[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

[Docket No. PRM-50-124; NRC-2022-0178]

Licensing Safety Analysis for Loss-of-Coolant Accidents

AGENCY: Nuclear Regulatory Commission.

ACTION: Petition for rulemaking; consideration in the rulemaking process.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) will consider in its rulemaking process issues raised in a petition for rulemaking, PRM-50-124, submitted by Ralph O. Meyer (the petitioner). The petition requested that the NRC amend its regulations regarding the licensing safety analysis for loss-of-coolant accidents.

DATES: The docket for the petition for rulemaking, PRM-50-124, is closed on **[INSERT DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**.

ADDRESSES: Please refer to Docket ID NRC-2022-0178 when contacting the NRC about the availability of information for this action. You may obtain publicly available information related to this action by any of the following methods:

- **Federal Rulemaking Website:** Go to https://www.regulations.gov and search for Docket ID NRC-2022-0178. Address questions about NRC dockets to Dawn Forder; telephone: 301-415-3407; email: Dawn.Forder@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 https://www.nrc.gov/reading-rm/adams.html. To begin the search, 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, at 301-415-4737, or by email to PDR.Resource@nrc.gov. For the convenience of the reader, instructions about obtaining materials referenced in this document are provided in the "Availability of Documents" section.
- **NRC's PDR:** The NRC PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time, Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Blake Purnell, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; telephone: 301-415-1380, email: Blake.Purnell@nrc.gov.

SUPPLEMENTARY INFORMATION:

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I. The Petition

The NRC received and docketed a petition for rulemaking (PRM) dated August 1, 2022, filed by Ralph O. Meyer. On November 23, 2022, the NRC published a notice of acceptance and docketing requesting comment on the petition in the *Federal Register* (87 FR 71531). The petition requested that the NRC amend its regulations in section 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," of title 10 of the *Code of Federal Regulations* (10 CFR). The regulations in 10 CFR 50.46 require the calculation of emergency core cooling system (ECCS) performance following postulated loss-of-coolant accidents (LOCAs) to demonstrate that the acceptance criteria in 10 CFR 50.46(b) are met. The petition requested the elimination of the acceptance criteria for peak cladding temperature (PCT) and maximum cladding oxidation (commonly referred to as maximum local oxidation, or MLO) in 10 CFR 50.46(b). As a replacement for these criteria, the petition requested that the NRC regulations be revised to limit the number of fuel rod ruptures to 1 percent for small-break LOCAs and 10 percent for large-break LOCAs. The petition states that nuclear power reactors in Germany must show that the proposed fuel rod rupture limits are met.

The petition asserts that the current acceptance criteria for the calculated PCT and MLO in 10 CFR 50.46(b) do not ensure an easily coolable geometry at moderate and higher fuel burnups due to fuel dispersal. The petition also asserts that the calculations of temperature and oxidation within the burst region of a fuel rod are prone to large uncertainties, and the technical bases for the acceptance criteria on these two parameters are complex and misunderstood. Specifically, the petition states that the beliefs that the temperature limit prevents autocatalytic oxidation and that a reduction in cladding thickness causes embrittlement are incorrect.

II. Public Comments on the Petition

The notice of acceptance and docketing of the PRM invited interested persons to submit comments. In response to a request by the Nuclear Energy Institute, the comment period was extended to March 8, 2023 (88 FR 7012; February 2, 2023). The NRC received nine comment submissions on the petition. The petitioner submitted five sets of comments that provided additional support for the petition. However, two sets of the petitioner's comments were provided several months after the comment period closed. Westinghouse Electric Company LLC, Framatome Inc., the Pressurized Water Reactors Owners Group, and the Nuclear Energy Institute each provided a comment submission opposing the petition. The NRC considered the comments provided prior to March 31, 2023, in making its determination on the petition. A summary of the significant comments and NRC responses is provided below. The NRC evaluation of the petition is provided in section III, "Evaluation of the Petition."

Several comments on the petition mention the pending draft final rule commonly referred to as 10 CFR 50.46c. This draft final rule was provided to the Commission in SECY-16-0033, "Draft Final Rule – Performance-Based Emergency Core Cooling System Requirements and Related Fuel Cladding Acceptance Criteria (RIN 3150-AH42)," dated March 16, 2016. The NRC responds to these comments below; the NRC will not consider these comments as part of the 10 CFR 50.46c rulemaking.

