THE OCRWM TRANSPORTATION PROGRAM

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ABSTRACT

The Nuclear Waste Policy Act of 1982 (NWPA), as amended, directs the U.S. Department of Energy (DOE) to develop a national system for the management and disposal of spent nuclear fuel and high-level radioactive waste. DOE established the Office of Civilian Radioactive Waste Management (OCRWM) to meet the NWPA mandate. An integral element of the projected waste-management system is preparing for the transportation of the waste. The OCRWM has organized the transportation element of the waste-management system into four major areas: (1) cask development, (2) operational planning and support systems development, (3) economic and system analysis, and (4) institutional interactions. The schedule for the development of the transportation system continues to be coordinated with that of the waste management system as a whole. The development of the transportation system has the basic goal of establishing shipping capability by 1998, to meet the new expectations of a Monitored Retrievable Storage (MRS) site by that time.

OCRWM TRANSPORTATION PROGRAM

Significant progress has been made to date in the development of the NWPA transportation program. Present and planned initiatives and activities in the four major areas are discussed below, including schedules to meet the recent changes in the OCRWM program direction.

Cask Development

The OCRWM is proceeding with the design and development of "from-reactor" casks for shipping waste either to a repository or an MRS facility. The Nuclear Regulatory Commission (NRC) will certify all cask designs. Contracts to develop preliminary cask designs for two legal-weight truck casks and three rail/barge casks were awarded in 1988. The preliminary designs for all five cask contracts were submitted to DOE and have undergone review. In accordance with the contracts, the DOE instructed the contractors not to proceed into final design without DOE approval.

Given programmatic and budgetary considerations, OCRWM has reviewed the scope of the cask program and decided to focus its resources on the continuation of one legal-weight truck design and one rail/barge design, with fabrication of the casks expected to begin in 1996. The second rail/barge and the remaining legal-weight truck cask designs are to be funded at a lower level and will concentrate their efforts on key technical features. The third rail/barge cask design is to be cancelled.

Given the above approach, DOE conducted an evaluation of each of the five cask design efforts. As a result of this evaluation, the DOE has made the following decisions. The General Atomics legal-weight truck cask design contract is proceeding as previously planned and the Westinghouse Electric Corporation contract has been substantially slowed down. For the rail/barge cask designs, the Babcock & Wilcox design is continuing as previously planned, the Nuclear Assurance Corporation contract has been substantially slowed down, and the Nuclear Packaging, Inc. contract is cancelled.

The option to design overweight truck casks and dual-purpose rail/barge casks were included in the original plans for from-reactor cask development. Efforts for both have been deferred while evaluations are made on the level of advantage they could give the program.

Other initiatives planned for future years are the designs and development of casks suitable for: shipping waste from the MRS, shipping nonstandard fuel and fuel-bearing components, and shipping defense high-level waste. As the from-reactor initiatives proceed, decisions will be made on future cask initiatives.

Because of such elements as the increased age of fuel to be shipped and burn-up credit, the proposed cask designs promise a considerable increase in carrying capacity. To assist in resolving issues universal to all the cask designs, OCRWM has a cask development technology program based at Sandia National Laboratories.

In anticipation of a negotiated site for the MRS facility before 1998, OCRWM is also assessing existing cask capabilities, if needed. The DOE has a long history of safe shipping experience to build upon in developing the transportation capabilities for the OCRWM program. Every effort will be made to benefit from the past experiences of both the DOE and the commercial industry in developing a safe and efficient transportation system.

Operational Planning and Support System Development

To continue with the operational planning for the transportation system, OCRWM is reviewing management options and evaluating the technical and procedural requirements for the system. Consistent with NWPA direc-

tives, the OCRWM plans to use private industry to the maximum extent possible in conducting future transportation operations.

