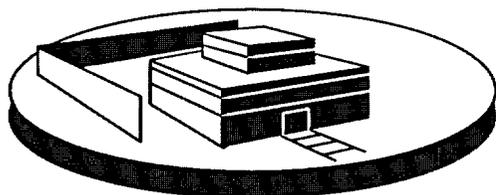
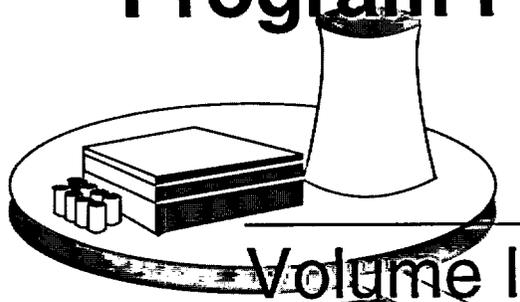


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Civilian Radioactive Waste Management Program Plan



Program Overview

December 19, 1994

U. S. Department of Energy



*Rec'd with letter dated
1/12/95*

**Civilian Radioactive Waste Management
Program Plan**

Volume I

Program Overview

December 19, 1994

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A MESSAGE FROM THE DIRECTOR

During the past year, the Civilian Radioactive Waste Management Program has undergone intensive review both internally and by external parties such as Congress, oversight bodies and other key stakeholders. The review revealed significant disparities among the Program's plans and schedules, the resources it was actually receiving, the work it was actually doing, and stakeholder expectations for results. We have developed a new approach that we believe will enable us, over the next five years, to make measurable and significant progress towards our key objectives within the resources we can realistically expect to receive. This Program Plan has been prepared to describe the new approach to the public, and especially to the Program's stakeholders, who have contributed to the review of the Program and the development of the concept.

Our immediate challenge is to provide for the timely acceptance and safe interim storage of spent nuclear fuel from the Nation's commercial reactors. If we fail to do so, extended at-reactor storage for many decades could become this Nation's waste management strategy by default. We have thus far been unable to site a centralized storage facility. In collaboration with the Congress, we need to clarify the role that this Program will play in the near-term management of commercial nuclear spent fuel.

Our national strategy must retain a clear focus on the long-term objective of waste disposal in a geologic repository. The Program's ultimate challenge is to provide adequate assurance to society that an operating geologic repository at a specific site meets acceptable standards of safety. In the final analysis, the test of adequacy must—and will—be a social judgement. We must do an honest, competent job of collecting sufficient data, performing rational analyses and providing the information necessary for society to make that judgment through the regulatory and political processes. As the near-term objectives for the Program are defined, the imperatives of the long-term strategy must be preserved.

In the months ahead, the Nation's approach to storage and disposal will be the subject of considerable debate in the Congress and elsewhere. We will do all we can, through this document and other means, to help ensure that the participants in that debate are fully informed about the current Program.

Daniel A. Dreyfus
Washington, D.C.

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1. OVERVIEW OF THE PROGRAM

1.1 INTRODUCTION

For more than a decade, the Office of Civilian Radioactive Waste Management has been implementing the mission established for it in the Nuclear Waste Policy Act of 1982 and its amendments. That mission, as defined in a strategic planning review conducted by the Department of Energy over the past year, is as follows:

Our mission is to manage and dispose of the Nation's spent nuclear fuel and high-level radioactive waste. We will provide leadership in developing and implementing strategies that assure public and worker health and safety, protect the environment, merit public confidence, and are economically viable.

Since its inception, the Civilian Radioactive Waste Management Program (the Program) has had to proceed in an ever-changing environment, responding to new legislative mandates, regulatory modifications, funding constraints, evolving stakeholder needs and expectations, and new Department of Energy directives. The task has proven more complex than originally envisioned. Progress has been made, but the schedule envisioned for the acceptance of spent nuclear fuel by the Program, for the availability of near-term Federal storage, and for development of a geologic repository has not been achieved. Estimated costs of characterizing the candidate repository site have mounted since the Site Characterization Plan for Yucca Mountain was published in 1988. Given these changes and constraints, the past five years have seen increasing Congressional and stakeholder dissatisfaction with schedule slippages and the escalating costs of the Program. In late 1992, the Secretary of Energy (the Secretary) informed the Congress that significant changes in the Program were being considered and actions were undertaken to evaluate a range of alternatives. By 1993, it had become clear that continuation of the Program in accordance with the then current approach was no longer a viable option.

1.1.1 Program Assessment

In 1993, at the direction of the Secretary, the new Director of the Office of Civilian Radioactive Waste Management (the Director) initiated a comprehensive assessment of the Program. He obtained the opinions of Congress and the Administration (during deliberations on the fiscal year 1995 budget), Program stakeholders, and Department of Energy management. In conjunction with the strategic planning process, meetings were held for Program managers and staff to consider how these diverse opinions could be used in planning a viable strategy. From these meetings and subsequent stakeholder feedback a new, more flexible approach was developed to respond to existing and future changes to the Program's environment.

1.1.2 Restructuring the Program

The new approach required substantial restructuring of the Program and its management. The restructuring defined two "business centers"—the Yucca Mountain Site Characterization Project and the Waste Acceptance, Storage and Transportation Project—and a management center for the Program that provides integration and management support to the Director and the projects.

Program and project activities were replanned and focused on interim milestones to provide near-term measures of progress in accomplishing the Program mission. Because of the scope of changes to the Program, the Office of Civilian Radioactive Waste Management developed this Program Plan to communicate the resulting plan and priorities for the period 1995–2000.

1.1.3 Content of the Program Plan

This plan consists of three volumes. This first volume provides an overview of the entire Program Plan. The first section of this volume provides background on the situation that led to the search for a new approach, and describes the key features of the approach that is being implemented. The second section provides an overview of plans for the two business centers and the management center. Volumes II and III, titled *Civilian Radioactive Waste Management Program Plan Volume II: Yucca Mountain Site Characterization* and *Civilian Radioactive Waste Management Program Plan Volume III: Waste Acceptance, Storage and Transportation*, provide detailed plans for the current fiscal year (1995) and the subsequent five-year planning period (1996-2000) for the two business centers.

The Program will continue to share information and seek the views of Program regulators, oversight organizations, and other stakeholders as it refines Program strategies and plans in the months and years ahead. This plan will be revised periodically to reflect progress, to respond to external advice and comments, and to convey to stakeholders, other interested parties, and Program personnel the resulting changes to the Program's approach, strategies, and plans.

1.2 BACKGROUND

1.2.1 The Accumulation of Highly Radioactive Waste

High-level radioactive waste in the form of spent fuel elements from commercial power reactors has been accumulating at nuclear reactor sites in the United States for several decades. The buildup of spent nuclear fuel from reactors currently in operation will continue over the next several decades. There are 109 reactors operating at 67 sites in 32 states. By the year 2030, all of these plants will have completed their initial 40-year license periods. The total cumulative discharge from those 109 reactors and reactors already shut down will total about 85,000 metric tons of heavy metal contained in the spent nuclear fuel.

In 1985, the President determined that defense-related high-level radioactive waste could be emplaced with the commercial waste in a repository. The Department's most recent evaluation of the quantities of high-level radioactive waste from the defense program indicates that, depending on canister design and waste composition, as many as 50,000 canisters may require disposal. The Program's planning basis calls for the disposal of 7,000 metric tons (equivalent to about 13,500 canisters) of this defense-related waste in the first repository.

1.2.2 Developing a System to Manage and Dispose of Highly Radioactive Waste

The Nuclear Waste Policy Act of 1982 and its amendments directed the Department of Energy (the Department) to develop a system to accept, transport, store, and permanently dispose of spent nuclear fuel and high-level waste from commercial utilities. The system would also provide for

disposal of defense-related high-level wastes. To pay for the system, the Nuclear Waste Policy Act established a Nuclear Waste Fund financed by commercial utilities, and ultimately by the consumers of the nuclear-generated electricity they produce and sell. The Federal government contributes a share of the Program cost associated with defense-related wastes.

In developing the system, the Department is regulated and assisted by a number of other bodies, both in Congressionally mandated relationships and also through the Department's own initiatives to reach out to stakeholders and other sources of expertise and opinion.

- The Nuclear Regulatory Commission is responsible for ensuring the safety of the system through its process of licensing waste management facilities and significant system components, such as containers for transportation, storage, and disposal of waste.
- The 1987 amendment to the Nuclear Waste Policy Act created a Presidentially appointed Nuclear Waste Technical Review Board to provide guidance on technical issues in system development.
- That amendment also established a Nuclear Waste Negotiator to work with states, Tribes, and localities to find voluntary host jurisdictions for waste management facilities and negotiate agreements with them for Congressional review and approval.
- The National Academy of Sciences provides analysis and recommendations regarding system issues, sometimes at specific Congressional direction, and maintains a standing committee on nuclear waste issues.
- The Nuclear Waste Policy Act requires the Department to consult with and seek the participation of states, Tribes, and local governments affected by waste management facilities, and authorizes the Department to provide financial assistance to support such participation. The Department frequently goes beyond legislative requirements to seek the involvement of a broader range of stakeholders, such as the utilities, environmental groups, and labor unions, as well as the general public.

1.2.2.1 Permanent Disposal

The Civilian Radioactive Waste Management Program is based upon a strategy of emplacing waste in special packages deep underground—"deep geologic disposal"—to isolate it for tens of thousands of years. Deep geologic disposal is also the consensus strategy being pursued by other countries in the world which are preparing for the permanent disposal of high-level radioactive wastes.

The Department is responsible for investigating or "characterizing" potential sites for a repository, and determining whether or not a site is suitable for a repository based on criteria defined in the Nuclear Waste Policy Act and expanded in Federal regulations. Site characterization is an on-going process which provides information to evaluate suitability, but also includes investigations to support the design of the repository and waste packages, such as underground ("in situ") tests to determine how heat generated by spent nuclear fuel will affect the surrounding rock. At later

stages, should the site prove suitable and construction and operation proceed, testing would shift to confirming that the repository is in fact safe.

If the Department recommends a site as suitable for repository development, and the President accepts the recommendation, the Department will prepare and submit an application to the Nuclear Regulatory Commission for a license authorizing construction of a repository. If the application is approved and construction proceeds, the Department must subsequently apply for and receive Commission approval to begin accepting waste into the repository and ultimately to permanently close the facility when waste emplacement is completed.

In the 1987 amendment, Congress directed the Department to conduct site characterization only at the Yucca Mountain site in Nevada. As a result, the State of Nevada, its localities, and the Indian Tribes in the area have been particularly active and concerned stakeholders in the Program.

1.2.2.2 Waste Acceptance, Interim Storage, and Transportation

Developing a repository, currently targeted for completion in 2010, is a long-term project. Recognizing that some nuclear utilities would begin running out of spent nuclear fuel storage space at their reactor sites before a repository would be available to accept waste, and also that some means of temporary storage might make the overall system operate more efficiently, Congress authorized the Department to site and develop an interim storage facility—generally called a "monitored retrievable storage" facility. Such a facility would enable the Department to alleviate utility storage problems by accepting waste on a timely basis, storing it temporarily at a centralized facility, and ultimately disposing of it in the completed repository.

Congress also directed the Department to develop a transportation system to move waste from reactor sites to the monitored retrievable storage facility or directly to the repository, and to work closely with potentially affected states and localities in planning and implementing that system. Components of transportation system development include development of containers for rail and truck shipment of waste, and plans for determining transportation routes when interim storage and repository sites are eventually selected.

Nuclear utilities, the state commissions that regulate them, and the national organizations that represent them have been among the most actively involved parties regarding waste acceptance issues. A number of local and Tribal governments have considered the possibility of hosting a monitored retrievable storage facility in their jurisdictions, which has sometimes generated considerable opposition within their respective states.

The overall waste management system being developed is illustrated in Figure 1.

1.2.3 Problems Encountered in Developing the System

When the Nuclear Waste Policy Act was enacted, it was envisioned that the Department would have a facility available in 1998 to accept waste for disposal, and the Department entered into

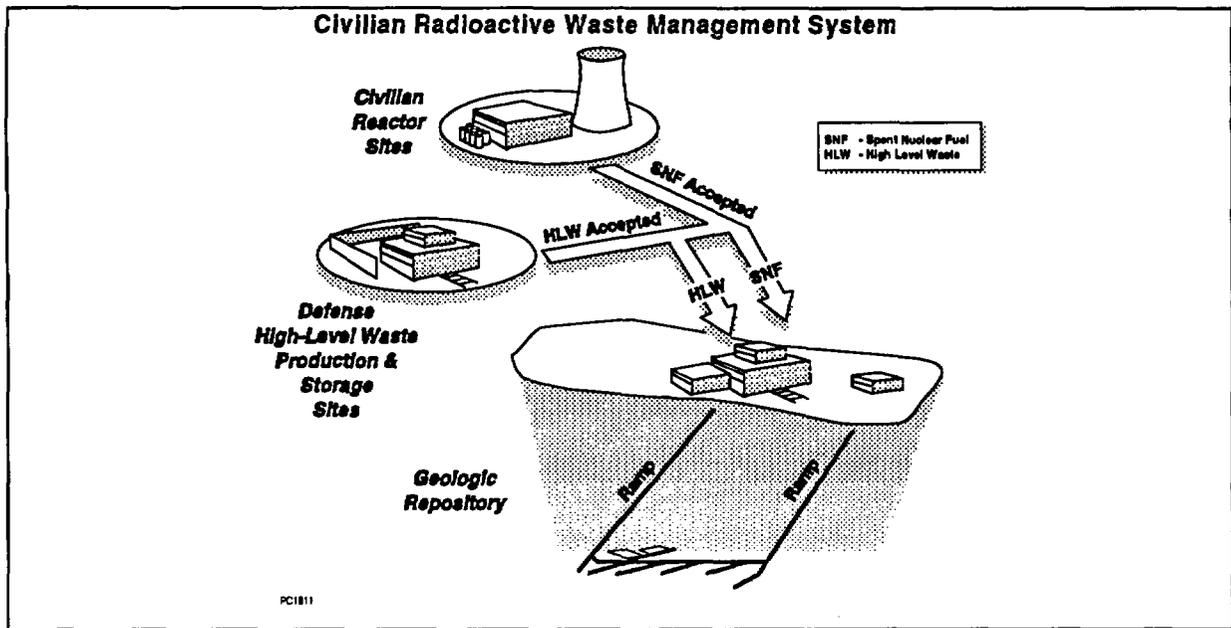


Figure 1. Civilian Radioactive Waste Management System

contracts with utilities on that basis. The repository site characterization effort, however, has proven to be far more complicated and time-consuming than was envisioned in the Program's early years. The Program has had to respond to diverse technical, operational, regulatory, and political challenges as they have evolved over time. Incorporating regulatory agency and oversight group recommendations into the Program has led to a more complex undertaking than initially envisioned. While significant technical progress has been achieved in characterizing the Yucca Mountain site, the currently estimated date of repository operation, if the site is found to be suitable, is 2010.

The Department's early initiative to site an interim storage facility in the eastern United States pursuant to the Nuclear Waste Policy Act of 1982 was curtailed when Congress passed the 1987 Nuclear Waste Policy Amendments Act. In the 1987 amendment, Congress authorized a monitored retrievable storage facility but limited the Department's authority to proceed with future siting efforts for such a facility. Under current law, the Secretary may not select a site for a monitored retrievable storage facility until a recommendation is made to the President for the approval of a site for a repository; and construction of a monitored retrievable storage facility may not begin until the Nuclear Regulatory Commission has issued a license for the construction of a repository.

The 1987 amendment also instituted a voluntary process for siting a monitored retrievable storage facility through the efforts of a Nuclear Waste Negotiator. The Congress in 1993, however, limited the financial support the Program could provide to entities that desired to explore possible sites with the Nuclear Waste Negotiator. The development of a monitored retrievable storage facility to meet the objective of spent nuclear fuel acceptance into an operating Federal radioactive waste management system by 1998 appears doubtful. The Department is currently reviewing options for waste acceptance and storage with its stakeholders.

1.2.4 Assessment of the Need for a New Approach

To address the situation described above, a comprehensive assessment of the Program was recently completed by the Program's senior management and technical staff. A catalog of past commentary on the Program by formal review bodies and stakeholders was compiled and evaluated. A series of strategic planning sessions with Program management was held to review the past comments, assess the current situation, define the key issues facing the Program, and develop approaches to address the issues. This section of the Program Plan describes the key issues that were evaluated and the features of the plan that will address those issues through the year 2000. It also identifies the primary objectives important to achieving the overall Program mission.

The assessment conducted by the Office of Civilian Radioactive Waste Management over the past year identified issues and concerns in three general areas: (1) site characterization efforts; (2) acceptance of waste from utilities beginning in 1998, and (3) management of the Program. The concerns are summarized in the following paragraphs.

1.2.4.1 Site Characterization

Congress has expressed concern about continuing growth in the estimated cost of site characterization—initially in the hundreds of millions but recently estimated at over \$6 billion. Furthermore, because the site characterization schedule did not call for definitive results until a license application was completed in 2001, progress was difficult to demonstrate or measure. In addition, due to continuing shortfalls in annual funding over the past five years, large annual funding requirements would have been needed under the existing Program approach for the next five years to maintain the schedule for disposing of waste in 2010. These requirements exceeded practical funding expectations. Public statements by many stakeholders have asserted that further schedule slips are unacceptable. Early observable progress within available resources is critical to the credibility of the Program, and clear measures of progress (metrics) are required for effective management. The new approach is designed to assure the scientific integrity of the evaluation of the suitability of Yucca Mountain, match the funding that can be expected, and define measurable progress.

1.2.4.2 Waste Acceptance

The Nuclear Waste Policy Act directed the Department to develop a system that would accept spent nuclear fuel from reactors and dispose of it in a repository beginning in 1998. In 1987, the Department announced a five-year delay in the opening date for a repository—from 1998 to 2003. While the Nuclear Waste Policy Amendments Act of 1987 authorized construction of a monitored retrievable storage facility, it linked the siting and construction of such a facility so tightly to the repository schedule that it could not be used to allow waste acceptance to begin in 1998 independent of the slippage in the repository development schedule. In 1989, the Department announced a further delay in the expected date of repository operation, to 2010. The Department also notified Congress that if the siting and licensing linkages between the monitored retrievable storage facility and the repository were modified, waste acceptance at a storage facility could begin by 1998. However, the linkages remain in place and the experience of the Nuclear Waste Negotiator suggests that a negotiated site for storage is not likely.

Because of questions related to acceptance of commercial spent nuclear fuel into the Federal waste management system in 1998, in May of 1994 the Department initiated discussions with stakeholders concerning options for acceptance and interim storage. In June 1994, a number of utilities and state agencies sued to seek clarification of the Federal Government's responsibility to accept spent nuclear fuel beginning in 1998. At the same time, utilities and reactor states proposed that Congress instruct and authorize the Department to take possession of spent nuclear fuel at the earliest possible time. It now appears possible that the next Congress will address the issues of waste acceptance and interim storage.

