

## **RULEMAKING ISSUE INFORMATION**

December 22, 2003

SECY-03-0219

FOR: The Commissioners

FROM: William D. Travers  
Executive Director for Operations

SUBJECT: TERMINATION OF RULEMAKING TO ADD M5<sup>TM</sup> CLADDING TO  
10 CFR 50.46, "ACCEPTANCE CRITERIA FOR EMERGENCY CORE  
COOLING SYSTEMS FOR LIGHT-WATER NUCLEAR POWER REACTORS"  
(WITS 200300060)

PURPOSE:

To inform the Commission of the staff's decision to terminate rulemaking to add M5<sup>TM</sup> fuel cladding to the cladding materials listed in 10 CFR 50.46, "Acceptance Criteria for Emergency Core Cooling Systems for Light-Water Nuclear Power Reactors." The staff had planned to add M5<sup>TM</sup> by way of a final rule to resolve, in part, the Nuclear Energy Institute's (NEI's) Petition for Rulemaking (PRM) 50-71, "Use of Cladding Material Other Than Zircaloy or ZIRLO<sup>TM</sup>," which requested that the Nuclear Regulatory Commission (NRC) allow licensees to use zirconium-based cladding materials other than zircaloy or ZIRLO<sup>TM</sup>. However, the staff is now planning to develop a performance-based rule that will grant PRM 50-71 in its entirety, by replacing the list of trademarked cladding materials in 10 CFR 50.46 with the words "zirconium-based cladding materials," as soon as the necessary technical basis can be developed to support the change. Development of the technical basis will include identification of the critical characteristics of the fuel cladding under both normal operating conditions and accident conditions, as well as the testing criteria needed to confirm adequate cladding material performance under those conditions.

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DISCUSSION:

On May 31, 2000 (65 FR 34599), the NRC published a notice in the *Federal Register* requesting comment on a petition for rulemaking submitted by NEI. The petitioner requested that the NRC amend its regulations in 10 CFR 50.44, "Standards for combustible gas control system in light-water-cooled power reactors," and 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," to allow nuclear power plant licensees to use zirconium-based cladding materials other than zircaloy or ZIRLO™. The petitioner noted that after these regulations were issued, commercial nuclear fuel vendors developed, and continue to develop, materials other than zircaloy or ZIRLO™ that NRC reviews and approves for use with commercial power reactor fuel. Each of these approvals requires the NRC to grant an exemption to the licensee that requests use of fuel in cladding materials other than zircaloy or ZIRLO™. The petitioner requested that NRC amend §§ 50.44 and 50.46 to provide licensees the discretion to use zirconium-based cladding materials other than zircaloy or ZIRLO™, provided that the cladding materials meet staff "accepted fuel cladding performance requirements." The petitioner asserted that the proposed amendment would not degrade the ability to meet regulatory criteria. Rather, it would remove an unwarranted licensing burden without increasing risk to public health and safety.

After the staff recommended proceeding with the proposed M5™ rulemaking, the Commission approved the staff's efforts to develop a performance-based rule for 10 CFR 50.46. In a Staff Requirements Memorandum dated March 31, 2003, on SECY-02-0057, the Commission approved the staff's recommendation to proceed with modifications to 10 CFR 50.46 to provide for a more performance-based approach to meeting ECCS acceptance criteria. The performance-based approach includes developing acceptance criteria for cladding performance such that licensees would be able to use materials other than zircaloy or ZIRLO™ without an exemption.<sup>1</sup> The research necessary to support the performance-based rulemaking is currently underway.

Once the information from research becomes available, the staff will proceed with developing the proposed performance-based rule. The proposed performance-based rule would achieve the full purpose of the NEI petition, whereas a more limited rulemaking adding one specific alloy would be a temporary step, since additional cladding materials are being developed. Given that fuel vendors are continuing to introduce new cladding materials with improved performance characteristics, the staff believes that adding new trademarked cladding materials to the list in 10 CFR 50.46 each time a new material is developed is not an efficient use of agency resources. Therefore, the staff plans to proceed with resolution of the NEI petition through the performance-based rulemaking, and to terminate the more limited rulemaking effort to explicitly add M5™ to 10 CFR 50.46.

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<sup>1</sup>A final rule(68 FR 54123) deletes the references to zircaloy and ZIRLO™ fuel cladding from 10 CFR 50.44 as part of the risk-informed rulemaking to revise 10 CFR 50.44.

RESOURCES:

Resources are available within the current budget to continue the activity to develop the technical basis for a performance-based rule. Resources for a performance-based rule will be included in the Fiscal Year (FY)06 budget.

SCHEDULE:

The Office of Nuclear Regulatory Research is currently conducting confirmatory research on irradiated zircaloy cladding and unirradiated M5 cladding, which should be completed in late FY04. The results of this research will help the staff develop the technical basis to support performance-based criteria for fuel cladding material in FY05. The staff plans to include the performance-based rulemaking effort in the FY06 budget. If the performance-based criteria is developed ahead of schedule, the staff will consider beginning the rulemaking effort in FY05, if resources are available.

COORDINATION:

The Office of the General Counsel has no legal objection to this paper.

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