November 19, 2009

MEMORANDUM TO: Michael J. Case, Director
Division of Engineering
Office of Nuclear Regulatory Research

FROM: Christiana H. Lui, Director ***/RA/***
Division of Risk Analysis
Office of Nuclear Regulatory Research

SUBJECT: TRANSMITTAL OF REPORT ON WORKSHOP ON PHILOSOPHICAL BASIS FOR INCORPORATING SOFTWARE FAILURES IN A PROBABILISTIC RISK ASSESSMENT

For your information, enclosed is a Brookhaven National Laboratory (BNL) technical report entitled, "Workshop on Philosophical Basis for Incorporating Software Failures in a Probabilistic Risk Assessment," BNL-90571-2009-IR, prepared under Task 1 of JCN N6725, "Digital System Software PRA," in support of the NRC Digital System Research Plan, FY 2005 – FY 2009 (and in support of draft NRC Digital System Research Plan, FY 2010 – FY 2014). The goal of the expert panel meeting (workshop), which was held at BNL on May 5 and 6, 2009, was to establish a "philosophical basis" for incorporating software failures into digital system reliability models for use in nuclear power plant probabilistic risk assessments. Here, "philosophical basis" is interpreted to mean the basic technical principles upon which these failures can be accounted for in a probabilistic model. At the workshop, the experts were also asked to discuss (1) how to include software in a reliability model of digital systems, and (2) methods for quantifying software failure rates and probabilities of digital systems. This report summarizes the discussions during the workshop, supplemented by the experts' written responses to a questionnaire provided prior to the workshop. The questionnaire solicited the experts' opinions on specific topics of modeling and evaluating software reliability.

Both Sushil Birla and Derek Halverson of your staff attended the workshop as observers, and I would like to express my appreciation for their time and input. If you have any questions regarding this report, please address them to the contact listed below.

Enclosure:
As stated

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