-cutting issues, activities, and programs within EM-60. Specific functions within the purview of EM-62 are as follows:

- Develop and implement strategic plans with EM-60 and serve as the EM-60 representative for the EM-wide strategic planning effort
- Formulate and issue national programmatic policies and guidance establishing national goals, priorities, and objectives and resolving cross-cutting issues
- Develop the consolidated EM-60 budget and related documentation and perform appropriate analysis on budget data and information

- Develop program execution guidance and plans both within EM-60 and as the EM-60 representative for EM-wide efforts
- Serve as the EM-60 lead on the Baseline Environmental Management Report (BEMR) project
- Develop performance measurement system by which line management can objectively measure progress on field activities
- Develop, promulgate, and revise, as required, procedures that implement regulatory guidance pertaining to receipt, management, and disposition of surplus contaminated facilities.

10.3 The Savannah River Office (EM-63)

The Savannah River Office provides programmatic guidance and direction, resource allocation, program analysis, program advocacy both internal and external to the DOE, policy evaluation, priority determination, program performance measures and performance monitoring of the EM-63 activities at the Savannah River Site. These activities include reduction of high or moderate risk conditions associated with unstable, excess nuclear and chemical materials, former nuclear weapons production facilities, and SNF; protection of workers, the public, and the environment from radiological and nonradiological hazards; safe management of surplus hazardous and nuclear materials; deactivation of facilities to attain lowest surveillance and maintenance costs; and disposition of facilities to alternative use or final decontamination and decommissioning. General functions of this office include, among others:

- Develop and implement strategic plans, policies, guidance, and program planning
- Prepare, approve, and defend the site-specific budgets
- Participate in the development of Defense Nuclear Facility Safety Board implementation plans
- Preparing and implementing site-specific NEPA documentation as identified by the DOE SNF Programmatic EIS
- Review and evaluate cost and schedule performance
- Review and evaluate environmental, safety and health performance
- Represent the program to Congress and respond to congressional information requests and correspondence
- Implementing the SNF management plans as defined by the DOE SNF Program
- Coordinate and respond to programmatic reviews and recommendations made by external and oversight organizations.

10.4 The Northwestern/Oak Ridge/Chicago Office (EM-65)

The Northwestern/Oak Ridge/Chicago Office provides programmatic guidance and direction, resource allocation, program analysis, program advocacy both internal and external to the DOE, policy

evaluation, priority determination, program performance measures and performance monitoring of the EM-65 activities at Hanford, Idaho, Oakland, Albuquerque, Chicago, and Oak Ridge sites. These activities include reduction of high or moderate risk conditions associated with unstable, excess nuclear and chemical materials, former nuclear weapons production facilities, and SNF; protection of workers, the public, and the environment from radiological and nonradiological hazards; safe management of surplus hazardous and nuclear materials; deactivation of facilities to attain lowest surveillance and maintenance costs; and disposition of facilities to alternative use or final decontamination and decommissioning. General functions of this office are the same as those for EM-63

10.5 The Nuclear Materials Stabilization Office (EM-66)

The Nuclear Materials Stabilization Office integrates DOE's programs for stabilizing excess nuclear materials to achieve safe, stable states for interim and long-term storage pending disposition. General functions of this office include:

- Provide program direction and policy for the integrated management of the stabilization of excess nuclear materials
- Designate materials within the scope of the program
- Develop and supplement guidelines for Site Management Plans, including reporting vehicles necessary to monitor progress
- Initiate reports to the Defense Nuclear Facilities Safety Board on changes to milestones in the Implementation Plan for the Board's Recommendation 94-1. Forward an annual report to the Board on the progress toward meeting the commitments in the Implementation Plan.

10.6 The Office of Technical Services (EM-37)

The Office of Technical Services provides quality assurance services to EM-67. EM-37 (formerly EM-33) has established a quality assurance program that meets the requirements for both the High-Level Waste Program and the SNF Program. This office also prepares and controls standard practice procedures used by the SNF Program. The Quality Assurance program being implemented by the SNF Program and oversighted by EM-37 is described in Section 14.