The main challenge facing the Waste Acceptance, Storage and Transportation Project is the uncertainty about when a Federal facility will be available so that the Department can begin accepting spent nuclear fuel and transporting it from reactor sites. The uncertainty complicates planning for spent nuclear fuel transportation. If a site for a storage facility and the authority and resources needed to develop one were made available, the Program would need to be prepared to move spent nuclear fuel more quickly than would be required for the 2010 repository schedule. Furthermore, the longer spent nuclear fuel remains at reactor sites, the greater the potential for it to be placed into a variety of storage systems that are designed for each utility's near-term storage needs rather than for compatibility with the rest of the waste management system.

1.2.4.3 Program Management

External groups, especially the Nuclear Waste Technical Review Board, the National Academy of Sciences, and the General Accounting Office, as well as stakeholders such as the nuclear utilities and state regulators, have cited deficiencies in the Program's management. The Program's own assessment affirmed that substantial management improvements were necessary. Concerns include growing costs, insufficient allocation of resources to scientific investigations, lack of integration of scientific results, slipping schedules, decisions that do not include stakeholder contributions, and difficulty of demonstrating measurable progress. With those concerns in mind, the Secretary is co-sponsoring with the Governor of Nevada an independent financial and management review of the Yucca Mountain Site Characterization Project to develop recommendations for the long term. However, there was an immediate need for changes that produce early progress that is substantial and measurable, and the need for management reforms could not await further review.

1.3 KEY FEATURES OF THE PROGRAM APPROACH

The concerns described above led to the assessment conducted by the Program over the past year. Underlying the assessment was a recognition that the social and policy environment in which the Program must achieve its mission has changed and will likely continue to change. The assessment also identified that over the past decade the Program had grown progressively more complex as it responded to new directions. In fact, the Program needed to be restructured, reorganized and replanned in a manner that was simpler, more visible and understandable to management and external oversight, and more flexible to respond to future changes. In the many stakeholder interactions with Program senior management and technical staff, a consistent theme emerged that the Program must remain responsive to evolving needs and circumstances while achieving its long-term mission. The recognition that the Program must be restructured and

replanned for flexibility led to the new Program approach, summarized in the following section and described in more detail in Section 2 and in Volumes II and III.

1.3.1 Site Characterization Approach

The previous approach to site characterization called for extensive testing to obtain a comprehensive understanding of the Yucca Mountain site to allow decisions to be made simultaneously on site suitability, licensing and repository design issues. Within the overall site technical program, the new approach distinguishes between tests required to evaluate site suitability, tests required to support licensing and define a cost-effective design, and tests required to confirm the safety of the repository before closure. This distinction permits phasing of tests to achieve an earlier evaluation of whether Yucca Mountain appears to be suitable and to preserve the schedule for licensing, constructing, and operating the repository if the site is found suitable. It also accommodates available resources.

The major objectives of the new approach are to:

- Initiate National Environmental Policy Act scoping activities in 1995 to identify issues and concerns of affected parties that will be addressed in the repository environmental impact statement
- Evaluate, by the end of 1998, whether Yucca Mountain appears to be technically suitable for development as a geologic repository
- Deliver a site recommendation report and environmental impact statement to the President in 2000, if the site is found suitable
- Submit a license application to the Nuclear Regulatory Commission in 2001, if the President approves the site recommendation.

At Yucca Mountain, emphasis is now on those scientific investigations and engineering activities deemed necessary and sufficient to support a technical site suitability evaluation in 1998. The technical site suitability evaluation centers on a sequential evaluation of compliance with the Department's siting guidelines in 10 CFR Part 960 related to long-term waste isolation, radiological safety, and technical feasibility. The evaluation utilizes site characterization data and analyses that are documented or referenced in technical basis reports subject to external peer review, followed by assessments of compliance by Program technical staff against one or more of the siting guidelines, and finally, if appropriate, findings by the Director of compliance with the guidelines.

At about the same time, site characterization data and analyses will be incorporated in documents submitted to the Nuclear Regulatory Commission for review and guidance as to sufficiency of the data and analyses for licensing. If the site appears to be technically suitable, site characterization activities after 1998—including in-situ thermal testing—will focus support on the development of a license application and more cost-effective repository and waste package designs. Results will provide input to the repository environmental impact statement in 2000, to the license application in 2001, to interactions with the Nuclear Regulatory Commission during

the licensing process, and to an amended license application in 2008. Confirmatory testing—including tests in selected drifts of the expanding underground facility—will continue through the construction and operation of the repository to ensure that the repository performs as predicted. Testing to confirm the performance of the repository will continue until closure—a period of at least 50 years and possibly up to 100 years.

1.3.2 Waste Acceptance, Storage and Transportation Approach

The key characteristic of the approach for the Waste Acceptance, Storage, and Transportation Project is to maintain flexibility to be able to respond quickly to external developments while demonstrating significant progress toward achieving current Program goals. The first priority is to clarify the approach to waste acceptance. The Department published a notice of inquiry on May 25, 1994 in the Federal Register to elicit the views of interested parties on waste acceptance and interim storage issues, and on options for offsetting a portion of the financial burden that the utilities may incur in continuing at-reactor storage of waste after 1998. The dialogue with stakeholders will contribute to the development of the Program's position on policies to address the near-term management of spent nuclear fuel.

An option identified in the notice of inquiry for offsetting a portion of the financial burden that the utilities may incur is the deployment of multi-purpose canisters to the utilities for dry storage of spent nuclear fuel at the reactor sites. Multi-purpose canisters are metal containers that can be loaded with spent nuclear fuel assemblies and then sealed. Used in conjunction with appropriate single-purpose casks or overpacks, the multi-purpose canisters can be stored, transported, and disposed of without being reopened. Exercising the multi-purpose canister option would require completion of a final environmental impact statement and its related record of decision, Nuclear Regulatory Commission certification of the canisters with their associated transportation casks and storage modules, and formal approval by the Department to fabricate and deploy the multi-purpose canister subsystem.

The main aspects of the approach for waste acceptance, storage and transportation are to:

- **Support timely resolution of the waste acceptance and interim storage issues.** The Program will continue the dialogue with state officials, utilities and other interested parties initiated in May 1994, and will be prepared to participate in and provide support for any Congressional deliberations concerning resolution of these issues.
- **Ensure that multi-purpose canisters are available in 1998 for possible at-reactor storage,** waste acceptance, transport, and ultimately for disposal. The availability of multi-purpose canisters for use at reactors starting in 1998 would facilitate standardization of interim storage and integration with the rest of the waste management system. Supply of these canisters by the Department could, to some extent, offset the direct site-specific costs to utilities of at-reactor storage until the spent nuclear fuel is accepted by the Federal Government for disposal.
- **Maintain readiness to develop a centralized interim storage facility** if and when a site and the necessary authority and resources are made available. The Program has already prepared the necessary implementation plans and a range of conceptual designs for such

a facility. Because more detailed work would not be useful until a specific site has been selected, no development work is included in the current plan. Scheduling and budgeting for such a facility must await future policy determinations as well as resolution of the siting issue. However, the Program will ensure that the Department can provide necessary information to support the policy process and respond quickly if a decision is made to proceed with a storage facility.

- **Develop the technical and institutional capability for acceptance and transportation of spent nuclear fuel from reactors to a storage facility** whenever such a facility is available, beginning as early as 1998. A new high-capacity truck cask and a transportation overpack for the multi-purpose canisters will be certified and prototypes will be constructed by the end of 1998. The necessary fleet of casks or overpacks could be purchased when a firm shipment schedule is available.
- **Participate actively in key deliberations that affect disposal of Departmental materials.** The Program will work with other parts of the Department to characterize defense high-level wastes, to prepare acceptance criteria for wastes that are destined for disposal in a repository, and to develop agreements concerning acceptance and disposal. The Program will also participate actively in deliberations that affect disposal of the Department's other radioactive materials.

1.3.3 Program Management Approach

The management objectives of the new approach are better integration of activities, more timely participation of stakeholders in the Program's decision process, clearer lines of responsibility and authority for Program personnel, and sharper focus on products and progress. The expected results are consistency of plans with budget limitations, realistic schedule targets, and measurement of accomplishments against plans.

The reorganization of the management structure is nearly completed. It clarifies organizational roles, focuses Federal leadership on program management and control, and makes participants more responsible and accountable for their work. The Program is now organized around the business centers of two projects and a central management center that provides program integration and management support services to the Director and the projects. The Program's basic organization structure is illustrated in Figure 2. The reorganized Yucca Mountain Site Characterization Office focuses on the scientific activities necessary to evaluate site suitability, to satisfy environmental requirements, and to develop a license application. The Office of Waste Acceptance, Storage and Transportation focuses on the availability of a multi-purpose canister subsystem and high-capacity transportation casks to standardize and simplify the storage and handling activities at utility sites and in the waste management system, on the continuing interactions with utilities to resolve the waste acceptance issue, on interactions with Federal customers, and on the maintenance of capabilities to respond to transportation and storage needs of the Program.

The Office of Human Resources and Administration, the Office of Quality Assurance, and the Office of Program Management and Integration constitute the management center that supports

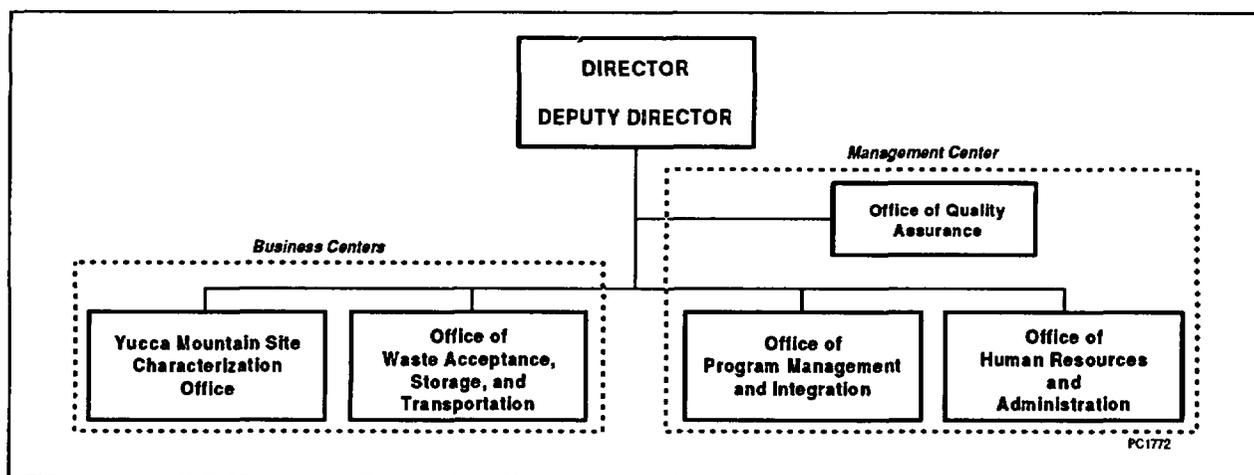


Figure 2. Basic Organization of the Program

the Director and the projects. The management center is focused on promoting the changes in culture required by the Program approach and ensuring that the Department's strategic goals, core values, total quality philosophy, and customer and stakeholder considerations are incorporated into the planning and implementation of the Civilian Radioactive Waste Management Program. This includes a greater emphasis on employee diversification, development and retention through mechanisms such as strategic planning for training and development, more flexible human resource practices, and improvements in performance appraisal and incentive programs.

Major contractor participants across the country have been consolidated under the technical direction of the Program's management and operating contractor. Further integration and rationalization of contractor arrangements is being pursued. When fully implemented, the restructuring of the Program will provide integration across both organization and geographic lines.

The new approach also more directly and fully involves stakeholders in the Program's decision process and establishes near- and long-term milestones that measure sequential progress toward Program goals. An example is the process leading to the technical site suitability evaluation. The process was developed in collaboration with stakeholders who had been expressing concerns about the credibility of the evaluation. In the current plan, the National Academy of Sciences will independently manage a peer review of each technical basis report prepared to support Program decisions in a sequence that culminates in the technical site suitability evaluation.

Stakeholders will be involved in nominating members of the review panels, and stakeholders will present scientific issues to the panels. The process provides early measures of progress, including a reviewed guidelines compliance assessment in 1995, and it will continue with formal guidelines compliance assessments each year until the technical site suitability evaluation is completed. The sequence is planned to be completed in 1998.

1.3.4 Primary Objectives and Major Milestones

1.3.4.1 Primary Objectives

Program activities have been refocused and rescheduled to meet the following primary objectives:

By the end of fiscal year 1998:

- The Director will make an **evaluation of the technical suitability of the site at Yucca Mountain** for development as a geologic repository, based on the record of technical and regulatory evaluations developed using the Program's suitability process.
- The Department will design, develop, obtain certification for, and **arrange to make available multi-purpose canisters for interim storage** of spent nuclear fuel at utility sites.

By the end of fiscal year 2000:

- If Yucca Mountain is found to be suitable for development as a repository, the Secretary will **deliver a final environmental impact statement and a site recommendation report to the President.**

In fiscal year 2001:

- If the President has approved the site, the Secretary will **submit a license application for repository construction** to the Nuclear Regulatory Commission.

1.3.4.2 Major Milestones

The major milestones discussed below and shown in Figure 3 contribute to achievement of the primary objectives. Lower-level milestones that support achievement of major milestones are summarized in Sections 2.1.5 and 2.2.5, and discussed in detail in Volumes II and III. Major milestones are:

Fiscal Year 1995

- Begin multi-purpose canister environmental impact statement process
- Begin repository environmental impact statement process.

Fiscal Year 1996

- Following Departmental approval of the multi-purpose canister final environmental impact statement, publish the record of decision in the Federal Register.

Major Milestones for Program Success

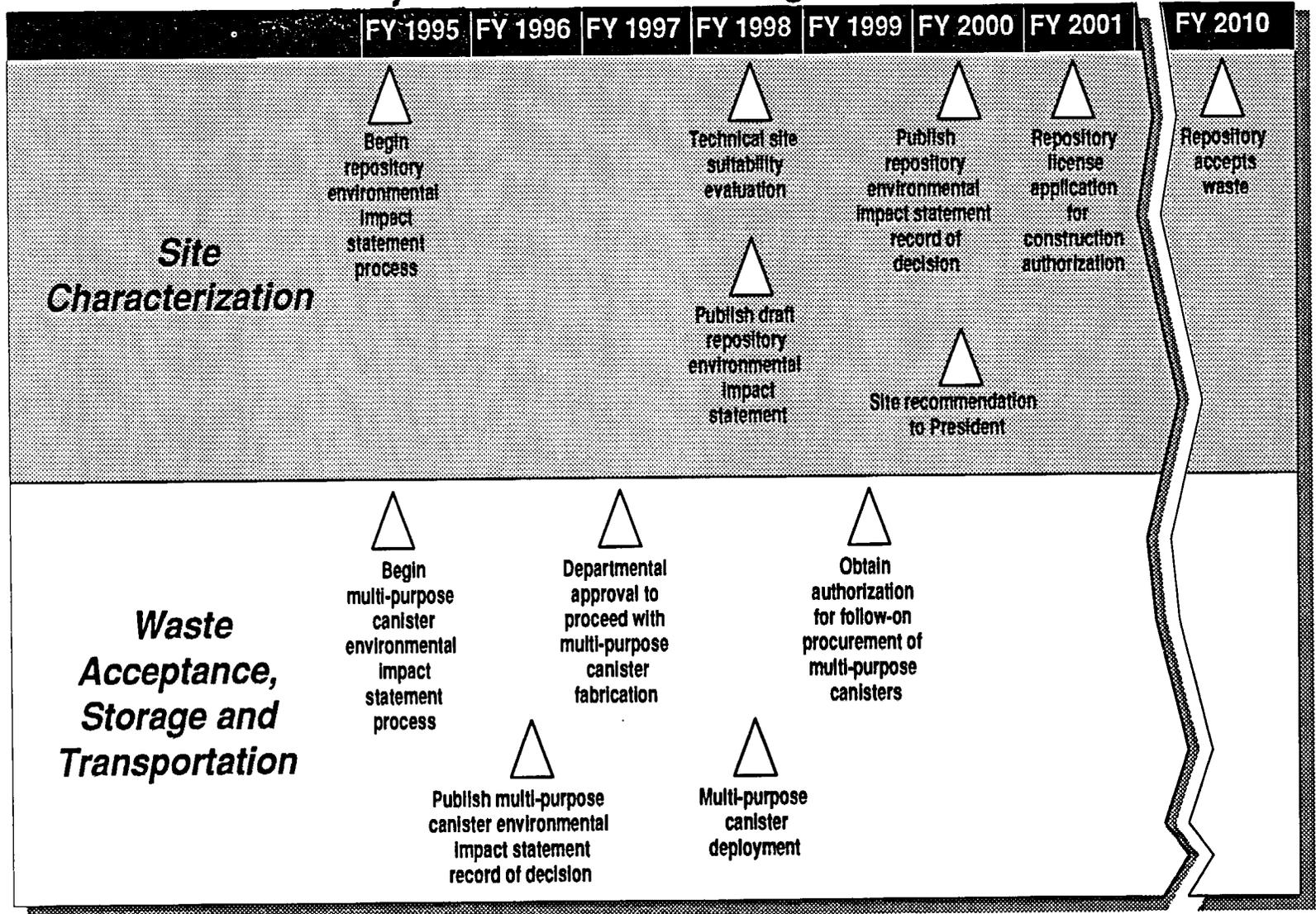


Figure 3. Major Milestones for Program Success

Fiscal Year 1997

- If the environmental impact statement record of decision supports fabrication and deployment of multi-purpose canisters, receive formal approval from the Department to proceed with the multi-purpose canister subsystem implementation and authorize the fabrication of multi-purpose canisters.

Fiscal Year 1998

- Receive formal approval from the Department to deploy multi-purpose canisters to utilities for initial at-reactor storage
- Provide a technical site suitability evaluation for the Yucca Mountain site that is based on the record of technical and regulatory compliance assessments developed using the Program's suitability process
- Distribute the draft repository environmental impact statement to begin the public comment period.

Fiscal Year 1999

- Obtain authorization for follow-on procurement of multi-purpose canisters to continue deployment to utilities.

Fiscal Year 2000

- Following Departmental approval of the repository final environmental impact statement, publish the record of decision in the Federal Register
- Submit the site recommendation report to the President, if the site is determined to be suitable for repository development.

Fiscal Year 2001

- Submit the repository license application to the Nuclear Regulatory Commission.

1.3.5 Program Funding Requirements

The Civilian Radioactive Waste Management Program funding requirements are shown in Table 1. The 1995 dollars reflect the Program's Congressional appropriation, and the 1996-2000 dollars reflect the estimated Program funding requirements for that period.

**Table 1. Civilian Radioactive Waste Management Program Funding Requirements
(Year of Expenditure Dollars in Millions)**

Budget Elements	FY 1995	FY 1996	FY 1997	FY 1998	FY 1999	FY 2000
Yucca Mountain Project	375	474	533	531	527	469
Waste Acceptance, Storage, and Transportation Project	57	62	69	86	89	87
Program Management and Compliance	90	94	104	107	113	122
Total Program	522	630	706	724	729	678

Note: Funding for FY 1995 represents the current program budget as authorized by Congress. Projected funding requirements for 1996 - 2000 represent planning estimates and are not yet approved.