Comment: The petitioner stated that it is appropriate to consider fuel fragmentation, relocation, and dispersal (FFRD) as part of the rulemaking for "Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors" (increased enrichment rulemaking).

NRC Response: The NRC agrees with this comment. The increased enrichment rulemaking plan was provided to the Commission in SECY-21-0109, "Rulemaking Plan on Use of Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for

Light-Water Reactors," dated December 20, 2021. In a staff requirements memorandum (SRM) dated March 16, 2022, SRM-SECY-21-0109, "Staff Requirements – SECY-21-0109 – Rulemaking Plan on Use of Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light Water Reactors," the Commission approved this plan and further directed the staff to consider FFRD issues relevant to higher enrichment and fuel burnup levels as part of the rulemaking.

Comment: One commenter stated that the range of burnups meant by "moderate fuel burnup" in the petition is not clear.

NRC Response: The NRC agrees that "moderate fuel burnup" lacks specificity. The NRC interpreted moderate fuel burnup to encompass currently authorized fuel burnups above which FFRD could potentially occur.

Comment: The petitioner stated that licensees should report the number of fuel rod ruptures during a LOCA so the NRC may determine if near-term action is needed to limit the amount of loose material in the core.

NRC Response: The NRC disagrees with this comment. The NRC has reasonable assurance, based on research and analyses, that the extent and consequences of fuel dispersal during a LOCA, for currently authorized fuel burnup levels, would be limited such that core coolability would not be challenged on a large scale.

Comment: The petitioner stated that, based on engineering judgment, setting rod rupture limits to 1 percent of the core for a small-break LOCA and 10 percent of the core for a large-break LOCA is reasonable and practical. The petitioner stated that

FFRD research should focus on establishing a technical basis for these limits and refine these limits as needed.

NRC Response: The NRC agrees that research would be needed to establish the technical basis for any fuel rod rupture limits that may be imposed. However, the NRC disagrees with the statement that the petition's proposed limits are reasonable and practical because there is currently not sufficient evidence to support this assertion.

Comment: The petitioner stated that current thermal-hydraulic codes can predict cladding rupture with enough accuracy such that built-in conservatisms are not needed to calculate the number of fuel rod bursts.

NRC Response: The NRC agrees that current thermal-hydraulic codes can predict fuel rod rupture with reasonable accuracy, such that best-estimate plus uncertainty models may be used. However, current LOCA analyses are not focused on fuel rod rupture. The conservatisms in current LOCA analyses are necessary to ensure that the PCT and MLO acceptance criteria are met.

Comment: The petitioner stated that, based on analyses and international experience, fuel rod ruptures can be limited to 1 percent for small-break LOCAs and 10 percent for large-break LOCAs. However, this may require some alteration in reactor core design or adjustment of power level to achieve.

NRC Response: The NRC determined that more research and analysis would be needed to demonstrate that the proposed fuel rod rupture limits could be met, under which operating conditions, and whether such limits are appropriate to ensure a reasonable level of safety.

Comment: The petitioner stated that current LOCA analyses do not address fuel dispersal, and that they assume it does not occur. In reality, fuel dispersal is expected to occur during LOCA.

NRC Response: The NRC acknowledges that fuel dispersal is not accounted for in current LOCA analyses and agrees that fuel dispersal is expected to occur during a LOCA. However, the NRC has reasonable assurance that the extent and consequences of fuel dispersal during a LOCA, for currently authorized fuel burnup levels, would be limited such that core coolability would not be challenged on a large scale.

Comment: The petitioner stated that increased enrichment and burnup could become an issue for long-term core cooling during large-break LOCAs.

NRC Response: The NRC agrees that the higher enrichment and higher burnups that are being considered in the future could increase the magnitude of fuel dispersal and thus it could become challenging to demonstrate long-term cooling. As noted above, the Commission has directed the staff to consider FFRD issues relevant to higher enrichment and fuel burnup levels as part of the increased enrichment rulemaking.

Comment: The petitioner stated that high burnup fuel is more likely to pulverize than low burnup fuel and is thus a greater threat to long-term core cooling.

NRC Response: The NRC agrees that high burnup fuel is more likely to pulverize than low burnup fuel, which would very likely result in higher amounts of fuel dispersal. However, the impact of fuel dispersal and particle size on long-term core cooling requires additional research.