10.7 Office of Civilian Radioactive Waste Management (RW)

RW's mission is to manage and dispose commercial SNF, DOE-owned SNF, and high-level radioactive waste. RW will provide leadership in developing and implementing strategies that assure public and worker health and safety, protecting the environment, merit pubic confidence, and are economically viable. As identified earlier, RW coordinates with EM-67 in the development of acceptance criteria for DOE-owned SNF to permit direct disposal in the first geologic repository. RW is coordinating the development of a multipurpose canister (MPC) that could be used both by commercial fuel owners for shipping and storing SNF. DOE may also use the MPC as modified. The future development and use of MPCs in the civilian radioactive waste management system will depend on the outcome of numerous bills currently being discussed in Congress. RW establishes the QA requirements for the SNF Program and

performs audits and surveillances to ensure these requirements are being properly implemented. The EM-37 HLW/SNF QAPM shall be the lead point-of-contact between RW and EM for QA activities related to both HLW and SNF. RW, together with EM, will develop the Memorandum of Agreement (MOA) to handle the acceptance and fee issues.

10.8 Defense Nuclear Facility Safety Board (DNFSB)

The DNFSB makes recommendations concerning engineering and management practices and policies related to DOE programs. These recommendations emphasize technical and managerial competence necessary to achieve effective project execution and provide adequate protection of public health and safety. The relationship between the DNFSB and EM-67 and their interfacing roles have been discussed in Section 3.

11. INFORMATION AND REPORTING

This section provides general guidelines for handling DOE SNF information and the reporting requirements established for the SNF Program. The SNF Program is centered on integrating and coordinating complex-wide activities related to SNF management. Central to the success of the SNF Program is the accurate, reliable and consistent information made available to all the program participants.

11.1 Policy

It is the policy of the DOE SNF Program to hold periodic meetings in accordance with the Office of Waste Management Program Manager's Guide to review current program status and performance and to inform management of potential problems and corrective actions.

11.2 Reports

Periodic status reports are generated and given as described in Table 11-1. The distribution for these reports is provided in Table 11-2.

Table 11-1. SNF Program reporting.

Report/period	Submission	Originator	Recipient	Comments	Distribution
SNF weekly status call	10:00AM ET, Mondays	EM-67 Staff, INEL	EM-67	Summary highlights (1-hour max.)	A
EM-67 monthly status report	Fifteenth of each month	Project participants	EM-67	Narrative status, monthly project control reports	B
Contracts funds status	Included in monthly report	Project participants	EM-67	Funds status and reconciliation	B
Cost performance	Included in monthly report	Project participants	EM-67	Project integrated cost and schedule by WBS	B
Milestone schedule status	Included in monthly report	Project participants	EM-67	Milestone status	B
PTS Reports	Monthly	Project participants	EM	Reports cost and schedule status by ADS	C

Table 11-2. Report distribution.

Distribution Code	Recipients	Number of Copies
A	EM-67 EM-67 Leads EM-37 INEL	Telecon
B	EM-63, EM-65, EM-66, EM-37 EM-67 Leads Operations Office Contractor Personnel	1 1 1 1
C	EM Leads Operations Office Contractor Personnel	Available on-line

11.3 Meetings

Periodic status meetings conducted during the planning and execution phases of the project are listed in Table 11-3. The schedule, location, participants, and comments are identified. The status review meetings schedules are coordinated with the planned receipt of status reports. The organization calling the meeting is responsible for preparing and distributing the meeting agendas and reports. Meeting reports should include significant results, action assignments, and special information items; reports will be distributed to all meeting participants and action assignees.

Table 11-3. SNF Program meetings.