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2. PROGRAM AND PROJECT ACTIVITIES FROM 1995 TO 2000

In the following sections, planned activities are presented for the Program's two business centers—the Yucca Mountain Site Characterization Project and the Waste Acceptance, Storage and Transportation Project—and the Program's management center. The projects are described in terms of the major activities and products required to meet near-term goals of the Program. The major products of the Yucca Mountain Site Characterization Project are the site suitability evaluation, the National Environmental Policy Act process, repository licensing, including the safety analysis report, and project management and compliance activities. The major products of the Waste Acceptance, Storage and Transportation Project are waste acceptance, the multi-purpose canister subsystem, the transportation subsystem, and project management and integration activities. The Program's management center provides services and products necessary to direct and integrate the Program and to ensure compliance with applicable statutes and regulations and Departmental policy and directives.

2.1 YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

The Department developed a detailed Site Characterization Plan in 1988 and has conducted site investigations in accordance with that Plan. Previous planning for the Yucca Mountain project assumed that most, if not all, studies contained in the Site Characterization Plan would be completed before the suitability of Yucca Mountain was evaluated. This planning made little or no distinction between tests required to evaluate the suitability of the site or "predict" the long-term performance of the repository, and those required to confirm the adequacy of the predictions and the long-term safety of a repository.

In the new approach, the site testing program activities are mapped to the major Project products they support by dividing the activities into three categories: tests that focus on evaluating the suitability of the site, tests that support a license application and completion of a cost-effective and safe repository design, and tests that confirm the long-term performance and safety of the constructed and fully loaded repository. The tests to evaluate technical site suitability, along with *some* of the design tests, are required to make a suitability decision. The others are not. It is this distinction in the testing program that enables the Program to define key interim evaluations before a final suitability decision, including a technical site suitability evaluation in 1998.

The technical site suitability evaluation will be made by the Director of the Office of Civilian Radioactive Waste Management. It is not a Secretarial action, and therefore does not represent a final agency action. The evaluation itself requires higher level findings on compliance with the Department's siting guidelines in 10 CFR 960 related to long-term performance and the guidelines related to radiological safety during operations and technical feasibility of construction. An assessment of compliance with the guidelines related to environmental, socioeconomic and transportation considerations is not included in the technical site suitability evaluation. Compliance with those guidelines will be assessed during the comment period on the draft environmental impact statement for the potential repository at Yucca Mountain.

The new approach with interim evaluations represents a change in the strategy for the site characterization program at Yucca Mountain. It recognizes that it was not realistic to assume that all information needed to make a final judgment on the long-term safety of a repository can be

gathered and analyzed before construction of a repository. Some of that information can only be gathered and analyzed *after* a repository is built and loaded. This approach is consistent with the original intent of the legislative and regulatory framework and with the recommendations of the National Academy of Sciences in the report, "Rethinking High-Level Radioactive Waste Disposal" (NAS, 1990).

The Program's current focus for site characterization is on tests and analyses most crucial to a suitability evaluation. If the site appears to be suitable, the Program's focus will shift to completing the acquisition and analysis of the site characterization data needed to apply for a repository construction authorization from the Nuclear Regulatory Commission. Confidence in the performance of the constructed repository with emplaced waste will be achieved through a performance confirmation program, which will continue until closure of the repository. The repository is being designed to permit waste retrieval for up to 100 years from the start of waste emplacement, twice as long as the retrieval period required by the Nuclear Regulatory Commission. This is being done to allow more time for performance confirmation activities.

The restructured and replanned Yucca Mountain Site Characterization Project requires no statutory changes to the Nuclear Waste Policy Act of 1982, as amended. However, it must and does anticipate a new Environmental Protection Agency standard for a repository at Yucca Mountain. If the new Environmental Protection Agency standard is substantially different, conforming changes must be made to the Nuclear Regulatory Commission regulation 10 CFR Part 60, as required by the Energy Policy Act of 1992. Implementation of the restructured Program on the schedule depicted in this plan will depend upon the Nuclear Regulatory Commission having adequate confidence that the new strategy for site characterization will provide sufficient information for evaluation of a license application, should one be filed, and assumes that potential litigation over the implementation of the Program will not lead to delays.

The following sections describe the three technical products of the Yucca Mountain Site Characterization Project: site suitability evaluation, National Environmental Policy Act process and repository licensing. Site characterization data and analyses will be an important component of all three Project products, a fact that emphasizes the importance of product integration. The actions required to ensure that integration and to conduct routine business activities in compliance with Federal, State, and local statutes and regulations are described as part of the Project's management and compliance element.

2.1.1 Site Suitability

The Program will evaluate site suitability on the basis of the Department's siting guidelines set forth in 10 CFR Part 960. The guidelines relate to preclosure or postclosure impact of the repository system. The preclosure guidelines address factors that could affect the public, the environment, or workers during siting, construction, and operation of the repository before permanent closure. The preclosure guidelines consist of three system guidelines and eleven technical guidelines. The system guidelines address the safety of the repository operations, the impact of the radioactive waste transport and other repository operations on the environment and socioeconomics of the affected areas, and the technical feasibility of building and operating the repository until permanent closure. The technical guidelines address specific aspects of the

proposed site, such as population density and geologic or meteorologic conditions, that bear on the safety of repository construction and operations.

The postclosure guidelines address the ability of the geologic setting of the site, along with the engineered barrier system, to contain and isolate radioactive waste after permanent closure of the repository. These guidelines consist of one system guideline and eight technical guidelines. The system guideline concerns the overall performance of the geologic repository system after permanent closure. The technical guidelines address specific aspects of the geologic setting of the site.

Each system and technical guideline includes a qualifying condition and, for some technical guidelines, one or more disqualifying conditions. To recommend a site for repository development, the Director must make a positive "higher level finding" for each qualifying and disqualifying condition described in the guidelines. A positive higher level finding can be supported when: (1) a disqualifying condition can be shown *not* to be present at the site and additional information is unlikely to change the conclusion, or (2) a qualifying condition can be shown to be present and additional information is unlikely to change the conclusion. According to 10 CFR Part 960, a site would be disqualified if: (1) a disqualifying condition is present at the site, or (2) a qualifying condition cannot be met at the site. Although formal findings are not required for the potentially adverse conditions and favorable conditions identified in the guidelines, information about these conditions will be incorporated into the evaluation of the related qualifying and disqualifying conditions. The principal objective of the site suitability program is to conduct those site studies, analyses, and evaluations necessary for the Director to reach findings on the qualifying and disqualifying conditions to evaluate the technical site suitability and, if the site is found suitable, to develop a site recommendation report by fiscal year 2000.

The site suitability program includes those site characterization, design, and performance assessment activities required to evaluate the suitability of the Yucca Mountain site. Site characterization activities include surface-based tests and tests in the underground exploratory studies facility to collect the data necessary to describe the features of the site. Waste package and repository design activities are integral to an overall suitability evaluation. They will help resolve the site suitability issues related to preclosure system guidelines for radiological safety and the feasibility of repository development using reasonably available technology. They will also help resolve the site suitability issues related to the postclosure system guideline that addresses the geologic repository system's long-term performance. Performance assessment activities use the site characterization and design information to assess the performance of the system and to evaluate the sensitivity of performance to select aspects of the site for use in evaluating the Yucca Mountain site against the guidelines.

Site characterization objectives are designed to provide recognizable measures of progress towards a site suitability decision. Compliance with the guidelines will be evaluated through a sequential approach. Individual guidelines or groups of guidelines will be evaluated as sufficient data and analyses become available during site characterization, so that there will be interim measures of progress toward evaluating suitability. Technical basis reports, described below, are planned between 1995 and 1997 to support higher level findings required by the Department's

guidelines. The Program will ensure that stakeholder representatives are involved at each major point in this incremental evaluation process, and will report the progress to all stakeholders.

Technical basis reports will be prepared to document the data and analytical results from site characterization activities that support the evaluation of the relevant qualifying and disqualifying conditions. The technical basis report will describe the Program's current understanding of the subject area, including evaluations of uncertainties, alternative models or interpretations permitted by the data, and bounds on conditions and processes that are consistent with reasonable models of the site. Each technical basis report will be submitted for review by outside experts. The National Academy of Sciences will select qualified reviewers and manage the review process.

The technical basis reports will cover the following topics:

- Surface processes
- Preclosure rock characteristics
- Tectonics
- Preclosure radiological safety
- Geochemistry/postclosure rock characteristics
- Geohydrology/transport
- Total system performance assessment.

Technical basis reports for which sufficient data are now available to support higher level findings will be addressed first. Technical basis reports that require more comprehensive data are to be addressed later. For example, a total system performance assessment scheduled to be completed in 1997 will provide the technical basis for the assessment of compliance with the postclosure system guideline and for the qualifying conditions of the technical guidelines that have a demonstrated effect on system performance. This occurs later in the technical site suitability process to allow the performance assessment program to take advantage of a more comprehensive set of technical data.

The new approach defines additional measures of progress and also accelerates key evaluations compared with those scheduled in the 1988 Site Characterization Plan. There are two reasons for this. First, while there is a single technical program to support multiple end-users, this approach separates the site suitability evaluations from the license application and allows Program resources to be focused sequentially and more effectively on the respective topics. Second, the approach uses conservative and/or bounding assumptions on site conditions and processes to evaluate the suitability of the site. These bounding assumptions may be reexamined in the license application, when additional site characterization data and refined models are available.

If the Yucca Mountain site appears to be technically suitable for development of a repository, the Director of the Office of Civilian Radioactive Waste Management will issue a technical site suitability evaluation in fiscal year 1998. After the 1998 evaluation, the Program will evaluate the remaining guidelines which address environmental quality, socioeconomic impacts, and transportation. The final determination of site suitability, based on the remaining guidelines and additional data and analyses, will be made by the Secretary in the site recommendation report to the President in 2000. Volume II, Section 2, describes the suitability evaluation program in more detail.

If any technical basis report leads to a negative higher level finding indicating that a disqualifying condition is present or that a qualifying condition cannot be met, the Director will recommend to the Secretary that the site be disqualified. If the Secretary disqualifies the site, site characterization activities will cease, environmental restoration activities will begin at Yucca Mountain, and the Department will notify the State and prepare a recommendation on future actions for Congress, as required by the Nuclear Waste Policy Act.

2.1.2 National Environmental Policy Act Process

The Nuclear Waste Policy Act specifies the overall approach to be taken to evaluate the environmental impact of the proposed repository. Under the planned schedule, the process will begin with a notice of intent to prepare an environmental impact statement for the repository issued by the Department in 1995 and will end with a record of decision filed by the Department in 2000. Consistent with the guidance of the Nuclear Waste Policy Act, the environmental impact statement will focus on the environmental impacts of the repository's potential construction, waste emplacement, and postclosure performance, to the extent that such impacts are known at the time the statement is being prepared. The environmental impact statement will also, as appropriate and feasible, examine various repository operational scenarios that may affect design features. This will assist Department decision-makers and provide a meaningful basis for comparison of the potential environmental impact associated with the proposed action.

In 1986, the Department prepared an environmental assessment, required by the Nuclear Waste Policy Act, which concluded that the site characterization would cause no significant environmental impacts. As required by law, an environmental program was established to monitor environmental impacts and mitigate any adverse effects. Environmental monitoring began in December 1985, and new site characterization activities began in July 1991. If the Yucca Mountain site is found suitable, the Secretary may recommend that the President approve the site for development as a repository. In accordance with the Nuclear Waste Policy Act, this recommendation must be accompanied by an environmental impact statement. The Nuclear Waste Policy Act provided that the environmental impact statement is not required to consider the need for the repository, alternatives to geologic disposal, or alternative sites to the Yucca Mountain site.

The primary purpose of an environmental impact statement is to document the characteristics of the existing environment and to anticipate what effect proposed activities will have on that environment. The National Environmental Policy Act process for Yucca Mountain will lead to a repository environmental impact statement that will be available for the Nuclear Regulatory Commission to use as a basis for issuing a repository construction authorization. The major elements of the Yucca Mountain environmental program include:

- Developing and issuing an environmental impact statement notice of intent and initiating the public scoping meetings
- Developing an environmental impact statement implementation plan
- Continuing on-going data collection programs as part of site characterization

- Developing a draft environmental impact statement for the repository
- Conducting public meetings and soliciting public comments on the draft environmental impact statement for the repository
- Developing a final environmental impact statement for the repository, including preparation of responses to public comments received on the draft environmental impact statement
- Developing a record of decision and, if necessary, a mitigation action plan.

The process also involves significant coordination within the Department and with cooperating organizations, the Nuclear Regulatory Commission, the State of Nevada, and other affected or interested parties.

The repository environmental impact statement will address the potential impacts associated with constructing and operating a repository at the Yucca Mountain site. The impacts of postclosure performance of the repository and waste transport will be examined to the extent that they are known at the time the environmental impact statement is being prepared.

The repository environmental impact statement will incorporate the methodologies and analyses from the national transportation impact assessments, including both highway and rail analyses, conducted for the multi-purpose canister environmental impact statement and other related Department of Energy environmental impact statements. Assessments will be updated, as necessary and appropriate, in the repository environmental impact statement. In addition, the repository environmental impact statement will identify alternative transportation corridors in Nevada for eventual construction of a rail spur to Yucca Mountain.

The environmental impact statement must be developed to support any recommendation by the Secretary to develop a repository. If necessary, following issuance of the record of decision on repository development, the Department will develop and issue a mitigation action plan, pursuant to its own National Environmental Policy Act program regulations (10 CFR 1021.331). The mitigation action plan is to address mitigation commitments made by the Department in the repository environmental impact statement record of decision. As more specific and detailed information is gathered, the Department will revise the mitigation action plan, as appropriate.

2.1.3 Repository Licensing

The Nuclear Waste Policy Act directs the Nuclear Regulatory Commission to promulgate and enforce regulations for deep geologic repositories to protect the health and safety of repository workers, the public, and the environment. Because of the long-term nature of site characterization and the potential that site testing might impact the waste isolation capabilities of the site, the Nuclear Waste Policy Act gave the Nuclear Regulatory Commission specific oversight and guidance responsibilities over the Program's activities prior to receiving any repository license application from the Department. The Department and the Nuclear Regulatory Commission are, therefore, engaged in prelicensing interactions as potential applicant and regulator. The Department will need to adjust to different relationships with the Nuclear

Regulatory Commission, moving from potential applicant during site characterization, to applicant during the licensing proceedings, and then to licensee and operator during operation, decommissioning, and permanent closure.

The licensing strategy being implemented includes timely acquisition of information needed to support each step in the licensing process and early resolution of regulatory issues. This strategy is implemented by: 1) identifying licensing information needed during site characterization, 2) developing and updating an annotated outline for a license application and providing it to the Nuclear Regulatory Commission staff for review so that the Commission may comment on the sufficiency of information collected prior to a site recommendation, 3) submitting topical reports on key issues to the Commission for staff evaluation and acceptance so that results of those evaluations can be used during any licensing hearing, and 4) adhering to the procedures mandated by the Nuclear Waste Policy Act.

The repository licensing process builds on the information, analyses, and designs that are required for the Department site suitability evaluation. The criteria that address site suitability conditions are similar to those used by the Nuclear Regulatory Commission in licensing, and they require similar data and analyses. Therefore, the evaluations related to the licensing criteria are largely contained in the suitability studies. Licensing activities will continue studies initiated as part of the site characterization process to provide data required in the licensing process for design of a safe repository. Selected technical basis reports used in the suitability evaluations may be incorporated into, or referenced by, the license application annotated outline or topical reports submitted to the Nuclear Regulatory Commission.

The primary objective of the licensing process is to obtain a license to construct the repository from the Nuclear Regulatory Commission. The target date for submittal of the license application is June 2001. The process that leads to the submittal of the license application is specified in the Nuclear Waste Policy Act and in regulations implementing it. This process defines a closely connected relationship among site suitability, National Environmental Policy Act compliance, and licensing activities and the associated Project products—the site recommendation report, the environmental impact statement, and the license application.

The licensing documentation will support the Nuclear Regulatory Commission's findings of reasonable assurance about the technical criteria, as required by regulations. The Program approach emphasizes findings in the following areas:

- Repository operations for a significant preclosure period
- Regulatory confidence of the waste package containment for at least 1,000 years after closure
- Acceptable bounding analyses of radionuclide releases and total system performance for 10,000 years
- Adequate testing programs to support the design and bounding analyses, particularly with respect to establishing the thermal effects on waste isolation.

Although most site investigations needed to evaluate suitability must continue to support the licensing process, several will be completed, or nearly so, when the technical site suitability evaluation is made in 1998. The results of these investigations will be incorporated into the license application as prescribed in Nuclear Regulatory Commission regulations. Data collection, designs, and analyses conducted after the 1998 evaluation will focus on the primary objective of the licensing program: submitting a successful license application to the Nuclear Regulatory Commission in 2001.

To demonstrate progress in developing a viable license application, the Department has established major milestones for submitting an annotated outline of the repository license application to the Nuclear Regulatory Commission. The annotated outline will incorporate specific information needed for licensing from the various project technical efforts in site characterization, design, and performance assessment, as well as from quality assurance. The outline will be updated annually and will help the Department assess when it has sufficient information to present to the Nuclear Regulatory Commission to resolve issues or decide that site characterization in a specific technical area is complete. The outline will provide a mechanism for the Nuclear Regulatory Commission to review and comment on the Department's increasingly detailed understanding of the proposed repository system, as well as the Department's interpretation of the Commission's guidance on expected format and content of the license application. Finally, the annotated outline process will facilitate the finalization and submittal of the license application in 2001, if the site is found suitable for development of a repository.

To demonstrate progress in achieving resolution of licensing issues, major milestones have been established for submitting topical reports for Nuclear Regulatory Commission review. Subjects for topical reports will include design and performance assessment methodologies and mathematical models for performance assessment.

Because of the special quality assurance requirements imposed on licensees of the Nuclear Regulatory Commission, quality assurance activities are included in support of the licensing program. These activities include the development and maintenance of controls to assure quality achievement in the technical program.

A separate activity is the development and implementation of an electronic information retrieval and distribution system to support the licensing process, as required by the Nuclear Regulatory Commission in 10 CFR Part 2, Subpart J. This system, known as the licensing support system, must be certified by the Commission at least six months before the Department submits a repository license application. The Department is working with the Commission and the Commission-sponsored stakeholder group (the Licensing Support System Advisory Review Panel) to develop an acceptable system that will be used for document discovery by all participants in the repository licensing hearings.

2.1.4 Management and Compliance

The objective of the management and compliance support element is to provide the project with the necessary planning and direction, as well as the human resources, facilities, equipment, and financial management to accomplish the restructured Project priorities while complying with applicable statutes and regulations governing Project activities. Basic elements associated with

normal business functions and compliance with Federal, State, and local statutes and regulations also are included in this category. This element also provides resources needed to support stakeholder and public involvement in the Yucca Mountain Project, as required by the Nuclear Waste Policy Act and Departmental policies.

