

DSI-6

STRATEGIC ASSESSMENT ISSUE PAPER



DSI 6: HIGH-LEVEL WASTE AND SPENT FUEL

INTRODUCTION

In August 1995, the Nuclear Regulatory Commission (NRC) staff initiated a Strategic Assessment and Rebaselining Project. This project was intended to take a new look at the NRC by conducting a reassessment of NRC activities in order to redefine the basic nature of the work of the agency and the means by which that work is accomplished, and to apply to these redefined activities a rigorous screening process to produce (or rebaseline) a new set of assumptions, goals, and strategies for the NRC. The results of this project are intended to provide an agency-wide Strategic Plan which can be developed and implemented to allow the NRC to meet the current and future challenges.

A key aspect of this project was the identification and classification of issues that affect the basic nature of NRC activities and the means by which this work is accomplished. These issues fall into three categories. The first category includes broad issues defined as Direction-Setting Issues (DSIs). DSIs are issues that affect NRC management philosophy and principles. The second category includes subsumed issues. Subsumed issues are those that should be considered along with the DSIs. The third category includes related issues. These are issues that should be considered after the Commission makes a decision on the option(s) for a DSI. Also, as part of the project, other issues of an operational nature were identified. These are not strategic issues and are appropriately resolved by the staff, and are not discussed in the issue papers.

Following the reassessment of NRC activities, issue papers were prepared to provide a discussion of DSIs and subsumed issues, and to obtain a review of these broad, high-level issues. These papers are intended to provide a brief discussion of the options as well as summaries of the consequences of the options related to the DSIs. Final decisions related to the DSIs will influence the related issues which are listed, but not discussed, in each issue paper. As part of the Strategic Assessment and Rebaselining Project, the issue papers are being provided to interested parties and to the public. Following distribution of the issue papers, a series of meetings are planned to provide a forum to discuss and receive comment on the issue papers. After receiving public comment on the issue papers, the Commission will make final decisions concerning the DSIs and options. These decisions will then be used to develop a Strategic Plan for the NRC. In summary, the Strategic Assessment and Rebaselining Project will analyze where the NRC is today, including internal and external factors, and outline a path to provide direction to move forward in a changing environment.

I. SUMMARY

A. Direction-Setting Issue

The Nation's high-level waste (HLW) repository and spent fuel storage programs are being significantly affected by the changes Congress is directing for the national program. Recent congressional budgetary mandates have resulted in significant downsizing of the Department of Energy's (DOE's) HLW disposal program and cancellation of DOE's multi-purpose canister (MPC) system for the storage, transport, and disposal of spent fuel. The Nuclear Regulatory Commission's (NRC's) programs in these areas have subsequently been affected as well. The NRC HLW disposal program has significantly scaled back its prelicensing activities commensurate with DOE's reduced program and NRC's reduced budget. Also, without a federally funded MPC or a centralized storage facility, the NRC's spent fuel storage program is receiving an increased number of applications for dual-purpose storage and transport systems for at-reactor storage.

Further regulatory and programmatic changes will be required if pending legislation in Congress becomes effective. However, the future of these bills is uncertain. In the meantime, the NRC and DOE programs continue in a state of budgetary and programmatic flux while in anticipation of a change in direction.

Acknowledging all of the barriers to success in the history of pursuing geologic disposal of HLW, this issue paper explores various options available to NRC for positioning itself during this era of uncertainty for the national HLW program. For HLW and spent fuel, the following direction-setting issue (DSI) was identified:

In recognition of current uncertainties, how should NRC approach the present high-level waste situation?

In pursuing the development of a repository for near-term disposal of the entire inventory of spent fuel generated by current nuclear reactors, the Nation's HLW program must overcome several key barriers. According to the Office of Civilian Radioactive Waste Management (OCRWM) of the DOE, the key specific barriers to the program's success are as follows:

- The lack of consensus among the scientific and technical community and the major interested and affected parties on fundamental elements of the program itself (including the approach to repository development, the role of cooling and the engineered barriers, and siting strategy) and on the regulations for repository performance
- The unprecedented nature of geologic disposal

- The linkages in the law between the siting and construction of a monitored retrievable storage (MRS) facility, and the licensing and construction of the repository
- Strong public resistance to waste management and other "undesirable" facilities, aggravated by doubts and distrust concerning DOE and Federal credibility, competence, and fairness
- General program and budgetary constraints

B. Options

The options considered in this paper present the range of approaches NRC could choose to take in its role in the national program. The first two options along with Option 5 represent a proactive approach and are not mutually exclusive. Pursuing Options 1 and 5 would be advocating change external to the NRC to refocus the national program and encourage a significant increase in progress, with option 5 dealing specifically with spent fuel storage. Pursuing Option 2 would modify NRC's programs in order to reduce uncertainties in licensing a repository as well as a centralized storage facility. Specific examples for pursuing each option are provided. Alternatively, options for continuing with the existing program as well as reducing NRC's role are also presented.

Option 1: Approach Congress and the Administration to Refocus the National Program

Specific examples of potential activities for pursuing this option are as follows:

- The Commission could advocate geologic disposal, integrated with interim storage, and propose schedules and budgets for the program. The Commission could further request Congress to stabilize the program by committing to a 5-year budget for the national program.
- The Commission could propose the creation of a quasi-Government agency responsible for the disposition (storage, disposal) of HLW in place of DOE.
- In anticipation of the time-consuming process required to resolve the licensing details of a contentious case, the Commission could propose that Congress determine the acceptability, if justified, of the Yucca Mountain site by law.

- The Commission could propose that NRC certify the repository rather than license it, possibly in the manner that the Environmental Protection Agency (EPA) certifies facilities such as the Waste Isolation Pilot Plant (WIPP), to lessen the burden of the complex licensing process.

Legislative change would be required to implement these activities, but implementation of any of them could enhance the progress of the national HLW program.

Option 2: Reduce Uncertainty by Modifying NRC's Programs

Specific examples of potential activities for pursuing this option are as follows:

- NRC could establish a formal, binding issue resolution process during the pre-licensing phase of the disposal program to lessen the number of potential issues to be litigated in the licensing hearing and in the Appeals Court.
- NRC could modify Parts 60 and 72 to address information gained from their use in conjunction with existing efforts to modify them.
- NRC could apply a risk-informed discipline through an internal, independent review of all proposed staff comments to DOE on repository safety issues.
- NRC could create an office-level organization for NRC's HLW disposal program, reporting directly to the Executive Director for Operations (EDO), to provide increased focus and accountability for NRC's role in enhancing progress in licensing the repository.
- NRC could develop a program for licensing of the repository or a centralized storage facility in which employees of DOE and its contractors as are designated NRC representatives, bound by oath, who certify that as design details are completed or decisions affecting performance are made, the design meets the regulatory requirements. This approach could be used to augment the NRC staff and provide added credibility and assurance to NRC's review.

These changes could result in overall program efficiencies and could reduce the uncertainties associated with repository licensing. In addition, NRC would be taking an active role, within the limitations of its legislative mandate, to enhance the progress of the national program.