Schedule	Location	Responsible organization	Participants	Comments
Every two months	Washington, DC	EM-67	Project participants	Project coordinating meeting, review progress, technical questions, action items, budget and schedule status
Ad hoc	Various locations	Technical Working Group	Project participants, as needed	Review technical issues, questions, and status for resolution
Ad hoc	Various locations	EM/RW Steering Group	EM/RW participants, as needed	Coordinate Em/RW resolution of DOE SNF disposition issues.

12. SYSTEMS ENGINEERING MANAGEMENT PLAN

DOE Order 4700.1 states that the System Engineering Management Plan (SEMP) should be considered as a component of the project management plan for any project requiring integration of engineering efforts. (Note: DOE Order 4700.1 is being phased out and being replaced with DOE Order 430.1, *Life-Cycle Asset Management.)* The Order also delineates the elements to be included in the SEMP such as planning, requirements definition, controls, analysis, processes, and integration. One of the early decisions made in developing the SNF Program was to maximize the use of systems engineering techniques in planning the program. Many of these elements are addressed in this Program Plan and it is not the intent of this chapter to repeat those elements. However, it is the intent to ensure appropriate coverage of the engineering elements. Therefore, related chapters of this plan have been reviewed to incorporate systems engineering elements and principles while other elements that are not covered will be addressed in this chapter. The systems engineering process, developed by the SNF Program, is described in the *DOE-owned Spent Nuclear Fuel Program Systems Engineering Process Summary* and the SNF Program requirements are found in the *Spent Nuclear Fuel Program Requirements Document.*

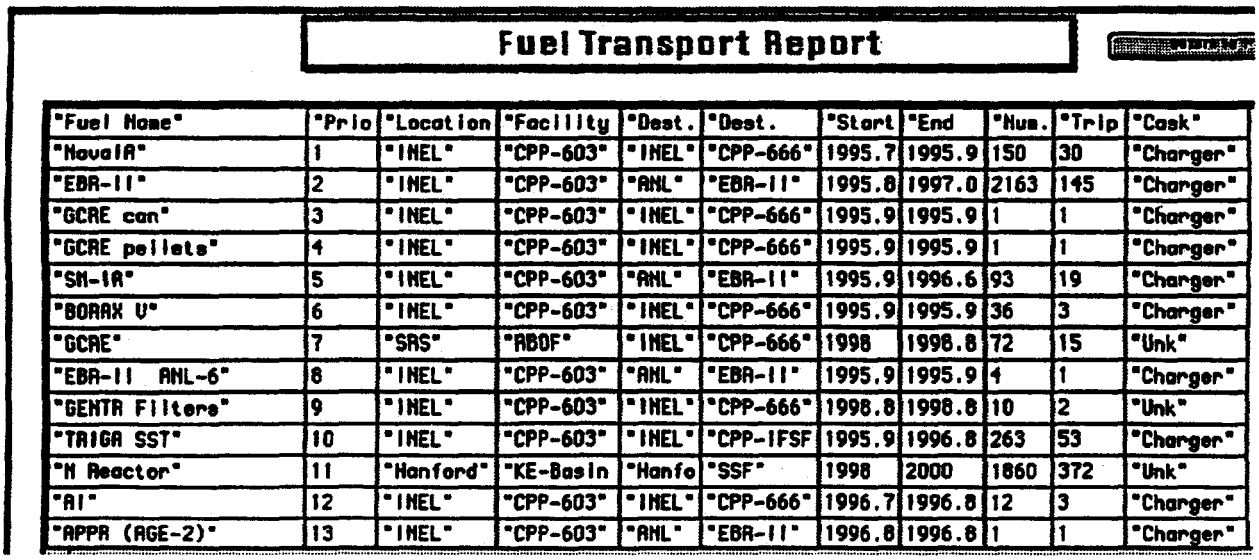
The following sections address trade-off studies and integration of program requirements, functions, and interfaces.

