

[7590-01-P]

**NUCLEAR REGULATORY COMMISSION**

**10 CFR Part 50**

**[NRC-2008-0602, NRC-2002-0020]**

**RIN 3150-AH43**

**Decoupling an Assumed Loss of Offsite Power from a Loss-Of-Coolant Accident**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Discontinuation of rulemaking activity and denial of petition for rulemaking.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) is discontinuing the rulemaking activity, "Decoupling an Assumed Loss of Offsite Power from a Loss-Of-Coolant Accident" (the LOOP/LOCA rulemaking), and denying the associated petition for rulemaking (PRM), PRM-50-77. The purpose of this action is to inform members of the public of the discontinuation of the rulemaking activity and the denial of the PRM, and to provide a brief discussion of the NRC's decision regarding the rulemaking activity and PRM. The rulemaking activity will no longer be reported in the NRC's portion of the Unified Agenda of Regulatory and Deregulatory Actions (the Unified Agenda).

**DATES:** Effective [INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*], the rulemaking activity discussed in this document is discontinued and PRM-50-77 is denied.

**ADDRESSES:** Please refer to Docket IDs NRC-2008-0602 (rulemaking activity) and NRC-2002-0020 (PRM) when contacting the NRC about the availability of information regarding this document. You may obtain publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web Site:** Go to <http://www.regulations.gov> and search for Docket IDs NRC-2008-0602 (rulemaking activity) and NRC-2002-0020 (PRM). Address questions about NRC dockets to Carol Gallagher; telephone: 301-415-3463; e-mail: [Carol.Gallagher@nrc.gov](mailto:Carol.Gallagher@nrc.gov). For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.
- **NRC's Agencywide Documents Access and Management System (ADAMS):** You may obtain publicly-available documents online in the ADAMS Public Documents collection at <http://www.nrc.gov/reading-rm/adams.html>. To begin the search, select "[ADAMS Public Documents](#)" and then select "[Begin Web-based ADAMS Search](#)." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to [pdr.resource@nrc.gov](mailto:pdr.resource@nrc.gov). The ADAMS accession number for each document referenced in this document (if that document is available in ADAMS) is provided the first time that a document is referenced.
- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

**FOR FURTHER INFORMATION CONTACT:** Robert Beall, Office of Nuclear Reactor Regulations, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-3874; e-mail: [Robert.Beall@nrc.gov](mailto:Robert.Beall@nrc.gov).

**SUPPLEMENTARY INFORMATION:**

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**I. Background**

In both SECY-01-0133, "Status Report on Study of Risk-Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommendations on Risk-Informed Changes to 10 CFR 50.46 (ECCS Acceptance Criteria)," dated July 23, 2001 (ADAMS Accession No. ML011800492), and SECY-02-0057, "Update to SECY-01-0133, 'Fourth Status Report on Study of Risk-Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommendations on Risk-Informed Changes to 10 CFR 50.46 (ECCS Acceptance Criteria)'" (ADAMS Accession No. ML020660607), the NRC staff recommended developing a possible risk-informed alternative to reliability requirements in ~~40 CFR~~ 50.46 of title 10 of the Code of Federal Regulations (10 CFR) and General Design Criterion (GDC) 35, "Emergency Core Cooling," of appendix A, "General Design Criteria for Nuclear Power Plants," to 10 CFR part 50, "Domestic Licensing of Production and Utilization Facilities." On March 31, 2003, in the staff requirements memorandum (SRM) for SECY-02-0057, ~~"Update to SECY-01-0133, 'Fourth Status Report on Study of Risk Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommendations on Risk-Informed Changes to 10 CFR 50.46 (ECCS Acceptance Criteria)'" (ADAMS Accession No. ML030910476), the~~

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Commission directed the NRC staff to proceed with a rulemaking to risk-inform the emergency core cooling system (ECCS) functional reliability requirements in ~~General Design Criterion (GDC) 35, "Emergency Core Cooling," of appendix A, "General Design Criteria for Nuclear Power Plants," to part 50 of title 10 of the Code of Federal Regulations (10 CFR), "Domestic Licensing of Production and Utilization Facilities."~~ This proposed rulemaking would provide licensees an option to relax the current analysis requirements for considering a loss of offsite power (LOOP) to occur coincident with a large-break loss-of-coolant accident (LOCA) (the LOOP/LOCA rulemaking). The SRM also stated that the NRC staff should include relevant issues and uncertainties that can impact plant risk (e.g., delayed LOOP and "double sequencing"<sup>1</sup> of safety functions).

