

## POLICY ISSUE NOTATION VOTE

March 3, 2006

SECY-06-0053

FOR: The Commissioners

FROM: Luis A. Reyes  
Executive Director for Operations

SUBJECT: PACKAGE PERFORMANCE STUDY STATUS UPDATE

PURPOSE:

1. To provide an update of the Package Performance Study (PPS), as directed in the Staff Requirements Memorandum (SRM), dated June 9, 2005, concerning SECY-05-0051, "Details and Projected Cost of a Demonstration Test of a Full-Scale Spent Nuclear Fuel Rail Transportation Cask Under the Package Performance Study."
2. To obtain Commission approval of the schedule to perform the PPS.

BACKGROUND:

In SECY-05-0051, dated March 28, 2005, the staff provided the details and projected cost of a demonstration test of a full-scale spent nuclear fuel rail transportation cask under the PPS. In the related SRM, dated June 9, 2005, the Commission approved the staff's proposed test plan and projected cost for the demonstration test. In addition, the Commission directed the staff to add a fire test scenario for a rail cask involving a fully engulfing, optically dense, hydrocarbon fire for a duration of one-half hour post-collision as a part of the proposed demonstration test.

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The Commission also directed the staff to take the following actions:

- Negotiate and complete a signed cooperative agreement with the German Federal Institute for Materials Research and Testing (BAM) (due June 23, 2006).
- Provide a status update on the staff's review and analysis of the full- and quarter-scale transportation cask drop test data obtained from BAM (due February 24, 2006).
- Review developments in the U.S. high-level waste program and prepare a Commission paper to recommend an appropriate time to begin executing the PPS (due February 24, 2006).
- Brief the Commissioners' Technical Assistants on the details of a proposed fire test and projected costs (due February 24, 2006).
- Ask the Advisory Committee on Nuclear Waste (ACNW) to review the revised demonstration test protocol (due March 26, 2006).

This paper provides information and an update for the tasks listed above, and requests Commission's approval of the schedule to perform the demonstration test.

#### DISCUSSION:

##### *Review and Analysis of the Full- and Quarter-Scale Cask Drop Test Data*

The staff will obtain the full- and quarter-scale cask drop test data from BAM after the Implementing Agreement between the NRC and BAM is signed. The staff will review and analyze drop test data for two casks to determine the extent to which the data support the objectives of the PPS, and will then recommend enhancements to the PPS project that may become apparent through this review and analysis. This task will involve detailed independent structural simulation and finite element analysis of the drop scenario for the full- and quarter-scale casks.

This task is expected to be completed 18 months after the Implementing Agreement between the NRC and BAM is signed. If the Agreement is signed in June 2006, as expected, the staff can complete the review and analysis of BAM test data by December 2007. This task can proceed independently from the U. S. Department of Energy's (DOE's) procurement of the transportation casks.

##### *Appropriate Time to Perform the Demonstration Test*

###### *Option 1*

Consistent with prior Commission direction, in this option, the transportation cask to be used for the proposed demonstration test will be one that DOE is likely to use to transport nuclear fuel to the potential high-level waste repository at Yucca Mountain, Nevada. In addition, the transportation cask design will have a valid NRC Certificate of Compliance to transport commercial spent nuclear fuel, in accordance with Title 10, Part 71, of the *Code of Federal Regulations* (10 CFR Part 71).

In a discussion with DOE personnel, the NRC staff learned that the schedule for procuring the transportation casks has been delayed so that DOE can evaluate the transportation, aging,

and disposal canisters (TADs) for transportation of spent nuclear fuel from commercial nuclear plants. Therefore, for this option, the demonstration test should be delayed until either DOE places an order to procure the transportation casks to support proposed Yucca Mountain repository operations or the NRC issues a certificate of compliance for the transportation cask design (whichever is later).

In SECY-05-0051, the staff provided a schedule for performing the demonstration test on a transportation cask. According to that schedule, all of the activities for the test can be completed in 192 weeks after the Commission gives its approval to proceed. If a fire test is included as a part of the demonstration test, the total overall schedule for the demonstration test will increase from 192 weeks to 200 weeks. According to the preliminary information obtained from DOE, the staff learned that DOE is likely to make a decision about the use of TADs for transportation of spent nuclear fuel and issue a performance specification for the transportation cask design in 2006.

An optimistic schedule to perform the demonstration test, for Option 1, includes the following milestones [after DOE issues performance specification for the transportation cask, ( $T_o$ )]

NRC receives application for certification of the transportation cask:	$T_o + 52$ weeks
NRC issues certificate of compliance for the transportation cask:	$T_o + 104$ weeks*
DOE awards contract for procurement of transportation casks:	$T_o + 104$ weeks
NRC staff starts preliminary planning and procurement activities:	$T_o + 104$ weeks
NRC staff recommends an appropriate time for the PPS demonstration test:	$T_o + 116$ weeks
Commission approves the demonstration test timing and protocols:	$T_o + 124$ weeks
NRC staff issues request for proposals for procurement of casks:	$T_o + 124$ weeks
NRC awards a contract for supply of the transportation cask:	$T_o + 160$ weeks
<b>NRC</b> performs the demonstration test:	$T_o + 274$ weeks
<b>NRC</b> issues demonstration test final report:	$T_o + 324$ weeks

If DOE issues the transportation cask specifications in mid-year 2006, the staff would start PPS preliminary planning, selection of test facilities, and procurement activities by mid-year 2008.

