SECTION 2.0
BACKGROUND AND ORGANIZATION OF EIS

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2.0 BACKGROUND AND ORGANIZATION OF EIS

This container system EIS for the management of naval spent nuclear fuel evaluates a range of alternatives that would provide a system of containers for storage, transport, and possible disposal of post-examination naval spent nuclear fuel. It identifies the Navy's preferred alternative for a container system for the management of naval spent fuel as a dual-purpose canister system. It also identifies the Navy's preferred alternative for a dry storage location for naval spent nuclear fuel as either a site adjacent to the Expended Core Facility at the Naval Reactors Facility or a site at the Idaho Chemical Processing Plant at INEL.

Since 1957, pre-examination naval spent nuclear fuel has been shipped by rail to a single site, the Naval Reactors Facility at INEL. There it is removed from the shielded shipping containers and put into the water pools at the Expended Core Facility for examination. All naval spent nuclear fuel at the Expended Core Facility is visually examined for unusual conditions and about 10 to 20% of the fuel is given more detailed examinations. The examination program is essential in supporting the Navy's continued safe operation of naval reactors and in designing new, improved reactor cores having a longer lifetime. After examination, the naval spent nuclear fuel is loaded into shielded containers and transferred to the water pools of DOE's Idaho Chemical Processing Plant at the INEL for storage pending final disposition. This EIS contains analyses and information consistent with that in the Programmatic SNF and INEL EIS (DOE 1995), which is a major reference supporting this document. The Programmatic SNF and INEL EIS, which covered in Volume 1 the DOE complex-wide aspects of management of spent nuclear fuel and in Volume 2 the environmental management and remediation at INEL, is closely related to this container system EIS because all naval spent nuclear fuel, after removal from the reactor, is shipped to INEL, where it is examined and then managed at the Expended Core Facility or the Idaho Chemical Processing Plant.

The Programmatic SNF and INEL EIS (DOE 1995) focused on establishing an integrated complex-wide program for the safe and effective management for present and reasonably foreseeable quantities of spent nuclear fuel pending its ultimate disposition. The Programmatic SNF and INEL EIS evaluated the impacts of various alternative locations where naval spent nuclear fuel should be managed and considered both wet storage in water pools and dry storage in containers in evaluating the impacts at each location. The Record of Decision selected INEL as the location for managing naval spent nuclear fuel rather than at Navy shipyards, the Savannah River Site, the Hanford Reservation, the Nevada Test Site, or the Oak Ridge Site.

This EIS follows the Programmatic SNF and INEL EIS to select the container system for managing naval spent nuclear fuel at INEL, provides a comparison of alternate locations on the INEL site for dry storage, and evaluates the impacts of transportation of naval spent nuclear fuel from INEL to a representative repository or centralized interim storage site.

Information from the Programmatic SNF and INEL EIS is repeated in this EIS where necessary to facilitate reader comprehension. Frequently, throughout this EIS the reader will be referred to specific sections of the Programmatic SNF and INEL EIS where the more elaborate descriptions, background, or analysis for the subject are presented.

2.1 Naval Nuclear Propulsion Program Overview

The Naval Nuclear Propulsion Program is a joint U.S. Navy/DOE organization responsible for all matters pertaining to naval nuclear propulsion, pursuant to Presidential Executive Order 12344, enacted as permanent law by Public Law 98-525 (42 USC 7158). The Program is responsible for:

- The nuclear propulsion plants aboard approximately 100 warships powered by over 120 naval reactors;
- Moored Training Ships located in Charleston, South Carolina, used for naval nuclear propulsion plant operator training;
- Nuclear propulsion work performed at six shipyards (four public and two private);
- Two DOE government-owned, contractor-operated laboratories devoted solely to naval nuclear propulsion research, development, and design work;
- Two land-based prototype naval reactors used for research and development work and training of naval nuclear propulsion plant operators; and
- The Expended Core Facility, located at the Naval Reactors Facility, which is located at the INEL.

More detailed discussion is available in U.S. Department of Energy and U.S. Department of Defense (1995), Hewlett and Duncan (1974) and Duncan (1990).

2.2 History and Mission of the Program

In 1946, at the conclusion of World War II, Congress passed the Atomic Energy Act, which established the U.S. Atomic Energy Commission (AEC) to succeed the wartime Manhattan Project, and gave it the sole responsibility for developing atomic energy. At that time, Captain Hyman G. Rickover was assigned to the Navy Bureau of Ships, the organization responsible for naval ship design. Captain Rickover recognized the military implications of successfully harnessing atomic power for submarine propulsion and that it would be necessary for the Navy to work with the AEC to develop such a program. By 1949, Captain Rickover had forged an arrangement between the AEC and the Navy that led to the formation of the Naval Nuclear Propulsion Program. In 1954, the nuclear submarine USS NAUTILUS put to sea and established the basis for all subsequent U.S. nuclear-powered warship propulsion designs. In the 1970s, government restructuring moved the AEC part of the Naval Nuclear Propulsion Program from the AEC (which was disestablished) to what became the DOE. Although the Naval Nuclear Propulsion Program grew in size and scope over the years, it retained its dual responsibilities within the DOE and the Department of the Navy, and its basic organization, responsibilities, and technical discipline have remained much as when it was first established.

The advantages of nuclear propulsion for naval vessels are several. By eliminating altogether the need for oxygen for propulsion, nuclear power offers a way to drive a submerged submarine without the need to resurface frequently. In addition, nuclear power offers a way to drive a submerged submarine at high speed without concern for fuel consumption.

Although originally developed for submarines, nuclear propulsion also significantly enhances the military capability of surface ships. Nuclear propulsion provides virtually unlimited high-speed endurance without dependence on tankers and their escorts. Moreover, the space normally required for propulsion fuel in oil-fired ships can be used for weapons and aircraft fuel in nuclear-powered aircraft carriers.

2.3 Characteristics of Naval Nuclear Fuel

Naval nuclear fuel is designed to meet the stringent operational requirements for naval nuclear propulsion reactors. Because it was designed for military application, all naval nuclear fuel designs will maintain their integrity indefinitely under the less demanding conditions encountered during land-based storage.