Comment: Several commenters recommend rejection of the PRM, but support rulemaking to address FFRD in a holistic manner that considers industry initiatives including accident tolerant fuel, increased fuel enrichment, and higher fuel burnups. Several commenters requested that the NRC revise the pending draft final rule for 10 CFR 50.46c to address FFRD issues and industry fuel design initiatives. One commenter indicated that the petition could be considered as part of an update to the draft final rule for 10 CFR 50.46c.

NRC Response: The NRC disagrees, in part, with this comment. As discussed in section IV, "Reasons for Consideration," the NRC will consider the petition in the ongoing increased enrichment rulemaking. The NRC plans to address regulatory issues related to accident tolerant fuel, increased fuel enrichment, higher fuel burnups, and FFRD in this rulemaking. The draft final 10 CFR 50.46c rule addresses several issues, including a concern regarding the brittle fracture of the cladding due to hydrogen absorption, but none of the issues addressed are related to the FFRD issue. The FFRD issue is associated with the ductile failure of the cladding at higher burnups, which is a different phenomenon than brittle facture, and can be a concern for design-basis events besides LOCAs. Therefore, the NRC does not intend to revise the draft final rule for 10 CFR 50.46c in response to this comment.

Comment: Two commenters stated that disciplines responsible for LOCA analyses understand the acceptance criteria in 10 CFR 50.46, what these criteria are surrogates for, and conservatisms therein.

NRC Response: The NRC acknowledges that the acceptance criteria in 10 CFR 50.46 are well understood by the experts that perform LOCA analyses. The rulemaking record for 10 CFR 50.46 adequately describes the basis for the acceptance criteria, what these criteria are surrogates for, and the conservatisms therein.

Comment: Several commenters stated that revising the ECCS acceptance criteria would require a large amount of effort and resources for industry to comply with them, and this would divert resources from industry's work on accident tolerant fuel and FFRD research. One commenter noted that criteria similar to the petition's proposed criteria could be valuable as an alternative or supplemental criteria to demonstrate core coolability, but this would still require significant time and effort to develop and implement.

NRC Response: The NRC staff will perform a regulatory analysis as part of the ongoing increased enrichment rulemaking process, which will consider the costs and benefits of the new rule and alternatives. In addition, the cumulative effects of regulations will be considered as part of the rulemaking process to identify and resolve issues that could lead to implementation challenges.

Comment: Some commenters stated that current ECCS performance criteria in 10 CFR 50.46 remain adequate for the protection of public health and safety. One commenter noted that the adequacy of the PCT and MLO acceptance criteria was supported by original testing, and subsequent testing to account for changes in plant operations continues to support the basic nature of these acceptance criteria. The commenters also noted that industry and NRC analyses performed since 2012 have confirmed the safe operations of the commercial nuclear fleet.

NRC Response: The NRC disagrees that the current acceptance criteria in 10 CFR 50.46 provide for adequate protection of public health and safety. The pending draft final rule for 10 CFR 50.46c includes revised acceptance criteria that are necessary to ensure adequate protection of public health and safety. However, the NRC agrees that industry and NRC analyses have confirmed the safe operations of the commercial

nuclear fleet. As documented in a February 10, 2012, memorandum, the staff completed an ECCS performance safety assessment in 2011 which confirmed, on a plant-specific basis, the safe operation of the commercial nuclear fleet following the identification of concerns with the current acceptance criteria in 10 CFR 50.46. As an interim measure until the final 10 CFR 50.46c is implemented, the staff updates this assessment annually to verify the continued safe operation of the fleet. Therefore, with respect to ECCS performance, adequate protection of public health and safety is provided by the current acceptance criteria in 10 CFR 50.46 in conjunction with the annual NRC assessments.

Comment: One commenter disagreed with the statement in the petition that the current acceptance criteria become ineffective at moderate fuel burnups because burst fuel rods experience massive fuel loss and do not retain fuel pellets in the fuel rods. The commenter stated that the petition lacks information to support this statement.

NRC Response: The NRC acknowledges the comment. NRC studies to-date predict that 1 to 3 percent of the fuel in the core might be dispersed during a large-break LOCA, using conservative dispersal thresholds, for currently authorized burnup levels. The NRC considers this to be a limited amount of dispersed fuel. The consequences of fuel dispersal at higher burnups are still the topic of ongoing research by the international community.

Comment: Some commenters stated that current methods to calculate the MLO and PCT are sufficiently detailed and conservative to demonstrate compliance with 10 CFR 50.46 with a high probability.

NRC Response: The NRC agrees with this comment for currently authorized fuel burnup levels and fuel designs.