Option 3: Maintain NRC's Existing High-Level Waste Repository Program

NRC could simply respond to existing legislative mandates and see how the national program evolves, responding as appropriate. This option would require no additional staff resources and would be the least disruptive to NRC's program. This would include modifying Part 60 of Title 10 of the Code of Federal Regulations (10 CFR Part 60) to add a new regulation (e.g., Part 60a) specifically applicable to Yucca Mountain as required by the Energy Policy Act of 1992 (ENPA). Staff would seek Commission approval for this rulemaking before it initiates any significant work on a new Part 60.

Option 4: Take a Minimal Approach to NRC's High-Level Waste Repository Program

To reflect the potential for the HLW program to continue without substantial progress, NRC could reduce its HLW repository program to a bare minimum, responding only to congressional, public, and DOE inquiries, until DOE submits an application or Congress redirects a national program. This option would result in an immediate savings in staff resources but may require additional resources, beyond current levels, to re-create the program and quickly address the issues when the national program is refocused.

Option 5: Take a Position on the Storage of Spent Fuel

Recognizing that an operational HLW repository is more than 10 years away, and that several reactors will lose full core reserve before the end of the century and be forced to turn to dry cask storage, the Commission could recommend that Congress establish a national approach for dry cask storage.

Specific examples of potential activities for pursuing this option are as follows:

- Acknowledging DOE's difficult experience in trying to site an MRS, the Commission could advocate at-reactor storage.
- Alternatively, the Commission could advocate centralized dry storage of spent fuel as possibly offering significant benefits over at-reactor storage.
- Similar to centralized storage, the Commission could advocate regional storage thereby allowing for greater equity in shouldering the responsibility for the nation's waste.

II. DESCRIPTION OF ISSUES

NRC's authority to regulate nuclear waste and spent fuel comes from its general licensing authority created by the Atomic Energy Act (AEA). Under the AEA, NRC's responsibilities include regulation of interim storage and disposal of radioactive wastes containing byproduct, source, and special nuclear material. Section 202 of the Energy Reorganization Act authorizes the Commission to regulate and license DOE facilities for the receipt and storage of HLW resulting from activities licensed under the AEA. The original requirements for disposition of HLW and spent fuel were contained in 10 CFR Part 50, Appendix F. The current principal regulatory requirements for disposal of HLW, which includes spent fuel, are contained in 10 CFR Part 60. Part 72 contains the Commission's requirements specifically for spent fuel storage.

In the early days of nuclear power development, spent fuel storage pools were designed under the assumption that discharged fuel would be cooled for 6 months, then shipped off site for reprocessing. As a consequence, many pools were capable of holding only 1 and 1/3 reactor cores, that is, one or two annual discharges of spent fuel (1/3 to 2/3 of the fuel assemblies in a reactor core), plus room for a full core (known as "full core reserve") in the event that the reactor vessel needed to be emptied for repairs. However, with the ban on nuclear reprocessing in the late 1970s and the subsequent demise of the commercial reprocessing industry in the United States, utilities began accumulating spent fuel in quantities that exceeded the design capacity of their storage pools. To alleviate the growing storage problem, new reactors were designed with larger pools, and higher density spent fuel storage racks were installed in existing pools. Despite the greater capacity, many reactors are running out of storage space in their pools and need an alternative for dealing with their spent fuel.

The Nuclear Waste Policy Act of 1982 (NWPAA), as amended, created the existing national program for dealing with the accumulation of spent fuel from reactors, as well as radioactive waste from reprocessing of spent nuclear fuel, and other HLW. The NWPAA designated DOE as responsible for disposing of the nation's HLW, which includes spent fuel, and required that disposal be made in a geologic repository licensed by NRC. As required by the NWPAA, NRC promulgated technical criteria for disposal of HLW in geologic repositories (10 CFR Part 60). The criteria address, among other things, siting, design, and performance of a geologic repository. Part 60 is applicable to any geologic repository and was developed, in part, to determine a site's suitability for a repository and has the effect of differentiating sites and the geologic media of potential repositories. In 1987, Congress amended the NWPAA (NWPAA) directing DOE to pursue site characterization of only Yucca

Mountain, Nevada. It was believed that pursuit of one location would be more cost-effective, and that of all the locations being characterized at that time, Yucca Mountain appeared to be the most suitable.

DOE has been characterizing the Yucca Mountain site for more than 10 years to learn whether it will be an acceptable site for construction and operation of a geologic repository. DOE's characterization activities have resulted in surface studies, boreholes, some below-ground experiments, and during the past year, a tunnel, the Exploratory Studies Facility, that will extend about 5 miles into Yucca Mountain when completed in early 1997. DOE had previously planned to submit a license application to NRC by 2001. However, due to FY 96 budget reductions and revisions to its program, DOE now plans on submitting a license application to NRC in 2002.

The NWPAA also established a program for an MRS facility to be developed by DOE and licensed by NRC. The facility would store spent fuel and other HLW pending shipment to a geologic repository. An MRS facility is basically an away-from-reactor independent spent fuel storage installation (ISFSI) for which DOE is the applicant. An MRS facility must meet the same safety requirements of NRC's Part 72 spent fuel storage requirements as any at-reactor site-specific ISFSI but, as mandated by the NWPAA, has certain siting, quantity, and schedule constraints that are linked to the development of a repository.

The NWPAA established a mechanism for locating a voluntary host site for an MRS site, but subsequent legislation passed in 1993 made it more difficult for a voluntary siting process to continue. As a result of the linkages to repository development and the suspension of the voluntary siting process, DOE's progress toward establishing an MRS facility has been stalled.

The NWPAA also states that DOE must take title to the Nation's HLW by 1998. However, until DOE takes title, storage of spent fuel and HLW is the responsibility of the generators and the owners. In addition, the act placed responsibility for the costs of permanent disposal and interim storage on the generators and the owners. Therefore, the NWPAA established the Nuclear Waste Fund (NWF), which is financed by a levy of 1 mill per kilowatt-hour on all electricity generated by nuclear power. NRC's and DOE's activities related to NWPAA HLW disposal and interim storage programs are financed by the NWF. So far, about \$6 billion has been collected, and \$4 billion has been spent.

Nuclear utilities have become increasingly concerned about what they view as a lack of progress and initiated a lawsuit, along with several State agencies, to determine whether DOE must accept their spent fuel by 1998. In late July, the U.S. Court of Appeals for the District of Columbia Circuit ruled that DOE must accept spent nuclear fuel from commercial nuclear power utilities by January 31, 1998, as required by the NWPAA. The Federal appeals court did not

specify how DOE should meet the deadline, Therefore it is not clear whether DOE must take physical possession of the spent fuel or whether it can compensate the utilities for storage costs until a federal storage site can be developed. In the meantime, faced with the loss of full core reserve and the slow progress of DOE towards accepting spent fuel, utilities have initiated dry cask storage operations at 9 different reactor sites in the past 10 years. Many more reactors face the loss of full core reserve by the end of this century. As some utilities have moved toward dry cask storage at their reactor sites, they have encountered local public resistance.

The NRC approves dry storage systems for spent fuel at ISFSIs through one of two processes under Part 72. The safety requirements for both processes are the same, only the procedures are different.

