

Rulemaking Issue
(Notation Vote)

May 31, 2016

SECY-16-0069

FOR: The Commissioners

FROM: Victor M. McCree
Executive Director for Operations

SUBJECT: RULEMAKING PLAN ON EMERGENCY PREPAREDNESS FOR SMALL
MODULAR REACTORS AND OTHER NEW TECHNOLOGIES

PURPOSE:

The purpose of this paper is to request Commission approval of the schedule for a rulemaking about emergency preparedness (EP) for small modular reactors (SMRs) and other new technologies, such as non-light-water reactors (non-LWRs) and medical isotope production facilities. This rulemaking would develop EP requirements for these technologies that would be commensurate with the potential consequences to public health and safety.

SUMMARY:

In the Staff Requirements Memorandum (SRM) for SECY-15-0077, "Options for Emergency Preparedness for Small Modular Reactors and Other New Technologies," dated August 4, 2015 (Agencywide Document Access and Management System (ADAMS) Accession No. ML15216A492), the Commission directed the staff to proceed with rulemaking for the establishment of EP requirements for SMRs and other new technologies. The SRM also required the staff to provide for information, a plan and schedule for this rulemaking, which is detailed in this paper. Subsequently in SRM-SECY-15-0129, "Commission Involvement in Early Stages of Rulemaking," dated February 3, 2016 (ADAMS Accession No. ML16034A441), the Commission approved institution of a requirement for a streamlined rulemaking plan in the form

CONTACT: Arlon Costa, NRO/DEIA
301-415-6402

SECY NOTE

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of a SECY paper that would request Commission approval to initiate all rulemakings not already explicitly delegated to the staff as a staff-delegated rulemaking. As such, the staff is providing the plan and schedule for the subject rule in the format of the rulemaking plan approved by SRM-SECY-15-0129.

Current regulations specify a plume exposure pathway emergency planning zone (EPZ) of about 10 miles and an ingestion exposure pathway EPZ of about 50 miles. The regulations further specify that the size of EPZs “may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized reactor power level less than 250 MW thermal.”¹ This rulemaking would develop a dose-based, consequence-oriented framework for future SMR applicants and licensees with respect to offsite EP that would reduce the need for exemptions related to regulations associated with large LWRs. The staff anticipates substantial public interest on this rulemaking because of the potential to alter the traditional offsite EP requirements for SMRs and other new technologies. The staff will use efficiencies gained from lessons learned during an ongoing decommissioning rulemaking addressing EP and an upcoming review of an early site permit (ESP) that intends to request exemptions to the EP requirements for reduced EPZs for an SMR facility.

This rulemaking is estimated to be a medium priority rulemaking, but is also Commission directed (SRM-SECY-15-0077). This rulemaking would be a significant U.S. Nuclear Regulatory Commission (NRC) licensing initiative as part of NRC’s Strategic Plan in support of SMRs and other new technologies. The staff’s expectation is that the backfitting and issue finality regulations do not apply for this rulemaking because it would only apply to future applicants.

The staff recommends an Advisory Committee on Reactor Safeguards (ACRS) review of this rulemaking during the development of the regulatory basis, proposed rule, and final rule. The staff recognizes the public’s interest in EP issues and estimates that the project, starting with the completion of the regulatory basis phase ending with publication of the final rule, will take approximately 4 years.

BACKGROUND:

In SRM-SECY-15-0129, the Commission approved institution of a requirement for a streamlined rulemaking plan in the form of a SECY paper that would request Commission approval to initiate all rulemakings not already explicitly delegated to the staff as a staff-delegated rulemaking. The Commission previously approved this rulemaking activity (SRM-SECY-15-0077). Accordingly, the staff requests approval of the schedule of the rulemaking pertaining to EP for SMRs and other new technologies, such as non-LWRs and medical isotope production facilities. EP plans currently required by Title 10 of the *Code of Federal Regulations* (CFR) 50.47(b) specify requirements to provide reasonable assurance that protective measures are taken during emergencies at nuclear power plants. EP complements accident prevention, mitigation features, and programs to provide defense-in-depth that best ensures no undue risk to public health and safety for a wide range of severe accidents. These EP regulations, guidance, and EPZ sizes, are developed for the existing fleet of large LWRs.

