June 1, 2007

Dr. William J. Shack, Chairman
Advisory Committee on Reactor Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

SUBJECT: HUMAN RELIABILITY ANALYSIS MODELS

Dear Dr. Shack:

Thank you for your letter to the Commission, dated April 23, 2007, on Human Reliability Analysis (HRA) Models. As stated in the letter, "[i]nsights and results from probabilistic risk assessments (PRAs) and models for human reliability performance provide valuable input to many regulatory decisions." Therefore, we appreciate the Committee's initiatives and support to address issues related to the use of different human performance models in regulatory applications. This letter summarizes current and planned staff activities, including interactions with the Advisory Committee on Reactor Safeguards (ACRS), to address the issues identified in your letter to the Commission.

On April 6, 2007, the staff and the Electric Power Research Institute (EPRI) briefed the ACRS on the proposed plans for evaluating several HRA models. Also, on March 22, 2007, the staff and EPRI briefed the Subcommittee on Reliability and Probabilistic Assessment on the same proposed plans. These briefings were consistent with the November 8, 2006, Staff Requirements Memorandum (SRM), resulting from the October 20, 2006 meeting with the ACRS in which the Commission directed the ACRS to work closely with the staff and external stakeholders to propose either a single agency model to use or guidance on which model(s) should be used in specific circumstances. The staff is proceeding to formalize the proposed plans into a potential cooperative effort with EPRI and integrating these plans with the on-going HRA benchmarking project and the implementation of an HRA database.

As briefed by the staff, the issue of method-to-method variability is being addressed by the HRA Research Program. The staff has published NUREG-1792, "Good Practices Implementing Human Reliability Analysis," in April 2005, and NUREG-1842, "Evaluation of Human Reliability Methods Against the Good Practices," in April 2006. The staff has two on-going efforts that can directly support the evaluation of the differences of HRA models: the HRA Empirical Study and the Human Event Repository and Analysis (HERA) (NUREG/CR-6903). The HRA Empirical Study is pursued as an international collaborative effort at the Halden Reactor Project simulator facilities. The objective of this study is to develop empirical evidence of the variability of HRA methods by collecting crew performance data for scenarios similar to those modeled in a PRA and compare them with HRA results from different HRA methods and analyst teams. HERA provides a structure for collecting evidence of human performance sources including, but not limited to, nuclear power plant simulators, Incident Investigation Teams, Augmented Inspection Teams, Special Inspections, and inspection reports. We are in the process of importing into HERA a compilation of human events and developing capabilities that would allow us to perform studies on the basis of actual historical evidence and, therefore, further validate the

results from the empirical study. A potential collaborative effort with EPRI will further enhance our ability to address the differences in HRA models, and their suitability in regulatory applications.

The staff values its continued interaction with the ACRS and benefits from the Committee's focus on the important issues related to the use of HRA models. Toward that end, the staff plans to brief the ACRS as it updates its HRA Research Program to consider the ACRS' recommendations and potential interactions with EPRI.

Sincerely,

/RA/

Luis A. Reyes
Executive Director
for Operations

cc: Chairman Klein
Commissioner McGaffigan
Commissioner Merrifield
Commissioner Jaczko
Commissioner Lyons
SECY

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