PSA 2011 Abstract
March 13-17, 2011 Wilmington, NC, USA

Proposed Topical Session: Risk-Informed Regulation and Licensing

Risk-Informed Regulatory Guidance for New Reactors

Donald Dube[1] and Christopher Fong[2]
[1]*U.S. Nuclear Regulatory Commission, Washington, DC, USA*
[2]*U.S. Nuclear Regulatory Commission, Region II, Atlanta, GA, USA*

Since the U.S. Nuclear Regulatory Commission (NRC) published its probabilistic risk assessment (PRA) policy statement in 1995, the NRC staff has developed or endorsed many guidance documents to support risk-informed changes to the licensing basis and the Reactor Oversight Process (ROP). In September, 2010, the staff requested Commission approval of the staff's recommendation to modify the risk-informed regulatory guidance to (1) recognize the lower risk profiles of new, large light-water reactors (LWRs) and (2) prevent a significant decrease in the enhanced levels of safety provided by these new reactors.

With the implementation of an enhanced level of severe-accident prevention and mitigation design capability being confirmed through the review of applications for design certification for new LWRs, the staff is identifying potential issues that may arise with the transition to operations and the use of the existing risk-informed framework. Although Regulatory Guide (RG) 1.174 and the current ROP have no specific provisions precluding their application to new reactor designs, the NRC experience with implementing both RG 1.174 and the ROP has only involved currently operating plants. As discussed in a 2009 white paper, the staff identified a number of potential issues posed by the lower risk estimates of new reactors using the current risk-informed guidance that could potentially allow for a significant erosion of the enhanced safety of new reactors as originally licensed. As a result, the staff is considering whether changes to RG 1.174 and the ROP are needed in light of the differing risk profiles and the 10 CFR Part 52 process (e.g., design certification rulemaking on enhanced severe-accident features per Section VIII.B.5 of appendices for each certified design). A number of industry representatives have expressed interest in pursuing risk-informed inservice inspection of piping for new reactors, and the staff expects additional risk-informed applications for new reactors in the future.

The full paper will provide the background, discuss the issues of concern, describe the options presented by the staff to the Commission, and provide an update on the status of risk-informed guidance for new reactors.