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USNRC

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Rules and Directives Branch
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Mail Stop T6-D59
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

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OFFICE OF SECRETARY
RULEMAKINGS AND
ADJUDICATIONS STAFF

SUBJECT: Industry Comments on Petition for Rulemaking, PRM-50-73
(*Federal Register* of October 12, 2001, 66 FR 52065)

PROJECT NUMBER: 689

Dear Mr. Lesar:

The NRC has published a notice of receipt of a petition for rulemaking that was filed by Mr. Robert H. Leyse. The petitioner requests that the NRC amend regulations on the acceptance criteria for emergency core cooling systems for light-water nuclear power reactors to address the impact of crud on cooling capability during a large-break, loss-of-coolant accident (LOCA). The Nuclear Energy Institute¹ offers the following comments regarding the proposed petition.

The petitioner states that § 50.46 and Appendix K to Part 50 do not address the impact of crud on coolability during a fast-moving (large-break) LOCA. This is an incorrect statement. 10 CFR 50.46 requires that the cooling performance of the ECCS, following postulated LOCAs, conform to criteria set forth in the regulation. These criteria include requirements that the calculated changes in core geometry be such that the core remains amenable to cooling and that the calculated core temperature be maintained at an acceptably low value for an extended period of time. These requirements adequately address any impacts that fuel crud may have on coolability during and following a large-break LOCA.

¹NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including regulatory aspects of generic operational and technical issues. NEI members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

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These requirements do not attempt to identify and address all phenomena and events that can be postulated to occur during and following a large-break LOCA. Instead, the regulations establish performance requirements (e.g., maintaining core coolability) necessary to ensure public health and safety. Associated regulatory guidance and NRC approved evaluation models are relied on to address the specific phenomena that can potentially impact these performance requirements. 10 CFR 50.46 requires that ECCS cooling performance be calculated in accordance with acceptable evaluation models and requires that these models include sufficient supporting justification to show that the analytical technique realistically describes the behavior of the reactor system during a LOCA.

Numerous thermal-hydraulic phenomena, events and associated technical models play a role in evaluation models for a large-break LOCA. Because the regulations specify performance requirements and are not overly prescriptive in the phenomena to be addressed, advances in the knowledge base associated with the large-break LOCA event can be readily addressed without requiring a rule change.

The evaluation models used by licensees are updated, as warranted, to address advances in understanding of LOCA phenomena, events and models; resulting from experiments, tests, as well as operational data. Licensees routinely monitor fuel performance during normal operation. Poolside examinations are commonly performed by licensees and by fuel vendors as part of ongoing fuel monitoring processes designed to ensure that fuel models are accurate and that the results of approved evaluation models provide defensibly conservative results. Unusual fuel performance or unexpected operational characteristics are thoroughly evaluated as a normal part of this process. Evaluation models are updated, as necessary, to address the results of these evaluations.

The petitioner states that crud deposits on fuel can become dislodged during a large-break LOCA and postulates that the redistribution of crud would result in substantial blockage of flow. The petitioner does not provide supporting evidence for these suppositions. In contrast, data have been collected and analyzed by licensees and fuel vendors as part of the fuel performance monitoring process noted above. The data collected thus far on crud morphology and expected behavior during a large-break LOCA do not support the characteristics and behavior necessary to support a "substantial blockage of flow." Irrespective of results obtained to date, it is important to note that fuel performance monitoring processes continue and the impact of new data on evaluation models will be continually evaluated.

In summary, the impacts of fuel crud deposits on large-break LOCA behavior that are postulated by the petitioner are not supported by industry data. Fuel performance monitoring processes and ongoing evaluations of impacts on NRC

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approved evaluation models provide a mechanism for ensuring that unexpected fuel behaviors are thoroughly evaluated and that the requirements of 10 CFR 50.46 continue to be met. Revisions to 10 CFR 50.46 and Appendix K proposed by the petitioner are not needed.

We appreciate the opportunity to comment on the petition for rulemaking. Please contact John Butler (202) 739-8108, jcb@nei.org if you desire further information.

Sincerely,



Alexander Marion

JCB/maa