

**NUCLEAR REGULATORY COMMISSION**

**10 CFR Part 50**

**[Docket No. PRM-50-122; NRC-2020-0150]**

**Accident Source Term Methodologies and Corresponding Release Fractions**

**AGENCY:** Nuclear Regulatory Commission.

**ACTION:** Petition for rulemaking; notice of docketing and request for comment.

**SUMMARY:** The U.S. Nuclear Regulatory Commission (NRC) has received a petition for rulemaking from Brian Magnuson dated May 31, 2020, requesting that the NRC revise its regulations to codify the source term methodologies and corresponding release fractions recommended in a report issued by Sandia National Laboratories. The petition was docketed by the NRC on June 18, 2020, and has been assigned Docket No. PRM-50-122. The NRC is examining the issues raised in PRM-50-122 to determine whether they should be considered in rulemaking. The NRC is requesting public comment on this petition at this time.

**DATES:** Submit comments by **[INSERT DATE 75 DAYS AFTER DATE OF PUBLICATION IN THE *FEDERAL REGISTER*]**. Comments received after this date will be considered if it is practical to do so, but the NRC is able to assure consideration only for comments received on or before this date.

**ADDRESSES:** You may submit comments by any of the following methods:

- **Federal Rulemaking Web Site:** Go to <https://www.regulations.gov> and search for Docket ID NRC-2020-0150. 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.

- **E-mail comments to:** [Rulemaking.Comments@nrc.gov](mailto:Rulemaking.Comments@nrc.gov). If you do not receive an automatic e-mail reply confirming receipt, then contact us at 301-415-1677.

- **Mail comments to:** Secretary, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Rulemakings and Adjudications Staff.

For additional direction on obtaining information and submitting comments, see “Obtaining Information and Submitting Comments” in the SUPPLEMENTARY INFORMATION section of this document.

**FOR FURTHER INFORMATION CONTACT:** Juan Lopez, Office of Nuclear Material Safety and Safeguards, telephone: 301-415-2338, email: [Juan.Lopez@nrc.gov](mailto:Juan.Lopez@nrc.gov), or Yanely Malave-Velez, Office of Nuclear Material Safety and Safeguards, telephone: 301-415-1519, email: [Yanely.Malave-Velez@nrc.gov](mailto:Yanely.Malave-Velez@nrc.gov). Both are staff of the U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

## **SUPPLEMENTARY INFORMATION:**

### **I. Obtaining Information and Submitting Comments**

#### **A. Obtaining Information**

Please refer to Docket ID NRC-2020-0150 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 Web Site:** Go to <https://www.regulations.gov> and

search for Docket ID NRC-2020-0150.

- **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/pdr.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, 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 (if it is available in ADAMS) is provided the first time that it is mentioned in this document.

- **Attention:** The PDR where you may examine and order copies of public documents, is currently closed. You may submit your request to the PDR via e-mail at [PDR.Resource@nrc.gov](mailto:PDR.Resource@nrc.gov) or call 1-800-397-4209 between 8:00 a.m. and 4:00 p.m. (EST), Monday through Friday, except Federal holidays.

## B. Submitting Comments

Please include Docket ID NRC-2020-0150 in your comment submission.

The NRC cautions you not to include identifying or contact information that you do not want to be publicly disclosed in your comment submission. The NRC will post all comment submissions at <https://www.regulations.gov> as well as enter the comment submissions into ADAMS. The NRC does not routinely edit comment submissions to remove identifying or contact information.

If you are requesting or aggregating comments from other persons for submission to the NRC, then you should inform those persons not to include identifying or contact information that they do not want to be publicly disclosed in their comment submission. Your request should state that the NRC does not routinely edit comment

submissions to remove such information before making the comment submissions available to the public or entering the comment into ADAMS.

## **II. The Petitioner and Petition**

The petition for rulemaking (PRM) was filed by Brian Magnuson. The petition requests the NRC revise its regulations in § 50.67 of title 10 of the *Code of Federal Regulations* (10 CFR), "Accident source term," to codify the source term methodologies and corresponding release fractions recommended in Sandia National Laboratories Report SAND2008-6601, "Analysis of Main Steam Isolation Valve Leakage in Design Basis Accidents Using MELCOR 1.8.6 and RADTRAD," dated October 2008 (ADAMS Accession No. ML083180196). The petitioner states that the revision would eliminate inconsistencies obtained from the use of different source term methodologies and release fractions and would provide the requisite means to ensure compliance with the underlying regulations. The petition may be found in ADAMS under Accession No. ML20170B161.

## **III. Discussion of the Petition**

The petition states that much of the past and present source term methodologies, including release fractions, used by nuclear power plants to perform accident dose calculations are inaccurate and nonconservative. The petition requests that the NRC revise § 50.67 to codify the source term methodologies and recommendations of Sandia National Laboratories report SAND2008-6601 and update and finalize related NRC guidance, Draft Regulatory Guide DG-1199 (Proposed Revision 1 of Regulatory Guide 1.183), "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," dated October 2009 (ADAMS Accession No. ML090960464).

The petition describes the current NRC guidance as “conceptually inaccurate” and “nonconservative” for calculations of radiological release doses, quoting from Sandia Report SAND2008-6601:

...these findings conclude that the current regulatory guidelines permitting the use of the fission product concentration in the drywell atmosphere during the first two hours prior to assumed vessel reflood is non-conservative for the purposes of evaluating the dose resulting from MSIV leakage, in addition to being conceptually inaccurate.

The petition also states that, despite the NRC acknowledging the safety significance of accident source terms, the NRC has not yet approved Draft Regulatory Guide DG-1199. As a result, the petitioner believes accident doses have been undercalculated for over 25 years. The petition indicates this would account for the uncertainties that high burnup fuel pellets could be reduced to a powder form and dispersed outside of the fuel rod during clad failure accidents (with or without fuel melt), used by the Radiological Assessment System for Consequence Analysis (RASCAL) calculation described in NUREG-1940, “RASCAL 4: Description of Models and Methods,” available online at <https://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1940/>.

#### **IV. Conclusion**

The NRC determined that the petition meets the requirements for docketing a petition for rulemaking under § 2.803, “Petition for rulemaking—NRC action.” The NRC will examine the merits of the issues raised in PRM-50-122 and any comments received on this document to determine whether these issues should be considered in rulemaking.

Dated: August 7, 2020.

For the Nuclear Regulatory Commission.

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