

August 10, 2010

MEMORANDUM TO: Timothy J. McGinty, Director  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Charles E. Ader, Director  
Division of Safety Systems and Risk Assessment  
Office of New Reactors

FROM: Michael J. Case, Director */RA/*  
Division of Engineering  
Office of Nuclear Regulatory Research

SUBJECT: REVIEW OF DRAFT NUREG/CR-XXXX, "EVALUATION OF  
JNES EQUIPMENT FRAGILITY TESTS FOR USE IN  
PROBABILISTIC RISK ASSESSMENTS FOR U.S. NUCLEAR  
POWER PLANTS"

The Division of Engineering is forwarding the subject Draft NUREG/CR-XXXX, "Evaluation of JNES Equipment Fragility Tests for Use in Probabilistic Risk Assessments for U.S. Nuclear Power Plants," for your review and comment. This research was performed as part of the Implementing Agreement made between the U.S. Nuclear Regulatory Commission (NRC) and the Japan Nuclear Energy Safety Organization (JNES) of Japan in the area of seismic engineering research.

The Japan Nuclear Energy Safety Organization (JNES) is conducting a multi-year equipment fragility test program to obtain realistic equipment fragility capacities for use in the probabilistic risk assessments (PRAs) of nuclear power plants (NPPs) in Japan. This test program started in 2002 and is planned to continue until 2012. The purpose of this test program is to improve the quality of the seismic fragility capacity database by determining realistic equipment fragility capacities from full-scale shaking table tests. This new data will allow more accurate PRAs to be performed to quantify the risk of NPPs during beyond-design-basis earthquakes. This test program reflects a philosophical shift from the design-proving test in the past that was intended to demonstrate the success of equipment under design basis or slightly larger earthquakes, to the current fragility test that determines the (ultimate) seismic capacity under beyond-design-basis earthquakes. This program consists of the test of a series of safety significant equipment, which are scheduled in two phases. Phase I includes large horizontal shaft pumps, large vertical shaft pumps, electrical panels, and control rod insertion capability and Phase II includes fans, valves, tanks, support structures, and overhead cranes.

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This report describes efforts conducted by Dr. Robert Kennedy and Brookhaven National Laboratory (BNL) to evaluate the results of the JNES equipment fragility tests. The goal of this research effort was to compare the JNES fragility results with the fragility data typically used in current U.S. probabilistic risk assessments (PRAs) and assess the impact that the new test results may have on current PRAs and how this data can be utilized for future PRAs. This report summarizes the evaluation of the Phase I JNES equipment fragility test data and provides insights on the applicability and application of this data in U.S. PRA practices.

We request that you provide us any comments on this NUREG/CR by October 15, 2010. Please feel free to contact me or Syed Ali of my staff (at 301-251-7658 or Syed.Ali@nrc.gov) if you have any questions or cannot accommodate this schedule.

Enclosure:  
Draft NUREG/CR-XXXX

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