

No. S-95-03
Tel. 301-415-8200

Remarks by Ivan Selin
Chairman, U.S. Nuclear Regulatory Commission
before the
International High-Level Waste
Management Conference
Las Vegas, Nevada
May 1, 1995

Progress Towards Understanding - Spent Fuel Storage and Disposal

INTRODUCTION

Good morning ladies and gentlemen. I am pleased to be here this morning to discuss with you the NRC perspective on the status of the national program to store and dispose of high-level radioactive waste. The theme of the conference this week is "Progress Towards Understanding." Papers to be presented at this conference and those presented at past conferences attest to the fact that progress is being made in DOE's determining the technical site suitability of the proposed repository site at Yucca Mountain. However, progress has come in small increments and until now has been exceedingly slow, contentious, and expensive. Moreover, many obstacles remain to continued progress in both the technical and policy arenas.

It is not my intent this morning to dwell on the problems of the past. Rather, my remarks will focus on the progress that has been made in the storage and disposal of spent fuel and the formidable challenges that remain, all from a broad health and safety point of view. In particular I will attempt to underscore those challenges that represent the greatest obstacles to reaching a permanent solution to the disposition of spent nuclear fuel.

Because of recent changes that have occurred in the high-level waste program and because of changes that are likely to occur in the near future, now is an appropriate time for a constructive dialogue on the management of spent fuel. Specifically, DOE has implemented its new Program Approach, emphasizing both the development of a multi-purpose spent fuel canister and an early determination of technical site suitability of the Yucca Mountain site. This program has produced significant, and, I believe, positive changes in the geologic

repository program. However, changes of greater magnitude are likely in the near future because of Congressional frustration with both the slowness and high cost of the repository program.

The reasons for the frustration are quite apparent. It is now more than thirty years since the first Federal efforts to devise a permanent solution to the problems of civilian radioactive waste disposal, and more than fifteen years since the Federal government found deep geologic disposal of high level waste to be feasible. And yet, we now face the dawn of the new millennium without a permanent solution.

NRC's role in finding a permanent solution rests in its responsibility to protect the public and the environment through the licensing of all phases of spent fuel management -- on-site storage, centralized interim off-site storage if it occurs, and eventual disposal. For the protection of the public health and safety there must be a coherent effort directed towards all phases of spent fuel storage and disposal. I believe that DOE's new Program Approach has the potential to add significantly to our confidence that a comprehensive and systematic plan exists for managing all phases of the disposition of spent nuclear fuel. However, progress must occur in all phases of spent fuel storage and disposal if lasting progress is to be made in reaching a permanent solution. In particular, the Program Approach's welcome new emphasis on a multipurpose canister cannot come at the expense of progress on the repository.

There are other benefits in having a coherent, comprehensive spent fuel plan in place, not the least of which will be the increased confidence that the public would gain from knowing that there is a clear, phased path to permanent disposal. As I will describe later in my presentation, the absence of a clear path to permanent disposal has resulted in the public's questioning the safety and basis for on-site storage at reactor sites. The absence of this path is also an impediment to stopping the spread of reprocessing overseas, a major contributor to the risk of nuclear proliferation -- but that is a topic for a different speech.

Given the amount of radioactivity locked into the spent fuel, failure to solve the spent fuel problem would be an environmental failure of the first magnitude. Moreover, without a solution to the spent fuel problem I doubt that nuclear power can continue to be a safe and environmentally acceptable method of generating power. It is ironic that, in the end, it might not be economics but spent fuel storage and disposal that determine the viability of nuclear power in the United States.

I now would like to discuss in greater detail our views on the status and obstacles-to-success in all phases of spent nuclear fuel management, including interim on-site storage,

centralized interim off-site storage, and a geologic repository for disposal.