The first process is a one-step, site-specific license for construction and operation of a dry storage facility. Receipt of a site-specific application is noticed in the Federal Register and an opportunity for a public hearing is provided. Along with the application, an applicant must submit an environmental report. The NRC publishes the results of its environmental review in the Federal Register. Upon completion of the safety review, a renewable license, with a term of 20 years, is issued. Six of the currently licensed ISFSIs hold a site-specific license.

The second process involves the use of a general license. The NWPA directed the NRC to establish procedures for the generic approval of storage containers for spent fuel "without, to the maximum extent possible, the need for additional site-specific approvals." As a result, the NRC added the general license provisions contained in Subpart K to Part 72 in a 1990 public rulemaking. Under these provisions, any Part 50 power reactor licensee can store spent fuel on its reactor site provided it uses an NRC-approved cask and performs written evaluations establishing that it can meet the conditions for its use.

After staff completes the safety review of an application for an approved cask, a proposed rule is published to amend Part 72 to add the storage design to the list of approved casks in Subpart K. A renewable certificate of compliance, with a term of 20 years, is issued for the cask when the final rule becomes effective. Casks that are approved through rulemaking are to be suitable for use under a range of environmental conditions sufficiently broad to encompass the majority of licensed nuclear power plants in the United States, without the need for further site-specific approval by the NRC. Three of the ISFSIs in operation store spent fuel under the general license. If a reactor is not scheduled for decommissioning, in general, the current trend is for utilities to use approved casks and store under a general license.

Each process has its own benefits. The site-specific process provides a licensee a storage system that meets its site-specific conditions and fuel specifications. In addition, with a site-specific Part 72 license, a decommissioned plant can store fuel without retaining its Part 50 license. Under the general license, a licensee can use a previously approved dry cask storage system. However, a licensee must be able to show that the approved cask it has selected meets its fuel and siting conditions. The general license process does not provide the opportunity for a hearing, but public participation is guaranteed through the rulemaking.

Congress is now considering legislation concerning HLW disposal and interim storage that would significantly alter the national program. After the development of several bills in the past 18 months, the two key bills now being considered are S. 1936 and HR. 1020. Bill S. 1936, which replaced S. 1271, passed the full Senate on July 31, 1996, with a vote of 63 to 37. The House Commerce Committee has cleared HR. 1020, but the full House has not acted on the legislation. At this time, the bill is not scheduled to come up for a full House vote before the end of September.

Both bills call for an integrated DOE management system consisting of interim storage at a centralized storage facility and permanent disposal at a geologic repository. HR. 1020 would require DOE to submit a repository application to NRC by 2001. A 2002 submittal is required by S. 1936. Bill HR. 1020 outlines a program for a centralized interim storage facility that, unlike the existing NWPAA, is not linked to the progress of the repository and is specifically located in Area 25 of the Nevada Test Site (adjacent to Yucca Mountain). In S. 1936, DOE cannot begin construction on an interim storage facility at Area 25 of the Nevada Test Site if the President finds by December 31, 1998, that Yucca Mountain is unsuitable for a repository based on a 1998 DOE viability assessment of Yucca Mountain for a repository. Both bills would require NRC licensing of the centralized storage facility within 16 months after receipt of an application. If the public were to exercise full participation rights under NRC's existing procedures, it is doubtful that the staff could accomplish licensing within this time frame.

Both bills would require regulatory changes to 10 CFR Parts 60 and 72. Both proposals specify a license term of 100 years for a DOE centralized interim storage facility. Although NRC has previously concluded that spent fuel can be stored safely for 100 years, Part 72 regulations specify a renewable ISFSI license term of 20 years and an MRS term of 40 years. The conclusion regarding the safety of storing spent fuel for 100 years was made after the rules were issued that specified the license terms for an ISFSI and an MRS.

The existing NWPAA gave EPA the responsibility for establishing environmental standards for the allowable release criteria of radioactive materials from a repository. NRC is to license the disposal of HLW in accordance with these

standards. In addition, ENPA directed EPA to fund a study by the National Academy of Sciences (NAS) to make recommendations for the technical basis of Yucca Mountain specific standards. NAS issued its report in August 1995. ENPA requires EPA to promulgate standards within one year after publication of the NAS report. These new standards specifically would apply to the Yucca Mountain site and should be based on and consistent with the findings of the NAS report. The ENPA also requires that within a year of EPA's promulgation of those standards, NRC must issue conforming regulations.

However, HR. 1020 removes EPA's authority to set standards for HLW disposal at Yucca Mountain, establishes a dose standard of 100 mrem/year, and removes subsystem performance objectives. Bill S. 1936 sets an overall system performance standard of 100 mrem, but also directs EPA to issue standards consistent with this measure unless it finds this standard presents an unreasonable risk. S.1936 also allows NRC to establish another overall system performance objective if it finds the designated standard not protective.

The future of both S. 1936 and HR. 1020 remains uncertain. The Administration is opposed to legislation which specifies the Yucca Mountain area as the location for a centralized interim storage facility before determining the viability of Yucca Mountain as a permanent geologic repository. To accommodate this concern, language was provided in S. 1936 to prohibit construction of an interim storage facility at Yucca Mountain before December 31, 1998. The bill provides for delivery to the President and Congress by DOE of a viability assessment for a repository at Yucca Mountain by June 30, 1998. The President must make a determination on the viability assessment by December 31, 1998. If the President determines that Yucca Mountain is not suitable for development as a repository, then DOE shall cease work on both an interim storage facility and a repository at the Yucca Mountain site. If the President makes such a determination, he shall have 18 months to designate an interim storage facility site. However, the Administration has stated that it is also opposed to S. 1936 because it undermines resources for development of a repository, and is prejudicial towards Yucca Mountain as a repository based on the designation of the site for an interim storage facility.

However, Congress introduced further uncertainty into the existing national program with its substantially reduced HLW funding for both DOE and NRC for fiscal year FY 96 (and likely for NRC in FY 97).

In 1993, DOE undertook a comprehensive assessment of its program in response to concerns that Congress and others raised about costs, schedules and accomplishments. As a result, a new "Program Approach" was developed and described in the 1994 Program Plan. Congress endorsed this new approach by approving a 37 percent increase in funding for FY95 to \$522 million (with \$375 million for the Yucca Mountain program). The principal purpose of the Program Approach was to set and meet near-term goals that would result in a decision

as to whether Yucca Mountain is a suitable site. DOE planned to make a technical site suitability evaluation in 1998 and submit a license application to NRC by 2001. DOE also had awarded a contract for the design of a MPC system for the storage, transport, and eventual disposal of commercial spent fuel. The MPC could have been used at an MRS facility or any other centralized interim storage facility, but recognizing the factors hindering the progress of an MRS, DOE hoped to provide the system to the utilities by the end of 1998 for at-reactor storage under a general license.

However, Congress reduced DOE's funding from its FY 95 funding level of \$522 million to \$400 million in FY96, about the same level of funding DOE had in FY 94. Congress sequestered \$85 million for a centralized interim storage facility, pending legislation, leaving \$250 million for the repository program and \$65 million for the rest of the HLW program. Congress directed DOE to focus the reduced scope on core scientific activities to resolve technical issues concerning the repository, and to defer preparation and submittal of a license application to the Commission. In addition, DOE canceled any further development of an MPC for NRC certification. In June 1996, DOE released a Revised Program Plan which outlines the revised approach consistent with its FY 96 and FY 97 funding level of \$400 million. Key objectives are to revise the Siting Guidelines in 1997, to complete a viability assessment of the Yucca Mountain repository site in 1998, to recommend to the President a repository site by 2001 and to submit a license application to NRC in 2002. DOE also described how it will update its Waste Containment and Isolation strategy, initially prepared in FY 96, to play a fundamental role in focusing and integrating the program's activities.