- Naval fuel is designed to operate in a high-temperature and high-pressure environment for many years. Current designs are capable of more than 20 years of successful operation without refueling.

- Naval spent nuclear fuel examined after 28 years of storage in a water pool exhibited no detectable deterioration. Measurements of the corrosion rates for naval fuel designs have shown that post-examination naval spent nuclear fuel can be safely stored wet or dry for periods much longer than the 40 years considered in this EIS. This is true for current designs which operate over 20 years in a reactor, as well as for earlier designs which operated for fewer years, because in all designs, highly corrosion resistant materials are used for the cladding. In this regard, it should be noted that naval spent nuclear fuel examined after 28 years of storage with no detectable deterioration, as cited above, was of an earlier design which operated for seven years and three months before being removed.

- Naval nuclear fuel is designed, built, and tested to ensure that the fuel structure will contain and hold the radioactive fission products. Naval fuel totally contains fission products within the fuel; there is no fission product release from the fuel in normal operation or when the fuel is removed, transported, or stored. Since the nuclear reactor core contains a large quantity of fission products, it is essential to contain them within the nuclear fuel in order to minimize radiation exposure to a ship's crew.

- Naval nuclear fuel is extremely rugged. It can withstand combat shock loads which are well in excess of 50 times the force of gravity (i.e., 10 times the seismic loads for which civilian nuclear power plant fuel is designed). It routinely operates with rapid changes in power level since naval ships must be able to change speed quickly in operational situations. Naval fuel consists of solid components which are nonexplosive, nonflammable, and noncorrosive. The ruggedness of naval fuel is demonstrated by the fact that two nuclear-powered ships were lost at sea in the 1960s, and subsequent environmental monitoring shows no release of fission products from the fuel despite the catastrophic nature of the loss of the ships (Naval Nuclear Propulsion Program 1994a).

The integrity of naval spent nuclear fuel is due in part to a long-standing program of examining naval spent nuclear fuel after it has been removed from prototype reactor plants and operating ships. These examinations have been conducted at the Expended Core Facility at INEL since 1958. Prior to 1992, naval spent nuclear fuel was reprocessed to permit reuse of the fissile uranium remaining. Since that time, it has been transferred to storage in water pools at the Idaho Chemical Processing Plant until a method for ultimate disposition is selected.

Naval nuclear fuel is highly enriched (93% to 97%) in the isotope U-235 as compared with civilian reactor fuel (about 4%). However, to ensure the design will be capable of withstanding battle shock loads, the naval fuel material is surrounded by large amounts of structural material made of an alloy of zirconium called Zircaloy. Naval spent nuclear fuel assemblies will fit dimensionally into the same container systems designed for civilian spent nuclear fuel. Because of the large amount of Zircaloy structure and the limit on total loaded weight of the container, the amount of fissionable material in a loaded container is similar for naval and civilian fuel in spite of the different enrichments (in each case, about 440 to 660 lb, or 200 to 300 kg, of U-235).

Criticality is also not a problem despite the high enrichment of naval nuclear fuel. Naval fuel contains high integrity burnable poisons which compensate for the depletion of U-235 as a core is depleted. Control rods made of hafnium will be firmly secured in most of the naval fuel assemblies loaded into the containers to ensure subcriticality. Detailed analyses have been made and demonstrate that naval fuel will remain subcritical under accident conditions.

Likewise, decay heat calculations have been made which demonstrate that no fission product releases will occur from naval spent nuclear fuel inside a container even assuming about 3 years of cooling after reactor operation. Releases under such conditions are not a problem because naval reactor volumetric power densities are typically less than those of commercial reactors and the fission product concentrations by volume of spent nuclear fuel are commensurately lower. These matters will be addressed as part of the process of obtaining a certificate of compliance to transport naval spent nuclear fuel.

Appendix E of this EIS also addresses low-level waste generated as a result of removing non-fuel bearing structures from naval fuel assemblies. Some of these structures are classified as special case low-level radioactive waste. This waste is addressed in this EIS because the same container system may be used for special case waste as is used for naval spent nuclear fuel and to ensure that selection of the container system allows for the use of the same container system for special case waste.

2.4 Regulatory Framework

Under the Atomic Energy Act of 1954, as Amended (42 USC §2011 et seq) ownership of United States nuclear fuel was assigned to the Atomic Energy Commission, now the U.S. Department of Energy. When naval fuel is used on board U.S. Navy warships, custody of the naval nuclear fuel rests with the Navy while ownership remains with DOE. When naval spent nuclear fuel leaves the shipyard after being removed from the warship, custody is transferred to DOE, in the person of the Naval Nuclear Propulsion Program, and the naval spent nuclear fuel is shipped to the Expended Core Facility in Idaho for examination. When naval spent nuclear fuel is shipped from the Expended Core Facility to the Idaho Chemical Processing Plant, custody is transferred from the Naval Nuclear Propulsion Program to the DOE Office of Environmental Management.

The Naval Nuclear Propulsion Program includes activities conducted by both the Navy and DOE. Executive Order 12344, enacted as permanent law by Public Law 98-525, and the Atomic Energy Act of 1954 establish the responsibility and authority of the Director of the Naval Nuclear Propulsion Program (who is also the Deputy Assistant Secretary for Naval Reactors within DOE) for all facilities and activities of the Program. These executive and legislative actions establish that the Director is responsible for all matters pertaining to naval nuclear propulsion, including direction and oversight of environmental, safety, and health matters for all program facilities and activities. This authority includes the certification of shipping containers which meet the design and testing requirements of 10 CFR Part 71. Thus certification by the Nuclear Regulatory Commission of shipping and storage containers for naval spent nuclear fuel is not required. However, consistent with long-standing program practice for pre-examination naval spent nuclear fuel any container system selected for post-examination naval spent nuclear fuel transportation will receive Nuclear Regulatory Commission review and certification for transport.

In this EIS, the term “naval spent nuclear fuel” refers to the category of spent nuclear fuel that has been removed from naval reactors (nuclear reactors used aboard naval warships, naval research or training vessels, or at land-based naval prototype facilities operated by the Naval Nuclear Propulsion Program). In this EIS, the term “DOE spent nuclear fuel” refers to any spent nuclear fuel which DOE has responsibility for managing with the exception of naval spent nuclear fuel.