The strategy for achieving the objectives is to continuously improve project management, performance measurement, and cost control. Expenditures will be planned and allocated in sufficient detail to be evaluated and controlled. Total quality management processes will be used in making strategic decisions. Although management and compliance are part of all site characterization, design, and construction activities, they are included in a separate category to identify the indirect costs of project management.

The management and compliance category consists of two main subelements: general management and compliance. The general management subelement includes functions that are required by any design, construction, and research program of this magnitude. Specifically, this subelement includes overall project direction; planning, coordination, baseline development, and change management; support services (e.g., procurement, contract management); provision of office facilities, vehicles, utilities, and security; and information management.

The compliance subelement includes those functions necessary to comply with Federal, State, and local laws and regulations, Department of Energy orders, as well as the Nuclear Waste Policy Act requirements to conduct the site characterization program in a safe, open and informative manner. This subelement includes systems engineering, protection of the environment, and maintenance of employee and public safety and health. Also included in the compliance subelement are those funds appropriated by Congress for oversight by the State of Nevada and affected units of local government, technical studies by Nevada universities, and payments equal to taxes in accordance with the Nuclear Waste Policy Act. Volume II, Section 5 of this Program Plan describes the management and compliance activities.

2.1.5 Major Milestones

This section outlines major milestones in the Yucca Mountain site characterization activities. The relationships among these milestones, as well as other supporting milestones, are shown in the Yucca Mountain Site Characterization Schedule, Figure 4.

Fiscal Year 1995

- Complete testing and begin operation of tunnel boring machine for development of the exploratory studies facility
- Complete Total System Performance Assessment-1995 (TSPA-1995)
- Issue repository environmental impact statement notice of intent and begin scoping process

YUCCA MOUNTAIN SITE CHARACTERIZATION SCHEDULE

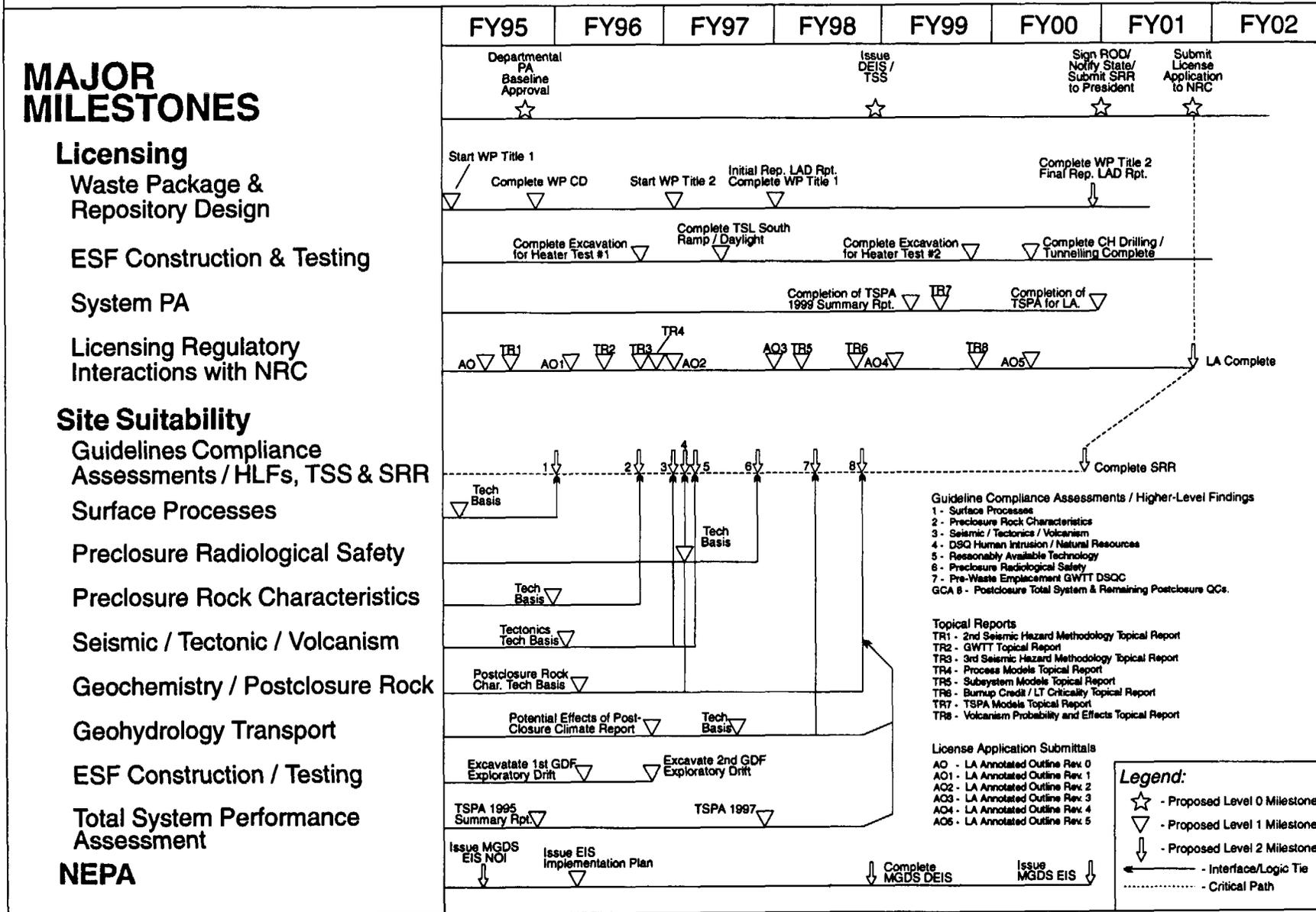


Figure 4. Yucca Mountain Site Characterization Schedule

- Complete technical basis and assess compliance with guidelines for surface processes, including erosion, surface characteristics, and preclosure hydrology; make recommendation to the Director regarding readiness to make higher level findings
- Complete interim reviews of the advanced conceptual design for repository surface and underground facilities
- Complete conceptual design for and initiate Title I design for waste package.

Fiscal Year 1996

- Complete exploratory studies facility's north ramp excavation, access to Ghost Dance fault, and access for heater test #1
- Complete technical basis and assess compliance with guideline for preclosure rock characteristics; make recommendation to the Director regarding readiness to make higher level finding
- Develop environmental impact statement implementation plan.

Fiscal Year 1997

- Complete Total System Performance Assessment-1997 (TSPA-1997)
- Complete technical basis and assess compliance with guidelines for tectonics and preclosure radiological safety (including site ownership and control, population density, offsite installations, and meteorology); make recommendation to the Director regarding readiness to make higher level findings
- Complete repository advanced conceptual design (including surface and underground facilities, balance of plant (non-nuclear), and waste package designs)
- Complete Title I design for waste package.

Fiscal Year 1998

- Complete guideline compliance assessments for pre-waste-emplacment groundwater travel time, the postclosure total system guideline, and all remaining postclosure qualifying conditions (geohydrology, geochemistry, rock characteristics, climate, and tectonics); make recommendation to the Director regarding readiness to make higher level findings
- Issue repository draft environmental impact statement for public comments
- Complete technical site suitability evaluation.

Fiscal Year 1999

- Complete Total System Performance Assessment-1999 (TSPA-1999).

Fiscal Year 2000

- Complete Total System Performance Assessment - 2000 (TSPA-2000)
- Issue final repository environmental impact statement and issue record of decision
- Complete site recommendation report and submit to the President, if the site is found suitable
- Complete repository license application design, including repository surface and underground facilities and balance of plant (non-nuclear)
- Complete waste package Title II design.

Fiscal Year 2001

- Submit license application for repository construction.

2.2 WASTE ACCEPTANCE, STORAGE, AND TRANSPORTATION PROJECT

The Department's waste management strategy has included the use of a monitored retrievable storage facility for interim storage of spent nuclear fuel. However, the Nuclear Waste Policy Act, as amended in 1987, authorized a monitored retrievable storage facility but linked the schedule for the Department's siting and development of the facility to the schedule for siting and development of a repository. The Act also provided a Nuclear Waste Negotiator to seek a volunteer site for a storage facility. The facility was to be licensed and constructed on a schedule which would allow the Department to begin removing spent nuclear fuel from utility sites beginning in 1998. A site for an interim storage facility has not been identified thus far.

To address this situation, the Waste Acceptance, Storage and Transportation Project strategy has been significantly revised in the new approach. Funding for a monitored retrievable storage facility has not been included in the plan, and will not be requested until a host site is identified. The Program does include a multi-purpose canister subsystem to permit spent nuclear fuel to be placed in standardized canisters for interim storage at reactor sites or at a central storage facility. These canisters can be used with appropriate overpacks for storage, transportation and disposal and thus reduce the handling of individual spent nuclear fuel assemblies. If the decision is made to implement the multi-purpose canister subsystem, the goal would be to make multi-purpose canisters available to the utilities in 1998. Current plans for the transportation subsystem are to move spent nuclear fuel to the repository beginning in 2010. In addition, the plans also provide flexibility for the Program to take spent nuclear fuel from reactor sites to an interim storage facility until the repository is ready to receive it, if the policy direction and resources to do so were provided.

Reactor site states and utilities have expressed concern that the Department will not be able to begin removing spent nuclear fuel from reactor sites in 1998. To address this concern, the Department is seeking comment from the broad range of stakeholders and the public on the Department's role in acceptance and interim storage of spent nuclear fuel.

While the Department of Energy has not requested changes to sections of the Nuclear Waste Policy Act that limit the Department's ability to site an interim storage facility, there are indications that the utilities and the state regulatory agencies may ask Congress to alter the Act to enable earlier development of such a site. If that occurs, the Department will require additional resources for design, licensing, and construction of the facility. The transportation activities would be replanned to be consistent with the facility development schedule. The Department would also review currently planned and published waste acceptance priorities to ensure that they are consistent with the policies and technical characteristics of the facility as set forth in the new authorization.

The following sections describe the approach for the Waste Acceptance, Storage and Transportation Project in terms of its major technical activities and products: waste acceptance, the multi-purpose canister subsystem, and the transportation subsystem. Also described are the functions required for integration of the technical products and the management of business activities in compliance with applicable regulatory requirements and Departmental policy and directives.

2.2.1 Waste Acceptance

Under the Nuclear Waste Policy Act, the Department is responsible for disposing of spent nuclear fuel and high-level radioactive waste at a Federal facility. The first step in this process is waste acceptance, which is defined as taking title and physical possession of the waste at the owners' sites. In order to accept waste, an active interface and a contract or agreement are required between the Department and the owners of the waste. The standard disposal contract, codified in 10 CFR 961, defines the roles and responsibilities of the Department and owners. The Department maintains an ongoing dialogue with owners and other stakeholders to ensure that the requirements of the standard disposal contract are understood by all parties and are executed successfully. This dialogue also assures that the Department has the information and data it needs to plan, design, and operate its waste management system. The Department is making plans and preparations for waste acceptance of commercial spent nuclear fuel utilizing multi-purpose canisters, single-purpose casks and dual-purpose casks. This variety of devices is necessary due to the uncertainty about when a Federal facility will be available to accept delivery of the waste and due to the non-uniform facility capabilities at each utility site.

In addition to disposing of spent nuclear fuel from commercial reactor sites and defense high-level waste, the Department is responsible for disposing of spent nuclear fuel and high-level radioactive waste resulting from various government initiatives and activities including commercial high-level wastes at West Valley, New York. Acceptance of this spent nuclear fuel and high-level waste will proceed from development and completion of necessary Memoranda of Agreement with the Department's Office of Environmental Management and with the State of New York. The basis for acceptance of both spent nuclear fuel and high-level waste will result from completion of technical waste acceptance criteria for each waste form. In support

of this Nation's nuclear nonproliferation policy, the Department has accepted spent nuclear fuel of U.S. origin from foreign research reactors, in order to assure its safe disposal. There are additional wastes that may need to be emplaced in a repository. The specific characteristics, amounts, and treatment and disposal options are not currently well defined. The Project is participating in discussions about the characteristics of these wastes and about the potential acceptance for disposal in a geologic repository.

A notice of inquiry was published in the Federal Register on May 25, 1994 to elicit the views of affected parties on: 1) the Department's preliminary position that it does not have a statutory obligation to accept waste in 1998 in the absence of an operational repository or storage facility; 2) the need for an interim, away-from-reactor storage facility prior to repository operations; and 3) options for offsetting a portion of the financial burden that the utilities may incur in continuing at-reactor storage of waste after 1998. The responses will assist in developing the Administration's position on the near-term management issues.

An option identified in the notice of inquiry is the provision of multi-purpose canisters to the utilities for dry storage of spent nuclear fuel at their sites. The utilities would continue ownership of the spent nuclear fuel while it remains stored at the reactor sites or other utility storage sites in the multi-purpose canisters. The Department would take title to the spent nuclear fuel upon its removal from those sites for Federal storage or disposal. Exercising this option might require a modification of the standard contract between the Department and the utilities contained in 10 CFR Part 961. A formal rulemaking may be necessary to include the multi-purpose canister alternative and establish the basis for cost sharing with the utilities.

New activities being planned to support possible multi-purpose canister implementation include:

- Identifying and developing site-specific plans for using multi-purpose canisters and identifying alternatives for sites unable to use the multi-purpose canister
- Revising the standard contract to incorporate the acceptability of multi-purpose canisters as a waste form; provisions for allocations, exchanges, deliveries, loading, and surveillance of multi-purpose canisters; and the subsequent acceptance of waste in multi-purpose canisters immediately before off-site transport
- Allocating and scheduling multi-purpose canister deliveries for initial at-reactor storage and the surveillance and validation of multi-purpose canister loadings before sealing
- Developing multi-purpose canister identification and tamper-proof sealing methods and fuel-loading verification and surveillance procedures consistent with national and International Atomic Energy Agency safeguards and materials control and accountability requirements and standards.

These activities are planned to be completed or operational by January 31, 1998.

2.2.2 Multi-Purpose Canisters

A multi-purpose canister subsystem offers several distinct advantages to the Civilian Radioactive Waste Management System and to the utilities in terms of operational flexibility, standardization, and simplicity. If the multi-purpose canister subsystem is implemented, spent nuclear fuel assemblies would be loaded into multi-purpose canisters at the reactor sites and permanently sealed. The canisters would then be stored, transported, and disposed of, without any additional handling of individual spent nuclear fuel assemblies. Specially designed overpacks would be used for storage, transportation, and disposal. Multi-purpose canisters would be compatible with storage at utility sites or at centralized interim storage sites.

After completion of an environmental impact statement and a decision to fabricate and deploy multi-purpose canisters, the Department would proceed with fabrication of canisters, transportation overpacks, and other supporting equipment for deployment to the utilities.

The Department also proposes to provide for the design and Nuclear Regulatory Commission certification of an on-site storage module, a spent nuclear fuel transfer device for transferring spent nuclear fuel to the multi-purpose canister, and a multi-purpose canister transfer cask for transferring the multi-purpose canisters from the pool to the storage module and between the storage module and transportation overpack. It is anticipated that the utilities would be responsible for loading and sealing the multi-purpose canisters, and furnishing the dry storage module (overpack), transfer casks, and other site-specific hardware. Multi-purpose canisters will be developed in two sizes to accommodate most reactor site capabilities. The spent nuclear fuel transfer device would permit those few utilities who otherwise were not capable of handling multi-purpose canisters to use them.

Because the multi-purpose canister will be used in storage, transportation and disposal, its design must include requirements derived from all three functions. An integrated approach to satisfy these requirements will require close coordination between the storage module and transportation cask design and certification activities and the repository and waste package design and licensing activities.

The multi-purpose canister subsystem acquisition process is intended to maximize participation by qualified vendors through full and open competition. A request for proposals for the multi-purpose canister design was released on June 3, 1994. It is anticipated that one or more design contracts will be awarded in fiscal year 1995, with the safety analysis report design to be completed in fiscal year 1996. Completion of an environmental impact statement and formal approval by the Department's Energy System Acquisition Advisory Board will be necessary before the Department's decision to proceed with the implementation of the multi-purpose canister subsystem. The decision on the initial fabrication and procurement of the multi-purpose canisters will be made at the same time.

Applications will be filed on behalf of the Department with the Nuclear Regulatory Commission for certificates of compliance under 10 CFR Part 71 for transportation and 10 CFR Part 72 for storage. Licensing issues, including a strategy for criticality control and transportation of multi-purpose canisters after prolonged storage at reactor sites or at a central storage facility, will be addressed with the Commission through topical reports and other means before application for

certification. A safety analysis report will be submitted for the 10 CFR Part 72 certification of the multi-purpose canister with the storage and on-site transfer design, and a separate safety analysis report will be submitted for the 10 CFR Part 71 certification of the multi-purpose canister with the transportation cask design. The multi-purpose canister design will address currently known constraints imposed by 10 CFR Part 60 in order to be compatible with geologic disposal requirements.

Approval of the use of multi-purpose canisters as part of the disposal waste package in the repository will occur when the Nuclear Regulatory Commission issues a repository license in accordance with 10 CFR Part 60. The multi-purpose canister environmental impact statement will include an assessment of surface-related repository impacts of using multi-purpose canisters and alternatives for waste disposal. This assessment will be based on available data on the surface facilities at the repository. A detailed assessment of the use of multi-purpose canisters as part of the waste package will be included in the repository environmental impact statement.

2.2.3 Transportation

The current transportation subsystem development schedule is paced to match repository availability in 2010 and to maintain readiness for earlier transportation should a site for Federal interim storage become available sooner than the repository. Transportation activities include development of transportation equipment, providing procedures and training to utilities for loading, handling and transferring of multi-purpose canisters, developing operational plans and procedures for multi-purpose canister transportation casks, and transporting the multi-purpose canisters and other waste forms as required from the utility storage sites to an interim Federal storage site if one is developed, and to the repository. The development and certification of transportation overpacks for multi-purpose canisters is included in the multi-purpose canister development activities discussed in Section 2.2.2.

The transportation subsystem also includes other transportation cask configurations. The Department will continue development of advanced technology, high-capacity highway transportation-only casks and trailers (GA-4/9 casks) and obtain certificates of compliance for these casks from the Nuclear Regulatory Commission under 10 CFR Part 71. Defense and commercial high-level waste to be disposed of in the repository will be stored at the producer sites and transported to the repository in special-purpose casks.

Institutional activities provide for stakeholder interaction and comment with respect to the conduct of spent nuclear fuel and high-level radioactive waste transportation. The Department also has transportation and storage cooperative agreements with ten national and regional groups, runs a public information program, and regularly participates in regional, national, and technical meetings on transportation. This network of relationships and contacts provides the Department with a broad spectrum of viewpoints for input into policy development. The Project is working with other Departmental elements in developing a strategy for involving stakeholders in the drafting of route selection criteria. This will be incorporated into formal guidance to Department programs, shippers, and carriers.