The NRC recognized the need to refocus its prelicensing HLW repository program to address the issues most significant to repository performance. Consequently, NRC redirected its HLW management program to focus on resolving the 10 key technical issues most significant to repository licensing. Other activities necessary for licensing were deferred as a result of the FY 96 budget reductions.

The FY 96 funding level for this refocused program is \$17 million, consisting of \$11 million in appropriated funds and \$6 million in previous year funds. In order to maintain the \$17 million funding level for the refocused program in FY 97, NRC requested \$14 million in appropriated funds to combine with \$3 million in previous year funds. The FY 97 House and Senate Appropriations Bills, if passed, would appropriate \$11 million in Nuclear Waste Funds to NRC--\$3 million less than the \$14 million requested. At this reduced funding level, the NRC will not be able to resolve three of the 10 key technical issues. These issues deal with repository design, waste package containment, and radionuclide transport.

A final uncertainty that can directly affect the national program is the public. The State of Nevada and a number of county and local governments and Indian Nations near Yucca Mountain are strongly opposed to disposal of HLW there. Prior to FY 96, the NWF provided financial support for these groups to develop and express their views. They have enacted State legislation and filed several lawsuits to prevent development of the site. They are also challenging the technical merit of Yucca Mountain for HLW disposal.

In addition, negative public response to dry storage facilities at some reactor sites has resulted in close scrutiny of dry cask storage activities, which, at times, has slowed the licensees' progress toward implementing licensed dry storage operations. Various activist groups have filed lawsuits to prevent dry storage at particular sites and, at times, have influenced State and local governments, thereby making dry storage for utilities a more difficult option.

Further, as a centralized interim storage facility and/or a repository becomes more of a real possibility, greater resistance to transportation may be expressed by local communities. However, in more than 35 years of radioactive materials shipping experience, there has never been a death or injury resulting from the radioactive contents of a package. In the mid-1980s, several hundred spent fuel shipments were made annually as spent fuel was being returned to nuclear reactors from the shutdown West Valley reprocessing facility. An NRC-certified transportation spent fuel cask has never had a release of radioactive materials during either normal operations or an accident. However, NRC continues to review and revise its transportation regulations as needed based on operational experience.

Because of the limited number of spent fuel shipments currently being made, general public interest has been limited. However, as this country approaches extensive interstate shipments of spent fuel again, public interest and involvement are expected to intensify. Even though the safety record demonstrates the adequacy of the current transportation system, the public's concerns about the risks of transporting large quantities of spent fuel could be a prominent aspect of the licensing process for a geologic repository or a centralized dry storage facility.

Beyond expressing concerns about radioactive materials and appealing to congressional representatives, the public can be expected to play an integral part in the adjudicatory hearing process for either a disposal license application or an application for a centralized storage facility; its concerns will require careful consideration.

As mentioned previously, in pursuing the development of a repository for the near-term disposal of the entire inventory of spent fuel generated by current reactors, the Nation's HLW program must overcome several key barriers. Key

specific barriers to the program's success range from technical issues, political issues, public mistrust, and budgetary constraints. The situation described has led NRC to the need to evaluate how it can best approach the evolving national program for HLW. Included in this evaluation is a need for the Commission to contemplate the agency's role in the nuclear waste arena, and how it may be able to effect change to reduce the uncertainties. Further, the NRC must consider how it can best be positioned for change while continuing to operate effectively in the established national program.

III. DISCUSSIONS

A. Discussion of Direction-Setting Issue

The long-term storage and disposal of HLW have experienced uncertainties since the mid-1950s. These uncertainties have included political, economic, and technical issues, which have been exacerbated by public mistrust. The technical uncertainties have become somewhat more focused and stabilized with advances in technology. However, the uncertainties created by the political environment and the public have been somewhat more difficult to anticipate and resolve, and require frequent and open interactions in order for NRC to remain aware of stakeholder's views and DOE's planned efforts. All of these uncertainties have affected, and been affected by, the economic uncertainties created for nuclear power.

It is interesting to compare the difficulties with the deep geologic disposal of HLW with a number of successes in dealing with the disposal of other hazardous wastes. While these other disposal programs have experienced significant difficulties and expense, nonetheless they have resulted in considerably more success. Although the HLW program is frequently characterized as an unprecedented undertaking to dispose of a hazardous waste in a deep geologic medium, chemically hazardous wastes are disposed of relatively routinely in near-surface trenches, even though some of these wastes will be hazardous forever. The difference between the progress made with the disposal of HLW radioactive waste versus chemically hazardous materials is not consistent with the hazard associated with each of these substances.

As the independent regulator of both DOE and the nuclear industry, the NRC has tended to remain silent on broad, national programmatic issues and has addressed only technical, regulatory issues. However, as a leader on nuclear safety issues worldwide, the question of whether the agency should play a larger role in national policy issues is raised.

The deficiencies in the current plan for the disposition of HLW could be seen as a significant gap in the safe use and disposal of nuclear materials. Recent decommissioning efforts and the freezing and rupture of the service

water system for the spent fuel pool at the shutdown Dresden 1 plant have focused attention on the safe operation of spent fuel pools at plants that are no longer operational. These plants depend on a number of pool support systems, including cooling water, electric power, instrumentation, and radiation detection, which are needed for other purposes in an operating plant but which may receive less attention once the plant is shutdown permanently. Without near-term access to a centralized storage facility or a disposal site, there is a case for moving all the fuel at these shutdown plants to a modern dry storage system. Onsite dry storage has proven to be a safe method for dealing with spent fuel from reactors in these types of situations; however, local opposition to onsite storage is occurring. Without a national plan for the Federal Government to accept spent fuel in the near future, some members of the public are concerned that these sites may become permanent storage locations.

This issue paper presents several options which would have NRC take a more proactive stance in its role in the national program, thereby attempting to effect change that could reduce the uncertainties and enhance progress. Options for continuing with the existing program, as well as reducing NRC's role, are also presented.

B. Discussion of Subsumed Issues

1. How should NRC address HLW standards and regulation?

Subject to existing legislation, the results of NRC's decision regarding its approach to the present HLW situation will directly determine how the agency should address HLW standards and regulation.

2. How should NRC position itself to meet its responsibility of licensing DOE's disposal of GTCC wastes?

The results of NRC's decision regarding its approach to the present HLW decision will directly affect its regulatory role in the disposal of greater than Class C (GTCC) waste. Under the Low-Level Radioactive Waste Policy Amendments Act, NRC is responsible for licensing DOE's disposal of GTCC. Although GTCC waste is classified as low-level waste, it is generally not acceptable for near-surface disposal, and disposal methods must be generally more stringent than those specified for other low-level wastes. In 10 CFR 61.55, the following statement is made: "In the absence of specific requirements in this part, such waste [GTCC] must be disposed of in a geologic repository as defined in Part 60 of this chapter unless proposals for disposal of such waste in a disposal site licensed pursuant to this part are approved by the Commission."

