

MONITORED RETRIEVABLE STORAGE: A STATUS REPORT

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ABSTRACT

The Department of Energy's progress in complying with Section 141 of the Nuclear Waste Policy Act is reviewed. The population includes a discussion of the contents of the Monitored Retrievable Storage (MRS) Proposal to the Congress, including the findings of the Department's evaluation of the need for and feasibility of MRS. Institutional aspects of the Proposal are also addressed.

INTRODUCTION

During the past three years the Department of Energy has had under preparation a proposal to the Congress for the inclusion of a monitored retrievable storage (MRS) facility in the waste management system. This proposal effort was initiated in response to Section 141 of the Nuclear Waste Policy Act (NWPA) of 1982 that instructs the Secretary of Energy to prepare a proposal for the construction of one or more MRS facilities. The NWPA states that the proposal to the Congress shall include the establishment of a Federal program for the siting, development, construction, and operation of such facilities; a plan for funding facility construction and operation; a plan for integrating the facility with other storage and disposal facilities authorized in the NWPA; and site-specific designs and cost estimates. The proposal was also to be accompanied by an environmental assessment and an evaluation of the need for and feasibility of such a facility.

The proposal efforts of the Department regarding MRS recently culminated in the completion of a three volume document that addressed all those items that Congress requested in Section 141. Volume 1, the Proposal, includes the Department's specific recommendations for the inclusion of MRS in the waste management system. These recommendations range from specifics on the recommended site for the facility, the former Clinch River Breeder Reactor in the Roane County portion of Oak Ridge, Tennessee, to provisions for impact assistance and other monetary reimbursements to the local and State governments surrounding the proposed site. Volume 2, the Environmental Assessment, is divided into two parts. Part 1 examines the need for an feasibility of constructing an MRS facility as an integral component of the waste management system. Part 2 includes descriptions of two facility design concepts at each of the three candidate sites, and a detailed assessment and comparison of the environmental impacts associated with each of six site-design combinations. The third volume, the Program Plan, describes activities, costs and

schedules for establishing a Federal program to develop, construct, and operate an MRS facility, if approved by the Congress. It presents plans for funding the construction and operation of the facility and for integrating the facility with other waste management facilities authorized by the Nuclear Waste Policy Act of 1982.

The Department was prepared to submit the proposal to the Congress on February 10, 1986, but was prohibited from doing so by the issuance of a declaratory judgement and a subsequent Federal court injunction handed down from the Middle District of Tennessee for the plaintiff in the suit, the State of Tennessee. Without commenting on the specifics of the suit, I would like to state that the Department quickly appealed the declaratory judgement and the injunction and asked for immediate relief from the Sixth Circuit Court of Appeals to submit the proposal to the Congress.

The Need for MRS

During the development of the proposal, the Department focused on identifying the quantifiable benefits and costs brought about by the addition of an MRS to the system. The results of the Department's analysis were presented in a Preliminary Environmental Assessment, that was released to the State of Tennessee last November, and in the review copy of the Proposal that was distributed to the Environmental Protection Agency, the Nuclear Regulatory Commission, and the State of Tennessee last December.

As the study of the need for MRS proceeded, it became apparent that the value of an MRS to the waste management system would derive from its ability to improve the overall performance of the system. As has been stated in the past, the waste management system could be operated safely without an MRS facility, but including the facility improves the Department's ability to develop and operate the functions of the system. Both the presently authorized system and the MRS system are capable of attaining the desired goal of ultimate radioactive waste disposal as presented in the NWPA, but in different ways and with different system vulnerabilities and efficiencies.

To provide some insight into the Department's views of the value of the MRS to the waste management system, we should first review the presently authorized system and then the same system with an MRS included.

The presently authorized system for the permanent disposal of spent reactor fuel includes only the waste generators, the transportation system and the first repository. (From this point on for comparison purposes, I shall refer to the presently authorized system as the no-MRS system, all of the pre-waste emplacement functions are performed at the repository or at the operating reactor sites. The transportation system would be responsible for moving spent fuel from all appropriate reactor sites, mostly in the eastern part of the nation, the first repository. Present schedules project that the Department would begin accepting spent fuel at low rates (400 MTU/year) from utilities into the no-MRS system in 1998 and that full scale acceptance (3000 MTU/year) would be achieved by the year 2003.