Efforts under operational planning are broken down into sub-elements. Field operations continue to monitor current DOE and industry shipments to learn from their experiences. Operational planning is now determining whether foreign technology and experience would be useful and will develop a strategy to obtain information, if needed. For servicing and maintenance functions, the draft cask maintenance feasibility study is near completion, providing concept cost and schedule estimates and definition of interfaces with potential repository and MRS facilities. Under cask handling, checklists are being developed for operational review of cask designs, including designs for ancillary equipment, transporters and intermodal transfer equipment. Carriage system studies include developing preliminary tractor performance criteria and weight, evaluating weight-saving options for tractor/trailer gross weights, and trade-off studies on system performance versus weight limits.

Work is near completion on reports from the Facility Interface Capability Assessment (FICA) project, which will provide information on the capabilities of reactors and other facilities to store and ship spent nuclear fuel. The FICA results are based on site visits and will give a more accurate picture of the facilities' capabilities to handle our cask con-figurations. It will supply data on those facilities which can presently handle the new OCRWM casks, those that would require a re-analysis of capabilities, and those that would require actual facility modifications.

Work has begun on the Near-Site Infrastructure (NSTI) project to determine the capabilities of each site to ship by truck, rail and barge. While the FICA project has focused on facility capabilities "inside the fence", the NSTI will focus on the transportation infrastructure "outside the fence". Current capabilities and potential for upgrades will be assessed for each mode. The results of the FICA and NSTI studies will provide input to OCRWM decisions on the modal mix for future shipments.

Economic and System Analysis

To ensure system integration within the transportation program and within the waste-management system, various studies and efforts are conducted involving more than one element of the transportation program and the OCRWM program. The structured analysis provides useful information necessary to undertake the development, integration, and evaluation of elements within the transportation system. To support system studies OCRWM, has developed or utilized technical models and databases.

Technical analyses are underway such as cost and risk studies, studies on human factors effects on operational safety, and transportation impacts of an MRS facility.

To enhance transportation analyses, detailed data are being collected using current, modified or newly emerging technical models and databases. Activities with the technical models consist of the development of TRICAM for optimization analysis, developing CASKCOM for life cycle costs analyses, modifying RADTRAN for more specific route analyses, updating and expanding HIGHWAY and INTERLINE for modal analyses, and verification and documentation of the models. Types of database development include preparation of the Transportation System Data Base (TSDB) as a standard reference document for transportation assumptions, the collection of accident rates for rail and road types and developing unit cost and risk factors for national transportation network analyses.

Institutional Interaction

The transportation program's unique situation within the OCRWM program requires communication and interaction with multiple Tribal, State, and local governments, utilities, technical associations, the transportation industry, the media, the public and other Federal agencies. Each of these organizations have varying authorities, responsibilities and concerns for many aspects of transportation. Productive interaction with such groups is important both in the implementation and the planning stages of the transportation program.

Institutional interactions between these parties are through communication and outreach activities such as cooperative agreements with interested groups, regularly scheduled interactive meetings, publications, presentations and public information efforts.

To assist in the discussion and resolution of issues and to promote the development of plans and procedures OCRWM has developed cooperative agreements with national, regional, and transportation-related organizations. Presently these groups consist of: the National Conference of State Legislatures (NCSL), the Western Interstate Energy Board (WIEB), the Southern States' Energy Board (SSEB), the Midwest Office of the Council of State Governments (COSG), the National Congress of American Indians (NCAI), the Conference of Radiation Control Program Directors (CRCPD), and the Commercial Vehicle Safety Alliance (CVSA). Cooperative efforts are also underway with the American Association of State Highway and Transportation Officials (AASHTO) to study uniform overweight truck permits between the States. This year OCRWM plans to initiate actions to produce a cooperative agreement with a northeastern regional group.