12.1 Trade-Off Studies

To aid in the development of the National SNF Program planning documents, performance of trade-off studies, and the management of the various program elements, a computer tool has been developed to simulate spent fuel movements throughout the DOE complex according to the Programmatic SNF EIS ROD, Regionalization by Fuel Type. Additionally, the computer simulation is being used to compare various management strategies and present the results for decision maker consideration. Currently, the Alternative Comparison Tool (ACT) accesses data from several sources such as, the Integrated Spent Nuclear Fuel Database System (ISNFDS), facilities report, cask-fuel combination matrix, and other reports from experts within the DOE complex.

ACT will perform the necessary trade-off studies to establish a baselined, documented path forward for each fuel type or fuel category. These trade-off studies include, but are not limited to, various SNF movement strategies, storage techniques, conditioning technologies, disposition strategies, etc. The results of these studies will primarily be displayed in terms of schedule and cost. The costs that are being used to compare alternatives include operation and maintenance, transportation, new facilities, and D&D. Where more detailed results are required, the capability exists to report for a given year the facility fill/depletion curves, facility and cask usage, stabilization and processing rates, and transportation schedules. Currently five metrics are tracked for each fuel: (a) MTHM, (b) fissile mass, (b) volume, (b) U^{235} content, and (e) total mass.

A sample output is shown in Figure 12.1. For this report, a simulation increment of 5 years was chosen and only the first page of the report was shown. The information displays the fuel type, where it is located, its destination, planned shipping date, planned shipment completion date, number of elements shipped, number of shipments, and the cask that will be used. The simulation tool tracks 253 line items of fuel that were given a high, medium, or low ranking in terms of shipping priority. Priorities were established based on fuel and facility risk.



Fuel Transport Report

"Fuel Name"	"Prio	"Location	"Facility	"Dest.	"Dest.	"Start	"End	"Num.	"Trip	"Cask"
"NavalA"	1	"INEL"	"CPP-603"	"INEL"	"CPP-666"	1995.7	1995.9	150	30	"Charger"
"EBR-II"	2	"INEL"	"CPP-603"	"ANL"	"EBR-II"	1995.8	1997.0	2163	145	"Charger"
"GCRE can"	3	"INEL"	"CPP-603"	"INEL"	"CPP-666"	1995.9	1995.9	1	1	"Charger"
"GCRE pellets"	4	"INEL"	"CPP-603"	"INEL"	"CPP-666"	1995.9	1995.9	1	1	"Charger"
"SM-1A"	5	"INEL"	"CPP-603"	"ANL"	"EBR-II"	1995.9	1996.6	93	19	"Charger"
"BORAX V"	6	"INEL"	"CPP-603"	"INEL"	"CPP-666"	1995.9	1995.9	36	3	"Charger"
"GCRE"	7	"SRS"	"RBOF"	"INEL"	"CPP-666"	1998	1998.8	72	15	"Unk"
"EBR-II ANL-6"	8	"INEL"	"CPP-603"	"ANL"	"EBR-II"	1995.9	1995.9	4	1	"Charger"
"GENTR Filters"	9	"INEL"	"CPP-603"	"INEL"	"CPP-666"	1998.8	1998.8	10	2	"Unk"
"TRIGA SST"	10	"INEL"	"CPP-603"	"INEL"	"CPP-IFSF	1995.9	1996.8	263	53	"Charger"
"N Reactor"	11	"Hanford"	"KE-Basin	"Hanfo	"SSF"	1998	2000	1860	372	"Unk"
"AI"	12	"INEL"	"CPP-603"	"INEL"	"CPP-666"	1996.7	1996.8	12	3	"Charger"
"APPR (AGE-2)"	13	"INEL"	"CPP-603"	"ANL"	"EBR-II"	1996.8	1996.8	1	1	"Charger"

Figure 12.1 Fuel transport report.

12.2 Integration

The National SNF Program is driven by many requirements governing the acceptance, storage, transportation, conditioning, and disposal of spent nuclear fuel. A system is being established to assist with the management and control these requirements. The Requirements Management System (RMS) associates program requirements with related functions, interfaces, and resources. Through this system, traceability of program functions from base requirements is maintained. Functional flow of the program elements is maintained, assisting with the definition of interfaces through the program. The RMS is implemented through CORE, a commercially available project engineering software package.