In the system with an MRS, as envisioned by the Department, the functions of the MRS facility would be threefold:

- 1) To provide an eastern hub for the transportation of spent fuel from eastern reactors to the first repository.
- 2) To perform most waste packaging functions for final emplacement that up to this point have been assigned to the repository.
- 3) To provide additional temporary storage capability to the waste management system for operational contingencies.

In contrast to the no-MRS system, the MRS system would have a separate facility centrally located to the majority for spent fuel scheduled for emplacement in the first repository from eastern and mid-western reactors. As a result, fuel from those reactors would be first shipped to the MRS by rail or truck. Fuel packaging functions (consolidation and canisterization) would then take place at the MRS facility. After consolidation into standard canisters, the spent fuel would be shipped from the MRS facility to the first repository in large casks aboard dedicated trains. The final disposal container, if necessary, would be added at the repository over the MRS-prepared canister. In addition to providing remote packaging functions, the MRS is also designed to provide the system with the capability to store approximately 15,000 tons of spent fuel on site. Regarding the MRS facility schedule, assuming that approval from the Congress occurs before the end of this fiscal year, the MRS would begin operations in 1996 - two years before the projected start of repository operations in the no-MRS system and would reach nearly full scale operations (2550 MTU/year) five years earlier than the no-MRS system.

Given the background, what are the tangible benefits of incorporating an MRS into the waste management system? From the Department's analysis, the significant advantages of the MRS can be summarized as follows:

A. Improvements In System Development

The MRS facility would decouple the development of pre-emplacment and emplacement functions of the system. The effect of this decoupling would be to separate the repository development and emplacement activities (the back end of the waste system) from reactor unloading, spent fuel transportation and packaging activities (the front end of the waste system) - those activities that must precede final emplacement. Thus, a two step process for implementing the waste system would be undertaken, allowing management efforts to be focused accordingly.

The earlier start date of the MRS (1996), would advance the identification and the development of the transportation system. Specific routing, logistics and equipment requirements for spent fuel shipment from reactors would be determined to five years earlier than present schedules. This earlier implementation of the transportation system would allow interaction with affected States to occur on a much earlier time frame, thereby giving more time in many instances to overcome institutional barriers that may arise.

B. Accelerated Waste Acceptance from Utilities

The MRS would allow the system, under current schedules, to receive spent fuel at nearly full scale rates five years sooner than the no-MRS system. With an MRS in the system, 15,050 MTU of spent fuel will have been received by the year 2003 as opposed to 3,900 tons without an MRS. This would significantly reduce the need for storage at reactor sites and attendant spent-fuel handling operations and costs.

C. Improvements in the Reliability and Flexibility of the System

The storage capability at the MRS would provide relatively inexpensive contingency storage in case of changes in the emplacement schedule at the first repository. It would also provide an operational buffer between waste acceptance and waste emplacement operations that would allow both to operate independently. With this capability, operating disruptions would not cascade through the system. During early years of system operation, this buffer would allow flexibility in balancing waste acceptance commitments made to utilities in 1991 (which will likely be lower than the no-MRS system acceptance capabilities) with start-up considerations and still somewhat uncertain repository acceptance rates and operating considerations.

D. Advantages for the Repository

By performing most waste handling functions for the system, the MRS would simplify the waste-handling operations of the repository. In real terms this means that the repository would be handling fewer shipments of waste canisters that would be free of any surface contamination with radioactive material. One additional advantage of the MRS system would be increased control of the rate of waste transfer to the repository that would enhance the efficiency of repository operations.