¹ 10 CFR 50.47(c)(2).

SECY-10-0034, "Potential Policy, Licensing, and Key Technical Issues for Small Modular Nuclear Reactor Designs" (ADAMS Accession No. ML093290268) discussed possible changes to EP requirements for SMRs. In SECY-11-0152, "Development of an Emergency Planning and Preparedness Framework for Small Modular Reactors" (ADAMS Accession No. ML112570439), the staff discussed its "intent to develop a technology-neutral, dose-based, consequence-oriented EP framework for SMR sites that takes into account the various designs, modularity and collocation, as well as the size of the emergency planning zone (EPZ)." In SECY-15-0077, "Options for Emergency Preparedness for Small Modular Reactors and Other New Technologies" (ADAMS Accession No. ML15037A176), the staff sought Commission direction to proceed with rulemaking for EP for SMRs and other new technologies. The Commission issued SRM-SECY-15-0077 directing the staff to proceed with rulemaking and to develop a plan and schedule to undertake the EP rulemaking for SMRs and other new technologies, such as non-LWRs and medical isotope production facilities.

Current regulations specify a plume exposure pathway EPZ of about 10 miles and an ingestion exposure pathway EPZ of about 50 miles. They further identify that the size of EPZs "may be determined on a case-by-case basis for gas-cooled nuclear reactors and for reactors with an authorized reactor power level less than 250 MW thermal."² This rulemaking would evaluate these requirements with the option "to derive a dose-based, consequence-oriented rationale"³ that would eliminate the need for case-by-case EPZ exemptions for SMRs and other new technologies.

DISCUSSION:

Title

Emergency Preparedness for Small Modular Reactors and Other New Technologies.

Estimated Schedule

Initiate regulatory basis phase – August 2016

Complete regulatory basis – March 2017

Publish proposed rule – September 2018

Publish final rule – April 2020

Preliminary Priority

The staff estimated that this activity would be a medium priority rulemaking using the Common Prioritization of Rulemaking (CPR) prioritization methodology. This rulemaking is estimated as a medium priority because: a) it would be a moderate contributor toward the NRC Strategic Plan safety goal and implement several of the Plan's safety strategies; b) it would be a moderate contributor toward the Strategic Plan's Regulatory Effectiveness strategies; c) it would significantly support an NRC licensing initiative with a future regulatory benefit, considering Commission and Congressional interest in SMRs and other new technologies; and d) there is substantial public interest on this topic. There is additional, relevant information supporting this

² 10 CFR 50.47(c)(2).

³ See discussions in SECY-11-0152 and SECY-15-0077.

preliminary priority in the “Relationship of the Work to the NRC’s Strategic Plan” section of this paper.

Description and Scope

The major objective of revising 10 CFR 50.47, Appendix E to Part 50, and associated regulations is to enhance regulatory effectiveness by providing a stable and predictable process for implementing EP for SMRs and new technologies. The revision will consider much smaller source terms expected in these designs when compared to large LWRs, as well as to considerations of different technological advancements in reactor designs and their associated design features impacting EP. The rulemaking would permit future applicants and licensees to demonstrate their safety case and technical basis to meet requirements of a consequence based approach for offsite EP and planning.

The benefits of changing the regulations for EP for SMR and new technologies include the following: a) reduction in the number of exemption requests as compared to current regulations; b) reduction of EPZ sizes that could be smaller than what is currently required by 10 CFR 50.47(c)(2), but reflective of offsite consequences and radiation risks to public health and safety; c) consistency in regulatory applicability in the review of EP plans in accordance to 10 CFR 50.47; and d) potential use of a performance-based EP regimen.

