

July 9, 2010

MEMORANDUM TO: Commissioner Svinicki
Commissioner Magwood
Commissioner Ostendorff

FROM: Commissioner Apostolakis /RA/
Chairman Jaczko /RA/

SUBJECT: USE OF RISK INSIGHTS TO ENHANCE SAFETY FOCUS OF
SMALL MODULAR REACTOR REVIEWS

1. Objectives

The objectives of this initiative are:

- a) To accelerate the development of a licensing framework informed by risk insights from Probabilistic Risk Assessments (PRAs) for small modular reactor (SMR).
- b) To do so in a manner that makes the reviews of SMR design certification and combined license (COL) applications more safety focused and more efficient.

2. Motivation

- a) The Commission has a long-standing policy to encourage the increased use of risk information in regulatory programs and processes, to the extent supported by the state-of-the-art methods and data and in a manner that complements the NRC's deterministic approach. There are several notable successes in using risk insights from PRAs, including the Reactor Oversight Process and risk-informed In-Service Inspection of piping. These have made NRC decision making more safety focused and efficient.
- b) Risk information has not yet been fully integrated into the reactor licensing process. Although 10 CFR 52 requires a PRA summary, current programs and guidance are still based on 10 CFR 50 and do not realize the potential benefits of risk informing the licensing reviews. Moreover, the Technology Neutral Framework, as issued in 2007 (NUREG 1860), is not ready for use in near-term licensing actions.
- c) When the agency receives new reactor license applications, staff will rely on existing guidance (e.g., standard review plans) to ensure compliance with 10 CFR Part 52 (with Part 50 methods and standards, as appropriate.)
- d) There is a rapidly expanding interest in pursuing a design certification, manufacturing license, or combined license for SMRs that the NRC will receive for possible review.
 - Reactor vendors are working on designs of integral PWRs and sodium-cooled fast reactors.

- DOE's advanced reactor program is increasing emphasis on molten salt reactors.
 - Domestic utilities are discussing plans to install SMRs.
 - The Department of Defense is studying the feasibility of using SMRs to power critical military installations.
- e) Risk insights from PRAs could be used to focus resources on the most risk-significant aspects of the design and provide a basis for enhancing the safety focus of review guidance in the near term.

3. Benefits

- a) In the short term, the NRC would be better prepared to conduct more safety focused and efficient reviews of SMR applications and, thus, be better able to respond in a timely manner to licensing requests.
- b) In the long term, this initiative can accelerate the development of a licensing framework informed by risk insights from PRAs. The SMR design certification, manufacturing license, and COL reviews could help in the formulation of a new risk-informed regulatory framework.
- c) This initiative could provide a more immediate risk-informed licensing review process than DOE's Next Generation Nuclear Plant (NGNP) pilot.

4. Recommended Process

We recommend that the Commission direct the staff to provide, within 6 months, a paper that addresses the following:

- a) Development of a framework, implementation strategy, and plans and schedules to more fully integrate the use of risk insights into pre-application activities and the review of small modular reactor applications, consistent with Commission Policy Statements. The initial effort should focus on how risk insights would be used to identify risk-significant systems, structures, and components (SSCs) and aspects of the design that contribute most to safety.
- b) Alignment of review resources, consistent with regulatory requirements, to risk-significant SSCs to enhance the efficiency of the review process. The plan should address the use of risk insights in determining which portions of existing review guidance (e.g., standard review plans) should be applied to SMRs.
- c) Development of risk-informed licensing review plans for each of the SMR reviews including the associated pre-application activities.
- d) Development of a new risk-informed regulatory framework building, as a long-term objective, on the SMR reviews, insights gained from the NGNP review activities and the earlier Technology Neutral Framework presented in NUREG-1860.

SECY, please track.

cc: SECY
CFO
OGC
EDO