E. Improvements in the performance of the Transportation System

Since the MRS would ship consolidated spent fuel assemblies in dedicated trains to the repository, the facility would bring about a significant reduction in the number of shipments that would be made to the repository, while minimizing the distances of spent-fuel shipments made in less efficient truck mounted casks. Being centrally located for most reactors serviced by the system, it would serve as a hub for transportation operations, and markedly reduce the number of cross-country shipping routes and shipments in transit at any one time.

The Costs of MRS

The addition of a large nuclear facility to the waste management system will not be accomplished without some additional cost. Our present estimates show that the net cost increase to the system of constructing and operating an MRS would range between \$1.6 and \$2.6 billion. These costs translate to a percentage system cost increase of 5 - 11%.

Given this increase in system costs, one might ask the question: Are there other ways of attaining the same benefits of MRS without adding a new facility to the system? To answer this question, an analysis was performed that looked at all aspects of the no-MRS system and how they could potentially be improved. The results of this analysis are presented in Volume 2 of the Proposal. The conclusion reached, after a thorough review of a number of no-MRS system options, was that, although several modifications evaluated could potentially improve individual aspects of the no-MRS system and could provide some of the same benefits as the MRS facility, no single improvement or combinations of improvements provides the same total system performance improvements as does deploying an MRS facility.

For the remainder of my remarks, I would like to address the unique aspects of the development of the Proposal itself that, from the Department's perspective, are precedent setting and in many cases controversial both inside and outside of government. In addition, I would like to review

some of the intangible benefits that the MRS can bring to the waste management system - benefits that have been difficult to quantify from the standpoint of dollars and cents during our evaluation of the MRS concept.

Institutional Interaction

Recognizing the complex institutional challenges that would be faced by the Department, Congress set forth in the NWA one of the most comprehensive outreach and public involvement plans ever mandated. The major institutional provisions of the NWA include requirements for notifying affected parties of various planned activities and soliciting their comments; consulting and cooperating with States and affected Indian Tribes and committing plans for such interactions to written agreements; assessing the effects of program activities on States and affected Indian Tribes, and local communities at frequent intervals throughout the program's implementation; and a substantial commitment to avoid or mitigate any negative impacts.

The participation of the government of the host State has always been held by the Department as crucial to the successful siting and development of the MRS program. To facilitate its participation, the Department awarded to the State of Tennessee a grant of \$1.4 million for evaluating the MRS Proposal as well as providing for other early interactions. After the announcement in April 1985 that three Tennessee sites were to be considered for the MRS facility, Governor Lamar Alexander initiated a State review of the MRS program and directed that it be coordinated through the Tennessee Safe Growth Cabinet Council. The Safe Growth council then initiated a range of efforts, drawing on the expertise of a large number of State and local officials and respected professionals from the academic and technical communities. Roane County and the City of Oak Ridge, the local governments sharing jurisdiction over the sites identified as the Department's preferred and alternative choices, were among those invited to participate. A similar invitation was extended to the local government in the Hartsville area, the location of the other alternative site. To evaluate the acceptability of an MRS facility at the Oak Ridge sites, the Clinch River Task Force was established in July 1985. The Task Force limited its activities to the determination of whether the proposed MRS facility would be acceptable to the Roane County and Oak Ridge Governments and, if so, under what conditions.

As discussed in its report completed in October 1985, the Clinch River Task Force found that the proposed MRS facility "could be made acceptable to the communities of Roane County and Oak Ridge" if the Department would comply with the conditions recommended by the Task Force. The issues, potential impacts and mitigating measures identified by the Task Force in that context (its special insights into local conditions and attitudes) and by the Safe Growth Cabinet Council were important in the formulation of several portions of the proposal.

These specific areas included the involvement of State and local governments, assurance about safety and environmental quality, and financial assistance.

Without delving too deeply into the specifics of the Department's comprehensive response to the Task Force's recommendations, I would like to point out two specific areas that major efforts were made by the Department in the MRS proposal to deal with the concerns of the citizens and public officials in the Oak Ridge area.