The existing technical and programmatic functions established for the SNF Program are being used as the starting point for the RMS effort. These functions and requirements were previously defined and decomposed (allocated) to a defined level in the national effort. Further decomposition will take place to show how the implementing functions meet defined requirements and where interfaces between program elements are needed. From this decomposition, further allocations define programmatic activity flow along with interfaces between the program elements. Program issues and resolutions identified from the allocation will be tracked through the RMS. An Issues Report will be issued and maintained. Dynamic simulation of the program flows will validate the time phasing of program activities to provide assurance that program elements are operating in concert with each other. The information resulting from the allocations provides full traceability of program requirements implementation and assignment, and allow a mechanism to more fully evaluate impacts of changes in requirements to the program. This information will be tied to the ACT to assure that such considerations are integrated into overall planning.

13. CONFIGURATION MANAGEMENT

Each site has established change control and configuration management systems that they use to manage their programs. The DOE SNF Program also utilizes a formal change control process to manage its baseline budget and schedules. This change control process approves the current-year planning and funding levels (Performance Measurement Baseline) and controls Program changes to the approved current-year work plans at Level 3 of the WBS. Approved changes are transcribed to the ADS and PTS for the site activities. A formal charter for the Change Control Board (CCB) and the assignment of staff to perform the CCB actions will be documented as part of the FY 1997 budget process.

13.1 Document Review and Approval Matrix

The review and approval of SNF Program documents are conducted at the required level in accordance with the requirements of this Program Plan and shown in Table 13-1. Revisions to existing documents are processed the same as the original document. The matrix identifies currently planned documents and will be updated as new documents are identified for approved and released by the SNF Program.

Table 13-1. SNF document approval matrix.

Document	EM-60	EM-67	EM-63	EM-37	EM-65	EM-62	Site
SNF Strategic Plan	A	R	R	R	R	R*	
SNF Program Plan	R	A	R	R	R	R*	R
SNF Quality Management Plan	A	R		R		R*	
SNF Requirements Document	R	A	R	R	R	R*	R
SNF Interim Storage Plan		A	R	R	R	R*	R
SNF Technology Integration Plan		A	R	R	R	R*	R
SNF Stakeholders Involvement Plan		A	R		R	R*	R
SNF Engineering Process Description		A	R		R	R*	R
SNF Standard Practice Procedures		R		A		R*	
SNF QARD Requirements Matrix		R		A			
Activity Data Sheets		A	R		R	R*	R
Formal reports		R	R*		R*		A
Informal reports			R*		R*		A
Site requirements documents		R*	R*	R*	R*		A
Site implementation plans			R*		R*		A

A - Review and approve R - Review and concur R* - Review and concur as necessary

14. QUALITY ASSURANCE AND QUALITY RECORDS

Documents from a variety of sources are used to develop the quality program, quality assurance plans, and procedures to control SNF work activities. However, the contents of the source documents do not necessarily apply to all program activities. The applicability of quality program regulations, DOE Orders and directives, national standards, and guidance documents to the SNF program needs to be evaluated on a site-by-site basis in accordance with the following guidance. For each specific site, the quality assurance programs for SNF management are still under development. Exceptions and/or changes to each site's quality assurance program may be needed to demonstrate implementation of RW-0333P, "Quality Assurance Requirements and Description" (QARD).

14.1 Quality Assurance Implementation Plan

14.1.1 Site Quality Assurance (QA) Plans. In response to DOE Order 5700.6C, Quality Assurance, and Title 10 of the Code of the Federal Regulations, Part 830.120, Quality Assurance Requirements, each site is developing or has developed a Quality Assurance Program Description Document (QAPD) to cover their site operations. These QAPDs are the foundation documents for each site's Quality Assurance Program. The QAPD contents establish the envelope for operation of the quality assurance program. The QAPD applies to organizations, individuals, vendors, and other entities working for the site. 10 CFR 830.120 provides requirements for managing nuclear facilities, while nonnuclear facilities are governed by DOE Order 5700.6C. These QA requirements are applicable to site activities and are further defined through application of DOE/RW-0333P for SNF activities as noted in the following paragraphs.

