POLICY ISSUE

(Notation Vote)

November 19, 2015 SECY-15-0146

FOR: The Commissioners

FROM: Victor M. McCree
Executive Director for Operations

SUBJECT: DENIAL OF PETITION FOR RULEMAKING REQUESTING AMENDMENTS REGARDING SPENT FUEL POOL SEVERE ACCIDENT EVALUATIONS (PRM-50-108; NRC-2014-0171)

PURPOSE:

To obtain Commission approval to deny a petition for rulemaking (PRM) submitted by Mr. Mark Edward Leyse (the petitioner). This paper does not address any new commitments.

BACKGROUND:

The U.S. Nuclear Regulatory Commission (NRC) received a petition for rulemaking dated June 19, 2014, from Mr. Mark Edward Leyse and assigned it Docket No. PRM-50-108 (Agencywide Documents Access and Management System Accession No. ML14195A388). The petitioner requested that the NRC require power reactor licensees to perform evaluations to determine the potential consequences of various postulated spent fuel pool (SFP) accident scenarios. The evaluations would be required to be submitted to the NRC for informational purposes. The NRC published a notice of docketing in the *Federal Register* (FR) on October 7, 2014 (79 FR 60383). The NRC did not request public comment on the petition because sufficient information was available for the NRC staff to form a technical opinion regarding the merits of the petition.

CONTACT: Daniel I. Doyle, NRR/DPR
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DISCUSSION:

The Petition

The petitioner requested that the NRC develop new regulations requiring that: (1) SFP accident evaluation models use data from multi-rod bundle (assembly) severe accident experiments for calculating the rates of energy release, hydrogen generation, and fuel cladding oxidation from the zirconium-steam reaction; (2) SFP accident evaluation models use data from multi-rod bundle (assembly) severe accident experiments conducted with pre-oxidized fuel cladding for calculating the rates of energy release (from both fuel cladding oxidation and fuel cladding nitriding), fuel cladding oxidation, and fuel cladding nitriding from the zirconium-air reaction; (3) SFP accident evaluation models be required to conservatively model nitrogen-induced breakaway oxidation behavior; and (4) licensees be required to use conservative SFP accident evaluation models to perform annual SFP safety evaluations of: postulated complete loss-of-coolant accident (LOCA) scenarios, postulated partial LOCA scenarios, and postulated boil-off accident scenarios.

The NRC staff reviewed the petition and, based on its understanding of the overall argument in the petition, identified and evaluated the following three issues:

- Issue 1: The requested regulations pertaining to SFP accident evaluation models are needed because the probability of the type of events that could lead to SFP accidents is relatively high.
- Issue 2: Annual licensee SFP safety evaluations and submission of results to the NRC is necessary so that the NRC is aware of potential consequences of postulated SFP accident/fire scenarios as fuel assemblies are added, removed, or reconfigured in licensees' SFPs.
- Issue 3: MELCOR is not currently sufficient to provide a conservative evaluation of postulated SFP accident/fire scenarios.

Section II, "Reasons for Denial," of the enclosed *Federal Register* notice (FRN) provides detailed NRC responses to the three issues identified in the petition.

NRC Evaluation of Issues Raised in the Petition

Issue 1-The petitioner stated that a long-term station blackout can happen in multiple ways, and a loss of SFP cooling and a SFP fire is a likely outcome. The petitioner argued that this is a sufficient basis for the requested regulations. The NRC staff disagrees. Numerous evaluations have shown that the risk of a SFP fire is low. There are multiple layers of protection to prevent uncovering of spent fuel and the potentially resulting fire.

Issue 2-The petitioner stated that the purpose of the evaluations would be to keep the NRC informed of potential consequences. The NRC staff disagrees. The SFP safety is provided by: conservative design of the SFP; operational criteria to control spent fuel movement, monitor pertinent parameters, and maintain cooling capability; mitigation measures if there is loss of cooling capability or water; and emergency preparedness measures to protect the public. The information proposed to be provided to the NRC is not needed for the effectiveness of the NRC's approach for providing SFP safety.

Issue 3-The petitioner stated that there are serious flaws with MELCOR, and, therefore, MELCOR is not currently sufficient for use in the requested annual SFP evaluations. The NRC staff does not agree that it is necessary to establish requirements for SFP accident evaluation computer models because the requested annual SFP evaluations are not necessary for regulatory decisionmaking. Therefore, it is not necessary for the NRC to establish requirements for how the evaluation should be conducted. Furthermore, the NRC staff disagrees with the petitioner's claims that MELCOR is flawed. The MELCOR computer code is the NRC's best estimate tool for severe accident analysis. It has the capability to mechanistically model the important physical phenomena given inherent uncertainties in accident progression phenomenology. The MELCOR computer code has been benchmarked against many experiments including separate and integral effects tests for a wide range of phenomena. These additional points, which need not be addressed to resolve the petition, are nonetheless discussed in the *FRN* denying the petition for rulemaking in order to address the assertions in the petition.

RECOMMENDATION:

The NRC staff recommends that the Commission deny PRM-50-108 because the petitioner failed to present any significant new information or arguments that would warrant the requested amendments. The NRC staff does not believe that the information that would be reported to the NRC as requested by the petitioner is necessary for effective NRC regulatory decisionmaking with respect to SFPs. The NRC staff continues to believe that the current design and licensing requirements for SFPs provide adequate protection of public health and safety. The enclosed FRN provides a detailed response to the issues raised in the petition.

The NRC staff requests the Commission's approval to publish the FRN denying the petition (Enclosure 1). The enclosed letter for signature by the Secretary of the Commission (Enclosure 2) informs the petitioner of the Commission's decision to deny the petition. The NRC staff will inform the appropriate congressional committees.

RESOURCES:

Denial of this petition will not affect budgeted resource needs.

COORDINATION:

The Office of the General Counsel has no legal objection to the denial of this petition and the documents in this package. The Office of Administration has reviewed and concurred on this paper.

/RA/

Victor M. McCree
Executive Director
for Operations

Enclosures:
1. *Federal Register* notice
2. Letter to the Petitioner

COORDINATION:

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Enclosures:
1. *Federal Register* notice
2. Letter to the Petitioner

ADAMS Accession Nos: **PKG**: ML14307A691, **SECY**: ML14307A134, **FRN**: ML14307A630, **LTR to Petitioner**: ML14307A157 *via email

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