Federal statutes, regulations and other requirements that would apply to the fabrication and deployment of the alternative container systems considered in this EIS are described in Chapter 8 of this EIS and additional details are provided in the Programmatic SNF and INEL EIS (DOE 1995 Volume 1, Chapter 7). In Chapter 8 of the current EIS, the federal statutes and regulations, Executive Orders, hazardous and radiological materials transportation regulations including the U.S. Nuclear Regulatory Commission regulations, and the application of the Resource Conservation and Recovery Act to naval spent nuclear fuel management are discussed. The discussion of the Resource Conservation and Recovery Act is covered in Section 8.1.5 under the Federal Facility Compliance Act and in Section 8.1.13 under the Solid Waste Disposal Act. DOE implements its responsibilities for the protection of public health, safety, and the environment through a series of Departmental Orders that are mandatory for operating contractors of DOE-owned facilities, including INEL. These DOE Orders are listed in Table 8.1 of Chapter 8 of the current EIS.

State regulations may apply to manufacturing container systems or to the handling, storage, or transportation of naval spent nuclear fuel. These are not discussed since the location of manufacturing and the location of a repository are not known. Requirements that would be applicable exclusively to the operation of a repository or to a centralized interim storage site are not discussed because these operations are beyond the scope of this EIS. Such requirements and pertinent environmental impacts would be covered in separate environmental documents prepared for each facility.

The National Environmental Policy Act (NEPA) requires that federal, state, and local agencies with jurisdiction or special expertise with respect to any environmental impact be consulted (42 USC § 4332 (2)(c)(v)). The NEPA implementing regulations require the Navy to obtain comments on the Draft EIS from these agencies and from Indian Tribes when effects may be on their reservations (40 CFR 1503.1(a)(1) and (2)). NEPA implementing procedures require consultation with other agencies, when appropriate, to incorporate any relevant requirements as early as possible in the NEPA process. To obtain comments, copies of this Draft EIS have been or are being provided to federal, state, and local agencies with jurisdiction by law or special expertise, and to affected Indian tribes. All comments received by the Navy have been considered in the Final EIS for the alternative container systems.

2.5 Summary of Naval Spent Nuclear Fuel Operations

Since 1957, over 660 container shipments of pre-examination naval spent nuclear fuel have been made to the Naval Reactors Facility at INEL. All of the shipments were made safely by rail and without release of radioactivity. At INEL, the naval spent nuclear fuel is removed from the shielded shipping containers and placed into the water pools at the Expended Core Facility. All naval spent nuclear fuel received at the Expended Core Facility is visually examined externally for evidence of any unusual condition such as unexpected corrosion, unexpected wear, or structural defects. After the fuel assembly structural components have been removed, the interior of the assembly is examined for the conditions discussed above. In addition, the assembly is examined for distortions from irradiation, heat, or the fission process which could interfere with the even distribution of primary coolant and consequent heat removal. The inspection also checks for possible flow obstructions due to foreign material or excessive corrosion product buildup.

About 10 to 20% of the naval spent nuclear fuel is given more detailed examinations for such purposes as confirming the adequacy of new design features, exploring materials performance concerns, and obtaining detailed information to confirm or adjust computer predictions of neutron physics, heat transfer, or hydraulic flow and distortion. These detailed non-destructive examinations (which do not breach the fuel cladding and thus do not affect fuel integrity) include eddy current techniques to determine corrosion film and cladding thicknesses, dimensional measurements to determine fuel assembly distortion, gamma scan technology to determine core fuel depletions, and other inspections. These examinations consist of detailed visual inspection, measurements of dimensions or distortion, evaluation of corrosion product build-up, or other non-destructive evaluations which do not penetrate the fuel cladding or otherwise reduce the integrity of the fuel. After examination, naval spent nuclear fuel is loaded into shielded containers and transferred to the DOE's Idaho Chemical Processing Plant at the INEL for storage.

These detailed examinations also include a very small number of fuel elements which are destructively examined by cutting through the cladding to allow evaluation of the interior of the fuel element. They represent less than one-tenth of one percent of the total amount of naval spent nuclear fuel to be managed at INEL. Currently, naval spent nuclear fuel in this form (a total of less than 0.05 metric ton) is managed in metal canisters that are located in the Expended Core Facility and Idaho Chemical Processing Plant water pools. Prior to placing this fuel in a dry storage container, it would be repackaged in canisters made of highly corrosion resistant metal that ensures the canister's ability to withstand harsh environments indefinitely. The total volume of fuel in this form can be fit within a single storage container analyzed in any of the alternatives considered in this EIS.

Some naval spent fuel assemblies currently at the Idaho Chemical Processing Plant or the Expended Core Facility were separated into smaller units to remove fuel elements for detailed examination or to facilitate reprocessing before the DOE ceased reprocessing in 1992. The separation did not entail cutting through the fuel element cladding but rather through other portions which joined the parts of the fuel assemblies together. The total amount of naval spent nuclear fuel in this form is less than 0.76 metric ton. Since such fuel retains its structural integrity and corrosion resistance because the cladding is intact, it can be managed in the same fashion as naval spent fuel that has not been separated by using appropriately configured container baskets.

At the Idaho Chemical Processing Plant, naval spent nuclear fuel is stored in water pools to shield workers from radiation. Naval nuclear fuel is designed to operate for decades in high-temperature, high-purity, and controlled pH water without substantial corrosion. The corrosion rate of naval nuclear fuel decreases rapidly as the water temperature decreases. Existing knowledge of the corrosion of the materials used in the cladding of naval spent nuclear fuel is extensive and shows that the cladding corrosion rate is more sensitive to changes in temperature than to changes of purity and pH of the water. This means that naval spent nuclear fuel can be stored in cool water storage pools not having the same stringent controls on purity and pH as reactor plants without substantial corrosion. This has been validated by experience at the Expended Core Facility and Idaho Chemical Processing Plant.

