

July 22, 2010

Mr. Anthony R. Pietrangelo  
Senior Vice President  
and Chief Nuclear Officer  
Nuclear Energy Institute  
1776 I Street NW, Suite 400  
Washington, DC 20006

Dear Mr. Pietrangelo,

By letter dated April 7, 2010, the Nuclear Energy Institute (NEI) requested that the U.S. Nuclear Regulatory Commission (NRC) reconsider expanding the applicability of General Design Criterion (GDC) 4, "Environmental and Dynamic Effects Design Bases," in Appendix A, "General Design Criteria for Nuclear Power Plants," to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities." Specifically, NEI requested that leak-before-break (LBB) analysis be considered as an acceptable means to close out Generic Safety Issue (GSI) 191, "Assessment of Debris Accumulation on Pressurized Water Reactor (PWR) Sump Performance." NEI proposed that this expanded application of LBB analysis is appropriate based in part on PWR licensees' having completed strainer performance analyses using conservative methods relative to expected post-accident conditions. A similar proposal was previously rejected by the NRC staff in 2004. As discussed below, the NRC staff will once again evaluate the impact of applying LBB analysis to address debris generation for GSI-191.

In Enclosure 2 to the April 7, 2010, letter, NEI said that the NRC's previous reasons for not accepting the use of GDC 4 are no longer applicable. In a follow-up letter dated April 27, 2010, to NRC Chairman Gregory B. Jaczko, NEI stated that the proposed alternative rule (10 CFR 50.46a, "Risk-Informed Changes to Loss-of-Coolant Accident Technical Requirements") to 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors," may not provide a timely course of action to close out GSI-191, and, therefore, NEI believes that GDC 4 is the preferred path to resolving GSI-191. In letters dated April 14, 2010, and April 26, 2010, the Union of Concerned Scientists provided additional perspective on utilizing GDC 4 as a means to close out GSI-191.

The staff's current re-evaluation of the application of LBB to address GSI-191 is in response to the Commission's direction in a Staff Requirements Memorandum entitled "Briefing on Resolution of Generic Safety Issue-191, Assessment of Debris Accumulation on Pressurized Water Reactor Sump Performance," dated May 17, 2010, and will be documented in a commission paper scheduled to be provided next month. In 2004, the NRC staff did not accept the industry proposal for crediting the application of LBB for sump evaluations because of the potential issues with pursuing such an expansion which, at the time, the staff determined would not provide any added safety benefit beyond that realized by the original scope of LBB. In addition, the staff believed that the expansion of LBB would require a policy decision by the Commission.

Title 10 CFR 50.46 requires that licensees demonstrate adequate core cooling through either a bounding analysis with a conservative evaluation model or a realistic analysis that estimates and explicitly accounts for uncertainties. In both cases, the rule requires a determination that there is a high probability that the acceptance criteria are not exceeded. The concept of design-basis accident analysis using prescribed models with known conservatisms that is embodied in 10 CFR 50.46 is intended to demonstrate the existence of acceptable safety margins, even in the face of substantial and largely unquantified uncertainties, such as those which presently exist regarding a number of key aspects of GSI-191.

In enclosure 1 to the April 7, 2010, letter, NEI provided its perspective regarding conservatisms in the approved guidance for conducting sump performance analyses and their comparison with expected behavior. The stated purpose was to provide a basis for ongoing discussions with NRC management and to support a conclusion of "reasonable assurance" that the PWR fleet has adequately addressed GSI-191. Although NEI identified conservative assumptions employed in the approved guidance, it did not provide an adequate basis to demonstrate that the "expected behavior" discussed therein would be representative of realistic post-accident conditions. As such, NEI did not address the significant underlying uncertainties and knowledge gaps that motivated the use of conservative approaches in some parts of the approved guidance. We will provide more specific comments and insights from the NRC staff's review of enclosure 1 in a separate letter to you from William Ruland, Director, Division of Safety Systems.

As you are aware, the staff's process for reviewing PWR licensees' analyses for demonstrating adequate sump strainer performance relies on an integrated approach that balances conservatisms against uncertainties and potential non-conservatisms in determining whether adequate sump performance has been demonstrated for a given plant. This approach has led to the closure of sump strainer performance issues at the majority of PWRs, though the related in-vessel effects issue remains unresolved for most plants pending the PWR Owners Group's resolution of remaining issues with its in-vessel effects topical report.

The staff has expended substantial resources in reviewing and working with industry on previous efforts to reduce unnecessary conservatism in various aspects of the sump performance issue, such as zone of influence and credit for debris settlement. We remain willing to review future approaches in these or other aspects of the issue, consistent with Commission regulations and policy.

Please contact William Ruland of my staff at (301) 415-3283 if you have additional questions on this matter.

Sincerely,

/RA/

Eric J. Leeds, Director  
Office of Nuclear Reactor Regulation

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 Eric J. Leeds, Director  
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