Relationship of the Work to the U.S. Nuclear Regulatory Commission’s Strategic Plan

The NRC staff expects that the rulemaking will have no negative impact on the safety goal of the NRC’s Strategic Plan. The most significant impact of the intended rulemaking to revise 10 CFR 50.47 and Appendix E would be the enhancement of regulatory effectiveness by providing a stable and predictable process for implementing new EP requirements for SMRs and new technologies. This approach supports the principles of good regulation, including openness, clarity, and reliability.

The staff notes that a rulemaking effort, “Regulatory Improvements for Decommissioning Power Reactors,” is currently ongoing, as directed by the Commission in SRM-SECY-14-0118, “Request by Duke Energy Florida, Inc., for Exemptions from Certain Emergency Planning Requirements” (ADAMS Accession No. ML14364A111). The EP component of the ongoing decommissioning rulemaking and future EP SMR rulemaking share similar elements. For example, the two rulemakings share a premise that dedicated offsite radiological EP programs can be reduced or are not needed, if accident analyses show that the U.S. Environmental Protection Agency protective action guides are not exceeded off site. The staff plans to consider public comments received on the Advance Notice of Proposed Rulemaking (ANPR) for the decommissioning rulemaking, which addresses similar changes to EP and planning regulations for decommissioning reactors. The questions in the ANPR for the decommissioning rulemaking address many of the same issues expected in the SMR rulemaking. The staff will supplement the comments from the ANPR with additional outreach efforts to stakeholders in the development of the EP for SMR and other new technologies rulemaking.

The Tennessee Valley Authority (TVA) has submitted an ESP application early on May 12, 2016. The ESP will seek a plant parameter envelope ESP for an SMR at the Clinch River site in Oak Ridge, TN. TVA included proposals in its ESP application for reduced EPZ sizes, for which it requests exemptions to the EP requirements in 10 CFR Part 50, “Domestic

Licensing of Production and Utilization Facilities,” and in 10 CFR Part 52, “Licenses, Certifications, and Approvals for Nuclear Power Plants,” Subpart A, “Early Site Permits.” The staff will use lessons learned from the ESP review to inform the development of the SMR EP rulemaking.

Substantial public interest is expected on this rulemaking because of the potential to significantly reduce or eliminate the traditional offsite EP requirements for SMRs and other new technologies. The staff intends to hold public meetings in concert with the publication of the proposed rule and revisions of guidance, as appropriate. The meetings will enable staff to engage stakeholders, receive feedback, and answer questions regarding the proposed rule and guidance. The staff is planning for an extended comment period on the proposed rule. In addition to publication in the *Federal Register*, the rulemaking and any proposed revision of guidance documents will also be placed on the NRC's web site to enhance public dialogue.

The staff plans to draw upon the previously discussed decommissioning rulemaking and TVA's ESP application review to inform the development of the technical basis, rule language, and guidance documents.

The staff intends to continue interaction with the Federal Radiological Preparedness Coordinating Committee to discuss issues of mutual interest to the NRC, Federal Emergency Management Agency, and other government organizations. The staff does not plan to form a rulemaking steering committee, but will consider the need for a steering committee to resolve rulemaking issues, if any arise.

Cost and Benefits

The proposed action is estimated to involve a medium magnitude of costs, largely due to developing a regulatory basis for and guidance supporting the methodology for demonstrating the appropriate EPZ size and EP plan for varying source terms and designs. The proposed action is estimated to provide the following benefits: a) reduction in the number of exemption requests as compared to current regulations; b) reduction of EPZ sizes that could be smaller than what is currently required by 10 CFR 50.47(c)(2) but ensure adequate protection of public health and safety; c) consistency in regulatory applicability in the review of EP plans in accordance to 10 CFR 50.47; and d) potential use of a performance-based EP regimen.

Cumulative Effects of Regulation

This rulemaking would have a net positive impact on cumulative effects of regulation because: a) it would potentially reduce regulatory burden for applicants for SMRs and other new technologies, b) it is currently anticipated that there are no critical skill sets or other ongoing NRC activities that would significantly impact the implementation of the proposed change, and c) the staff plans to hold public meetings at several key steps in the process and provide an extended public comment period.