2.6 INEL Facilities Related to Loading and Storage of Naval Spent Nuclear Fuel

2.6.1 Expended Core Facility

The Expended Core Facility is located within the fenced perimeter of the Naval Reactors Facility at INEL. The Expended Core Facility is a large laboratory facility used to receive, examine, prepare for storage, and ship naval spent nuclear fuel and irradiated test specimen assemblies. The information derived from the examinations performed at the Expended Core Facility provides engineering data on nuclear reactor environments, material behavior, and design performance. These data are used to develop new longer-lived nuclear fuel, to support operation of fuel in existing nuclear powered warships, and to reduce the cost of manufacturing fuel. Post-examination naval spent nuclear fuel is prepared at the Expended Core Facility for storage and shipment to the Idaho Chemical Processing Plant. A comprehensive description of the Expended Core Facility and its operations is presented in the Programmatic SNF and INEL EIS (DOE 1995, Volume I, Attachment B to Appendix D).

The building which houses the Expended Core Facility is a concrete block structure approximately 1,000 ft (approximately 300 m) long by 194 ft (approximately 60 m) wide. This structure provides offices and enclosed work areas, including an array of interconnected reinforced concrete water pools which permit visual observation of naval spent nuclear fuel during handling and inspection while shielding workers from radiation. Adjacent to the water pools are shielded cells used for operations which must be performed dry. Access to the Expended Core Facility for the receipt and shipping of large containers is provided by large roll-up doors that allow railcar and truck entry. A schematic view of the Expended Core Facility is shown in Figure 2.1 and a photograph of the water pool area is provided in Figure 2.2.

The Expended Core Facility has been specifically designed to provide the unique physical and administrative controls required by the Naval Nuclear Propulsion Program to ensure safe handling of irradiated nuclear fuel and contaminated components with a high degree of worker safety and protection for the environment. The original Expended Core Facility building was constructed in 1957 and consisted of a water pool and a shielded cell with a connecting transfer canal. The facility has been modified and upgraded to accomplish the expanding mission of the facility since then, including the addition of three more water pools, several shielded cells, and other capabilities dictated by the nature of the work required.