Before the start of transportation of casks loaded with spent nuclear fuel, operational transport planning and control, field operations, and cask service and maintenance capability must be in

place. Current activities support the acquisition and analysis of site-specific data for multi-purpose canister subsystem implementation for transportation risk analysis, off-site transportability assessments, and development of site-specific service plans.

The Department will develop and implement a strategy in accordance with Nuclear Waste Policy Act Section 180(c) to provide technical assistance and funds to States and Indian Tribes for training public safety officials through whose jurisdictions the Office of Civilian Radioactive Waste Management will transport spent nuclear fuel and high-level waste. Such assistance and funds are planned to be made available three to five years before shipping commences.

Activities being planned in response to the revised Program approach include:

- An evaluation of impacts on transportation subsystem development if transportation operations must commence prior to 2010, should an interim storage site become available.
- An evaluation of cask maintenance facility requirements associated with the use of multi-purpose canisters.

2.2.4 Management and Integration

Activities associated with standard business functions, such as management of the project cost and schedule baselines and evaluation of changes on project priorities are included in this project element. An additional priority is integrating Program and project plans in a manner that is consistent with the Program objectives. The major functional areas are discussed below.

The objective of the Project's management and integration activities is to ensure the successful attainment of project goals and milestones. Management and integration activities provide cost, schedule and technical direction to Waste Acceptance, Storage and Transportation Project implementation activities, provide managerial input to Program documents, and support the annual budgeting and planning process.

Management and integration also includes system engineering and quality assurance activities. System engineering activities ensure the sound and cost-effective application of system engineering principles to the Waste Acceptance, Storage and Transportation Project. The quality assurance activities ensure that the design, fabrication, and testing are performed in accordance with appropriate quality assurance requirements. Interactions with the Nuclear Regulatory Commission in obtaining certificates of compliance under 10 CFR Parts 71 and/or 72 for the proposed multi-purpose canister, its overpacks, and other transportation-only cask systems are covered in the activities discussed in Sections 2.2.2 and 2.2.3.

2.2.5 Major Milestones

This section outlines major milestones in waste acceptance, storage, and transportation activities. The relationships among these milestones, as well as other supporting milestones, are shown in the Waste Acceptance, Storage and Transportation Schedule, Figure 5.

WAST PROJECT SUMMARY SCHEDULE THRU YEAR 2000

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WPA39 v1

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12/15/94

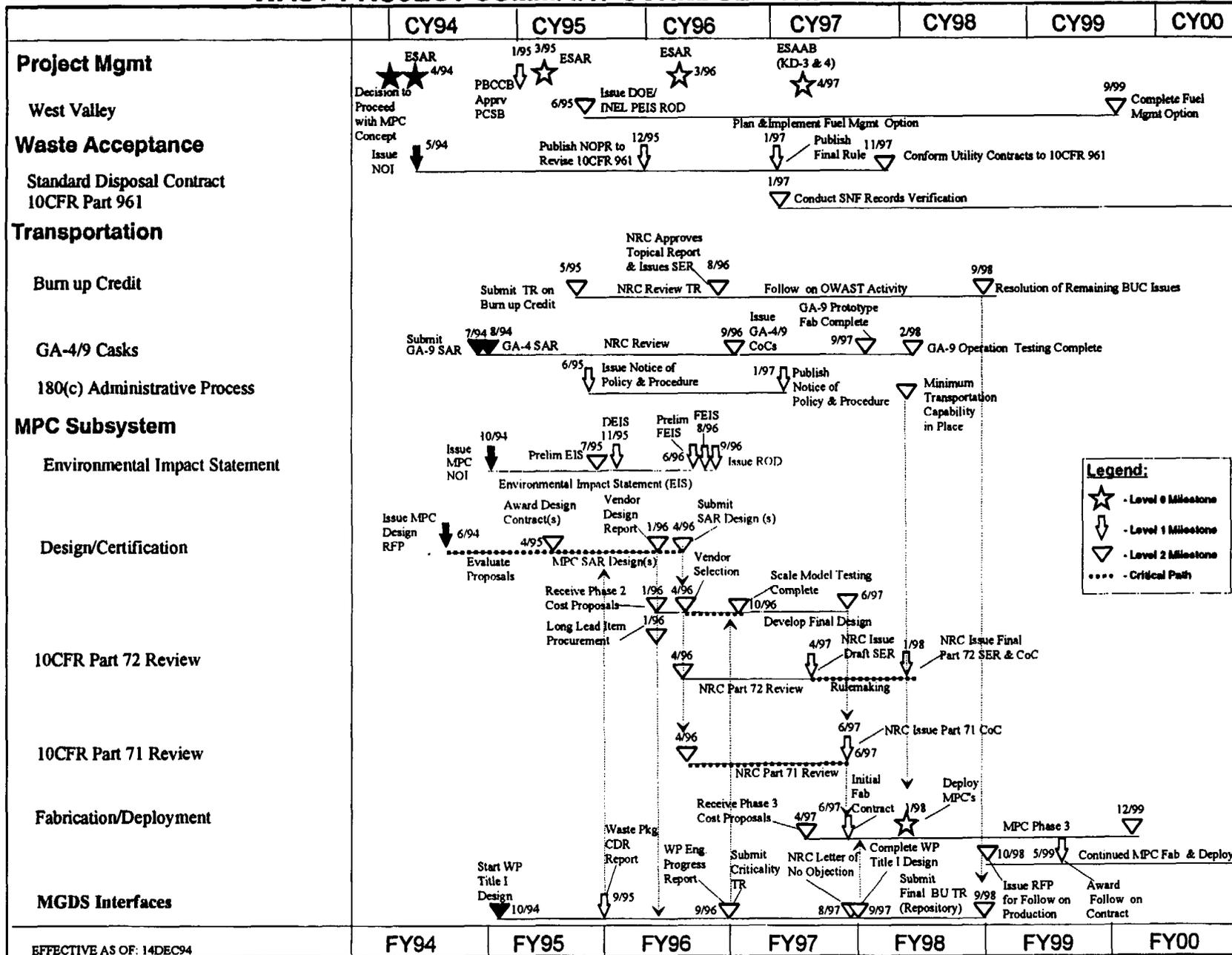


Figure 5. Waste Acceptance, (ge and Transportation Schedule

Fiscal Year 1995

- Issue notice of intent and begin the multi-purpose canister environmental impact statement process
- Award contract(s) for the multi-purpose canister design, certification and optional fabrication
- Issue a notice of proposed policy and procedures for implementing Section 180(c) of the Nuclear Waste Policy Act.

Fiscal Year 1996

- Complete multi-purpose canister environmental impact statement and record of decision
- Complete multi-purpose canister subsystem design and submit safety analysis reports to the Nuclear Regulatory Commission
- Receive certificates of compliance from the Nuclear Regulatory Commission* for GA-4/9 cask designs
- Issue notice of proposed rulemaking to revise the standard contract (10 CFR Part 961) for multi-purpose canister implementation.
- Complete multi-purpose canister scale-model testing.

Fiscal Year 1997

- Receive draft certificates of compliance from the Nuclear Regulatory Commission* under 10 CFR Part 72 for multi-purpose canister designs
- Issue final rule on standard contract with utilities
- Receive certificates of compliance from the Nuclear Regulatory Commission* under 10 CFR Part 71 for multi-purpose canister transportation cask
- If supported by the multi-purpose canister environmental impact statement record of decision, begin production of canisters for deployment
- Complete first GA-4/9 prototype
- Publish notice of policy and procedures for implementing Section 180(c) of the Nuclear Waste Policy Act.

* Assumed milestone completion by the Nuclear Regulatory Commission.

Fiscal Year 1998

- Receive final certificates of compliance from the Nuclear Regulatory Commission* under 10 CFR Part 72 for multi-purpose canister storage overpack
- Receive formal approval from the Department to deploy multi-purpose canisters
- Complete GA-9 operation testing.

Fiscal Year 1999

- Award out-year contract for multi-purpose canister fabrication.

* Assumed milestone completion by the Nuclear Regulatory Commission.

2.3 PROGRAM MANAGEMENT

The Civilian Radioactive Waste Management Program's strategic planning process is at the core of its effort to improve program management. The process provides senior Program managers with opportunities to continuously and collectively address the technical, managerial, and institutional conditions and challenges of Program implementation. It is designed to support the formulation and, as conditions evolve, reformulation of Program goals and the strategies for achieving them. These goals and strategies, in turn, provide a sound, consistent basis for defining, integrating, and performing the Program's four primary management functions: (1) program planning; (2) managing Program resources; (3) implementing and executing Program activities; and (4) assessing and improving Program performance. During fiscal year 1994, the strategic planning process was principally used to identify and address the fundamental strengths and weaknesses of these functions. The results of the 1994 process included:

- Confirming the Program mission and developing a vision statement
- Defining goals (which are presented in Appendix A) to guide Program direction
- Realigning Headquarters and project organizations, including contractors, to address the Program's primary business centers and to better leverage the Program's technical and managerial expertise and eliminate structural and procedural deficiencies
- Developing a Program approach to describe, at a summary level for each business center, the technical work scope and schedule to be completed under existing and expected funding levels
- Initiating the development of a comprehensive, multi-year program plan to define business center and program management activities and milestones, as well as to provide the Program's oversight, regulatory, technical review, and stakeholder communities with a clear and detailed understanding of its work and measures of its progress.

In fiscal year 1995, the Program will focus on identifying and addressing a number of cross-cutting issues, improving the linkages across the four program management functions, and on recalibrating its management tools (e.g., schedules, baselines, change control and performance review and reporting processes) to improve access to the data and information needed to effectively manage the Program. A key milestone in 1995 is the preparation and implementation of a revised Program Management System Manual, which will set forth the essential policies, processes, procedures, and practices of program management.

An overview of the objectives and planned activities for each program management function are provided in the following sections. A composite schedule of major program management milestones is presented at the end of this section.

2.3.1 Program Planning

The key components of the Program's planning process include strategic planning, business and management center planning, formulating and executing annual work plans, and establishing Program- and project-level cost, schedule, and technical baselines. The planning process provides the basis for determining, prioritizing, and allocating Program resources; defining, costing, and executing work scope and schedules; and monitoring, analyzing, and improving Program performance.

2.3.1.1 Strategic Planning

In fiscal year 1995, the Program will conduct a systematic review of the conditions and challenges driving current Program goals, strategies, and work. The review will center on determining the validity, significance, and evolution of those conditions and challenges, and assessing the appropriateness of the Program's efforts to address them. The review, which is intended to include interactions with a cross-section of Program stakeholders, regulatory authorities, oversight entities, and technical reviewers, will also provide the management community with the opportunity to identify new and emerging issues that are likely to affect the Program's progress towards achieving its goals. Some of the more significant conditions and challenges that the Program's strategic planning process is likely to address in the current fiscal year include:

- Supporting the spent nuclear fuel and high-level radioactive waste management policy deliberations of the 104th Congress
- Establishing a mechanism to ensure Program funding is commensurate with the work to be performed
- Formulating strategies to address interim spent nuclear fuel storage needs
- Addressing the demands and international implications of storing and disposing of Departmental materials, including spent nuclear fuel and high-level radioactive waste
- Identifying and securing the scientific and technical expertise required to do the Program's work.

The Program's current strategic plan will be revised, as necessary, to reflect, provide the rationale behind, and share with external parties any significant change in Program direction.

2.3.1.2 Business and Management Center Planning

The primary objective of business and management center planning is to establish and maintain a comprehensive, multi-year program plan, which provides sufficient detail about the activities, milestones, and schedules of the Program's business and management centers. This detail is necessary for implementing Program strategies, formulating Program budgets, achieving Program goals, and measuring progress and performance. In addition to directing the work of the Program's Federal and contractor work force, the business and management center planning process also provides for a meaningful, timely, and continuing basis of interactions with the Program's oversight, regulatory, technical review, and stakeholder communities.

The Program will continuously review its program plans and revise them, in their entirety, on an annual basis.

2.3.1.3 Work Planning

The work planning process results in the preparation of annual work plans, which provide detailed descriptions of the work and products or deliverables planned for the Program's business and management centers. This process is designed to separate the total Program scope defined in the business and management center plans into discrete, manageable work segments and assign responsibility and resources to the Program's Federal and contractor organizations.

2.3.1.4 Cost, Schedule, and Technical Baselines

The Program's cost, schedule, and technical baselines are management tools, which provide reference estimates for the resources, time, and work required to implement the Program. The baselines are derived from the Program's strategic and business and management center plans. They define the criteria and objectives against which Program performance and progress can be measured, thus facilitating effective program control.

2.3.2 Resource Allocation and Management

The Program must provide adequate resources to implement planned activities. These resources must be allocated and managed to ensure their effectiveness today and in the future. Effective resources utilization requires careful coordination between program planning and resources management. The planning process provides the basis for allocating and managing resources (e.g., funding, staffing, equipment) to support Program implementation, specifically, the work performed by the Program's business and management centers. The allocation component of this function is primarily concerned with the Program's budget formulation and execution processes. The management component focuses on maximizing the Program's return on its allocations or "investments." The Program approach has focused near-term and long-term initiatives on improved allocation and management of human, funding, and capital and other investment resources. These initiatives are discussed below.

2.3.2.1 Human Resources

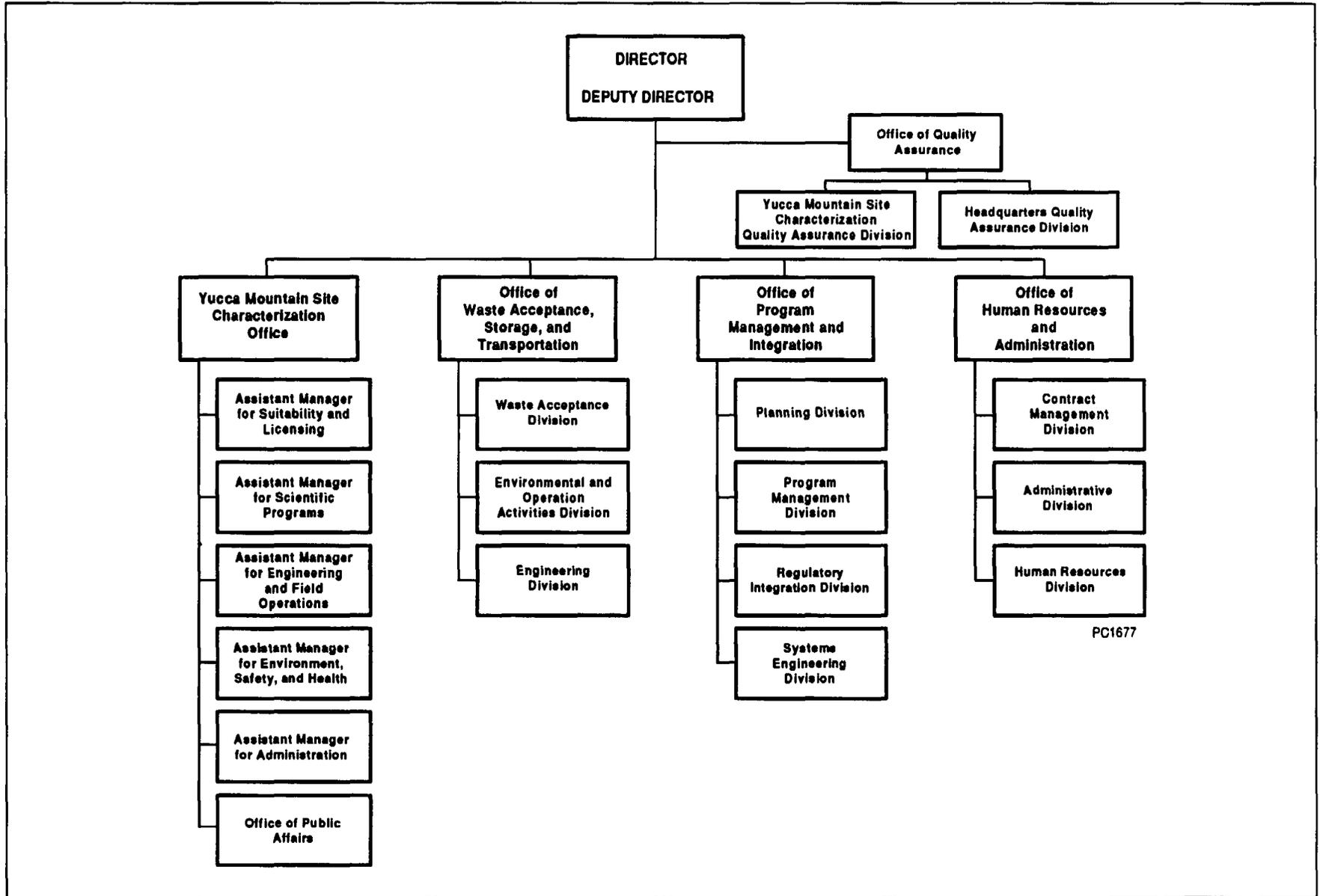
One of the Program's strategic goals is to enhance the effectiveness of its human resources. This goal reflects a Department-wide commitment to create a more productive and rewarding work environment for its employees, align the skills and expertise of its employees with agency priorities, create opportunities for career development, and increase diversification of the workforce. The overall goal of this human resources policy within the Program is the empowerment of employees who, under fewer levels of management and with an increased accountability and a greater stake in decisions, will assume a more effective and responsible role in achieving the Program mission.

The Federal Organization. In 1994, responding to the Secretary's strategic initiatives and the Program's strategic planning process, the Federal management structure was reorganized so that it is more focused, efficient, product-oriented, and open. The Federal reorganization was implemented on July 10, 1994 (see Figure 6). Program resources were organized into two business centers and a Headquarters management center. The two business centers are the Yucca Mountain Site Characterization Project and the Waste Acceptance, Storage and Transportation Project. The management center includes personnel from the Office of Human Resources and Administration, the Office of Quality Assurance, and the Office of Program Management and Integration. The Office of the Director defines overall policy and direction for the Program.

The restructuring flattened the Program's organization, eliminated all branch-level organizations, decreased the number of subordinate offices, and increased the employee-to-supervisor ratio. The reorganization had the following objectives:

- Provide clear lines of responsibility, authority, and accountability
- Place authority at organizational levels where the work tasks are managed
- Fully integrate all Program activities across organizational and geographic divisions
- Streamline the organization and eliminate middle management positions to increase employee-to-supervisor ratio
- Clarify roles and responsibilities between Headquarters and field
- Reduce duplication of effort
- Improve ability to achieve objectives by employing a "team" approach.

During fiscal year 1995, the Federal workforce will increase in size with 35 new positions. The increase in staff will be utilized to provide these positions at the two business centers. Additional realignment of staff resources to meet Program priorities will be accomplished by transferring personnel from the management center to field positions at the Yucca Mountain Site Characterization Project.



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Figure 6. The Program's Federal Organization (effective 7/10/94)

The Contractor Organization. The Program's contractor organization also is being restructured. The historical objective of acquiring the "best" available technical and scientific service organizations to directly assist the Program's Federal workforce has had the unintended consequence of creating a fragmented, costly, and unwieldy contractor structure. To resolve these problems, the Program is restructuring the relationships of its contractors and government support participants. The contractor structure described below is illustrated in Figure 7.