Comment: One commenter stated that calculations of MLO and PCT using NRC-approved methods support the demonstration of a coolable core geometry and continued safe operation under postulated LOCA conditions.

NRC Response: The NRC agrees that for currently authorized fuel burnup levels and fuel designs, calculations of MLO and PCT using NRC-approved methodologies support the demonstration of a coolable core geometry and continued safe operation under postulated LOCA conditions. This was documented in SECY-15-0148, "Evaluation of Fuel Fragmentation, Relocation and Dispersal Under Loss-Of-Coolant Accident (LOCA) Conditions Relative to the Draft Final Rule on Emergency Core Cooling System Performance During a LOCA (50.46c)," and is supported by the NRC staff's annual updates to the ECCS performance safety assessment. This assessment captures the latest ECCS performance analysis results and changes and confirms safe operation of all nuclear power plants with respect to the proposed acceptance criteria in the draft final rule for 10 CFR 50.46c.

Comment: One commenter stated that the petition contains a quoted statement from a paper by the German Reactor Safety Commission (RSK) that was taken out of context. The commenter stated that the RSK determined that the criteria in the proposed 10 CFR 50.46c rule are adequate to prevent cladding fragmentation during quench, contrary to what the petition implies.

NRC Response: The NRC agrees with this comment based on a review of the RSK document referenced in the petition.

Comment: Several commenters stated that the fact that the PCT and MLO criteria in 10 CFR 50.46 are surrogates for the demonstration of the post-quench coolability of the core is well understood and well documented. In addition, the proposed

surrogate criteria in 10 CFR 50.46c would maintain the coolability goal and thus maintain plant safety.

NRC Response: The NRC agrees with this comment. Extensive technical bases for the current 10 CFR 50.46 rule and the pending draft final 10 CFR 50.46c rule have been developed and describe the rationale for the surrogate criteria in great detail.

Comment: One commenter stated that the petition does not provide evidence to support the limits on the percentage of fuel rod bursts proposed in the petition as being appropriate to ensure core coolability. Several commenters stated that the proposed rod burst criteria in the petition do not account for important differences between the various plant designs operating in the United States. These differences could be particularly important when assessing fuel dispersal and its consequences. One commenter stated that using a core-wide burst limit does not make sense given that only high burnup rods are susceptible to fuel dispersal.

NRC Response: The NRC agrees that the petition does not provide evidence showing that the proposed fuel rod rupture limits would ensure core coolability and the petition does not account for differences in plant designs. As noted above, research would be needed to establish the technical basis for any fuel rod rupture limits that would be imposed.

Comment: Several commenters responded to the petition's statement that the proposed fuel rod rupture limits are used in Germany. The German regulatory limits on the percentage of fuel rod ruptures are related to radiological consequences and not used for core coolability assessments. The historical ECCS acceptance criteria for MLO and PCT remain in German regulations.

NRC Response: The NRC agrees with this comment based on a review of the German regulations.

Comment: Several commentors stated that, as described in SECY-15-0148, plants continue to operate safely with existing burnup limits and current styles of operation. Any increases above currently licensed fuel burnup levels would require NRC approval. The NRC Research Information Letter 2021-13, “Interpretation of Research on Fuel Fragmentation, Relocation, and Dispersal at High Burnup,” dated December 2021, concluded that significant fine fragmentation begins above a fuel burnup threshold of 55 gigawatt days per metric ton uranium, which is conservative.

NRC Response: The NRC agrees with this comment.

Comment: One commenter stated that general aspects of FFRD have been known since the 1980s and widespread dispersal that would impact coolability was not expected to be significant.

NRC Response: The NRC agrees that fuel dispersal would be limited under current licensed burnups and operating practices. However, for higher fuel burnup levels, the NRC recognizes that fuel dispersal could challenge core coolability.

Comment: One commenter stated that conclusions from a Westinghouse paper cited in the petition have been superseded by new research and are not appropriate to support the suggested criteria in the petition.

NRC Response: The NRC agrees with this comment, because the Westinghouse paper, as explained by the commenter, did not consider fuel pellet thermal conductivity degradation and other material high burnup phenomena.

Comment: One commenter stated that the French nuclear industry is also evaluating a modification to the historical LOCA criteria that is somewhat similar to 10 CFR 50.46c but is based on strength instead of ductility.