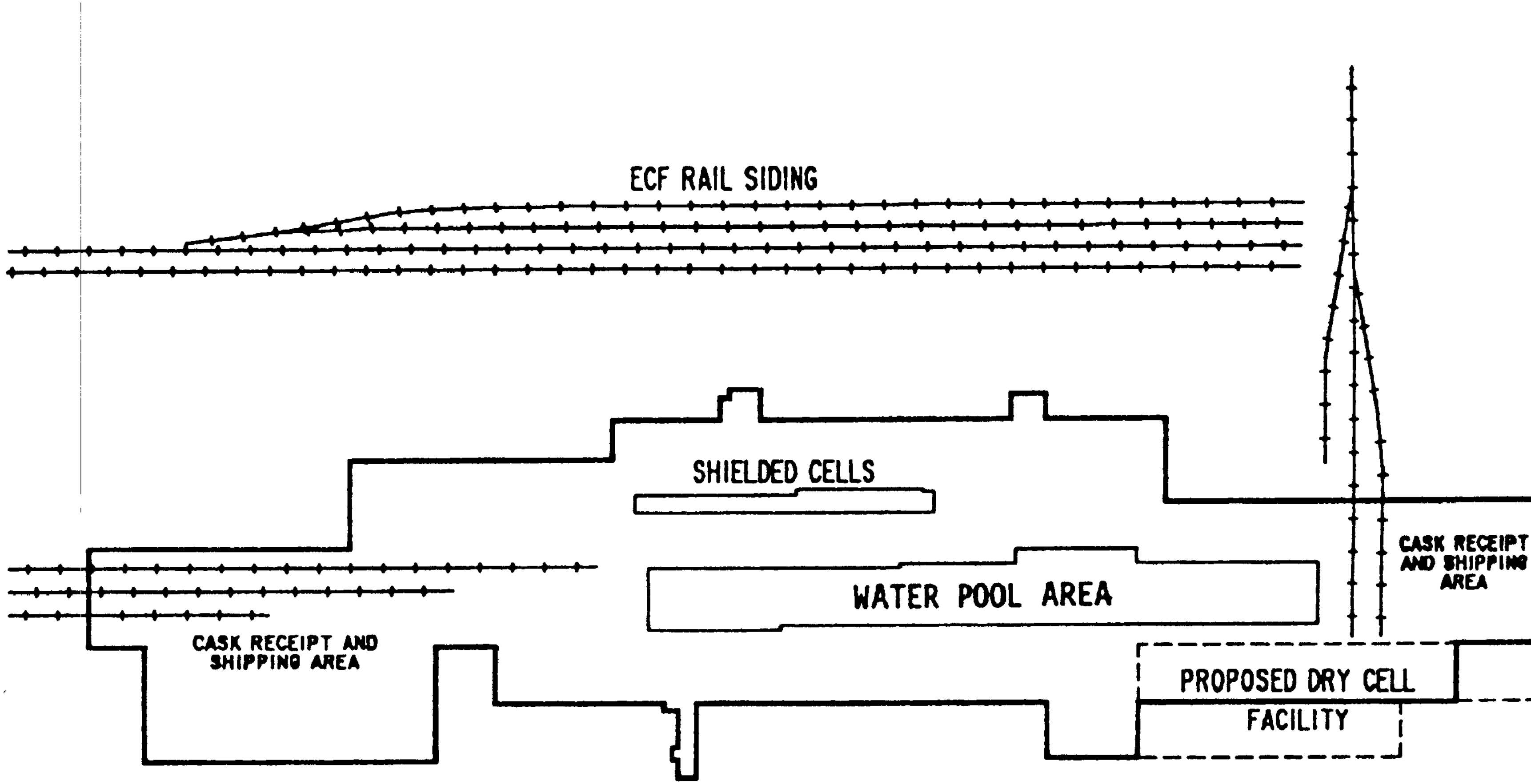

FIGURE 2.1 Schematic View of Expended Core Facility

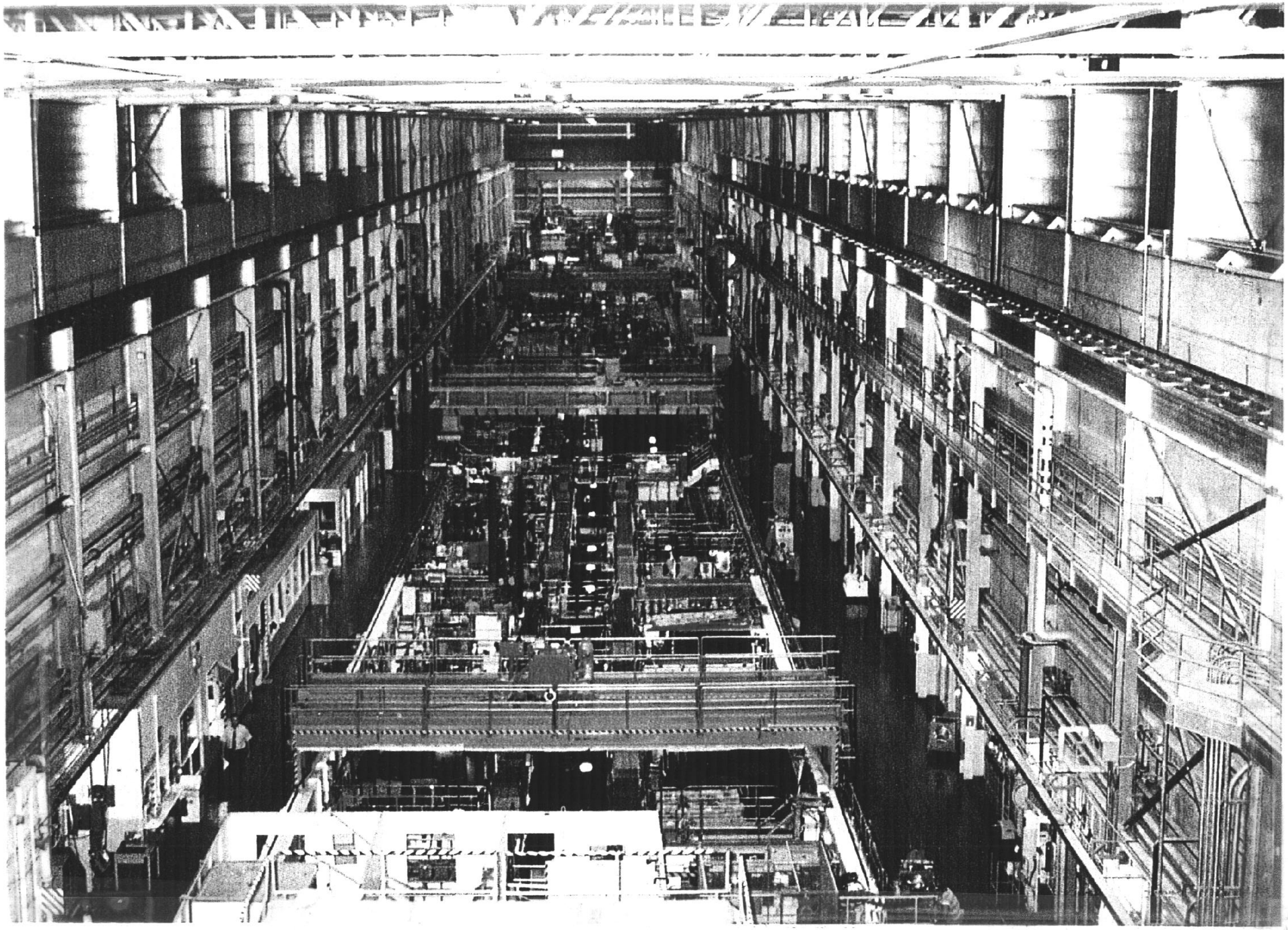

FIGURE 2.2 Water Pool Area of the Expended Core Facility

2.6.2 Idaho Chemical Processing Plant Storage Facility

The Idaho Chemical Processing Plant covers approximately 250 acres (approximately 100 ha) and comprises 150 buildings. It is located in the southwestern part of the INEL site, near the Test Reactor Area.

The original purpose of the Idaho Chemical Processing Plant was to reprocess government-owned nuclear fuel from research and defense reactors. Since 1953, approximately 20 tons (approximately 18 metric tons) of uranium-235 has been recovered (of which about 5 tons [or approximately 4.5 metric tons] came from reprocessing naval spent nuclear fuel). In 1992 the DOE decided to phase out the reprocessing activities. Therefore, there is a need for storage of naval spent nuclear fuel generated from operations of naval reactors now that the DOE is no longer reprocessing spent nuclear fuel to recover the fissile material.

The current purpose of the Idaho Chemical Processing Plant is to receive and store naval spent nuclear fuel and other DOE spent nuclear fuel until a permanent repository or interim storage site outside the State of Idaho becomes available. In addition, high-level radioactive liquid and solid wastes also will be prepared for disposition in a permanent repository. The Idaho Chemical Processing Plant develops technologies for the disposition of civilian and naval spent nuclear fuel, sodium-bearing waste, and high-level radioactive waste, and also develops technologies to minimize waste generation and manage radioactive and hazardous wastes for the DOE.

The major operating facilities at the Idaho Chemical Processing Plant provide for both storage and treatment of both naval spent nuclear fuel and spent nuclear fuel from other DOE programs. The storage facilities provide water pools and dry storage for naval spent nuclear fuel, calcine (dry, granular waste) storage, and liquid high-level radioactive waste storage in underground tanks. A photograph of one of the water pool areas at the Idaho Chemical Processing Plant is provided as Figure 2.3. Treatment facilities include a waste solidification facility for treatment of liquid high-level radioactive waste and sodium-bearing waste (the New Waste Calcining Facility) and evaporators to concentrate high-level radioactive liquid waste, low-level radioactive waste and mixed low-level radioactive waste. Another treatment facility prevents radioactive waste from being discharged to the percolation ponds and recovers nitric acid for reuse. Mixed and low-level radioactive wastes are handled and stored in the Radioactive Mixed Waste Staging Area and the Hazardous Chemical/Radioactive Waste Facility. Other operating facilities include process development and robotics laboratories.