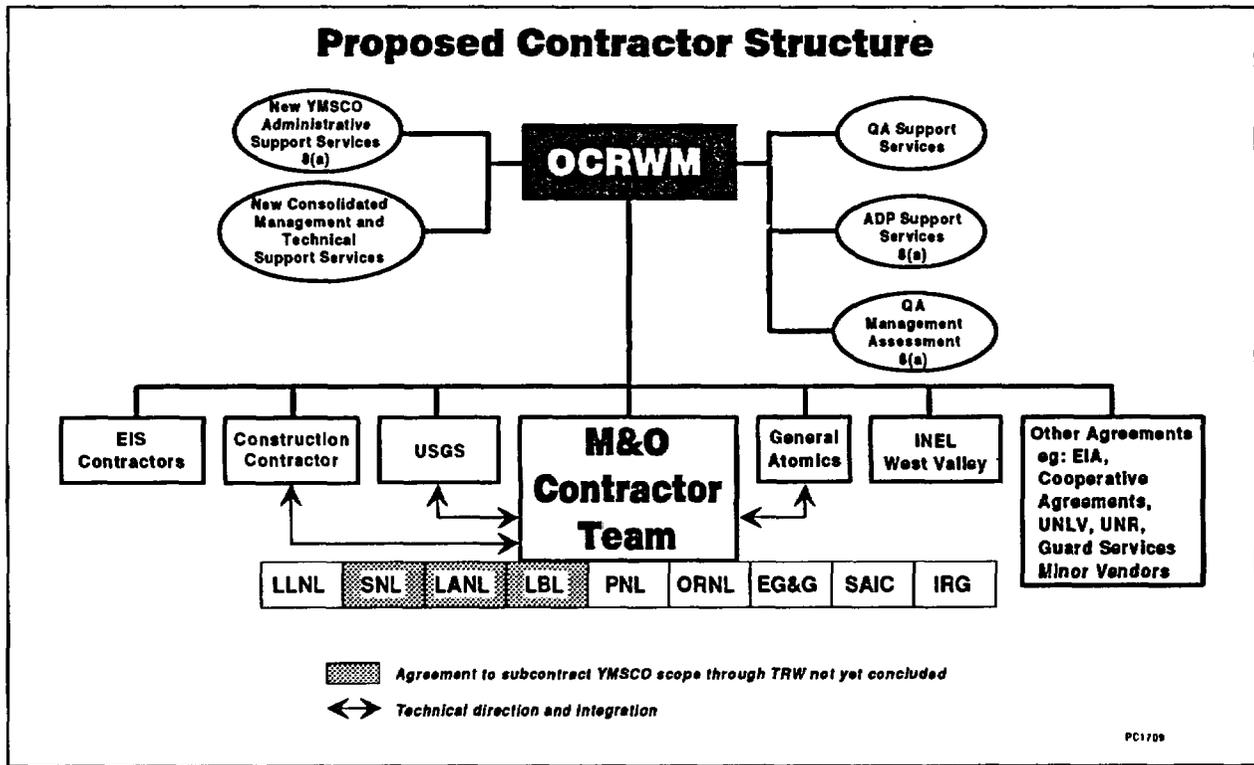


Figure 7. The Program's Proposed Contractor Organization

The major feature of this restructuring has been the consolidation of work under the Program's management and operating (M&O) contractor. This transition is almost completed and has eliminated the participation of some contractor organizations in the Program and linked other participants to the M&O via teaming agreements and other mechanisms. The total number of direct Program participants has been reduced by over 40 percent, from 44 at the time of award of the M&O contract to 25, thereby improving management effort and efficiency. This transition will be completed in fiscal year 1995.

Another key area of restructuring has been to initiate the establishment of a single management support organization. Management and technical support services at the projects and Headquarters are presently provided by several different contractors. The Office of Civilian Radioactive Waste Management plans to award a single contract to consolidate these support services. It is expected that this new contract will be in place in calendar year 1996.

The consolidation and restructuring described above has succeeded in reducing not only the number of participants but also the Department-managed interfaces. Federal staff has been freed to focus on critical program and project management issues, strategic planning, and policy implementation. Accountability for day-to-day performance has been imposed clearly upon the M&O contractor.

Other Human Resources Initiatives. Several other important initiatives are being pursued within the Program to address the strategic goal of enhancing the effectiveness of human resources. First, the Program is working toward greater diversity in its workforce. The diversification of the workforce is intended to bring new thinking and perspectives into Program and Department decision-making. Secondly, the Program is committed to ensuring greater opportunity for staff participation in the Program decision process. Staff input was a critical part of the decision-making process regarding the recent reorganization of the Program's Federal workforce. Considering input from the full range the Program workforce is actively encouraged in the new organization to foster better decision-making. Opportunities to improve workforce collaboration across the Program's business and management centers are evident in the "openness" of its planning process. In addition, the Program is moving forward to develop and implement a more visible and understandable decision process that will expand the involvement of staff.

The management center is charged with developing and implementing a total quality management program and a customer service program for the Office of Civilian Radioactive Waste Management. The philosophy of total quality management and customer service, and of continuous improvement is incorporated in the Secretary's Strategic Plan and the Departmental core values, as well as the Program's own Strategic Plan and revised approach to achieving its mission. The Program has adopted the Department's core values, including customer-orientation, commitment to excellence, teamwork, respect for the environment, empowerment, ethical behavior, and a belief that the people involved with the Department are its most valuable resource.

The Program is also developing and implementing a broadly based career development program tailored to individual employee needs. There is increased focus on training, temporary assignments, mentorships, and other personnel development initiatives. Finally, the performance appraisal system is being simplified and revised to ensure that it is consistently applied, accurately reflects actual performance, and fosters the core values of the Department.

2.3.2.2 Funding Resources

The results of the program planning process are submitted through the Office of Management and Budget to Congress each year as the President's budget. The Congress, in turn, appropriates funds for the Program in the execution year. The Director, through an integrated budget review process in which each office director and his staff present their annual plan updates, allocates the resources to the highest Program priorities. The Program and project baselines are updated with these allocations. Using Department and contractor automated financial systems, expenditures are tracked and analyzed and variances reported each month for management action. At the bi-monthly Director's Program Review, the Director and all of the office directors review Program

and resource status and makes the necessary adjustments to ensure critical Program milestone activities are not affected.

2.3.2.3 Capital and Other Investment Resources

Implementation of planned activities requires resource investments such as equipment acquisition, procurement of contractor services, facility leasing, and information management systems acquisition and support. The physical plant not only provides room to work but also increases productivity through improved communications links, integrated work environments and improved morale.

2.3.3 Program Implementation

The work of the Civilian Radioactive Waste Management Program is carried out at its business and management centers. The work of the Yucca Mountain Site Characterization Project and the Waste Acceptance, Storage, and Transportation Project are described in Volumes II and III of this plan.

The work of the Program's management center involves leading, as well as supporting the Program's business center activities. The leadership role includes strategic planning, policy formulation, interactions with oversight, regulatory, technical review, and stakeholder communities, Program-level management of resources, risk management, and program control.

The Program's management center also leads a collaborative effort, which includes management and staff from each of the business centers, to establish, implement, and maintain a framework for Program integration. This framework is used to identify and address managerial and technical functions, decisions, activities, and issues with cross-cutting Program impacts. The Program's key and continuing integration challenges involve policy formulation, regulatory compliance, technical work scope and execution, and public involvement.

The management center's support role involves establishing and maintaining the managerial and organizational infrastructure needed to support the Director and to guide and facilitate business center work. This role includes quality assurance oversight, managing the Nuclear Waste Fund, disseminating public information, and managing contracts. Overviews of the Program's integration initiatives and support services are provided in the following sections.

2.3.3.1 Integration of Nuclear Waste Policy Development

The Program's management center coordinates Program interactions on a number of important external interfaces. The Department is developing plans to treat, store, and dispose of defense-generated high-level radioactive wastes that were not considered when this Program was chartered by the Congress. Program- and project-level personnel have been appointed to cross-cutting groups, coordinated through the management center, to support this activity. These groups will participate in the development of issues, options, and recommendations for use by the Department and the Program. The Program also needs to consider and participate in the development of Departmental policies on the disposal of Greater-Than-Class-C-level waste and other wastes not slated for disposal in the repository.

The following describes several of the more critical near-term policy development and integration issues the Program is pursuing. The Program will continue to address all significant policy development issues.

Acceptance of Defense Wastes in the First Repository. The Nuclear Waste Policy Act requires that the President evaluate the use of one or more of the repositories to be developed under the Act for the disposal of high-level radioactive waste resulting from defense activities. In 1985, the President determined that the high-level waste produced at the Hanford Plant, the Savannah River site, and the Idaho National Engineering Laboratory could be emplaced with the commercial waste in a repository. The Department anticipated that initially there would be a total of 20,000 canisters of defense waste from those facilities. The Department's most recent evaluation of the quantities of high-level radioactive waste indicates that as many as 50,000 canisters may require disposal.

If the Yucca Mountain site is found suitable and receives a license, the Program's current planning basis calls for the disposal of high-level waste resulting from the reprocessing of 7,000 metric tons of heavy metal from the defense Program, out of a total statutory limit for the first repository of 70,000 metric tons of heavy metal, prior to operation of a second repository. The 7,000 metric tons from high-level waste translates to 13,500 canisters of high-level radioactive waste that are to be disposed of in the first repository, out of a possible 50,000 canisters that may require disposal.

There are additional wastes that should eventually be emplaced in a geologic repository. Specific characteristics and amounts are not well known. Treatment and disposal options for these wastes are not as well defined as for spent nuclear fuel and high-level radioactive waste.

Acceptance of Spent Nuclear Fuel of U.S. Origin from Foreign Research Reactors. The Department has proposed an acceptance policy for spent nuclear fuel of U.S. origin from foreign research reactors. This policy supports nonproliferation of weapons usable material by retrieving spent nuclear fuel containing U.S. origin highly enriched uranium from foreign research reactors. The policy is consistent with Section 903(a) of the Energy Policy Act of 1992, which restricts the export of highly enriched uranium from the United States. An important complement to the proposed acceptance policy is the Reduced Enrichment for Research and Test Reactor Program. That program provides incentives and opportunities to all foreign countries to return U.S. origin spent nuclear fuel containing highly enriched uranium.

The Civilian Radioactive Waste Management Program is participating in planning discussions about potential disposal of this waste in the geologic repository, and the characteristics of the waste form being proposed for this highly enriched uranium waste.

Long-term Integrated Spent Nuclear Fuel Program: The Department is currently developing an integrated, long-term program to provide for the storage, conditioning, and final disposition of all spent nuclear fuel in the current or future possession of the Department. The Department's Integrated Spent Nuclear Fuel Program will define appropriate waste conditioning methods for this material and work with the Civilian Radioactive Waste Management Program to define compatible waste acceptance criteria for geologic disposal.

2.3.3.2 Regulatory Integration

Program management activities in regulatory integration are focused on ensuring that compliance approaches of the two projects are compatible with each other, with applicable statutes and regulations, and with Departmental policy. There are three principal areas of regulatory integration: Program-wide compliance with the National Environmental Policy Act, coordination of interactions with the Nuclear Regulatory Commission to identify and initiate resolution of licensing issues affecting both projects, and general policy guidance on compliance with other statutes and regulations and Departmental directives. Significant implementation activities are described below.

National Environmental Policy Act Compliance. This section describes the Office of Civilian Radioactive Waste Management's current thinking regarding its approach for compliance with National Environmental Policy Act. The approach is still under advisement within the Department. Any modifications to the approach described in this section will be incorporated in a subsequent update of the Program Plan.

The primary direction for the Program's approach to National Environmental Policy Act compliance comes from the Nuclear Waste Policy Act, as amended. The Nuclear Waste Policy Act directs the Office of Civilian Radioactive Waste Management to prepare the following environmental documents:

- An environmental impact statement to accompany the recommendation by the Secretary to the President to site, construct, and operate a geologic repository. This environmental impact statement will be included in the Secretary's application to the Nuclear Regulatory Commission for construction authorization for a geologic repository. The Commission is required to adopt this environmental impact statement, to the extent practicable, in developing the construction authorization.
- An environmental assessment to accompany the recommendation by the Secretary or the Nuclear Waste Negotiator to site and operate a monitored retrievable storage facility. If the recommendation is approved by Congress, an environmental impact statement will be prepared to accompany the application to the Nuclear Regulatory Commission for a license to construct and operate a monitored retrievable storage facility.

In the Nuclear Waste Policy Act, Congress also limited the National Environmental Policy Act by specifying issues that do not need to be addressed by the environmental documents, such as the need for a repository or a monitored retrievable storage facility, alternatives to geologic disposal, or alternative sites for the repository. The purpose of these directives was to "... avoid litigation regarding its [National Environmental Policy Act] applicability and to ensure that the essential objectives of [the National Environmental Policy Act] are met without such litigation" (Congressional Report, 1982).

In addition to the Program elements explicitly authorized by the Nuclear Waste Policy Act, the Office of Civilian Radioactive Waste Management is proposing a technology development initiative for the Federal waste management system to utilize multi-purpose canisters for storage, transportation, and disposal of spent nuclear fuel. The Program is planning to prepare an

environmental impact statement for this proposed action. The multi-purpose canister environmental impact statement will evaluate the environmental impacts of a potential decision to fabricate and deploy multi-purpose canisters and alternatives for use in storage and transportation of spent nuclear fuel and, to the extent practicable, the impacts of multi-purpose canister use on geologic repository surface facility activities. The multi-purpose canister conceptual design will incorporate currently known constraints imposed by 10 CFR Part 60 in order to be compatible with geologic disposal requirements.

The Program's National Environmental Policy Act compliance approach uses the multi-purpose canister environmental impact statement to evaluate the non-site-specific impacts of multi-purpose canisters on the overall Program. As the Department recommends a site for the repository, or if a site is identified for an interim storage facility, the site-specific impacts will be comprehensively addressed and, where appropriate, analyses will be incorporated by reference from the multi-purpose canister environmental impact statement to the site-specific (repository or interim storage facility) environmental impact statement(s). Cumulative impacts which are normally linked to a site will be evaluated in the appropriate site-specific environmental impact statement.

Prelicensing Interaction with the Nuclear Regulatory Commission. The Headquarters management center is responsible for implementing the Program-level licensing strategy. This strategy consists of several fundamental principles. The Program is committed to coordinating frequent, early interactions with the Nuclear Regulatory Commission. The objective of these interactions is to provide information to the Commission in a manner that allows them to discharge their responsibilities for prelicensing guidance and oversight described in the Nuclear Waste Policy Act, so that the potential repository license application can be reviewed in a timely manner. Information will be provided to the Commission by way of topical reports, technical reports, technical exchanges, and the annotated outline of the license application.

The management center is also responsible for coordinating efforts to resolve issues that affect both projects. Examples include coordinating the efforts of both projects to resolve with the Nuclear Regulatory Commission the use of burnup credit for multi-purpose canister design and as an option for long-term criticality control. Another activity is to interact with the Commission to obtain their acceptance of a consistent, integrated approach to the thermal management of the waste in repository design and the potential use of multi-purpose canisters for disposal, to be described in the repository license application.

Guidance on Compliance with Environmental, Safety and Health Requirements. The Program's management center provides guidance to the projects on compliance with environmental, safety and health requirements through the Program's Regulatory Guidance Document. The management center also contributes to the development of Departmental policy and directives by participation in interagency working groups and review of draft Departmental orders and directives. Finally, the management center assists in Departmental planning efforts by coordinating project input and production of the Program's Five-year Environmental, Safety and Health Management Plan. This plan is updated and submitted annually to the Department's Office of Environment, Safety and Health.

2.3.3.3 Technical Integration

Integrating and optimizing the Civilian Radioactive Waste Management System is a major technical and management challenge due to the complexity of the Program's implementation schedule and the large number of assumptions that must be carried in the Program's planning basis. The major elements of work in fiscal year 1995 and the extended planning years include:

- Maintaining a hierarchy of documents that serves to convey regulatory requirements and Program technical policy decisions systematically to the designers of the waste management system in a format that is usable and verifiable, and ensuring that the documents accurately reflect and are responsive to changes in policy
- Identifying, analyzing, and evaluating various repository operational scenarios that could affect the Program's management and disposal of high-level radioactive waste and spent nuclear fuel
- Providing personnel, improved tools, techniques, and data for evaluating Program alternatives and proposed changes to the technical baseline
- Providing identification, analysis, and evaluation of various repository operational scenarios from a Program perspective as potential input to the design process
- Facilitating the design and development of system physical and functional interfaces through the identification of interface requirements and the coordination of interface design agreements
- Providing the Program-level data and analyses to support the development and implementation of strategies to address the technical approaches to waste management.

Risk management is an important systems engineering activity that is performed in conjunction with program integration and planning. The program-level effort to determine the areas of program risk uses as a starting point a network of program-level decisions called the decision hierarchy. The program-level decisions included on the decision hierarchy are identified through analysis of the Program schedule and technical baselines. The risk management process includes development of the decision hierarchy, identification of decision support data needs, identification of programmatic risks, development of approaches to reduce programmatic risks, identification of contingencies, and the identification of options for responding to the contingencies. The process identifies the risks induced by the need to make decisions in a chronological order that require assumptions regarding one or more future decisions. Early identification of risks provides the opportunity to develop plans that identify approaches to reduce the level of risk and to implement contingency options.

Technical integration activities encompass a wide range of technical issues that cross-cut the Program. The following sections describe two of the major technical integration areas that will be the focus of activities in the coming years: the system-wide strategy for thermal management and multi-purpose canister and waste package design.

System-wide Strategy for Thermal Management. The thermal management strategy that is being pursued will provide:

- By 1998, information needed for evaluating the technical suitability of the Yucca Mountain site
- By 2001, information needed for the application for a repository construction authorization
- By 2008, information needed for improvement and selection of the repository thermal design
- Measurements and observations for as long as 100 years to confirm this design.

In addition, the strategy allows for the integration of waste acceptance, storage, and transportation, and multi-purpose canister design issues. The strategy recognizes that if a decision is made to deploy the multi-purpose canister subsystem, the canister design and interim storage have constraints that may be affected by repository thermal design. The strategy also takes into account the fact that waste acceptance and interim storage (whether at a reactor or interim storage site) play a role in repository thermal management and could help to provide additional design flexibility. Furthermore, the strategy incorporates the flexibility to plan for disposal of a wide range of Departmental waste forms with a wide range of thermal characteristics.

The objectives of repository thermal management are to develop a cost-effective thermal design compatible with waste isolation and containment as defined in 10 CFR Part 60 and 960, to design waste packages compatible with the multi-purpose canister concept that provide containment while near-field temperatures are high and uncertainties are large, and to design the underground facility in order that thermal conditions compatible with preclosure operations and monitoring are achieved, and to maintain flexibility in the design to minimize risks. The short-range goal of the strategy is to identify an adequate thermal loading with uncertainty acceptable to the licensing process. The long-range goal of the strategy is to achieve a safe and cost-effective system design.

