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August 11, 2008

MEMORANDUM TO: Chairman Klein
Commissioner Svinicki

FROM: Commissioner Lyons **/RA/**
Commissioner Jaczko **/RA/**

SUBJECT: ECONOMIC CONSEQUENCE MODEL

Over the past 25 years, the Nuclear Regulatory Commission (NRC), U.S. nuclear industry, and international nuclear safety organizations have completed substantial research on nuclear power plant response to hypothetical accidents that could damage the core and containment and result in offsite consequences. Insights gained from this research have been incorporated to update accident consequence modeling computer codes such as NRC's MELCOR code that models the progression of severe accidents in light water reactors and NRC's MACCS2 code that models potential offsite consequences.

Earlier reactor accident consequence studies did not have the benefit of realistic consequence modeling computer codes and sometimes resorted to conservative assumptions regarding the timing and magnitude of radioactivity releases. In turn, this resulted in unrealistic estimates of accident consequences, including health effects.

In the NRC's ongoing State-of-the-Art Reactor Consequence Analysis project (SOARCA), the staff is using the MELCOR and MACCS2 codes, informed by updated plant specific information, to develop realistic estimates of the potential health effects that could be realized as the result of an accident. This project is intended to update the analytical methods and models for realistic evaluation of severe accident progression and offsite consequences and provide improved realistic planning tools to the agency for regulatory decision-making.

Although the MACCS2 code has the ability to calculate land contamination and economic cost associated with hypothetical reactor accidents, that particular part of the code's capability has not been updated recently and, therefore, may not currently produce accurate results.

It is important that the NRC has at its disposal the means to realistically determine the full spectrum of radiological accident consequences. Such determinations may be used in a variety of regulatory decision-applications, including those involving analysis of hypothetical reactor accidents (e.g., SOARCA) and radiological dispersion devices (RDDs), risk assessments, emergency preparedness exercises, and evaluation of any actual contamination events.

Accordingly, the staff should continue to implement the Commission's prior direction to evaluate and update, as appropriate, analytical methods and models for realistic evaluation of severe accident progression and offsite consequences, including economic consequences, and develop an integrated, predictive, computer-based tool to assist decision-making in the event of a severe reactor accident. The updated methods and models should be applied to SOARCA

and to the agency's ongoing source security initiatives, including evaluation of the consequences of RDDs. The staff should provide the Commission with policy papers, as necessary, on appropriate clean-up standards to use to determine economic consequences. Further, the staff should continue to seek international collaborative opportunities, where they would benefit us in this effort.

SECY, please track.

cc: W. Borchardt, EDO
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