IV. OPTIONS

Option 1: Approach Congress and the Administration To Refocus the National Program

1. Option

In view of the lack of focus, stability, and slow progress of the HLW program, the Commission could become more proactive in seeking resolution of the problems by approaching Congress and the Administration with one or more proposals to reduce uncertainty in the national program. Examples of proposals that could be pursued are discussed below.

2. Discussion

For example, the Commission could advocate geologic disposal as a sound means for disposing of the Nation's HLW and ask Congress and the Administration to establish the development of an integrated spent fuel storage and disposal system with proposed schedules and budgets. Further, the Commission could ask Congress to stabilize the program by committing to a 5-year budget resolution for DOE and NRC.

The Commission previously endorsed an integrated HLW management system in its comments that Congress solicited on proposed legislation. However, the Commission has not been proactive in offering its own position for an integrated management system that specifically recognizes that geologic disposal is acceptable and that offers realistic schedules and a budget. The Commission could propose realistic schedules and a 5-year budget commitment in an effort to effect a change that has real potential for implementation.

The Commission could include in this statement a discussion of the advantages of centralized interim storage. As reactors continue to run out of space in their spent fuel pools, more utilities are being forced to turn to onsite dry storage.¹ (see Option 5)

In requesting a commitment for a 5-year budget resolution for DOE and NRC, the Commission could note that this amount of time would provide for licensing and startup of an interim storage facility, as well as receipt of an application for a repository. A stabilized budget would result in a stabilized program and would allow the staff to focus on technical and licensing issues and not

¹ In a report issued March 1996, the NWTRB recommended modest planning for a generic federal centralized storage facility so as not to compete with a repository, and that further development should be deferred until after a decision has been made about Yucca Mountain as a host for a repository.

be distracted by issues pertaining to program restructuring as a result of budgetary actions.

Another idea that NRC could propose to the Administration and Congress is to vest the HLW disposition function in a new quasi-Government agency whose sole responsibility would be the storage, transportation, and disposal of HLW. This approach could bring more realism into schedules and budgets and bring greater stability and focus to the HLW program. The NWF could be directly administered by that agency. While the NRC could continue to regulate these activities, the new agency could be overseen by a joint committee of Congress, similar to the Joint Committee on Atomic Energy, which would review and approve the budgets of the agency and NRC (with unexpended receipts remaining available in the NWF). The budgets could be established for multiple years to ensure stability in the level of effort.

This approach would permanently link the NWF to the program, removing it from potential use as general revenue for lowering budget deficits. In addition, by fully applying the one-mill-per-kilowatt-hour HLW disposal charge to its intended use, this approach could lessen the potential for rate-setting commissions to remove the charge from the rate base. This approach would reflect a national will to resolve the HLW problem, and create an environment of greater accountability and credibility.

The NWPA required the Secretary of Energy to undertake a study of alternative approaches to managing the HLW program. In 1983, the Secretary appointed a blue-ribbon Advisory Panel on Alternative Means of Financing and Managing Radioactive Waste Facilities to conduct such a study. In its 1984 report, the panel stated that it "found wanting" such alternatives as an improved OCRWM, an independent Federal commission and a private corporation, and preferred the alternative of a public corporation.

The establishment of such a corporation offers one possible solution to OCRWM's credibility and program implementation issues. The statute creating this independent corporation might insulate it from year-to-year budgetary pressures by providing it the independence to spend its own revenues with minimal congressional budgetary oversight. The statute could empower the agency to go outside the civil service system to recruit staff that possess the special skills and expertise necessary to design and implement programs that are both technically complex and institutionally sensitive. Further, the statute creating the public corporation could restrict its mission to siting, constructing, and operating both a centralized storage facility and a repository and the associated transportation system. The statute could also require the public corporation to obtain substantive predecisional input from potential affected and interested parties.

DOE/OCRWM believes the main question the creation of such an agency raises is how to ensure the requisite congressional oversight and public accountability and the openness and inclusiveness that the success of the waste program requires. Because of concerns that past waste management efforts have been largely unresponsive to public concerns, there may be considerable reluctance to establish a lead organization with any greater independence than DOE for fear that it might be even less responsive to the concerns of Congress, the Administration, and the public. Achieving an acceptable balance between independence and accountability would therefore be one of the central challenges in designing an independent waste management authority. Oversight by a joint committee of Congress might provide that balance.

The Alternative Management and Financing Panel established under the NWA found such a corporation superior to other alternatives based on the five organizational tests weighted most heavily by the panel: credibility, stability, internal flexibility, political immunity, and cost-effectiveness. Its greatest drawback, the panel found, would be the time and costs of transition. However, given the current uncertainties with both the direction and success of the current program, such transitional problems might be outweighed by true, steady progress in the program.

Another concept NRC could propose is the development of a framework that gives Congress explicit decisionmaking responsibility regarding a repository at Yucca Mountain. Recognizing that progress on the ultimate disposition of HLW has been slow and that it took an act of Congress to select a site for characterization, it is arguable that making a decision on a repository in a reasonable amount of time will require Congress to make the decision. Because opening a repository is expected to be such a contentious issue, a licensing hearing and associated Appeals Court litigation could last indefinitely. Therefore, rather than having DOE prepare an application for licensing by NRC, DOE could develop legislation, with comment by both NRC and EPA, for Congress to determine the acceptability of Yucca Mountain for a repository by law.

It is expected that Congress would rely heavily on NRC's evaluation of DOE's data and information and NRC's subsequent recommendation before enacting such a law. NRC could solicit public comment in some fashion during the evaluation of DOE's information, but ultimately, to make real progress, Congress could legislate the acceptability of Yucca Mountain, if justifiable, for repository operations.

Finally, DOE has been characterizing the Yucca Mountain site for more than 10 years to determine whether it will be an acceptable disposal site. DOE's characterization activities have resulted in surface studies, boreholes, and some below-ground experiments. However, it is only in the last 18 months that DOE began tunneling into the mountain and made progress in constructing the

exploratory studies facility. Significant work is yet to be done to demonstrate that Yucca Mountain is suitable for geologic disposal of HLW and can meet the requirements of 10 CFR Part 60.

To lessen the burden of the complex licensing process, NRC could propose the use of a certification process modelled on the way EPA is certifying the WIPP rather than the licensing process currently prescribed by the NHPA. Essentially, certification could be accomplished in one action by NRC, rather than in separate approvals for construction, licensing, and closure. It is expected that construction of the repository could begin before certification had been granted, as happened with the WIPP. DOE's compliance with the established set of standards could be revisited by NRC on a periodic basis, as is the practice in license renewal.

The Commission could develop and articulate its position on the national program and propose any of these ideas to Congress and the Administration through a variety of means.

3. Impacts

No regulatory changes would be required for the Commission to take a proactive stance and articulate its position. However, regulatory changes as well as legislative changes, may be required if Congress and the Administration chose to implement any of the examples described.

If Congress and the Administration implemented the creation of a quasi-Government agency, the technical requirements of Parts 60 and 72 could remain the same, but references to DOE would be replaced, as appropriate.