INTERIM ON-SITE STORAGE

The NRC, in the original waste confidence finding of 1984, determined that spent fuel could be stored safely for at least 30 years beyond the expiration of a reactor's operating license, for a total storage period of 70 years. This finding was updated in 1990, extending the period that spent fuel could be stored safely at reactor sites to at least 100 years. These findings were based, in part, on the assumption that spent fuel could be stored on-site while a repository for permanent disposal was characterized and constructed. This assumption is still valid but it is starting to come under challenge. An increasing number of plants find themselves obliged to provide additional spent fuel storage on-site for a longer period than originally planned. Many of these plants have reached or will soon exhaust reactor pool storage capacity. These plants will be forced to move towards dry storage as the only available option for additional spent fuel storage.

NRC considers both wet and dry storage to be safe technologies, but we view dry storage as by far the preferred method for supplementary storage of mature spent fuel at operating plants. Moreover, as I will describe in greater detail later in my remarks, at those plants in premature or extended shutdown, the NRC finds several strong reasons why we would prefer to see dry storage systems replace existing fuel pools for on-site storage.

Although we have confidence that spent fuel can be safely stored on-site for at least 100 years, we recognize continuing challenges to such storage. The three greatest challenges are:

- * the negative response of the public to the operation of dry storage facilities at reactor sites,
- * burdens involved in operating spent fuel pools at plants that are no longer operating, and
- * the fact that most current storage casks are neither designed nor certified for transportation of spent fuel, either to a centralized storage facility or to a repository.

The response of the public and some professionals to dry storage at reactor sites has been troubling, particularly when we consider the outstanding safety performance of spent fuel storage systems. Some of the negative reaction can be attributed to an understandable but unjustified fear that an on-site spent fuel storage facility could become a *de facto* repository -- unjustified because all the spent fuel will continue to be stored

at the site in all cases -- either in pools or in the less risky dry receptacle if one is built.

To address this challenge a coordinated effort is needed to promote a better understanding of the very low risk associated with dry spent fuel storage. But we must recognize that people are unlikely to support the shift to dry storage technology until they see that there is a workable solution to permanent disposal. Only in this way will public confidence reach a level such that on-site dry storage is considered at least as safe and acceptable as the more problematical in-pool on-site storage.

Recent decommissioning efforts at the Shoreham and Yankee Rowe plants, and the recent freezing and rupture of the service water system for the spent fuel pool at the shut-down Dresden 1 plant, have focused our attention on the safe operation of spent fuel pools at plants 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 not always receive adequate attention once the plant is shut down permanently. Without near term access to a centralized storage facility there is a compelling case for moving all the fuel at these shut-down plants to a modern dry storage system. Put simply, dry storage offers fewer opportunities for things to go wrong.

A final challenge to interim on-site storage relates to the design of casks certified for storage. These casks were designed and certified for on-site storage only and cannot be easily modified for transportation. Furthermore, there are only a limited number of rail and truck transportation casks available should fuel need to be transferred to a centralized storage facility or a repository. DOE's multi-purpose canister program is intended to address this problem. In 1998, DOE foresees obtaining the initial MPC certification for storage and transportation under Parts 72 and 71 of the Commission's regulations, respectively. Later the MPC with appropriate overpack would be evaluated as part of the overall repository system in meeting Part 60 performance objectives. If DOE submittals are timely and adequate we believe that we will be able to complete the required rulemakings to support the storage and transportation certification of the large and small MPC systems by the end of 1998.

CENTRALIZED INTERIM OFF-SITE STORAGE

NRC continues to believe that at-reactor storage is safe. However, centralized storage, an alternative to leaving spent fuel stored at 74 or more sites distributed throughout the country, offers significant benefits. Risk obviously would be reduced. There would also be a significant savings to ratepayers by providing for concentrated NRC and DOE inspection and

surveillance programs. We also believe that there would be operational and programmatic benefits to be gained by integrating such a facility into DOE's program for accepting waste from utilities.

It is my personal view that because there are safety, technical, cost, and programmatic advantages to a centralized interim off-site storage facility, legislation directed towards establishment of such a facility could partially resolve one of the most vexing environmental issues facing this nation. Therefore, I support those parts of the bills currently before Congress that would provide for a centralized off-site storage facility, but I take no position on where such a facility should be located.

