



UNITED STATES NUCLEAR REGULATORY COMMISSION

Current Status of the Package Performance Study

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PACKAGE PERFORMANCE GOAL

Demonstrate the inherent robustness of full scale spent nuclear fuel transportation casks by conducting confirmatory research using an enhanced public participatory approach



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TEST PROTOCOLS REPORT- NUREG 1768

Comment Period: Feb - May 2003

Four Dominant Themes

- Full scale testing
 - to regulatory limits
- Conduct a realistic demo test based on realistic accident scenarios
- Test casks to failure
- Address Terrorism





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PPS – CHALLENGES

- Design and perform a full-scale test or tests to demonstrate the robustness of current vintage spent nuclear fuel transportation casks
- Use realistic test conditions
- Recognize budget realities
 - Increased test realism
 - Increased program costs
- Improve public understanding of and confidence in cask certification process



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COMMISSION DIRECTION – MAY 04

- Purchase and test a full-scale, NRC certified rail transportation cask
 - Realistically conservative test
 - Sufficient instrumentation to collect data for validating analytical methods, including scaling
 - Fully engulfing fire
- Submit a demonstration test plan, for approval
- Submit predictions of cask performance (6 months after test plan approval)
- Interact with the US Department of Energy (DOE) concerning potential funding for PPS and potential use of a truck cask for PPS



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DEMONSTRATION TEST PLAN DEVELOPMENT

- Scenario Development
 - Cask transportation accidents are low probability events
 - 8 accidents involving transportation of casks, 1.6 M miles, no releases (2002)
 - 4 truck accidents, 4 train accidents
 - Over 1300 spent fuel shipments in NRC certified packages have taken place in the last 20 years
 - Department of Transportation (DOT) Volpe Center data (1988-1995)
 - Provides a relative ranking of rail accident scenarios
 - Highest conditional probabilities are train derailments resulting in impacts or collisions with soil, roadbeds, rock, structures, railcars, or locomotives



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DEMONSTRATION TEST PLAN DEVELOPMENT

- Challenges
 - The ability to validate scaling methodology
- Uncertainties
 - Nonlinear nature of collision (i.e., yielding impact surface)
 - Analysis predictions (railcar behavior, cask tie-downs, friction)



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COMMISSION DIRECTION

- Staff Conceptual Demo Test Plan
 - submitted July 2004
- Commission Direction - Dec 2004
 - (SRM-SECY-04-0135)
 - Clarified demonstration test
 - orientation – 90 Degrees across rail track
 - natural progression – no fire testing



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COMMISSION DIRECTION

Recommended

Explore 2004 Drop Tests (Germany and US)





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PPS – SCHEDULE

- Conceptual Test Plan for Commission Review – Spring 05
- After Commission Approval – expect
 - Development of Detailed Test Plan
 - Test Facility Selection and Preparation
 - Cask Procurement
 - QA Oversight for Cask Fabrication



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CONCLUDING REMARKS

- Cask certification process provides protection of public health and safety
- Commission has provided guidance to the staff on the direction of PPS
- NRC staff is developing a test plan
- NRC staff will keep Public informed of progress



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QUESTIONS/DISCUSSION