For Congress to determine the acceptability of Yucca Mountain by law, again, the technical requirements of Part 60, as they are being modified in accordance with ENPA, could remain the same, but references to licensing could be eliminated.

Finally, for NRC certification of a repository instead of licensing, regulations to implement this process would be needed; standards specific to Yucca Mountain might also be required.

Minimal staff resources would be required for 6 months to a year to prepare position documents for Commission consideration and use in communicating with Congress and the Administration.

It is expected that no significant changes in NRC staff resources would be required if a quasi-Government agency were created. NRC would be dealing with a different party as the applicant, but its role would essentially remain the same, unless directed otherwise by Congress.

NRC HLW technical staff would probably not be substantially affected if Congress determined the acceptability of Yucca Mountain by law in that it would be expected that these individuals would be needed to provide an evaluation and recommendation to Congress. However, a reduction in staff primarily involved with licensing and the associated hearing would be possible because licensing would no longer be a part of the process.

If NRC were to certify a repository rather than license it, the NRC HLW program would have to be restructured and reorganized. If certification proved to be less complicated than licensing, public involvement would be less resource intensive and staff to support these activities could be reduced. The current staff effort to modify 10 CFR Part 60 would be refocused without a significant resource impact if the certification model was adopted.

Option 2: Reduce Uncertainty by Modifying NRC's HLW Program

1. Option

Alternatively, or in addition to trying to proactively affect change external to the NRC, NRC could look inward to develop modifications to reduce uncertainty in the national HLW program. Assuming that a repository and a centralized interim storage facility are elements of the national HLW program, the following examples are potential activities NRC could pursue.

2. Discussion

Currently, the repository licensing process provides an opportunity for a public hearing after receipt of an application. Because of the significant public interest in this project, the staff believes that a request for a hearing is inevitable. Recognizing the protracted nature of licensing through an adjudicatory hearing process, exploring methods for reducing the number of issues litigated would be beneficial.

To lessen the number of potential issues to be litigated in the hearing and the Appeals Courts, the agency could pursue methods of obtaining resolution--including binding resolution--during prelicensing or early in a licensing hearing. Currently, issue resolution between NRC and DOE is an iterative process. When an issue is resolved, the NRC staff transmits a letter to DOE stating that it has no additional questions. However, this letter is not binding and the issue can still be reopened at any time as a result of new information. Any issue can be subject to further scrutiny during the hearing process after receipt of an application.

If the Commission adopted this option, the staff would endeavor to develop a number of methods that would make the adjudicatory process more efficient. It is not certain which methods would ultimately be employed or successful, but several potential methods have been identified. These include:

- rulemaking to codify resolution of significant issues in advance of an application or completion of the hearing;
- structuring the hearing process into phases that would permit early resolution of particularly contentious issues, with phased submission by DOE of separate chapters or sections of its application;
- rulemaking to provide for a more informal hearing, in whole or in part, by incorporation of more informal methods of adjudication such as those in Part 2, Subpart L; and,
- negotiation of issues, which could begin now, among the affected parties, including NRC, DOE, Nevada, Nye County, EPA, and NWTRB, for pursuit of stipulations in lieu of submission of expert testimony or other evidence (even if consensus is not achieved, the process might lead to resolution of ancillary issues or a better focus for the expenditure of DOE and NRC resources).

Ideas for reaching early, binding resolution of issues have been presented to the Commission in the past (see SECY-86-323, SECY-89-023).

Another example of how NRC could effect change internal to the agency would be to proceed with regulatory changes to 10 CFR Parts 60 and 72 to address information gained from their use. Part 60 was developed 14 years ago with no experience in licensing a repository. Although Part 60 has not yet been used in licensing, in its review of DOE's program, the staff has had the opportunity to become more familiar with Part 60 and its strengths and weaknesses. Depending on the interpretation and the stringency of implementing Part 60, some are concerned that demonstrating compliance with Part 60 at any site could be complex and unwieldy. Part 60 could be revised to respond to the information gained since its promulgation. Revisions will be necessary in any case to be consistent with NAS recommendations and the forthcoming EPA standard for Yucca Mountain. In addition, revisions are currently being developed in accordance with ENPA.

With respect to 10 CFR Part 72, the regulations are in place to license a centralized interim storage facility. However, although the Commission has previously concluded that spent fuel can be stored safely for 100 years, the renewable license term for an MRS is 40 years, while for an ISFSI it is 20 years. NRC could consider modifying its regulations to allow for storage for

100 years, recognizing that a 100-year license appears in currently proposed legislation. NRC could also evaluate Part 72 to ensure that it is adequate to provide for safe storage for 100 years.

In addition, Part 72 is specific to spent fuel storage. There are currently no provisions to provide for storage of other HLW or GTCC waste. GTCC is currently a disposition problem for reactor licensees involved in decommissioning.

Since 1986, the staff has been working with DOE to encourage DOE's continued development of a program for accepting transfer of, and providing storage and disposal capacity for, commercial GTCC wastes. DOE's progress on developing a program for disposal has been slow, however, because of difficulties in selecting a storage site and because the amount of GTCC waste in existence is limited. It has been generally thought that it would be more cost-effective and efficient to dispose of this waste in the HLW geologic repository rather than in its own separate facility. In the meantime, there is no site available for GTCC wastes.

The staff recently received a petition for rulemaking from a reactor licensee involved in decommissioning to modify Part 72 to provide for storage of GTCC waste. The staff is currently inclined to grant this petition. Along with granting this petition, the staff could also include certain HLW as defined in Part 60 for inclusion under Part 72. As a variation, NRC could request Congress to require DOE to select a storage site for GTCC waste within 1 year.

NRC could also enhance its repository prelicensing and licensing review process in order to effect change internal to the agency to reduce uncertainties in the national HLW program. One method would be to apply a risk-informed discipline in the review of safety issues through an internal, independent review of all proposed staff comments to DOE on repository safety issues. Before being submitted to DOE, proposed NRC comments on the repository could be required to show that a substantial reduction in uncertainty or a substantial increase in performance in protection of the public health and safety is obtained for the repository. The staff could be required to show these results in a quantitative manner or to provide qualitative arguments to support the significance of its proposed comments and to defend its position.

Adding this type of discipline could be accomplished through issuing a staff policy and procedures letter and could eliminate ambiguity in reviewing technical issues. This discipline, along with eliminating ambiguity in Part 60, could greatly enhance the licensability of a repository under Part 60 and could greatly increase the potential for protection of the public health and safety.

Another example of a possible internal change would be for NRC to separate the HLW repository program from the Division of Waste Management (DWM) and create an organization at the office level, reporting directly to the EDO, in a fashion similar to that of the Office of State Programs. Currently, responsibility for the HLW program rests in DWM. The director of this office would provide a single focus of accountability for NRC's role in the licensing of the repository. Creating this office would demonstrate the Commission's commitment to its role in the national HLW program.

In the final example, NRC might develop a program that uses "Designated Engineering Representatives" in licensing a repository or a centralized interim storage facility. This process depends not only on a review by the regulator but also on assistance rendered by designated employees of the applicant. These employees are called Designated Engineering Representatives, who review the design and the design process to ensure, on behalf of the regulator, that all aspects of the regulations are complied with. These "designees" hold key technical positions and are usually selected from the ranks of the firm's more senior engineers, who typically have 15 to 20 years' experience. Such designation is deemed an honor and can enhance the designee's career or stature. These positions are sought after. Many designees hold supervisory positions as well.