DISPOSAL IN A GEOLOGIC REPOSITORY

We continue to believe that deep geologic disposal is a sound and technically feasible solution to the problem of permanent disposal of spent nuclear fuel and other high-level radioactive wastes. Accordingly, we are confident that, assuming sound science is used to demonstrate that a site meets NRC requirements, the Commission will be able to determine with reasonable assurance that spent fuel and other high-level radioactive wastes can be disposed of safely in a geologic repository.

With respect to ongoing site characterization activities at Yucca Mountain, to date we have identified no technical problems that would indicate that the site is unsuitable or unlicensable under existing regulations. However, NRC continues to have concerns. Past reviews have raised programmatic and technical issues with DOE's program. Implementation of the Program Approach places new emphasis on resolving these issues in a timely manner.

The Program Approach has resulted in significant changes to previous plans to characterize and license a geologic repository at the proposed Yucca Mountain site. Although the early emphasis on addressing important technical issues for suitability and licensing is a positive step, it is still unclear what the scope and significance of a technical site suitability determination will be. In particular, DOE has yet to settle on a reference design for the repository other than to suggest that a range of thermal loading strategies will be considered. Without such a design, it is difficult for the NRC to assess whether the information to be collected will be sufficient to support a determination of suitability or to support a license application.

The determination that the site is suitable for further characterization, leading to submittal of a license application, is a DOE responsibility. However, because of our concern with the ambiguity of the Program Approach and because a technical

suitability finding is an intermediate step in developing a geologic repository, the NRC intends to review, evaluate, and comment on the results of DOE's site suitability findings. Our reviews will focus on key technical issues associated with licensing a repository. These focused reviews should determine whether DOE is collecting sufficient data to support licensing needs and will facilitate an evaluation of how well DOE's Program Approach is working.

Other challenges are posed by the Program Approach. The approach contemplates the issuance of an initial license based on a range of thermal loadings. DOE expects to select an operating thermal load for emplacement by 2008. This approach may depart from the thinking underlying the guiding regulation -- 10 CFR Part 60 -- which envisioned a single repository design through all phases of construction and operation. This approach also has implications with respect to when we will initiate our formal review process for the license application. If necessary, we are prepared, within limits, to adapt our process to address concepts in the Program Approach so long as health and safety are protected. We cannot afford to be, in the Vice President's words, "obsessed with procedures but oblivious to the results."

In addition, there are three ongoing activities at the national level that could require modifications to NRC's regulations. First, the National Academy of Sciences is reviewing the technical bases for standards for a Yucca Mountain repository. Second, we are examining all our regulations to determine whether they are obsolete, unnecessarily burdensome, too prescriptive, or duplicate other agencies' regulations. Finally, high-level waste-related legislation currently under consideration in Congress would force the NRC to amend existing regulations for the disposal of high-level radioactive waste in geologic repositories.

Any changes required to adjust Part 60 to Congressional or Administration mandates are likely to kindle considerable concern among the public. Therefore, should changes become necessary, NRC will ensure that ample time is provided for public involvement.

SUMMARY

In summary, I wish to reiterate that although progress has occurred in the technologies associated with the storage and disposal of high-level radioactive waste, many obstacles remain to finding a permanent solution. Without significant progress towards finding a solution to disposal, on-site storage and centralized off-site storage will continue to encounter resistance from those who believe one or the other option could result in the establishment of a *de facto* disposal facility. Legislation would be very useful to break this logjam.

Further, if lasting progress is to be made towards a final solution to the problems associated with high level waste, it is critical that progress must occur in all phases -- interim on-site storage, centralized off-site storage and a geologic repository. As a result, funding of the high-level waste program must be at sufficient levels to maintain progress in all phases. Starving one phase to the benefit of another could result in the eventual collapse of the entire program.

Finally, neither the ratepayers nor their representatives in Congress will continue to accept progress in siting and licensing a geologic repository at the rate or cost that have occurred in the past. Scientists and engineers working on this project at DOE, NRC, and elsewhere must be prepared to increase the efficiency and rate of progress substantially without decreasing the high quality of work necessary to ensure that public health and safety will be protected.

Thank you.