2.7 Planned Reductions in the Number of Nuclear-Powered Naval Vessels

Following the successful operation of the USS NAUTILUS in 1954, the number of nuclear-powered submarines and surface ships in the U.S. Navy grew steadily until it reached a peak of just over 150 ships in 1987. Figure 2.4 is a graph of the total number of nuclear-powered vessels (historical and projected) in the U.S. Navy (Naval Nuclear Propulsion Program 1994b). Since 1988, the number of nuclear-powered vessels in the U.S. Navy has decreased as the overall size of the Navy has decreased as a result of the end of the Cold War. The Navy has been able to accomplish its mission with fewer ships, partly because the ships and crews became more capable over the years and partly because the development of longer-lived nuclear reactor cores makes it possible for nuclear-powered ships to spend more time on duty and less time in shipyards being refueled. A major factor in the reduction in the number of nuclear-powered vessels is that, since the end of the Cold War, the Navy has embarked on a program to reduce the number of warships in its fleet. With the Navy

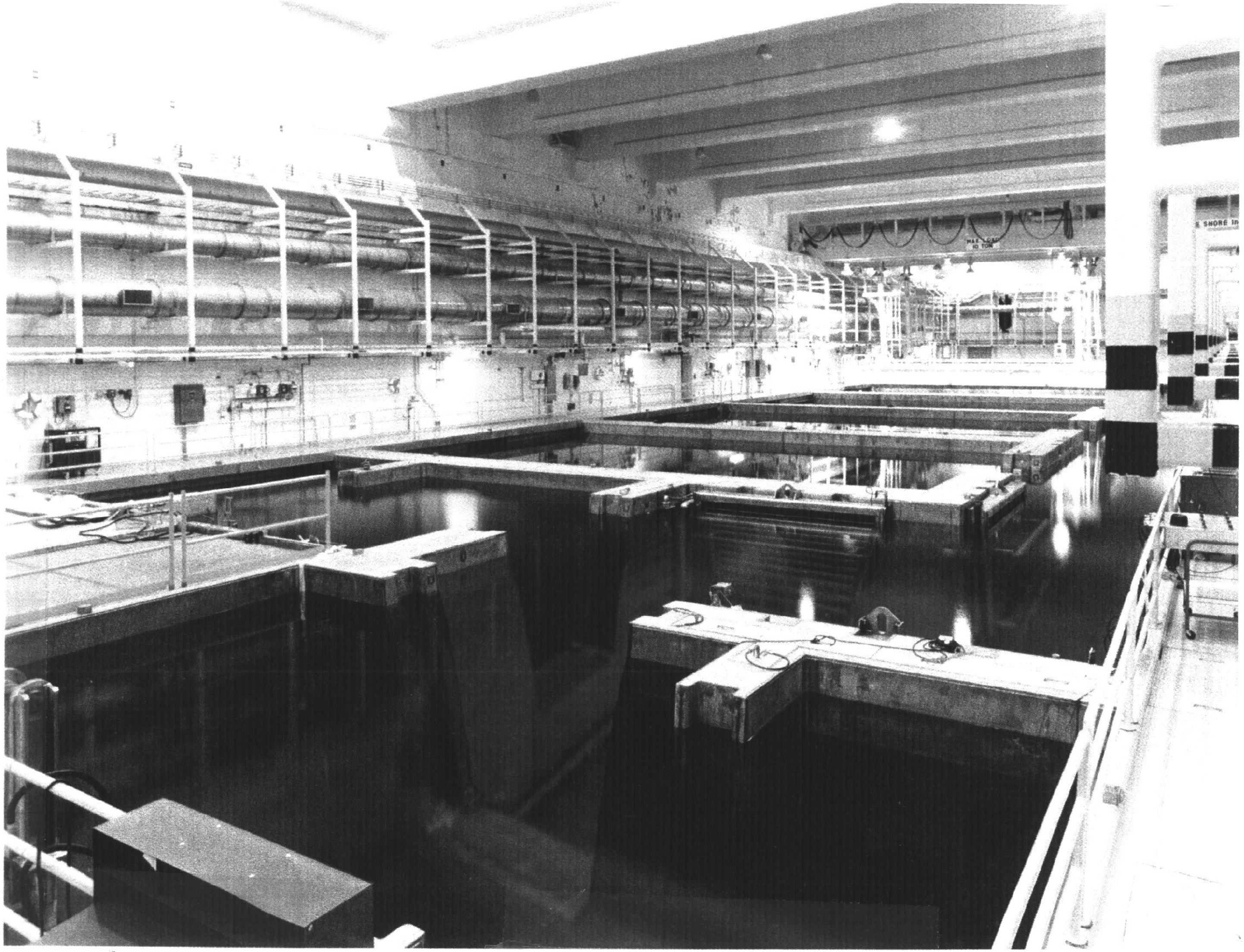

FIGURE 2.3 Water Pool Area of the Idaho Chemical Processing Plant

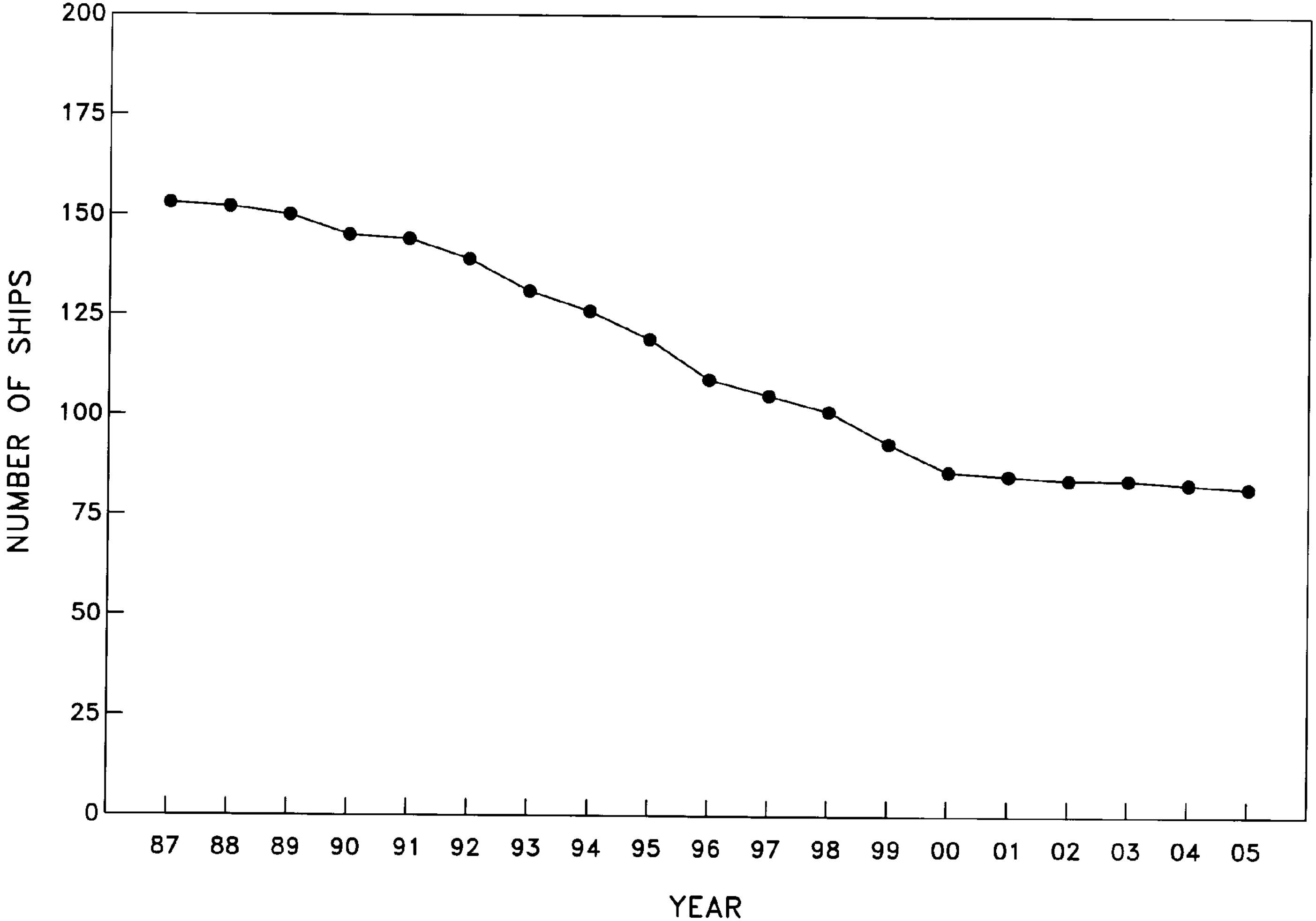

FIGURE 2.4 Total Number of Nuclear-Powered Ships in the U.S. Navy

downsizing from a fleet of almost 600 warships to a fleet of just over 300, the number of nuclear-powered warships is also diminishing. The actual size of the nuclear-powered fleet by the year 2000 is expected to be between 80 and 90 vessels having between 95 and 110 reactors (since surface ships have two or more reactors).

Figure 2.4 shows the peak number of nuclear-powered naval vessels in 1987 and the number of nuclear-powered ships in the fleet under current planning. This planned reduction reflects the most recent changes in the mission of the U.S. Navy, including the effects of the end of the Cold War. Under this plan, the number of nuclear-powered naval vessels will be reduced by the end of the next 10 years to approximately one-half the number at its peak. The Navy is moving ahead with this plan, but it should be remembered that such plans may change in the future if Congress alters the Navy's mission in light of world developments.

This plan for reducing the number of nuclear-powered naval vessels served as the basis for establishing the amount of naval spent nuclear fuel to be generated, which then was reflected in the development of environmental impacts in this EIS. For example, the planned reduction in the number of ships in future years is incorporated into all of the impacts associated with storage or shipment of naval spent nuclear fuel reported in this EIS. Similarly, the timing and number of naval spent nuclear fuel shipments used in the calculation of impacts associated with transportation are based on this plan.

2.8 Other NEPA Reviews