The objectives for waste acceptance, storage and transportation thermal management are to develop cask and multi-purpose canister designs that comply with 10 CFR Part 71 and 10 CFR Part 72 thermal requirements, to provide multi-purpose canister designs consistent with available repository thermal testing and design information, and to determine benefits of waste acceptance and storage strategies both for repository thermal design and to avoid de-rating of multi-purpose canisters.

These objectives are to be accomplished through a sequence of steps. The first step is to develop a flexible design for the elements of the system (repository, waste package, multi-purpose canister). This design will encompass a range of thermal loadings. The design will be developed to support the 1997 record of decision on multi-purpose canister deployment, the 1998 site suitability evaluation, and the 2001 repository license application. The next step is to conduct analyses for the technical site suitability evaluation and initial license application in terms of a

low thermal loading selected from the range of loading encompassed by the flexible design. The thermal loading that will be selected will be that which can be supported by site characterization tests and measurements conducted by 1998.

The third step takes place if the Yucca Mountain site is determined to be suitable and is approved for repository development. In this step, higher thermal loadings are evaluated to improve cost and performance. In-situ heater tests operating for progressively longer times and at higher temperatures will reduce site thermal response uncertainty and demonstrate the basis for any proposed increase in safe repository thermal loading limits. The Program will consider this information and will select a thermal design before the license application update in 2008.

The final step is to conduct confirmatory testing of the thermal design. This testing will involve evaluation of thermal effects for emplaced waste packages. The testing will be used to evaluate performance and rock response during operations to ensure that waste isolation and containment will be achieved and repository operations can be conducted. This confirmatory testing will be conducted as part of the performance confirmation Program.

The approach described above has been selected because it provides the most flexibility in the design and the best means of exploring the full range of thermal loading options.

Multi-Purpose Canister and Waste Package Designs. A number of significant interfaces exist between the proposed multi-purpose canister subsystem and the geologic repository. The major interfaces are related to repository waste handling operations, the waste package design, and the repository subsurface design with respect to thermal loading. Issues related to thermal loading and its impact on the subsurface design of the repository were discussed in the previous section. The following discussion focuses on the technical integration issues that must be resolved between the multi-purpose canister subsystem and the repository waste package design.

If the multi-purpose canister subsystem is deployed for use in interim storage, transportation, and ultimately as part of the repository waste package, the canister subsystem must interface smoothly with the waste package design. During disposal operations, the multi-purpose canister would be placed inside the disposal overpack and the two components together must meet the containment and other performance requirements of the waste package. Important interfaces that have been identified are materials compatibility, long-term criticality control, and thermal design. Interface issues regarding the integration of the multi-purpose canister and the disposal overpack must be addressed now, even though the multi-purpose canister design precedes the waste package design by several years. These issues have been considered in the conceptual design of the multi-purpose canister subsystem, and will continue to be the subject of system evaluations and trade-off studies in later design phases. Design flexibility will be maintained as site suitability information relevant to the interface between the multi-purpose canister and the waste package is obtained.

2.3.3.4 Implementation of Public Participation Policy

Because of the far-reaching public implications of this Program, its activities must be conducted in an open and inclusive manner. The Nuclear Waste Policy Act and the Secretary's Public Participation Policy establish public participation as a key component in Program activities and

the current Program approach reaffirms this commitment. The Program believes that these interactions will result in better decisions and a stronger Program.

Integrating public involvement requires that technical and policy issues be analyzed to determine their institutional implications. The Program believes that the public is best served and technical and institutional integration is best achieved in a decentralized environment in which Program officials and staff are easily accessible, decision making is more visible, and a focus on discrete elements is more likely. Consequently, in the Program's reorganization, external relations responsibilities were decentralized. The effects of this reorganization are reflected in the descriptions of public involvement initiatives discussed in the project-specific portions of this document.

The Program will continue to interact with institutions, organizations, and individuals representing a variety of interests. The Program counts among its many stakeholders the following: Congress; affected State, local, and Indian Tribal governments; other Federal agencies; review and oversight bodies; corridor States; public utility commissioners; utility and industry groups; foreign governments and international organizations; universities and scientific and technical communities; minority and low-income communities (to address environmental justice considerations); interest groups (governmental, environmental, civic, business, professional, unions); professional societies (technical, scientific, etc.); trade associations; the media; and the public. These stakeholders have diverse perspectives, varying levels of involvement, including rights provided by statutes and executive orders, and disparate goals for the Civilian Radioactive Waste Management Program. In many instances, the positions advocated by these entities may prove to be contradictory and difficult, if not impossible, to reconcile. In this context, satisfying one segment of the Program's stakeholders may displease another. This is the challenge for devising an effective public involvement program.

In 1995, the Program will release a draft Public Involvement Plan for public review and comment. This document will describe how the Program intends to implement the Secretary's Public Participation Policy and will present an overall approach for providing stakeholders with meaningful opportunities to engage in the Civilian Radioactive Waste Management Program's decision-making process. Among the features of this plan will be the Program's commitment to provide timely notification of predecisional access points to the broadest stakeholder audience possible, and notify stakeholders through the *Office of Civilian Radioactive Waste Management Bulletin*, the *Federal Register*, and other vehicles; release draft documents for public review and comment, such as the draft Public Involvement Plan and the Invitational Travel Policy; review and respond to comments in a timely manner; provide public comment periods at all public meetings; use technology to ensure that correspondence is handled promptly; and conduct meetings at times and places as convenient and accessible as practical.

2.3.3.5 Integration of Information Resources Management Initiatives

A key principle of reinventing government initiatives, as stated in the National Performance Review, is that government streamlining and process improvement efforts will be accomplished through the strategic application of information technologies.

The management center is responsible for ensuring that Program mission performance is improved through strategic information management initiatives that link the Program's substantial investment in information technologies to the work of its business and management centers.

The Program's information management function involves defining a mission based on business and management center needs; establishing core processes that accomplish the mission; understanding the key decisions that guide mission delivery processes; supporting those decisions with the right information available to the right people at the right time; and using technology to collect, process, and disseminate information in ways that improve the delivery of products and services to customers. In fiscal year 1995, the Program will emphasize the following information management goals:

- Facilitate information management and planning of information resources to support programmatic missions and functions
- Provide a management tool for aiding the identification and avoidance of duplicative and/or overlapping information systems and a structured process to identify and manage the Program's information resources in an efficient and cost-effective manner
- Establish a comprehensive performance assessment and improvement program to determine how well information resources management is supporting the mission needs of each of the Program's business centers and to identify continuous improvement opportunities.

Strategic Information Management Planning. A key information resources management activity in fiscal year 1995 will be the development of a strategic plan that will identify how information resources will be deployed to meet the specific information needs of each of the Program's business and management centers. The strategic plan will present the linkages upward to Department and Program Strategic Plans and the Department's Information Resources Management Strategic Plan. It will also drive operational planning efforts (acquisition, software, telecommunications, records, etc) that will be required to implement the information resources management strategies identified in the plan. The strategic planning process will utilize partnerships between the information resources management community and Program managers to link information technologies to Program requirements; analyze for improvement opportunities the processes, practices, and procedures required for the accomplishment of Program milestones; and identify Program performance measurement activities.

Information Architecture Approach. A key component of Program's strategic information management effort is an information architecture approach that provides a blueprint (or foundation) upon which all information, data, and information systems are defined organized, developed, accessed, maintained, and managed. Information architectures are a means of ensuring that information systems are anchored in management functions. The approach also facilitates the establishment of information technology use priorities; facilitates the assessment of the effectiveness of current systems and system support; ensures that needed information is accessible to key user groups; promotes the involvement of Program managers in information management issues; provides a basis for problem-solving of information management issues and assessing future information management reforms.

2.3.3.6 Quality Assurance Oversight

A major and continuing commitment of the Office of Civilian Radioactive Waste Management is to achieve and ensure quality in all essential aspects of the Program. To this end, an integrated system of plans and actions has been established to achieve and ensure quality at all levels of the Program—from Headquarters, through the projects, to the participating contractors. The overall quality assurance program is delineated in the Quality Assurance Requirements and Description document which sets forth the quality assurance policy and requirements for a disciplined quality assurance program.

Functions and activities related to "achievement of quality" are exercised by the line organizations. Functions and activities related to "verification of quality"—audits, surveillance, reviews, and assessments—are shared by the Program's line and quality assurance organizations. The major elements of work in fiscal year 1995 and the extended planning years include:

- Maintaining the quality assurance program and performing quality assurance audits and surveillance of work subject to the Quality Assurance Requirements and Description document
- Providing administrative oversight for the Office of Civilian Radioactive Waste Management quality concerns program
- Overseeing and coordinating the self-assessment program and annual independent quality assurance management assessment
- Continuing consolidation of procedures in the areas of stop work, corrective action, and trend analysis, in order to economize operations and effect a more efficient approach for all affected organizations
- Implementing a performance-based auditing program that will produce audits that measure important steps of critical end-products or processes
- Continuing development of a culture in which continuous improvement is a fundamental and integral part of the Program mission; where each organization's personnel will seek continuous improvement in the performance and efficiency of all work processes/activities; and that all personnel are encouraged by management to report deficiencies and suggest improvements.

An important mechanism for resolution of concerns about the quality of work being performed by or for the Office of Civilian Radioactive Waste Management is the quality concerns program. Allegations of inadequate quality can be raised by Federal or contractor employees or by stakeholders. Formal procedures protecting the anonymity of the individual reporting the concern, if so requested, are in place to ensure that the concern is adequately investigated, appropriate corrective action is taken, and the results reported to interested parties.

2.3.3.7 Other Management Support Services

Nuclear Waste Fund. The principal function of Nuclear Waste Fund management is to manage the Nuclear Waste Fund investment portfolio. This function, carried out by the Administration Division, also develops and coordinates, with the Chief Financial Officer, borrowing and investment strategies for the Nuclear Waste Fund.

Internal audits of the Nuclear Waste Fund are also conducted. This is an ongoing activity. The Nuclear Waste Fund balance is reported in the monthly report on Program status.

Public Information. Program management implementation activities for providing public information range from developing and implementing an educational institutional program to conducting Program-wide information activities. Specific activities include:

- Preparing and coordinating Program-wide publications for the Office of Civilian Radioactive Waste Management
- Coordinating the education and exhibit program
- Coordinating relations with various institutional programs
- Managing activities related to the Radioactive Waste Management Fellowship Program and the Historically Black Colleges and Universities Program
- Developing support to facilitate institutional and communication training programs
- Conducting international cooperative activities related to education and public information programs.

Contracts Management. The Program's management center is also responsible for contracts management. These responsibilities include preparation and coordination of Program-wide procurement and financial assistance plans and strategies; coordination of work authorizations, tasking, and funding; evaluation of cost and schedule performance; and administration of award fee processes. In addition, the management center provides compliance oversight, coordinates contract resource allocation, reviews procurement documents for compliance with Program and Departmental acquisition policies, provides centralized contract management support; manages the Program-wide small and disadvantaged business activities; and coordinates review and processing of unsolicited proposals.

2.3.4 Progress Measurement and Change Control

The primary objective of this management function is to assess the extent to which the Program is progressing in accordance with the milestones, baselines, and work defined within its planning process. The Program's cost, schedule, and technical baselines provide the reference estimates for the funding, time, and work required to achieve Program- and project-level milestones. Program performance is measured against these estimates.

Program baselines will be reviewed and may be revised, as necessary, to reflect changes resulting from program planning (e.g., Program redirection), the availability and allocation of funding and other resources, or from difficulties and obstacles in executing work scope. Revisions to the Program's baselines will be managed through a formal change control process. Changes to the baselines may, in turn, lead to the revision of Program plans, as well as to changes in the allocation of resources, and definition and scope of work to be performed.

To ensure Program goals and objectives are being met as planned and to accommodate changes resulting from changed resource allocation or Program implementation priorities, a process for monitoring progress and implementing change is in place. This process, called the baseline management process, ensures that technical, cost, and schedule baselines are clearly defined, integrated, and controlled throughout all phases of the Civilian Radioactive Waste Management Program. The technical baseline provides the work scope that is the basis for the cost and schedule baselines, which are developed during the planning process. Together, the technical, cost and schedule baselines are the basis against which the Director measures Program performance. Impacts resulting from proposed changes to either the technical, cost or schedule baselines will be identified and evaluated, and changes to the baselines will be approved, when appropriate. In addition, performance measurement ensures that variances from the baselines are described, impacts are identified, and corrective action is taken to eliminate or minimize these impacts.

The baselines are controlled through the use of four hierarchical levels of change control boards. The Baseline Management Plan, signed by the Director, establishes the operating parameters for these boards to ensure that the management decisions are made at the lowest practicable level. To ensure the integrity of this important process, the Director has, in 1995, established a task force to review existing procedures, identify weaknesses and provide enhancement recommendations. In addition, the Director's Program Review, held bi-monthly, will review progress against these baselines, analyze significant variances and review change control board activity. These actions will provide further assurance that resources have been applied to the highest Program priorities.

2.3.5 Program Management Milestones

Fiscal Year 1995

- Update the Program Strategic Plan (as required)
- Update the Program Plan (annually)
- Update of the Program Management Systems Manual which will update management policies, processes, procedures and practices for the Program
- Update the Program work breakdown structure to reflect a more comprehensive product orientation and the Program approach work scope
- Update the Program cost and schedule baselines to reflect the Program approach

- Complete consolidation of Department of Energy quality assurance procedures
- Provide integrated on-line automated configuration information system
- Complete preparation of the Civilian Radioactive Waste Management total system description
- Initiate an information management architecture project through a pilot test at Headquarters
- Establish and implement collaborative process for stakeholder/customer involvement, including review of comments on the draft plans
- Begin implementation of the Career Development Program tailored to individual employee needs.

Fiscal Year 1996

- Award new consolidated technical and management support contract which will support to Federal staff at both business centers and the management center
- Complete consolidation of identified Program participant quality assurance procedures
- Update contractual reporting requirements to reflect the revised program planning and control system management procedures.

Fiscal Year 1997

- Plan and coordinate the final repository advance conceptual design review
- Plan and coordinate the waste package Title I design review.

Fiscal Year 1998

- Plan and coordinate the multi-purpose canister deployment readiness review.

Fiscal Year 2000

- Plan and coordinate the waste package Title II design review.

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3. SUMMARY

The Department of Energy has prepared the Civilian Radioactive Waste Management Program Plan to communicate its revised Program approach to its constituents. This volume has described the basis and key features of the current Program approach, and has summarized the plans for the Program's two business centers—the Yucca Mountain Site Characterization Project and the Waste Acceptance, Storage and Transportation Project—and the Program's management center that supports the Director and the projects in achieving the Program mission. Volumes II and III correspond to the Yucca Mountain Site Characterization Project and the Waste Acceptance, Storage and Transportation Project, respectively. Those volumes describe in more detail the activities for each project for the current fiscal year (1995) and for the subsequent five-year planning period (1996-2000).

Volume II, the Yucca Mountain Site Characterization plan, describes the goals, activities, schedule milestones, and funding requirements for the major products of that Project for the fiscal years 1995 through 2000. The three major products required to meet near-term goals of the Program approach at the Yucca Mountain Site Characterization Project include the site suitability evaluation, National Environmental Policy Act process, and the repository license application.

Volume III, the Waste Acceptance, Storage and Transportation plan, describes the goals, activities, schedule milestones, and funding requirements for the major products of that Project for the fiscal years 1995 through 2000. The major products of the Waste Acceptance, Storage and Transportation Project include the waste acceptance process, the multi-purpose canister subsystem, and the transportation subsystem.

Successful execution of this plan will allow the Office of Civilian Radioactive Waste Management to meet its goals as defined in its Strategic Plan and to fulfill its mission to manage and dispose of the Nation's spent nuclear fuel and high-level waste. The Program will continue to provide leadership in developing and implementing strategies that accomplish this mission and assure public and worker health and safety, protect the environment, merit public confidence and are economically viable.

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4. REFERENCES

1. Congressional Report, House Interior and Insular Affairs Committee Report No. 97-491, April 27, 1982
2. DOE (U.S. Department of Energy), *Mission Plan for the Office of Civilian Radioactive Waste Management, Overview and Current Program Plan*, DOE/RW-0005, Washington, D.C., 1985
3. DOE (U.S. Department of Energy), *Monitored Retrievable Storage Submission to Congress*, DOE/RW-0035 (three volumes), Washington, D.C., 1987a
4. DOE (U.S. Department of Energy), *OCRWM Mission Plan Amendment*, DOE/RW-0128, Washington, D.C., 1987b
5. DOE (U.S. Department of Energy), *Draft 1988 Mission Plan Amendment*, DOE/RW-187, Washington, D.C., 1988a
6. DOE (U.S. Department of Energy), *Site Characterization Plan, Yucca Mountain Site, Nevada Research and Development Area, Nevada*, DOE/RW-0199, Washington, D.C., 1988b
7. DOE (U.S. Department of Energy), *Draft Mission Plan Amendment*, DOE/RW-0316P, Washington, D.C., 1991
8. DOE (U.S. Department of Energy), *Annual Capacity Report*, DOE/RW-0412, Washington, D.C., 1992
9. DOE (U.S. Department of Energy), *Notice of Inquiry for Waste Acceptance Issues*, Federal Register Vol. 59, p. 27007, May 24, 1994a
10. DOE (U.S. Department of Energy), *Notice of Publication of Public Participation Policy and Guidance*, Federal Register, Vol. 59 p.44725, Aug. 1994b
11. DOE (U.S. Department of Energy), *Multi-Purpose Canister System Evaluation: A Systems Engineering Approach*, DOE/RW-0445, Washington, D.C. 1994c
12. M&O (Civilian Radioactive Waste Management System Management and Operating Contractor), *Conceptual System Description of the Civilian Radioactive Waste Management System*, Draft Rev. 01, A00000000-01717-5700-00009, in preparation
13. NAS, *Rethinking High-Level Radioactive Waste Disposal*, National Academy Press, Washington, DC, 1990
14. NRC (U.S. Nuclear Regulatory Commission), *Format and Content Guide for the License Application, for the High-Level Waste Repository*, Draft Regulatory Guide DG-3003, 1990.

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APPENDIX A
RELATIONSHIP OF THE PROGRAM PLAN TO
PROGRAM STRATEGIC GOALS

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RELATIONSHIP OF THE PROGRAM PLAN TO PROGRAM STRATEGIC GOALS

The goals stated in the Strategic Plan for High-Level Nuclear Waste Disposal are the result of meetings held between late 1993 and mid-1994. During that period, the Director and his senior staff assembled for several multi-day sessions to assess the Program's strategic objectives and debate the means to achieve them. In these sessions, the participants reviewed and recast the Program's mission, analyzed the external and internal situations, stakeholders' expectations, statutory and regulatory requirements, and resource realities to arrive at Program goals, objectives, issues and strategies. The goals that were articulated (see Table A-1) reflect the current societal and political environment to which the Program must be responsive, and indicate the near-term issues where management will place near-term emphasis. This section addresses the relationship between the strategic goals and the Program's plans through 2001. The goals have been reordered for discussion in terms of the three crucial problems identified in the comprehensive assessment of the Program.