NRC Response: Relevant industry experience, including foreign experience, may be considered by NRC, as appropriate, in the increased enrichment rulemaking.

Comment: One commenter stated that the distribution of ruptured rods in the core is important, and clusters of ruptured rods are more detrimental than more evenly distributed ruptures.

NRC Response: The NRC agrees with this comment based on engineering judgment.

III. Evaluation of the Petition

The petition states that the PCT and MLO acceptance criteria in 10 CFR 50.46(b) would not ensure adequate core cooling during a LOCA because these criteria do not prevent significant fuel dispersal at currently authorized fuel burnup levels and higher.

The PCT and MLO acceptance criteria in 10 CFR 50.46 are important to preventing gross fuel rod failure via a brittle failure mechanism. This ensures that fuel assemblies will remain in a rod-like array within the reactor core that is easier to cool than a rubble pile of fuel and cladding. However, research has shown that the PCT and MLO acceptance criteria do not prevent ductile failure of the cladding (ballooning and rupture), which could lead to fuel dispersal in the reactor core through a rupture in the fuel cladding at higher fuel burnups. Therefore, while the NRC considers the PCT and MLO to be appropriate surrogate metrics for cladding embrittlement, the NRC agrees with the petition's assertion that the acceptance criteria for the calculated PCT and MLO

in 10 CFR 50.46(b) do not prevent fuel dispersal due to ductile failures at higher fuel burnup.

For currently authorized fuel burnup levels, the NRC has determined, based on research and analyses, that the extent and consequences of fuel dispersal during a LOCA would be limited such that core coolability would not be challenged on a large scale. However, for higher fuel burnup levels, the NRC recognizes that fuel dispersal could challenge core coolability, and the Commission has directed the staff to consider FFRD issues relevant to higher enrichment and fuel burnup levels as part of the increased enrichment rulemaking. Therefore, the NRC agrees with the petition that rulemaking is needed to address FFRD issues at higher fuel burnup levels.

The NRC disagrees with the petition's assertion that the technical bases for the PCT and MLO acceptance criteria in 10 CFR 50.46(b) are complex and misunderstood. The calculated PCT and MLO typically occur in the ballooned region of a fuel rod during a LOCA. The NRC acknowledges that the calculation of these parameters is complex and subject to large uncertainties but has found that these calculations can be performed in an appropriately conservative manner. It is well understood by the NRC and experts that perform such calculations that the PCT and MLO acceptance criteria are relatively simple surrogate metrics that correlate with the phenomena leading to an autocatalytic reaction and to embrittlement, respectively. In addition, the rulemaking record for 10 CFR 50.46 adequately describes the basis for the acceptance criteria.

As a solution to the issues raised in the petition, the petition requested that the NRC regulations be revised to limit the number of fuel rod ruptures to 1 percent for a small-break LOCA and 10 percent for a large-break LOCA. The petition also requested that the PCT and MLO acceptance criteria be eliminated from the NRC regulations. The petition indicates that German nuclear reactors were subject to the fuel rod rupture limits proposed in the petition.

The NRC agrees with several commenters that the petition does not provide an adequate technical basis to support the specific limits on the number of fuel rod ruptures. The German regulations include limits on the PCT and MLO during a LOCA to ensure core coolability that are similar to the acceptance criteria in the NRC regulations. The German regulations also include limits on the number of fuel rod ruptures as indicated in the petition, but these limits are related to the confinement of radioactive materials and not related to core coolability. In addition, the NRC found that the petition does not provide a technical basis to support eliminating the PCT and MLO acceptance criteria from the regulations. Specifically, the petition does not explain how limiting the number of fuel rod ruptures would prevent gross fuel rod failure via a brittle failure mechanism. Thus, the NRC concludes that additional research and analysis would be needed to support changing the regulations as requested in the petition.

IV. Reasons for Consideration

The NRC will consider the issues raised in the petition in the rulemaking process because fuel dispersal during a LOCA could challenge core cooling and the regulations in 10 CFR 50.46 do not specifically address this issue. The NRC agrees with the petition's assertion that the acceptance criteria for the calculated PCT and MLO in 10 CFR 50.46(b) do not prevent fuel dispersal at higher fuel burnup and that significant fuel dispersal could challenge core cooling. In SRM-SECY-21-0109, the Commission directed the staff to consider FFRD issues relevant to fuels of higher enrichment and burnup levels as part of the increased enrichment rulemaking. Thus, the FFRD issues raised in the petition are already being addressed in an ongoing rulemaking. Although the NRC disagrees with some of the petition's assertions, the NRC recognizes that rulemaking to address FFRD issues could affect the existing methods for performing

ECCS analyses and revise the basis for the acceptance criteria in 10 CFR 50.46 in a manner that resolves the petition's concerns.