The Record of Decision for the DOE Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement was issued on May 30, 1995. On October 17, 1995, the federal District Court entered a Court Order that incorporated as requirements all of the terms and conditions of the parties' Settlement Agreement, including a reduction in the number of spent nuclear fuel shipments coming to the State of Idaho. Some of the projects described in the Court Order which are not related to the management of naval nuclear spent fuel may require further project definition or NEPA evaluation by the DOE. All additional NEPA evaluations will be timely to assure full compliance with the Court's Order.

Other NEPA reviews pertinent to this EIS, because they address impacts directly related to naval spent nuclear fuel or the impacts covered in the other reviews and must be cumulatively evaluated with the impacts in this EIS, are discussed in Sections 2.8.1 and 2.8.2. Included in the discussions are reviews currently in preparation, planned for the future, or specified through pertinent legislation but not planned.

2.8.1 NEPA Documents Completed or in Progress

The following NEPA documents have been completed or are in progress:

- Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement (DOE/EIS-0203-F) — This Programmatic SNF and INEL EIS evaluates the impacts over the next four decades of transporting, receiving, processing, and storing spent nuclear fuel for which DOE is responsible. It also analyzes the site-specific consequences of spent nuclear fuel management and environmental restoration at INEL. The fuel considered consists of that generated by DOE production reactors and by research and development reactors; naval reactors; foreign research reactors; other miscellaneous generators; and special-case commercial reactors. The final Programmatic SNF and INEL EIS was issued April 28, 1995, and the Record of Decision was issued on June 1, 1995. An amended Record of Decision (61 FR 9441) was issued on March 8, 1996. Naval spent nuclear fuel is analyzed in both the Programmatic SNF and INEL EIS and in the current EIS.

- Environmental Assessment of Urgent-Relief Acceptance of Foreign Research Reactor Spent Nuclear Fuel (DOE/EA-0912) — This Environmental Assessment and associated Finding of No Significant Impact were issued on April 22, 1994. The Environmental Assessment considered the receipt, overland transport, and temporary pool storage at the Savannah River Site of 409 spent nuclear fuel elements from foreign research reactors. The proposed action analyzed in this Environmental Assessment was intended to ensure that the organizations responsible for eight foreign research reactors from which urgent-relief spent nuclear fuel shipments would be accepted would continue to participate in the Reduced Enrichment for Research and Test Reactors Program, a key nuclear weapons nonproliferation program proposed by the United States, until completion of the EIS on proposed policy for foreign research reactor spent nuclear fuel.