Designees are usually nominated by the applicant but are appointed by the regulator if it is satisfied with their personal and professional qualifications and experience. In the capacity of designee, the individual is bound by the same requirements, instructions, procedures, and interpretations as employees of the regulator. The Designated Engineering Representative system enables the regulator to have a substantially increased number of highly qualified technical people reviewing whether or not all of the pertinent regulations and procedures have been satisfied. However, the regulator does not defer or delegate any of its responsibilities to the designees, thus reserving to itself the approval of major elements of the certification process (e.g., major design philosophy affecting safety). The cost to the regulator is primarily the time to review the applications and select the individuals.

This approach to regulation could be adopted by NRC for the HLW program and other programs. It may not require legislation. NRC could designate employees of DOE and its contractors to review the design and the design process for the repository and a DOE centralized interim storage facility to ensure, on behalf of NRC, that all aspects of 10 CFR Part 60 and/or Part 72 are met and that the documentation of decisions and positions important to licensing will meet the rules of evidence for the hearing. This approach could augment the current staff effort while providing added credibility and assurance to NRC's review.

3. Impacts

No regulatory changes would be required to implement resolution of issues through a rulemaking, or use of a risk-informed discipline in the review of safety issues. The staff could incorporate these processes through a staff policy and procedures letter. Minimal staff resources would be required to develop a staff policy and procedures letter. Staff resources would likely be in the tens to implement the examples or other likely actions under this option.

No increase in resources would be necessary for a new office. However, significant restructuring of the HLW program and the remaining programs in the DWM would be required, which would result in a small increase in the use of resources for a short period to develop and implement the new organization.

Option 3: Maintain NRC's Existing High-Level Waste Repository Program

1. Option

Recognizing that it is difficult to anticipate what Congress will ultimately direct and that it may be difficult for the agency to effect legislative change, NRC could respond to existing legislative mandates and see how the national HLW program evolves. The 10 CFR Part 72 regulations and licensing program are essentially in place to handle most likely situations directed by Congress.

2. Discussion

After the FY 96 budget cut, NRC modified its HLW repository program to concentrate on KTIs. Because of insufficient resources to address all aspects of each of the KTIs and because each of these issues encompasses a number of subissues, the staff is using a "vertical slice" approach. This approach has been successfully used in other areas of NRC responsibility, including reactor licensing. To focus and prioritize the work within each KTI, the staff will review a narrow slice or subissue in depth, and conclusions about the broader issue will be inferred from examining this slice in great detail. As each vertical slice is completed, another slice on a different aspect of the KTI will be pursued. In this way, the NRC program can be adjusted to changes in the budget by altering the number of slices being examined. This approach allows for more efficient use of resources in resolving technical issues. Until the uncertainty in the national HLW program is reduced, the NRC HLW program would remain positioned for change. The HLW program can be modified to include preparation for a license application, depending on the action taken by Congress.

The staff has been working with EPA to develop reasonable and implementable standards. The staff is planning to recommend options to the Commission for revising the Commission's regulations to be consistent with these Yucca Mountain specific standards. Options are under consideration to address those areas that have potential for unbounded speculation. For example, not knowing what the nature of the biosphere at Yucca Mountain will be 10,000 years from now (e.g., glaciation, rain forest, a large city surrounding Yucca Mountain), it is difficult to license in accordance with a dose criterion that is to govern for this length of time. The frequency of human intrusion also can lead to unbounded speculation. The staff is engaged in an effort to address these issues, and the Commission will be involved as the rulemaking progresses.

3. Impacts

No regulatory changes or additional staff resources would be required for this option.

Option 4: Take a Minimal Approach to NRC's High-Level Waste Repository Program

1. Option

Recognizing that no definite direction has been provided for the future of the HLW program, NRC could reduce its program to the bare minimum. This course of action would reflect the potential for lack of progress on the Nation's HLW program until DOE submits an application or a national decision is made to proceed with a different program.

2. Discussion

Under the existing national HLW program, NRC is required by law to perform some activities, such as review certain DOE products. In pursuing this option the agency could either limit the depth of these activities or seek legislation to withdraw from these activities all together. A limited staff would be retained to respond to inquiries from Congress, the public, and DOE. In pursuing this approach, NRC would not be relinquishing its commitment to regulate geologic disposal of HLW. Rather, NRC would be recognizing the difficulties in making progress under the existing national HLW program and would therefore be making an effort to save resources until they are required. However, additional resources, beyond current levels, would be required to recreate the program and to more quickly address the issues if DOE submits an application or a different HLW repository program is mandated.

3. Impacts

No regulatory changes would be required for this option.

The HLW program would be reduced to a caretaker level from its present level of FTE resources comprising approximately 40 FTEs. The CNWRA would be dissolved. This action would result in saving more than \$7 million per year based on FY 96 appropriations (i.e., not including use of carryover funds from prior years).

Option 5: Take a Position on the Storage of Spent Fuel

1. Option

Recognizing that an operational HLW repository is more than 10 years away, and that several reactors will lose full core reserve before the end of the century and be forced to turn to dry cask storage, the Commission could recommend that Congress establish a national approach for dry cask storage.

2. Discussion

Historically, the Commission has considered deep geologic disposal an appropriate way to dispose of HLW and spent fuel. The Waste Confidence proceedings have continued to demonstrate that geologic disposal can be accomplished safely. However, the technical and societal acceptability of a specific site such as Yucca Mountain remains under debate. Over the years, considerable national and NRC resources have been devoted to the technical investigation of this and other sites, and additional years and resources will be needed for DOE to develop, and for the NRC to review, a license application. Further, the argument has been made that spent fuel is in fact a valuable resource, and access to it should not be denied future generations. One response to this situation could be for NRC to advocate a national program for dry cask storage to provide ample time for the technical and policy issues to be resolved.

For example, the Commission could advocate at-reactor storage as a safe and effective means for dealing with the nation's spent fuel and ask Congress to modify the national program as needed. At-reactor dry storage has been effectively demonstrated for the past 10 years, when NRC licensed its first ISFSI in 1986. Since that time, no unresolvable safety issues have been identified in the technology or NRC's regulations. The objections to dry storage have evolved around fabrication issues, the general licensing process, and objections to local storage because they believe it may become indefinite storage. Even though some facilities have faced local opposition to dry storage operations, none of these difficulties have amounted to the difficulty DOE experienced in trying to site an MRS as a centralized storage facility.

At-reactor storage, as opposed to centralized storage, provides a staff highly-trained in the more complex reactor events to deal with potential events related to dry storage.

As an alternative, the Commission could advocate centralized storage as potentially offering significant benefits in comparison to storing spent fuel at the power reactor sites throughout the country. Centralization of the waste would allow a more focused safety and inspection program by both DOE and NRC. Operational and programmatic benefits could also be gained by integrating such a facility into DOE's program for accepting waste from utilities. Some of these benefits include facilitating utility planning for storage needs and providing for early planning of the HLW transportation system. A variation on centralized storage would be regional storage, which would provide the same benefits as well as more evenly distribute the responsibility for shouldering the nation's spent fuel.