Activities with these groups include the AASHTO's studies and recommendation on the feasibility of nationwide uniform overweight truck permitting, providing input to OCRWM's decision on overweight cask designs;

development of the pilot test for draft spent fuel highway inspection procedures developed by CVSA; incorporation of the CRCPD recommended radiological inspection procedures into the CVSA procedures; and initial planning to assist in the training needs of the local governments and the Indian Tribes stated in Section 180(c) of the NWPA, as amended. A draft implementation strategy for Section 180(c) requirements is planned to be issued for public comment this year.

As the development of the transportation program proceeds, the OCRWM will interact more closely with specific parties--such as the utilities, carriers, States, Indian Tribes and local governments--to coordinate shipping arrangements, to clarify individual responsibilities for transportation activities, and to finalize shipping policies.

The transportation program has met with the Nuclear Waste Technical Review Board and the MRS Review Commission to give reports and answer questions regarding the status of the transportation program. Coordination is ongoing with the Edison Electric Institute/Utility Nuclear Waste and Transportation Program's (EEI/UWASTE) Utility Working Group and the entire transportation network. OCRWM staff also present program updates to associations interested in the program throughout the year.

The OCRWM transportation activities is coordinated with those of the DOE Office of Environmental Restoration and Waste Management, which manages current shipments of noncommercial, defense, and research-related nuclear materials for the DOE. The Transportation Management Division within the Office of Environmental Restoration and Waste Management provides a DOE-wide source of expertise for operations, policy and procedures, and research and development. The OCRWM will incorporate this expertise into its transportation program, yet continue to take into account specific requirements of the OCRWM program that are separate from present DOE operations.

TRANSPORTATION SCHEDULE

The schedule for the development of the transportation system needs to be able to support operations for both the MRS facility and the repository.

For the "from-reactor" initiative, the final designs are expected to be completed by 1991, with preparation of the Safety Analysis Reports for Packaging (SARP) ending in 1992. Receipt of NRC Certificates of Compliance are expected in 1993, and fabrication will begin in 1996. The "from-reactor" casks are expected to be ready for shipping to an MRS or repository by 1998. Determination of the need of other cask initiatives will be made between 1991 and 1993.

Operational planning will be dependent on other OCRWM program decisions affecting the projected level of operations needed in 1998. Ongoing operational logistics studies are supporting the planning for operations by 1998. Different management options for the operations of the transportation system will be explored and the preferred option subsequently selected in 1994. Initiation of the equipment acquisition will also begin between 1994 and 1995. Operational procedures will be finalized before operations are initiated in 1998. Identification of the modal mix and issuance of the cask fleet contract are planned for between 1995 and 1997.

Major system studies necessary for the transportation program to be successfully incorporated into the waste-management system presently consist of completing the transportation near-site infrastructure studies by 1991-1993, and completing any necessary transportation studies for an environmental impact statement for an MRS by 1994-1995, and by 1998 for a repository.

Within the institutional program, the proposed schedule for implementation of the training assistance to the local governments and Indian Tribes is being developed. OCRWM plans to develop and release an implementation strategy for assessing training-assistance requirements for 180(c) in 1990. Definition of basic training needs of Indian Tribes and local governments, workable mechanisms for administering funds, and provisions for the assistance will be completed by 1993. After determining the preliminary modal mix, and identifying potential routes for training purposes OCRWM will begin assistance between 1993 and 1995. As OCRWM continues assistance from 1995 through operations, adjustments and re-training will be made as needed to reflect any planned changes and turn-over of local and Tribal staff.

CONCLUSION

OCRWM plans to support negotiations for an MRS and will be prepared to ship to the MRS by 1998, with shipments to a repository not expected until 2010. The transportation program is presently revising program documents and schedules to meet these adjustments. Development of the transportation strategy will reflect the changes in the waste-management system stated in the "Report to Congress on Reassessment of the Civilian Radioactive Waste Management Program" and the Secretary of Energy's re-evaluation of the OCRWM program.

Present planning and implementation efforts for the transportation program are striving to ensure that safe, efficient transport of spent fuel will proceed, as need, to the MRS and to final disposal at a repository.