Agreement State Considerations

There are no Agreement State considerations for this rulemaking.

Backfitting and Issue Finality

The staff's expectation is that the backfitting and issue finality regulations do not apply. The proposed revisions to EP requirements would not represent backfitting because they would contain new requirements to design, construct, and operate new facilities. The intended rule defining the new EP regulations and guidance for SMRs and other technologies such as non-LWR designs would be in place before an applicant applies for a license. The backfitting and issue finality regulations do not protect current or future applicants from the imposition of new or different requirements. Therefore, the staff will not be required to prepare a backfit analysis for the proposed rule.

Guidance

The staff estimates that one or more new guidance document(s) will be developed in parallel with the rulemaking. Current guidance for operating reactors would likely remain unchanged.

Advisory Committee on Reactor Safeguards Review

The staff requests Commission direction on whether the Advisory Committee on Reactor Safeguards (ACRS) review is warranted. The staff believes that this rulemaking falls within the scope of the ACRS Charter and therefore ACRS review is warranted. The staff recommends ACRS review during the development of the regulatory basis, proposed rule, and final rule.

Committee to Review Generic Requirements Review

The staff does not believe the Committee to Review Generic Requirements review is necessary because the backfit regulations do not apply, as described in the "Backfitting and Issue Finality" section of this paper.

Analysis of Legal Matters

The Office of the General Counsel (OGC) has reviewed the rulemaking plan regarding a rulemaking that considers a dose-based, consequence-oriented approach to EP for SMRs and other new technologies, such as non-LWRs and medical isotope production facilities. This rulemaking would eliminate the need for case-by-case EPZ exemptions for SMRs and other new technologies, such as non-LWRs and medical isotope production facilities. The Commission approved this undertaking in SRM-SECY-15-0077.

The regulations and associated guidance described in the rulemaking plan would not constitute backfitting as defined in 10 CFR 50.109(a)(1) because they would apply to specific new technologies only and not to currently licensed large LWRs. For this reason, the staff will not need to conduct a backfitting assessment for the proposed rule. The proposed rule will require

preparation of an environmental assessment, as it appears that there are no categorical exclusions in 10 CFR 51.22(c) that would apply to this rulemaking.

The determination of whether the rule is a “major rule” under the Congressional Review Act will be made during the development of the regulatory analysis prepared for the proposed rule.

The proposals in this plan would require licensees to generate and maintain records related to their EP operations. Accordingly, the rule would require the Office of Management and Budget review and approval for the purpose of the Paperwork Reduction Act.

OGC has concluded that there are no known bases for legal objection to the rulemaking.

COMMITMENT:

If the Commission approves the schedule for the rulemaking, the staff will add the rule to the CPR during the next budget formulation cycle.

RECOMMENDATIONS:

The NRC staff recommends that the Commission approve the schedule for the rulemaking pertaining to EP for SMRs and other new technologies, such as non-LWRs and medical isotope production facilities.

The staff also recommends ACRS review during the development of the regulatory basis, proposed rule, and final rule.

RESOURCES:

The enclosure includes an estimate of the resources needed to complete this rulemaking. Resource estimates in the enclosure are not publicly available and would be used to address the broad issues outlined in SECY-11-0152, SECY-15-0077, and SRM-SECY-15-0077.

COORDINATION:

OGC has no legal objection to this action. The Office of the Chief Financial Officer has reviewed this paper and has no concerns with the estimated resources in the enclosure.

/RA/

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Executive Director
for Operations

Enclosure:
Resources

COORDINATION:

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Executive Director
for Operations

Enclosure:
Resources

SRM-S15-0077

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| DATE | 01/20/16 | 01/21//16 | 01/28/16 | 02/02/16 |
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| NAME | BHolian | MWylie (MKaplan for) | PMoulding (MCapentier for) | FMiller |
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| NAME | JUhle | VMcCree | | |
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