Although the Commission has not taken a position on the location of a centralized or regional facility, based on the difficulty DOE experienced in siting an MRS, the Commission could ask Congress to specify a location(s). With respect to a single facility, the Commission could note to Congress that the amount of transportation would be reduced if the facility were located in the same place as a repository.

Recognizing the opposition to Yucca Mountain and other potential repositories, the Commission could advocate any of the above examples as an approach for dealing with the Nation's HLW indefinitely. In articulating a position to advocate indefinite storage, the Commission could build upon its Waste Confidence findings of 1990 that concluded that spent fuel could be stored safely for 100 years. The Commission could also state, and ask that Congress confirm, that this approach does not invalidate the NRC's Waste Confidence decision. A license could be issued for a term longer than the 20 years currently allowed by the regulations, but recognizing that an ISFSI license is renewable, a single term of 100 years would not be necessary. The Commission could commit to periodically revisit the safety of long-term dry storage.

Recognizing that a near-term proven solution with long-term results could be provided with dry storage, the Commission could also advocate full reconsideration of the alternatives for the ultimate disposition of HLW on a periodic basis, such as every 20 years. Methods other than geologic disposal for ultimate disposition of HLW have not been seriously considered since the mid to late 1970s. With the continuing development of modern technology, there may be benefits from a safety, environmental, energy independence, or economic perspective to revisit alternative methods of disposition.

3. Impacts

No regulatory changes would be required for the Commission to articulate its position. However, regulatory changes as well as legislative changes, would be required if Congress and the Administration chose to implement any of the examples described. For example, if Congress chose to pursue at-reactor storage indefinitely, it would need to re-evaluate the need for the NWF and all of the funds that have been provided by the utilities to date.

If indefinite storage were pursued, changes to 10 CFR Part 72 would be required. The technical requirements would probably remain the same, but Part 72 would probably be modified to include HLW other than spent fuel, as well as GTCC, and the term of license for an ISFSI would have to be modified.

Minimal staff resources would be required for 6 months to a year to prepare position documents for Commission consideration and use in communicating with Congress and the Administration.

If Congress and the Administration chose to proceed with indefinite storage, the resource impacts on NRC's HLW repository program would be significant. (A small NRC HLW staff might be retained to monitor and review DOE's disposal activities.) The program would be reduced to the caretaker level, down to approximately five FTEs (from approximately 40 FTEs) and dissolving the CNWRA would provide a savings of about \$7 million per year based on FY 96 appropriations (i.e., not including use of carryover from prior years). It is expected that DOE would be responsible for revisiting alternative methods for disposition.

The resources required for a rulemaking to modify 10 CFR Part 72 to accommodate aspects of indefinite storage would be several staff members for about 2 years. Resources to review a centralized interim storage facility, without consideration of the potential impacts of pending legislation, are currently planned in the budget for the Spent Fuel Project Office (SFPO) at approximately two FTEs and \$500,000 for FY 1998-2000. If a Federal centralized storage facility were licensed, it is expected that few new dry storage systems or ISFSI applications would be submitted, and the SFPO's FTE resources could be significantly reduced from its current level of approximately 50 FTEs. Spent fuel activities would continue at a caretaker level, and combined with the organization's nonspent fuel transportation activities, the total resources required would probably be reduced by half. However, if indefinite at-reactor storage were pursued, the SFPO would need to remain at its current level, if not increase, to handle the increased number of applications expected.

V. RELATED ISSUES

After the Commission has made decisions concerning the Direction-Setting and Subsumed Issues discussed above, additional issue(s) such as those related to implementation details will be addressed as the Strategic Plan is implemented. The Related Issues are listed in this section to provide a more complete understanding of the higher level Direction-Setting and Subsumed Issues.

- A. How can the NRC staff assure compatibility for spent fuel storage and transportation in the regulations?

Recognizing that a centralized storage facility and/or a repository are expected elements of a national HLW program, the transportation of spent fuel is inevitable. Industry is moving heavily toward the development of dual-purpose systems because of the spent fuel handling efficiencies gained with a system designed for both storage and transport. With the recent staff review of applications for dual-purpose systems, some differences in the regulatory processes for NRC approval in storage and transportation have been identified. Without a Federal national program like the MPC system, several more new applications are expected. The NRC staff needs to assess the differences between the two sets of regulations and ensure compatibility before it becomes overwhelmed with numerous applications for dual-purpose systems.

- B. What should NRC do to assist Part 50 licensees that have terminated their power reactor operations and are planning to decommission their pools and obtain a Part 72 license and need to dispose of their greater than Class C waste?

Utility-generated GTCC waste consists mainly of highly irradiated reactor components with fixed contamination, such as in-core radiation monitoring instrumentation. To date, the 10 CFR Part 50 licenses of reactor licensees have allowed them to store this waste under Part 30, in accordance with 10 CFR 50.52. However, Part 50 licensees are now beginning to decommission their power plants and need a means for dealing with their GTCC waste so they can terminate their Part 50 license. These licensees are usually beginning dry spent fuel storage operations under a Part 72 license and are decommissioning their pools. As mentioned under Option 2, the staff recently received a petition for rulemaking from a decommissioning licensee to modify Part 72 to provide for storage of GTCC waste. The staff is inclined to grant this petition. Along with granting this petition, the staff could also include other HLW as defined in Part 60 for inclusion under Part 72.

VI. COMMISSION'S PRELIMINARY VIEWS

Staff actions regarding the various options should be held in abeyance pending the Commission's final decision on this issue paper.

The Commission's preliminary view on this issue is to proceed with Option 3 (Maintain NRC's existing HLW Program). This approach would enable NRC to continue to support the national HLW program at whatever level is appropriate to keep pace with the national program. However, the Commission intends to revisit this issue if, and when, the Congress provides further legislation on this issue.

In addition, the Commission would like to explore taking a more active role in resolving issues in the national HLW program, consistent with NRC's mission. The Commission particularly seeks public comment on what additional activities the NRC might reasonably undertake.

ACRONYMS

AEA	Atomic Energy Act
CFR	Code of Federal Regulations
CNWRA	Center for Nuclear Waste Regulatory Analyses
DOE	Department of Energy
DSI	direction-setting issue
DWM	Division of Waste Management
EDO	Executive Director for Operations
ENPA	Energy Policy Act of 1992
EPA	Environmental Protection Agency
FAA	Federal Aviation Administration
FY	fiscal year
GTCC	greater than Class C
HLW	high-level waste
ISFSI	independent spent fuel storage installation
KTI	key technical issues
MPC	multi-purpose canister
MRS	monitored retrievable storage
NAS	National Academy of Sciences
NRC	Nuclear Regulatory Commission
NWF	Nuclear Waste Fund
NWPA	Nuclear Waste Policy Act of 1982

ACRONYMS (continued)

NWPAA	Nuclear Waste Policy Act of 1982, as amended
NWTRB	Nuclear Waste Technical Review Board
OCRWM	Office of Civilian Radioactive Waste Management
SFPO	Spent Fuel Project Office
WIPP	waste isolation pilot plant