Commented [A2]: See edit in footnote 1 below.

In parallel with the LOOP/LOCA rulemaking, the NRC ~~had been pursuing~~ pursued a separate rulemaking for a risk-informed definition of large-break LOCA ECCS analysis requirements (the 50.46a ECCS rulemaking). The proposed regulations in the 50.46a ECCS rulemaking would have allowed both pressurized water reactors (PWRs) and boiling water reactors (BWRs) to decouple a LOOP from a LOCA for certain break sizes.

## II. Process for Discontinuing Rulemaking Activities

When the NRC staff identifies a rulemaking activity that can be discontinued, the staff requests approval from the Commission to discontinue it in a Commission paper. The Commission provides its decision in an SRM. If the Commission approves discontinuing ~~the a~~ rulemaking activity, the NRC staff ~~will~~ informs the public of the Commission's decision.

<sup>1</sup> Double sequencing is defined as a situation where electrically powered safety and accident mitigation equipment automatically start, shut down, and restart in rapid succession when called on to operate. Delayed LOOP and double sequencing ~~was~~ ere evaluated and dispositioned in GSI-171, "ESF Failure from LOOP Subsequent to LOCA," for the current regulations (<https://www.nrc.gov/sr0933/Section%203.%20New%20Generic%20Issues/171r1.html#>). GSI-171 does not need to be reevaluated if the LOOP/LOCA rulemaking is discontinued.

A rulemaking activity may be discontinued at any stage in the rulemaking process. For a rulemaking activity that has received public comments, the NRC ~~will consider~~ those comments before discontinuing the rulemaking activity; however, the NRC staff will not provide individual comment responses.

After Commission approval to discontinue the rulemaking activity, the NRC staff ~~will~~ updates the next edition of the Unified Agenda to indicate that the rulemaking is discontinued. The rulemaking activity will appear in the completed section of that edition of the Unified Agenda but will not appear in future editions.

A rulemaking activity proposed for discontinuation may ~~(1)~~ have been initiated in response to accepting one or more PRMs, or ~~may (2)~~ include issues from one or more PRMs that were accepted and added to the ongoing related rulemaking activity. Therefore, discontinuation of the rulemaking activity also requires the NRC to take action to resolve the associated PRM(s) and to inform the petitioner(s) and the public of the NRC's action.

~~Discontinuing the associated NRC action to discontinue a~~ rulemaking would normally ~~allow~~ ~~an~~ result in NRC denial of the associated PRM ~~to be denied~~ for the same reasons.

### III. Decoupling an Assumed Loss of Offsite Power from a Loss-Of-Coolant Accident

The Boiling Water Reactor Owners Group (BWROG) submitted for NRC review a licensing topical report NEDO-33148, "Separation of Loss of Offsite Power from Large Break LOCA," dated April 27, 2004 (ADAMS Accession No. ML041210900). The BWROG stated that the licensing topical report would support plant-specific exemption requests to implement ~~specific~~ plant changes that are currently not possible with the existing regulatory requirements to consider a LOOP coincident with a large break LOCA. The NRC intended to derive some of the technical ~~aspects support~~ for the proposed LOOP/LOCA rulemaking from NEDO-33148 ~~to benefit BWR licensees~~. The proposed rulemaking would allow BWR licensees to make specific

design changes that otherwise could not be made without exemptions from the current 10 CFR 50.46 requirements.

The BWROG initially chose to pursue an approach that relied on a generic probabilistic risk assessment (PRA) and other published reports for justification of several important assumptions made in NEDO-33148 (e.g., large-break LOCA probability, consequential/delayed LOOP, and double sequencing of electrical loads). The BWROG proposed to address these issues in Revision 2 of NEDO-33148, which was submitted on August 25, 2006 (ADAMS Accession No. ML062480321). Revision 2 presented the risk analyses as risk assessment methodologies rather than a generic risk assessment. In a letter to the BWROG dated March 24, 2008 (ADAMS Accession No. ML080230696), the NRC detailed the conditions and limitations that were required for approval of NEDO-33148, Revision 2. Some of the outstanding technical issues included LOOP/LOCA frequency determinations, seismic contributions to break frequency, the maintenance of defense-in-depth, and the treatment of delayed LOOP and double sequencing issues. The NRC staff determined that these issues would-needed to be adequately addressed in order to complete a regulatory basis that could support a proposed LOOP/LOCA rulemaking.