Table A-1. Program Strategic Goals

General

- Goal 1 Lead the collaborative development and implementation of national policy for the disposal of high-level radioactive waste.
- Goal 2 Participate actively in key deliberations which affect disposal of Department of Energy nuclear materials.

Management

- Goal 3 Strengthen fiscal and program management practices.
- Goal 4 Enhance effectiveness of human resources.

Waste Acceptance, Storage, and Transportation

- Goal 5 Resolve the 1998 waste acceptance expectation issue.
- Goal 6 Provide for interim storage, timely waste acceptance, and transportation of spent nuclear fuel compatible with disposal.

Yucca Mountain Site Characterization

- Goal 7 Evaluate site suitability for Yucca Mountain.
- Goal 8 Provide for timely waste emplacement in a disposal facility.

A.1 General Goals

Goal 1: Lead the collaborative development and implementation of national policy for the disposal of high-level radioactive waste.

This plan is itself a result of analysis and discussion involving the Director of the Office of Civilian Waste Management, his staff and their supporting contractors, Department of Energy management, other Department of Energy organizations, and the Program's stakeholders. In keeping with the goal, the Program will continue to actively share information and to take account of the views of stakeholders as this plan is implemented. A good example is the planned response to stakeholder concerns about the credibility of the Department's future evaluation of the suitability of Yucca Mountain for a repository. Stakeholders will participate in the nomination of independent scientists to review each technical analysis that supports the evaluation, and they will present issues to scientific review panels that are independently managed by the National Academy of Sciences. The Academy will develop independent assessments of each technical analysis that supports the suitability evaluation.

Goal 2: Participate in key deliberations which affect disposal of Department of Energy nuclear materials.

With the end of the Cold War and subsequent reconfiguration of the Department's nuclear weapons complex, the nation is facing decisions concerning the treatment and disposition of plutonium, highly enriched uranium, and other radioactive materials that will be recovered in the defense complex cleanup efforts. This goal addresses the need for the Program to use its knowledge in the deliberations that will affect disposition of all highly radioactive materials for which the Department of Energy is responsible. The Secretary of Energy recently established a Department-wide plutonium disposition project office to establish policy for plutonium control and disposition. The Department is also developing plans to treat, store, and dispose of those defense-generated high-level radioactive wastes that were not considered when this Program was chartered by the Congress. The Office of Civilian Radioactive Waste Management is involved in those deliberations.

A.2 Program Management Goals

Goal 3: Strengthen fiscal and management practices.

The Secretary of Energy has committed to an independent financial and management review of the Yucca Mountain Site Characterization Project. It is being conducted by a management consulting firm selected and supervised by a panel comprising two members, one appointed by the Secretary and one by the Governor of the State of Nevada. The panel has initiated the review, with results expected sometime in 1995.

The organization of the Office of Civilian Radioactive Waste Management has been changed to accommodate the new Program approach. The major objective is to integrate management activities between the Headquarters management center and the two business center of the Program—the Waste Acceptance, Storage and Transportation Project and the Yucca Mountain Site Characterization Office. The new management center deals with overall program integration

as well as management support services. The business centers of the Waste Acceptance, Storage and Transportation Project and the Yucca Mountain Site Characterization Office were reorganized to simplify their structures and their Federal staff was increased in size. A new support contractor organization is being developed to provide independent and coordinated support to Federal managers at the business and management centers. The Program is moving forward to consolidate the major implementing contractors under the technical direction of the management and operating contractor.

Goal 4: Enhance effectiveness of human resources.

The Secretary has recognized that the Department's policies regarding employee recruiting, diversity, training, career development, and workplace environment will be critical factors in determining whether the Department meets its goals and objectives in all areas. The existence of this goal within the strategic plan clearly signals the Program's intent to foster a more rewarding and productive workplace environment. A number of initiatives, including career development and affirmative action programs, are being prepared for implementation during fiscal year 1995.

A.3 Waste Acceptance, Storage and Transportation Goals

Goal 5: Resolve the 1998 waste acceptance expectation issue.

One of the more difficult challenges facing the Department of Energy has been the goal of spent nuclear fuel acceptance into an operating Federal radioactive waste management system by 1998. That goal is in doubt because siting efforts have not achieved significant progress in locating and developing an interim storage. After a thorough review, the Department believes it does not have a legal obligation under the Nuclear Waste Policy Act to accept spent nuclear fuel absent an operational repository or other facility constructed under the terms of the Act. However, this situation has raised serious concerns among the utilities and their state regulatory agencies. They believe the Department has an unconditional obligation to begin accepting spent nuclear fuel in 1998.

The revised Program includes a continued public dialogue with affected parties concerning the Department's obligations and role in acceptance of spent nuclear fuel, in interim storage, and in otherwise sharing the costs of storage of spent nuclear fuel at reactor sites after 1998. The Department is committed to resolving this issue. In May 1994, the Department of Energy published a notice of inquiry in the Federal Register seeking comments on these issues. In October 1994, the Department extended this public comment period to allow a greater opportunity for public input. The importance of addressing these issues has been underscored by legal action taken by some of the states, public utility commissions, and nuclear utilities which are concerned that the Program will not meet the dates established for waste acceptance in the Nuclear Waste Policy Act.

The Program will continue to maintain the capability to implement whatever resolution of this dilemma is prescribed by Congressional direction or judicial action.

Goal 6: Provide for interim storage, timely waste acceptance, and transportation of spent fuel compatible with disposal.

Thus far, neither the efforts of the Department nor any other organization, including the Office of the Nuclear Waste Negotiator, have located an interim storage site that could be available by January 31, 1998. For that reason, the waste acceptance and storage strategy has been broadened to explore other options for the Program. While no new resources are allocated for development of an interim storage facility, work has already been completed on an advanced conceptual design. This design progress allows this capability to be added if a site and the necessary resources should become available. The objective is to be prepared to proceed with a monitored retrievable storage facility should a site become available. If a site for a monitored retrievable storage facility is made available, the Department will request funding for design, licensing, construction, and operations.

The revised Program is focused on development of a multi-purpose canister to integrate the system and facilitate spent nuclear fuel storage at reactor sites or a central storage facility. The objective is to have multi-purpose canisters available for use in 1998.

The transportation system is planned to provide the capability to move spent nuclear fuel from reactor sites when the repository is ready to receive it. However, current plans for transportation system development would provide the capability of transporting spent fuel from the utility sites to an interim storage facility by the time the facility is completed, if a site were to be made available. High capacity truck casks and a transportation overpack for the multi-purpose canister will be completed and certified by 1998.

A.4 Yucca Mountain Site Characterization Goals

Goal 7: Evaluate site suitability for Yucca Mountain.

The Site Characterization Plan, issued in 1988, contained an extensive testing, design, and performance assessment program designed to produce a comprehensive understanding of the Yucca Mountain site. Until the current Program approach was developed, planning for the Yucca Mountain project assumed that most, if not all, studies contained in the Site Characterization Plan would be completed before the suitability of Yucca Mountain was evaluated. The new Program approach represents a change. It recognizes that the resources required to carry out such a program have not been and are unlikely to be available. The new approach is consistent with the available resources and the original intent of the legislative and regulatory framework, as well as with recommendations of the National Academy of Sciences contained in the report, "Rethinking High-Level Radioactive Waste Disposal" (NAS, 1990).

The new approach distinguishes three sets of investigations: those required for evaluating site suitability; those required for a cost-effective design, and those required for confirming postclosure safety of the repository as built. This distinction permits phasing of tests to evaluate earlier whether a repository built at Yucca Mountain could isolate waste in accordance with Environmental Protection Agency and Nuclear Regulatory Commission regulations. The objective is to evaluate whether or not Yucca Mountain appears to be technically suitable to serve as a geologic repository by the end of fiscal year 1998.

Goal 8: Provide for timely waste emplacement in a disposal facility.

If the site appears to be technically suitable, the focus will then shift to acquiring additional data and developing the analyses needed to submit an application to the Nuclear Regulatory Commission for a repository construction authorization. The objectives are:

- To deliver a site recommendation report and environmental impact statement to the President in fiscal year 2000, if the site is found suitable
- If the President and Congress approve the recommendation, to apply for a construction authorization from the Nuclear Regulatory Commission in fiscal year 2001.

Not enough data will be available by 2001 from underground thermal testing to define a cost-effective repository design. However, enough information will be available to define a safe temperature limit for the repository, and the Department will present a flexible design that can operate within the safe limit. The design will be modified to exploit the possible cost-saving benefits of high operating temperatures when and if it is established by subsequent thermal tests that such operations are safe.

Additional confidence in this data and the demonstration of the long-term performance of the site will be achieved through a performance confirmation program lasting as long as 100 years, if necessary. The repository will be designed to permit waste retrieval at any time during this period if it becomes apparent that the site cannot meet the long-term requirements.

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APPENDIX B

GLOSSARY

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GLOSSARY

Advanced Conceptual Design is the final part of the conceptual design phase for the repository and engineered barrier system, including the waste package. It is intended to develop possible solutions to all identified design-related licensing issues and to develop design requirements for the technical baseline. This phase will explore limited design alternatives and will establish and refine the design criteria and concepts to be finalized in the later design phases that will complete the Title I and Title II design activities.

Burnup credit is a strategy being considered for effective reduction in spent nuclear fuel reactivity in multi-purpose canisters and transportation casks. The strategy considers the burnup of fuel instead of using fresh fuel assumptions in establishing criticality control measures and the design of the appropriate spent nuclear fuel geometry and neutron absorbing material that must be utilized in spent nuclear fuel loading. Burnup credit is one of the licensing issues that will be addressed in obtaining certificates of compliance for transportation casks and the multi-purpose canister.

Criticality control is the suite of measures taken to maintain nuclear fuel, including spent nuclear fuel, in a subcritical condition during storage, transportation and disposal, so that no self-sustaining nuclear chain reaction can occur. Subcriticality is assured by loading spent fuel in specific configurations that meet certain requirements related to fuel age, enrichment, and reduction in nuclear fuel reactivity through burnup.

Energy Policy Act is the Federal statute that specified key elements of the National Energy Strategy proposed by the Administration in 1990. Section 801 of the Act directs the Environmental Protection Agency to contract with the National Academy of Sciences to provide "findings and recommendations on reasonable standards...that would govern the long-term performance of a repository at the Yucca Mountain site. Section 802 extends the term of the Nuclear Waste Negotiator. Section 803 instructs the Department of Energy to evaluate whether its current programs and plans are adequate to deal with additional volumes or categories of nuclear waste that might be generated by nuclear power plants newly licensed after October 1992. Enacted in 1992, the Energy Policy Act was published at 42 USC 1251 et seq.

Environmental assessment is a public document for which a Federal agency is responsible that serves to provide sufficient evidence and analysis for determining whether to prepare an environmental impact statement or a finding of no significant impact.

Environmental impact statement is a detailed written statement for which a Federal agency is responsible and which is required by section 102(2)(C) of the Nuclear Waste Policy Act to support a decision to proceed with major Federal actions affecting the quality of the human environment. The environmental impact statement must describe: the environmental impact of the proposed action; any adverse environmental effects which cannot be avoided should the proposal be implemented; alternatives to the proposed action; the relationship between local short-term uses of man's environment and the maintenance and enhancement of long-term productivity; and any irreversible and irretrievable commitments of resources which would be involved in the proposed action should it be implemented.

Exploratory studies facility is a facility constructed for the purpose of performing underground studies during site characterization.

Greater-than-Class-C waste is radioactive waste that is not generally acceptable for near-surface disposal and for which waste form and disposal method must in general be more stringent than those specified for Class C wastes in 10 CFR Part 61. Because 10 CFR Part 61 does not specify requirements for disposal of greater-than-Class-C wastes, these wastes must be disposed of in a geologic repository unless proposals for disposal of such waste in a disposal site licensed under 10 CFR Part 61 are approved by the Nuclear Regulatory Commission. No greater-than-Class-C waste disposal sites have been licensed under 10 CFR Part 61.

High-level radioactive waste is (1) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (2) other highly radioactive material that the Nuclear Regulatory Commission, consistent with existing law, determines requires permanent isolation. The Civilian Radioactive Waste Management System will accept only solidified high-level waste.

License Application Design continues the development of the design based upon the concepts established and approved during advanced conceptual design. This design phase provides the design reflected in the license application and upon which the safety analysis report and final environmental impact statement are based.

Licensing support system is an electronic information retrieval and distribution system to support the licensing process, as required by the Nuclear Regulatory Commission in 10 CFR Part 2, Subpart J. This system must be certified by the Commission at least six months before the Department submits repository license application. The Department has worked with the Commission and the Commission-sponsored stakeholder group to develop an acceptable system that will be used for document discovery by all participants in the repository licensing hearings.

Multi-purpose canister is a sealed, metallic container holding multiple spent nuclear fuel assemblies in a dry, inert environment and overpacked separately and uniquely for the various system elements of storage, transportation, and disposal.

National Environmental Policy Act is the Federal statute that is the national charter for protection of the environment. The Act is implemented by procedures issued by the Council on Environmental Quality. These procedures ensure that environmental information is available to public officials and citizens before Federal decisions are made and before Federal actions are taken. The National Environmental Policy Act was published at 42 USC 1251 et seq., and includes subsequent amendments.

Notice of inquiry is a notice published in the Federal Register eliciting the views of affected parties on issues that may result in rulemaking by a Federal agency.

Notice of intent is a notice published in the Federal Register that an environmental impact statement will be prepared and considered by a Federal agency. The notice is required by the National Environmental Policy Act implementing procedures. The notice must: describe the

proposed action and possible alternatives; describe the agency's proposed scoping process including whether, when, and where any scoping meeting will be held; and state the name of an agency official who can answer questions about the proposed action and the environmental impact statement.

Nuclear Waste Policy Act is the Federal statute that establishes the Office of Civilian Radioactive Waste Management and defines its mission to develop a Federal system for the management and geologic disposal of commercial spent nuclear fuel and other high-level radioactive wastes, as appropriate. The Act also specifies other Federal responsibilities for nuclear waste management, establishes the Nuclear Waste Fund to cover the cost of geologic disposal, authorizes interim storage until a repository is available, and defines interactions between Federal agencies and the states, local governments, and Indian tribes. Enacted in 1982, the Nuclear Waste Policy Act was published at 42 USC 10101 et seq., and includes subsequent amendments.

Overpack is a structural component used to hold and protect the multi-purpose canister so that the combination meets the Nuclear Regulatory Commission requirements for its application. There are several types of overpacks: one for transportation under 10 CFR Part 71; one for transfer under 10 CFR Part 72; one to be considered for storage under 10 CFR Part 72; and one for disposal under 10 CFR Part 60. An overpack is designed for its particular use in conjunction with the multi-purpose canister.

Peer review is a documented critical review performed by personnel who are independent of those who performed the work but have technical expertise at least equivalent to those who performed the original work.

Performance assessment is any analysis that predicts the behavior of a system or a component of a system under a given set of constant or transient conditions.

Postclosure refers to the period of time after the closure of the geologic repository.

Preclosure refers to the period of time before and during the closure of the geologic repository.

Spent nuclear fuel is fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.

Stakeholders are individuals or organizations who have an important, ongoing interest in the service and service quality of the Office of Civilian Radioactive Waste Management.

Storage cask is a waste receptacle designed to safely hold one or more spent-fuel assemblies during storage at a reactor site, a monitored retrievable storage facility, or a repository.

Strategic plan is a plan which attempts to set forth the mission and objectives of an organization. The Department of Energy has a strategic plan, and the Office of Civilian Radioactive Waste Management has a draft plan, which is being reviewed by stakeholders and interested parties.

Systems engineering systematically applies science and engineering principles to control a complex total system development effort for the purpose of achieving an optimum balance of all system elements. It is a process that transforms and integrates operational needs and requirements into a description of system requirements to maintain the overall system effectiveness.

Title I design, or preliminary design, is the preliminary stage of project design which utilizes the conceptual design and/or design criteria that have been prepared for the project as a design basis. Sufficient design has been performed during Title I work to firmly fix or freeze the project scope and features such that costs and schedules can be further developed.

Title II design, or definitive design, is performed by an architect-engineering firm or, in limited cases, by the operating contractor who utilizes the approved Title I design and the revised project design criteria as the design base. Completion of the definitive design ends the design phase of a project and normally allows the beginning of the construction phase.

Transfer cask is a device that 1) contains a multi-purpose canister as the canister is being loaded with spent nuclear fuel in a utility's spent fuel pool, 2) provides shielding, heat transfer, and structural support for the loaded multi-purpose canister as it is being moved from the pool to a processing area, 3) accommodates the welding equipment as the multi-purpose canister is being seal welded, 4) provides a means of dry transfer of the loaded and sealed multi-purpose canister to either a canister's transportation cask or storage cask, and 5) provides a means of dry transfer of the loaded multi-purpose canister from the on-site storage cask to a multi-purpose canister transportation cask.

Utilities are commercial entities which provide electricity to users for a fee. Utilities collect money that goes into the Nuclear Waste Fund, if the utility company generates power using nuclear reactors.

Waste form is the radioactive waste materials and any encapsulating or stabilizing matrix.

Waste package is the waste form and any containers, shielding, packing, and other absorbent materials immediately surrounding an individual waste container.

10 CFR Part 2 is the Nuclear Regulatory Commission regulation, titled "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," that governs the conduct of the Commission's licensing proceedings. Subpart J of 10 CFR Part 2, titled "Procedures Applicable to Proceedings for the Issuance of Licenses for the Receipt of High-Level Radioactive Waste at a Geologic Repository," contains specific requirements for the repository licensing process. These include requirements for the Department to develop and implement an electronic licensing support system.

10 CFR Part 60 is the Nuclear Regulatory Commission regulation, titled "Disposal of High-Level Radioactive Wastes in Geologic Repositories," that sets forth technical requirements governing development of a permanent geologic repository for spent nuclear fuel and high-level radioactive waste. The regulation also includes the oversight and licensing duties of the Nuclear Regulatory Commission.

10 CFR Part 71 is the Nuclear Regulatory Commission regulation, titled "Packaging and Transportation of Radioactive Material," that implements Department of Transportation requirements for packaging and transporting high-level waste.

10 CFR Part 72 is the Nuclear Regulatory Commission regulation, titled "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel and High-Level Radioactive Waste," that sets forth technical requirements for licensing private storage facilities to receive, ship, and store spent nuclear fuel, and outlines procedures by which the Department of Energy is licensed to receive, ship, and store spent fuel at a temporary facility.

10 CFR Part 960 is the Department of Energy guideline, titled "General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories," that establishes guidelines to compare sites and select a site for recommendation to the President for development of a geologic repository.

10 CFR Part 961 is the Department of Energy regulation, titled "Standard Contract for Disposal of Spent Nuclear Fuel and/or High-Level Radioactive Waste," that specifies the conditions under which the Department will take title to the spent nuclear fuel or high-level waste from utilities or other waste owners.

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