MRS Steering Committee

To provide a mechanism for State and local involvement in the implementation of the MRS project and for obtaining recommendations and evaluations regarding the design, construction, operation, and decommissioning of the proposed facility, the Department will propose to the Congress that establishment of an MRS Steering Committee. The Steering Committee would provide overall guidance to the MRS effort, conduct performance evaluations and recommend corrective actions regarding the operation of the facility. As presently envisioned by the Department, the Committee would be composed of five members representing the utilities that contribute into the Nuclear Waste Fund, and a chairman that would be named by DOE in consultation with the Governor.

The Steering Committee would also have the authority to establish and maintain specialized subcommittees or ad hoc committees to review or provide oversight on particular areas of interest or concern. In this regard, the DOE project or plant manager will have formally assigned responsibilities to be responsive to the Steering Committee's actions. Areas of concentration for subcommittees, that are mentioned in the proposal, are Environment Safety and Health, Transportation, Public Information, and Financial Matters.

Consultation and Cooperation Agreement

Although the MRS Steering Committee would provide a mechanism for the direct and continuous involvement of State and local governments in the management and oversight of the MRS project, it would only be part of the baseline interaction agreement, called the Consultation and Cooperation (C&C) Agreement, that would be negotiated between the Department and the State of Tennessee. Such an agreement is provided for under Section 117 of the NWPA and would become applicable should the Congress approve the facility.

In accordance with this provision, the Department would seek to enter into a binding written C&C Agreement with the State of Tennessee within 60 days of Congressional approval of the proposal. The agreement would be an "umbrella contract" between the Department and the State. It would cover all the items deemed important by the State, the local community and the Department in addition to or as part of the specific requirements of the NWPA for this agreement. Some of the major items would include:

1. How the MRS Steering Committee would be formed and function.
2. How the State or the Department may alter the agreement.
3. How the Department shall assist the States or units of local government in resolving offsite concerns.
4. How the cooperation between the State and the Department would take place on a regular basis.
5. How the objections of the State are resolved at any stage of the project through negotiation, mediation, or other mechanisms.

Although most of the above provisions address State concerns, it is expected that the concerns of the local communities surrounding the site would be incorporated throughout the development of the C&C agreement with the State. This would include the degree to which issues of purely local concern would be left as a matter of negotiation or agreement between the unit of local government and the Department directly.

Intangibles

To bring my presentation to a close, I would now like to address some intangibles that the MRS can provide to the waste management system. The intangible benefits due to the inclusion of a fully integrated MRS into the waste management system can be categorized to fall basically into two main areas -- institutional benefits and public and utility confidence.

The institutional benefits are those lessons we are learning and would continue to learn in interactions between the Department and State and local government that will occur on virtually every issue until an MRS is sited, constructed and operated. One of the benefits of the MRS mentioned earlier was the early identification of the transportation system and the attendant effects related to the development of early working relationships with those States that would have shipments of spent fuel passing through them when the system becomes operational. But the development of the MRS will produce broader institutional benefits than just those expected for the transportation system. For example, the experience gained from interactions with the State of Tennessee would allow better definition of certain institutional arrangements for the repository system. Furthermore it would allow the Department to demonstrate to the potential repository host States, potentially affected Indian Tribes, local governments and the public that facilities developed under the NWPA will be safe and responsible corporate citizens and neighbors.

Finally, the public and utility confidence area refers to the general perception of the public and utilities regarding whether the ultimate job will be done. The problem of long term high level radioactive waste disposal has been with us since the initiation of the Manhattan Project during World War II. Many unsuccessful attempts were made in the past to deal with this issue with various forms of legislation until the first comprehensive public law, the NWPA was passed in 1982. Now we are faced with the first real test of that law. The question before the Congress with the

MRS is whether or not we are going to take positive, concrete action towards a final solution of the high level radioactive waste problem. Should the MRS be approved by the Congress, it is our belief that the entire program will gain momentum not only from the construction and operation of the MRS facility but also from the public's confidence that the overall problem is gaining a solution. In conclusion, we believe that public confidence and acceptance of this program, through the approval of MRS, cannot but help facilitate the massive task we face in this area.