

April 5, 2006

Mr. Alexander Marion
Senior Director, Engineering
Nuclear Energy Institute
1776 I Street, NW, Suite 400
Washington, DC 20006-3708

SUBJECT: REQUEST FOR REVIEW OF TOPICAL REPORT 1008108, "LICENSING CRITERIA FOR FUEL BURNUP EXTENSION BEYOND 62 GWd/tU - INDUSTRY GUIDE," FOR REVIEW DUE TO MAJOR DEFICIENCIES (TAC NO. MC7042)

Dear Mr. Marion:

By letter dated March 17, 2005, the Nuclear Energy Institute (NEI) submitted Electric Power Research Institute (EPRI) Topical Report (TR) 1008108 to the U.S. Nuclear Regulatory Commission (NRC) staff for review. The TR was submitted in support of the NRC's generic regulatory improvements and to form the basis for NRC criteria for use of high-burnup fuel. A fee waiver was granted on May 20, 2005, because this TR supports NRC regulatory improvement efforts. The NRC staff has completed an acceptance review of your application and the supporting information in accordance with the TR program criteria. We have concluded that there are technical deficiencies in the licensing strategy proposed in TR 1008108 for high-burnup applications and that the TR is not sufficient to support the NRC's rulemaking efforts on this subject. Therefore, the NRC staff is not accepting this TR for review at this time. The technical deficiencies, which were discussed with NEI staff at a November 2, 2005, meeting, are outlined below.

I. Evolution of Fuel Pellet Structure with Burnup

In this TR, the development of a high burnup rim region is briefly discussed in the context of a rod ejection accident. The characterization of the rim region, in addition to the overall pellet structure, needs to be expanded. The impact of these evolutionary changes to the pellet structure needs to be quantified for steady-state, anticipated operational occurrences (AOOs), and all accident scenarios. Furthermore, the impact on these pellet changes needs to be evaluated with respect to validating fuel performance models (e.g., fission gas release, relocation, swelling).

II. Radiological Source Term

The fuel pellet and its grain structure are often considered the first boundary to the release of fission products. The continued degradation of the fuel pellet structure and the development of a high burnup rim region will affect the radiological source term. It is the industry's responsibility to characterize and quantify the fission gas release resulting from normal steady-state operation, power ramps/maneuvers, AOOs, and all accident scenarios.

III. Short-Term & Long-Term Fuel Storage

Short-term fuel storage (i.e., spent fuel pool, dry-cask), transportation, and long-term fuel storage need to be either specifically addressed or coordinated with a companion TR.

IV. Deviations for Licensing Strategy and Future Amendments

The EPRI TR defines a uniform licensing strategy for developing and reviewing high burnup applications. From a process perspective, the TR should briefly define how vendors would successfully deviate from these guidelines. Further, the TR should define a process for amending the information in the TR, if needed (i.e., to integrate new testing information or new operating experience).

V. Loss-of-Coolant Accident (LOCA) Acceptance Criteria

Based upon the scope of the Argonne National Laboratory research program and the availability of high burnup clad material, it is not anticipated that Section 50.46 of Title 10 of the *Code of Federal Regulations* acceptance criteria will be validated beyond 62 GWd/tU. As a result, it is the responsibility of the industry to conduct LOCA testing data to validate its clad materials performance at high burnup.

For the reasons stated above EPRI TR 1008108, "Licensing Criteria for Fuel Burnup Extension Beyond 62 GWd/tU - Industry Guide" is not being accepted for review. If you wish to submit a revised report addressing the technical deficiencies outlined in this letter, you would not have to request another fee waiver. The fee waiver that was granted on May 20, 2005, would still be valid. Additionally, a revised report should be accompanied by an appropriately redacted non-proprietary version of the report and address all issues discussed in NRC letter to Mr. David J. Modeen dated June 15, 2005.

Sincerely,

/RA/
Ho K. Nieh, Deputy Director
Division of Policy and Rulemaking
Office of Nuclear Reactor Regulation

Project Nos. 669 and 689

cc: See next pages

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Project No. 669

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