On June 12, 2008, the BWROG formally withdrew its licensing topical report, NEDO-33148, from further NRC review and discontinued its supporting effort. The BWROG's withdrawal letter (ADAMS Accession No. ML081680048) stated that further development of NEDO-33148 "is no longer cost effective and, if ultimately approved in the form presently desired by NRC staff, adoption by licensees would most likely be prohibitively expensive." The withdrawal of NEDO-33148 and the discontinued effort by the BWROG demonstrated a potential loss of industry interest in this initiative. -support for a proposed LOOP/LOCA rulemaking.

In SECY-09-0140, "Rulemaking Related to Decoupling an Assumed Loss of Offsite Power From a Loss-of-Coolant Accident, 10 CFR Part 50, Appendix A, General Design Criterion 35 (RIN 3150-AH43)," dated September 28, 2009 (ADAMS Accession No. ML092151078), the NRC staff proposed three options for the Commission to consider as a path forward on the LOOP/LOCA rulemaking: (1) discontinue the LOOP/LOCA rulemaking, (2) proceed with the LOOP/LOCA rulemaking without the BWROG topical report, or (3) continue to defer the LOOP/LOCA rulemaking until implementation of the 50.46a ECCS rulemaking. The Commission approved the third option (to defer the LOOP/LOCA rulemaking) in the SRM for SECY-09-0140, dated July 2, 2010 (ADAMS Accession No. ML101830056).

In SECY-16-0009, "Recommendations Resulting from the Integrated Prioritization and Re-Baselining of Agency Activities," dated January 31, 2016 (ADAMS Accession No. ML16028A189), the NRC staff recommended that the 50.46a ECCS rulemaking be discontinued. In the SRM for SECY-16-0009, dated April 13, 2016 (ADAMS Accession No. ML16104A158), the Commission approved discontinuing the 50.46a ECCS rulemaking ~~and~~ directed the staff to publish an FRN to inform the public. The ~~An~~ FRN, published ~~on~~ October 6, 2016 (81 FR 69446), informed the public of the NRC's decision to discontinue the 50.46a ECCS rulemaking.

~~In both SECY 01 0133, "Status Report on Study of Risk Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommendations on Risk Informed Changes to 10 CFR 50.46 (ECCS Acceptance Criteria)," dated July 23, 2001 (ADAMS Accession No. ML011800492), and SECY 02 0057, "Update to SECY 01 0133, "Fourth Status Report on Study of Risk Informed Changes to the Technical Requirements of 10 CFR Part 50 (Option 3) and Recommendations on Risk Informed Changes to 10 CFR 50.46 (ECCS Acceptance Criteria)" (ADAMS Accession No. ML020660607), the NRC staff recommended developing a possible risk informed alternative to reliability requirements in 10 CFR 50.46 and~~

~~GDC 35.~~ In support of this potential ~~risk-informed alternative to reliability requirements in 10 CFR 50.46 and GDC 35~~~~alternative to GDC 35~~, the NRC performed substantial work in a number of technical areas, including ~~estimating LOCA frequencies estimation and the conditional probability of a LOOP, given a LOCA~~ (see memorandum from A. Thadani to S. Collins, "Transmittal of Technical Work to Support Possible Rulemaking on a Risk-Informed Alternative to 10 CFR 50.46/GDC 35," dated July 31, 2002 (ADAMS Accession No. ML022120661)). As part of this work, the NRC identified a number of areas of uncertainty associated with estimating the conditional probability of a LOOP, given occurrence of a LOCA, ~~including (e.g.,~~ very limited data on major ECCS actuations and LOOPS after such actuations, incomplete knowledge about all of the factors that can impact the probability of consequential LOOP because of electrical transient factors,<sup>2</sup> and the impact on offsite system voltage due to deregulation of the electric utility industry~~). To complete a fully developed regulatory basis for the LOOP/LOCA rulemaking, the NRC staff would need to ensure that these areas of uncertainty are adequately addressed as part of the rulemaking activity.~~

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On June 28, 2016, and October 26, 2016, the NRC held public meetings (ADAMS Accession Nos. ML16203A003 and ML16319A153, respectively) to receive external stakeholder feedback on the need for a LOOP/LOCA rulemaking. The NRC presented information on what would be required by the NRC and the industry to continue the proposed rulemaking activity. The NRC's position was similar to the March 24, 2008, letter to the BWROG detailing the information that would be needed to complete review of licensing topical report NEDO-33148. Representatives from the Nuclear Energy Institute and the PWR and BWR Owners Groups also presented their perspectives on continuing the proposed LOOP/LOCA rulemaking effort. The industry ~~re-stated that the conclusions~~~~its view~~ from the 2008 withdrawal of the licensing topical