V. Availability of Documents

The documents identified in the following table are available to interested persons through one or more of the following methods, as indicated.

DOCUMENT	ADAMS ACCESSION NO. / *FEDERAL REGISTER* CITATION
PRM-50-124, Ralph O. Meyer, Petition for Rulemaking, dated August 1, 2022	ML22284A087
PRM-50-124, "Licensing Safety Analysis for Loss-of-Coolant Accidents," notice of docketing and request for comments, dated November 23, 2022	87 FR 71531
PRM-50-124, "Licensing Safety Analysis for Loss-of-Coolant Accidents," extension of comment period, dated February 2, 2023	88 FR 7012
Nuclear Energy Institute, Request for Extension of the Comment Period for PRM-50-124, dated January 23, 2023	ML23023A275
Comment (001) from Ralph Meyer on PRM-50-124, dated October 12, 2022	ML23009B712
Comment (002) from Ralph Meyer on PRM-50-124, dated January 12, 2023	ML23031A196
Comment (003) from Zachary Harper of Westinghouse on PRM-50-124, dated February 2, 2023	ML23058A228
Comment (004) from Gayle Elliott on behalf of Framatome Inc., dated February 23, 2023	ML23061A128
Comment (005) from Mike Powell on behalf of Pressurized Water Reactors Owners Group on PRM-50-124, dated March 1, 2023	ML23062A715
Comment (006) from Frances Pimentel on Behalf of Nuclear Energy Institute on PRM-50-124, dated March 3, 2023	ML23062A716
Comment (007) from Ralph Meyer on PRM-50-124, dated March 14, 2023	ML23074A071
Comment (008) from Ralph Meyer on PRM-50-124, dated July 26, 2023	ML23209A607
Comment (009) from Ralph Meyer on PRM-50-124, dated September 11, 2023	ML23254A398

SECY-21-0109, “Rulemaking Plan on Use of Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors,” dated December 20, 2021	ML21232A237
SRM-SECY-21-0109, “Staff Requirements – SECY-21-0109 – Rulemaking Plan on Use of Increased Enrichment of Conventional and Accident Tolerant Fuels Designs for Light-Water Reactors,” dated March 16, 2022	ML22075A103
SECY-16-0033, “Draft Final Rule – Performance-Based Emergency Core Cooling System Requirements and Related Fuel Cladding Acceptance Criteria (RIN 3150-AH42),” dated March 16, 2016	ML15238A947 (Package)
SECY-15-0148, “Evaluation of Fuel Fragmentation, Relocation and Dispersal Under Loss-Of-Coolant Accident (LOCA) Conditions Relative to the Draft Final Rule on Emergency Core Cooling System Performance During a LOCA (50.46c),” dated November 30, 2015	ML15230A200
NRC Research Information Letter 2021-13, “Interpretation of Research on Fuel Fragmentation, Relocation, and Dispersal at High Burnup,” dated December 2021	ML21313A145
NRC Memorandum from Paul M. Clifford to William H. Ruland, “ECCS Performance Safety Assessment and Audit Report,” dated February 10, 2012	ML12041A078

VI. Conclusion

For the reasons cited in this document, the NRC will consider the petition in the ongoing rulemaking for “Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors.”

The NRC tracks the status of PRMs on its website at https://www.nrc.gov/about-nrc/regulatory/rulemaking/rules-petitions.html. The public may monitor the docket for the rulemaking on “Increased Enrichment of Conventional and Accident Tolerant Fuel Designs for Light-Water Reactors” on the Federal rulemaking website, https://www.regulations.gov, by searching on Docket ID NRC-2020-0034. In addition, the

Federal rulemaking website allows members of the public to receive alerts when changes or additions occur in a docket folder. To subscribe: 1) navigate to the docket folder (NRC-2020-0034); 2) click the “Subscribe” link; and 3) enter an email address and click on the “Subscribe” link. Publication of this document in the *Federal Register* closes Docket ID NRC-2022-0178 for PRM-50-124.

Dated: <Month XX, 2023>.

For the Nuclear Regulatory Commission.

Tomas Herrera,
Deputy Secretary of the Commission.