14.1.2 RW Repository Requirements Application. The Quality Assurance (QA) Program being applied to the DOE-owned SNF activities is described in the High Level Waste (HLW) /SNF Quality Management Plan (QMP) (DOE 1995g). The QMP is based on the requirements of EM-30, "Quality Assurance Program Description" (QAPD), and the DOE/RW-0333P. The SNF Program, administered by EM-67, has established the DOE/RW-0333P as the applicable standard for the following applications:

- Characterization or data collection for input or use for interim storage or ultimate disposition that could affect the acceptance of SNF in a Nuclear Regulatory Commission (NRC) licensed storage facility
- Conditioning for interim storage or into final form for disposal that could affect the acceptance of SNF in an NRC licensed storage facility or repository
- handling and packaging for interim storage or disposal that could affect the acceptance of SNF in an NRC licensed storage facility or repository.

The implementation of the DOE/RW-0333P for these activities will facilitate the interfaces between EM, NRC, and RW and assure the smooth flow of the SNF from existing conditions through interim storage to final disposition. Sites must identify the DOE/RW-0333P requirements that apply to their items and activities. A systems engineering approach is the preferred method for determining this applicability. Each site must develop and submit a quality assurance plan, an organizational procedure, and a requirements matrix to the Operations Office. The National SNF QA Program (HLW/SNF QAPM) must approve the QA programs.

The appropriate criteria from other acceptable quality standards will be utilized as they apply to the remainder of SNF activities as defined in the individual site QAPD. If the decision is made to

privatize the licensing, construction, and operations of new interim storage facilities or packaging and transportation of SNF, the NRC regulations will apply through the direct application of 10 CFR 70, 10 CFR 71, or 10 CFR 72, as appropriate.

The QMP defines the scope of application to those SNF Program management activities performed within EM-60 organizations involved with the SNF Program. The QMP identifies the specific authority and responsibility for the SNF quality-related activities. It also defines roles, responsibilities, and activities of the EM-30 organization assigned QA responsibilities for the SNF Program.

14.2 Spent Fuel Quality Records Management and Control

Quality assurance records are completed documents that furnish evidence of the quality of items and activities. Spent fuel QA records are generated when SNF is handled, moved, characterized, or conditioned. QA records are also generated during the design, specification, and qualification of facilities or equipment involved with SNF disposal. Spent fuel QA records must be controlled to ensure that information is accurate and available for use in support of the eventual disposition of SNF in an ultimate disposal facility or monitored retrievable storage (MRS) facility. Accordingly, each SNF site will implement a records management system specifically for the DOE SNF Program.

Records which were generated prior to development of the DOE SNF Program also may need to support interim storage and ultimate disposition of SNF. Until all SNF information needs are identified by the Office of Civilian Waste Management, participating sites will ensure that previously generated records are protected from damage, loss, or destruction. When previously generated records are used to support interim storage or ultimate disposal of SNF, they will be validated as quality assurance records and managed under the QA records program at each site.

An Integrated Spent Nuclear Fuel Database System (ISNFDS) was developed as a management tool specifically for DOE EM-67 as the single source of data for management planning during disposition of DOE's SNF. The ISNFDS now contains information on all DOE-owned SNF, even if it is not in the control or custody of DOE. Data in the ISNFDS which are needed to support acceptance of SNF in a geologic repository will be qualified to requirements of DOE/RW-0333P by the SNF sites. The ISNFDS will be updated with qualified data which will then be made available to the Unified Database which is being developed by RW. If the database can be adequately qualified, there is some potential for the ISNFDS to provide the core of the QA data package that must accompany the SNF to the geologic repository.

15. REFERENCES

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