<sup>2</sup> As used here, transient factors include the electrical disturbance triggered by starting electrically powered safety and accident mitigation equipment as a result of the LOCA and the conditions of the offsite transmission system grid.

report ~~remain valid, in~~ that the estimated implementation costs would be prohibitively expensive for the benefit received. In addition, industry representatives recommended that the NRC staff devote its resources to other risk-informed licensing activities that have significantly higher industry interest, ~~such as (e.g., applications to implement 10 CFR 50.69, "Risk-informed categorization and treatment of structures, systems and components for nuclear power reactors," and risk-informed technical specifications).~~

The NRC is discontinuing the LOOP/LOCA rulemaking activity. The current regulations provide adequate protection of public health and safety, ~~and the incremental safety improvement that was the subject of this rulemaking effort should not be regarded as involving adequate protection but instead should be regarded as a proposed safety enhancement.~~ This rulemaking would have provided licensees an option to relax the current analysis requirements for considering a LOOP to occur coincident with a LOCA. Based on the feedback from the industry, it is unlikely that any licensee would seek licensing basis changes that would rely on the proposed rulemaking ~~because it would not be cost effective to do so.~~ The issues that caused the industry to withdraw the BWROG topical report in 2008 are still applicable today and the industry has greater interest in the progress of other risk-informed initiatives. Therefore, pursuit of this effort would likely have minimal practical impact on safety. ~~In addition, the NRC has a limited annual budget and higher priority rulemakings under consideration.~~ Based upon (1) the assessment that there is no current adequate protection issue with respect to compliance with the current ECCS rule; (2) ~~the information currently known in terms of~~ the lack of significant safety benefits from the rulemaking, (3) ~~the industry's representations of the costs of implementing a LOOP/LOCA rule as currently envisioned by the staff,~~ (4) the industry's representation that it would be unlikely for any licensee to voluntarily use the LOOP/LOCA rule because the estimated implementation costs would be prohibitively expensive for the benefit received, and (5) ~~the~~ industry's stated interest in pursuing other risk-informed licensing

activities, ~~(65) the NRC's limited annual budget, and (75) the preferred focus on higher priority rulemakings~~, the NRC is discontinuing the LOOP/LOCA rulemaking.

#### **IV. Petition for Rulemaking (PRM-50-77)**

On May 2, 2002, the NRC received a PRM from Bob Christie, Performance Technology (ADAMS Accession No. ML082530041), related to the topics in the proposed LOOP/LOCA rulemaking. The PRM requested that the NRC amend its regulations in appendix A to 10 CFR part 50 to eliminate the requirement to assume a LOOP coincident with postulated accidents. The NRC docketed the petition and assigned it Docket No. PRM-50-77. The NRC published a notice of receipt and request for comment on the PRM on June 13, 2002 (67 FR 40622), and received one comment supporting the PRM from the Strategic Teaming and Resource Sharing ~~(STARS)~~ organization (ADAMS Accession No. ML022490192). The petition was resolved by a decision to consider its issues within the LOOP/LOCA rulemaking, but the petition remained open because of the ongoing developments related to this rulemaking. However, in late 2007, the NRC Executive Director for Operations approved changes to the PRM process to enhance the efficiency and effectiveness of dispositioning a PRM. As a result of those enhancements, the NRC closed this petition on April 13, 2009 (74 FR 16802), with a commitment to follow through with the original resolution to consider it within the LOOP/LOCA rulemaking.

Because of the agency's decision to discontinue the LOOP/LOCA rulemaking, the associated petition, PRM-50-77, is denied for the reasons discussed above. As provided at § 2.803(i)(2), the NRC has decided not to complete the rulemaking action and is documenting this denial of the PRM in the docket for the closed PRM.

#### **V. Conclusion**

The NRC is no longer pursuing the LOOP/LOCA rulemaking and is denying PRM-50-77 for the reasons discussed in this document. In the next edition of the Unified Agenda, the NRC will update the entry for the rulemaking activity and reference this document to indicate that ~~the~~ rulemaking is no longer being pursued. The rulemaking activity will appear in the completed actions section of that edition of the Unified Agenda but will not appear in future editions. If the NRC decides to pursue a similar or related rulemaking activity in the future, it will inform the public through a new rulemaking entry in the Unified Agenda.

Dated at Rockville, Maryland, this      day of      2017.

For the Nuclear Regulatory Commission.

Annette L. Vietti-Cook,  
Secretary of the Commission.