November 6, 2008

Mr. Steve Kraft, Senior Director
Used Fuel Management
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: SPENT FUEL POOL CRITICALITY ANALYSIS AND NEUTRON ABSORBERS

Dear Mr. Kraft:

The purpose of this letter is to request NEI's assistance in addressing the NRC's concern regarding the poor quality, consistency, and methodologies used in spent fuel pool (SFP) criticality license amendment requests (LAR) and continuing problems with the degradation of neutron absorption material used in the SFPs.

The NRC has a strategic safety goal to "Ensure adequate protection of the public health and safety and the environment." One of the intended strategic outcomes of that goal is the prevention of any inadvertent criticality events. To that end the NRC's regulation and guidance stipulate SFPs have a large margin to criticality. In recent years the means by which licensees demonstrate and maintain compliance have become increasingly complex.

SFP storage facilities are changing in configuration and in the methods used to analyze criticality and control SFP activities in order to maximize capacity. The kinds of changes proposed by licensees include increasingly complex geometry arrangements, administrative controls, increased reliance on neutron absorbers, new fuel assembly designs, increased fuel enrichments, and new spent fuel rack materials of construction.

In addition, operating experience continues to show degradation issues with permanently installed neutron absorbers. Reliance on these materials to ensure sub-criticality is therefore of increasing concern to the staff. Means to improve the performance of these materials and/or monitor their effectiveness should be developed when they are credited in criticality analyzes.

Since March 2006 the NRC has received 14 SFP criticality LARs. Most of those submittals had at least one significant information and/or technical deficiency, significant enough to not meet the acceptance criteria in the Office of Nuclear Reactor Regulation's Procedure LIC-109, "Acceptance Review Procedures" (Reference RIS 2008-21). Those deficiencies are associated with precedents and references, justification of assumptions, fuel assembly and SFP rack characterization, determination of biases and uncertainties, and validation of computer codes. While not every LAR has had these deficiencies in equal measure, the trend is prevalent enough to cause the staff concern. These deficiencies take a considerable amount of staff and licensee resources to resolve. If left unresolved these deficiencies increase the opportunities to create a situation where sub-criticality is not assured as documented in NRC Information Notice 2005-12.

Because of ongoing concerns with LAR quality and neutron absorber degradation, the staff requests a meeting be held with NEI, licensees, vendors and the staff to discuss these issues and develop a plan to address them. Please work with the NRC NEI lead Project Manager to set up this meeting in the near future.

If you have any questions, please contact me at 301-415-3283.

Sincerely,

/RA by Jared Wermiel for/

William H. Ruland, Director
Division of Safety Systems
Office of Nuclear Reactor Regulation

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