### *Option 2*

In this option, the initiation of PPS activities would not be tied to DOE's procurement of the cask or NRC's issuance of a cask certificate of compliance. The NRC staff will submit a revised cost estimate and test protocols for approval to the Commission by September 2007. After the Commission's approval, the NRC staff will start the detailed planning and procurement activities for the demonstration test. Selection of this option would likely expedite the start of the demonstration test.

\* Generally, NRC schedules Part 71 cases for a one year review, with a timeliness performance goal to complete all cases within two years

The contracts for the supply of a transportation cask, locomotive, and test facility can be awarded as early as August 2008, and the final report for the demonstration test can be issued 200 weeks after Commission's approval to proceed with the test. However, in this option, the transportation cask to be used for the demonstration test may not necessarily be one that will be used by DOE to transport nuclear fuel to the potential high-level waste repository at Yucca Mountain, Nevada. In addition, the procurement cost for the transportation cask in this case is likely to be higher since the cask supplier may not be the same as the one selected by DOE to supply a large number of casks, and such cask procurement may represent the first of a kind and the only fabrication contract for such cask.

*Briefing for Commissioners' Technical Assistants on the Details of a Proposed Fire Test and Projected Costs*

The overall dimensions and internal details of the transportation cask will influence the design of the fire test facility and instrumentation required to monitor the behavior of the cask during a fire test. Therefore, the details and projected costs of a proposed fire test, for Option 1, cannot be determined until DOE selects a transportation cask. To ensure that the Commission is provided with a realistic cost estimate and fire test scenario, the briefing to the Commissioners' Technical Assistants should be delayed until after DOE places an order to procure the transportation casks or the NRC issues a certificate of compliance for the transportation casks (whichever is later). However, if the Commission approves Option 2, the staff will include the best cost estimate and fire test scenario as a part of the Commission paper for the Option 2 revised cost estimate and test protocols.

*ACNW Review of the Revised Demonstration Test Protocol*

The transportation cask demonstration test protocols for Option 1, including the fire test, cannot be finalized until after DOE selects a transportation cask for use in transporting spent nuclear fuel to the proposed Yucca Mountain Repository. Therefore, for Option 1, the ACNW review of the test protocols should also be delayed until after DOE places an order to procure the transportation casks or the NRC issues a certificate of compliance for the transportation casks (whichever is later). Under either Option 1 or Option 2, the staff will schedule the ACNW review prior to the Commission's decision on demonstration test timing and protocols.

*Projected Cost of the Demonstration Test*

The total cost to perform the demonstration test depends on the cost of acquiring a transportation cask with a supporting railcar, locomotive, freight railcars, and test instrumentation, as well as the cost of pretest and post-test structural analyses and the cost of conducting the actual demonstration test. The staff will not be able to obtain a firm price for these items until after the bidding process is complete. Approval to enter into contracts for these proposed procurements will be requested in accordance with the Commission's approved procedures.

COMMITMENT:

The staff will keep the Commission informed of the status of the PPS and the BAM cask drop test data analysis by annual briefings to the Commissioners' Technical Assistants, beginning in

February 2007.

RECOMMENDATIONS:

The staff recommends that:

- (1) The Commission approve the PPS demonstration test schedule as described in Option 1 above. The staff will provide to the Commission a revised cost estimate and test protocols for performing the demonstration test 12 weeks after DOE places an order to procure the transportation casks or the NRC issues a certificate of compliance for the transportation casks (whichever is later).
- (2) The briefing for the Commissioners' Technical Assistants on the details of the fire test and projected costs, and the ACNW's review of the test protocols be delayed until 12 weeks after DOE places an order to procure the transportation casks or the NRC issues a certificate of compliance for the transportation casks (whichever is later).

RESOURCES:

A total of \$582K and 1.5 FTE in **Fiscal Year (FY) 2006**, and 1.5 FTE in FY 2007, has been budgeted for limited PPS activities in the Office of Nuclear Regulatory Research (RES) and the Office of Nuclear Material Safety and Safeguards (NMSS). The FY 2007 and FY 2008 funding for the PPS activities will be reevaluated during the NRC's FY2008 Planning, Budgeting, and Performance Management (PBPM) process.

COORDINATION:

The Office of the General Counsel has reviewed this paper and has no legal objections. The Office of the Chief Financial Officer has also reviewed this paper for resource implications and has no objections.

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