- Environmental Impact Statement on a Proposed Nuclear Weapons Nonproliferation Policy Concerning Foreign Research Reactor Spent Nuclear Fuel (DOE/EIS-0218-F) — The nonproliferation policy EIS, issued on February 23, 1996, addresses adoption and implementation of policy for the United States to accept and provide storage and ultimate disposition of spent nuclear fuel from foreign research reactors containing uranium produced or enriched in the United States. DOE issued a Record of Decision on May 13, 1996 (61 FR 25092) and an amended Record of Decision on July 25, 1996 (61 FR 38720).

- Draft Site-Wide Environmental Impact Statement for the Nevada Test Site and Off-Site Locations Within Nevada (DOE/EIS-0243) — The Draft EIS was issued on February 2, 1996. This sitewide EIS will address management decisions regarding alternatives for the future use of the Nevada Test Site and related areas. The EIS addresses defense programs, waste management, environmental restoration, nondefense research and development, and resource management planning. The sitewide EIS does not address any aspect of civilian or naval spent nuclear fuel management or disposal, including any issues associated with a potential repository in Nevada.

- Final Generic Environmental Impact Statement: Handling and Storage of Spent Light Water Power Reactor Fuel (NUREG-0575) — This EIS, issued in August 1979 by the Nuclear Regulatory Commission, evaluates the environmental impacts of storing commercial spent nuclear fuel at reactor sites. This EIS is part of the basis for the Nuclear Regulatory Commission's Waste Confidence Decision (44 FR 61372, 49 FR 34658, and 54 FR 49767) that spent nuclear fuel can be stored at reactor sites without harm to the environment.

- Final Environmental Statement on the Transportation of Radioactive Material by Air and Other Modes (NUREG-0170) — This EIS, issued in August 1977 by the Nuclear Regulatory Commission, evaluates the environmental impacts of transporting radioactive material, including spent nuclear fuel.

- Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada — As directed by the Nuclear Waste Policy Act, DOE initiated preparation of an EIS that would accompany a recommendation if one is made to the President to locate a geologic repository. On August 7, 1995, DOE published a Notice of Intent to prepare the Repository EIS. Following a 90-day scoping period which ended on December 5, 1995, the DOE deferred activities on the repository EIS until Fiscal Year 1997. The Nuclear Regulatory Commission will consider the Repository EIS, to the extent practicable, in the process of issuing the repository construction authorization and license. The EIS will evaluate the potential impacts of developing a repository site, including the effects of construction, operation, and closure. In accordance with the Nuclear Waste Policy Act, the Repository EIS will not consider the need for a repository, alternatives to geologic disposal, or alternative sites to Yucca Mountain.

- Environmental Assessment for Stabilization of the Storage Pool at Test Area North — The Draft Environmental Assessment was issued on February 20, 1995, and a Finding of No Significant Impact was issued on March 6, 1996. | The Environmental Assessment was reissued to incorporate public comments and a draft Finding of No Significant Impact on May 10, 1995. The document is currently undergoing final revision and is expected to be released soon. The proposed action would remove Three Mile Island core debris, government owned commercial fuels and "loss of fluid test" (LOFT) fuel assemblies from INEL's Test Area North storage pool. The storage pool would be de-watered and placed in an industrially safe condition. A dry cask storage facility would be constructed at INEL's Idaho Chemical Processing Plant to receive and store the Three Mile Island core debris.

2.8.2 Other NEPA Documents in the Nuclear Waste Policy Act

The Nuclear Waste Policy Act directs DOE to prepare an Environmental Assessment to support a recommendation to Congress of a site for a Monitored Retrievable Storage facility for commercial spent fuel. The Nuclear Waste Policy Act also directs DOE to prepare an EIS to support any license application to the Nuclear Regulatory Commission for a Monitored Retrievable Storage facility construction and operation. To date, DOE has made no recommendation for a site. However, after analyzing public comments received in response to DOE's Notice of Inquiry on Waste Acceptance Issues published on May 25, 1994 (59 FR 27007), DOE has concluded that it does not have an unconditional statutory or contractual obligation to accept high-level waste and spent nuclear fuel beginning January 31, 1998, in the absence of a repository or interim storage facility constructed under the Nuclear Waste Policy Act. In addition, DOE has concluded that it lacks statutory authority under the Nuclear Waste Policy Act to provide interim storage (60 FR 21793; May 3, 1995). This matter is currently before the Federal Courts and is also the subject of legislation being considered in both houses of Congress.

2.9 Organization of this EIS

This EIS examines and compares the environmental impacts of fabricating and deploying alternative container systems for the management of naval spent nuclear fuel. This environmental evaluation of alternative container systems lends itself to a different format than most site-specific EISs, where the Environmental Setting and Environmental Impacts or Consequences are discussed in separate chapters. The remainder of this EIS is structured as follows:

- Chapter 3 presents the details of the alternative container systems, including the No-Action Alternative. The chapter also provides a summary comparison of the alternatives and impacts estimated in Chapters 4, 5, 6, and 7 and forms the heart of this EIS.

- Chapter 4 addresses the manufacture of canisters, casks, and associated equipment. It includes a discussion of the environmental setting for manufacturing and the potential impacts associated with manufacturing components of the various systems.

- Chapter 5 addresses the loading, handling, and storage of naval spent nuclear fuel assemblies, canisters, and casks at INEL. The chapter includes a discussion of the environmental setting for the facilities and of the potential impacts of loading and storage associated with each alternative.

- Chapter 6 addresses issues related to unloading of containers at a representative or notional repository or centralized interim storage site.

- Chapter 7 addresses the transportation of naval spent nuclear fuel between facilities utilizing the alternative container systems. It includes a discussion of the environmental setting of representative routes and the potential impacts of transportation associated with each alternative.

- Chapter 8 provides a summary of the laws and regulations applicable to the actions discussed in this EIS.

- Chapters 9 and 10 contain a list of preparers and references, respectively.

- Chapter 11 provides the comments to the Draft EIS and the Navy responses. |

- The appendixes provide background information and details of the methodology, evaluations, and analyses presented in this EIS.

- Abbreviations and Acronyms, a Glossary, an Index and a Distribution List are found at the end of the document.