[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[NRC-2025-0775]

Level 3 Probabilistic Risk Assessment Project Documentation (Volume 5)

AGENCY: Nuclear Regulatory Commission.

ACTION: Draft report; request for comment.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is issuing for public comment a draft report on the Level 3 Probabilistic Risk Assessment (PRA) project; specifically, "Volume 5: Overview of Reactor, Low-Power and Shutdown, Level 1, 2, and 3 PRAs for Internal Events."

DATES: Submit comments by **November 3, 2025**. Comments received after this date will be considered if it is practical to do so, but the Commission is able to ensure consideration only for comments received on or before this date.

ADDRESSES: You may submit comments by any of the following methods; however, the NRC encourages electronic comment submission through the **Federal rulemaking website**:

- **Federal rulemaking website:** Go to https://www.regulations.gov and search for Docket ID **NRC-2025-0775**. Address questions about Docket IDs in Regulations.gov to Bridget Curran; telephone: 301-415-1003; email: Bridget.Curran@nrc.gov. For technical questions, contact the individual(s) listed in the "For Further Information Contact" section of this document.

- **Mail comments to:** Office of Administration, Mail Stop: TWFN-7-A60M, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, ATTN: Program Management, Announcements and Editing 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: Alan Kuritzky, Office of Nuclear Regulatory Research, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; telephone: 301-415-1552; email: Alan.Kuritzky@nrc.gov.

SUPPLEMENTARY INFORMATION:

I. Obtaining Information and Submitting Comments

A. Obtaining Information

Please refer to Docket ID **NRC-2025-0775** 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-2025-0775**.
- **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 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 (ET), Monday through Friday, except Federal holidays.

B. Submitting Comments

The NRC encourages electronic comment submission through the **Federal rulemaking website** (https://www.regulations.gov). Please include Docket ID **NRC-2025-0775** 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. Discussion

As directed in SRM-SECY-11-0089, “Options for Proceeding with Future Level 3 Probabilistic Risk Assessment (PRA) Activities,” the staff is conducting a full-scope multi-unit site Level 3 PRA (Level 3 PRA project) that addresses all internal and external hazards; all plant operating modes; and all reactor units, spent fuel pools, and dry cask storage. For definitional purposes, a Level 1 PRA estimates the frequency of accidents that cause damage to the nuclear reactor core; this is commonly called core damage frequency. A Level 2 PRA starts with the Level 1 core damage accidents and estimates

the frequency of accidents that release radioactivity from the nuclear power plant. A Level 3 PRA starts with the Level 2 radioactivity release accidents and estimates the consequences in terms of injury to the public and damage to the environment.

The reference site for this study contains 2 four-loop Westinghouse pressurized water reactors with large dry containments. The objectives of the Level 3 PRA project are to (1) develop a Level 3 PRA, generally based on current state-of-practice methods, tools, and data, that (a) reflects technical advances since the last NRC-sponsored Level 3 PRAs (NUREG-1150), which were completed over 30 years ago, and (b) addresses scope considerations that were not previously considered (e.g., low-power and shutdown risk, multi-unit risk, other radiological sources); (2) extract new insights to enhance regulatory decision making and to help focus limited NRC resources on issues most directly related to the agency's mission to protect public health and safety; (3) enhance PRA staff capability and expertise and improve documentation practices to make PRA information more accessible, retrievable, and understandable; and (4) demonstrate technical feasibility and evaluate the realistic cost of developing new Level 3 PRAs.

The work performed under this project is being documented as a multi-volume report. The current Level 3 PRA project reports (Volume 5) describe the analyses and results for the reactor, low-power and shutdown, Level 1, 2, and 3 PRAs for internal events. Each set of Level 3 PRA project reports covering the Level 1, 2, and 3 PRAs for a specific site radiological source, plant operating state, and hazard group (or groups) is accompanied by an overview report. The overview reports summarize the results and insights from all three PRA levels.

The Level 3 PRA project analyses reflect the reference plant as it was designed and operated as of 2012. To provide results and insights better aligned with the current

design and operation of the reference plant, the overview reports also provide a reevaluation of the plant risk based on a set of new plant equipment and PRA model assumptions and compare the results of the reevaluation to the original study results. This reevaluation reflects the potential impact of FLEX strategies (which reduce the risk to the public), as well as the current reactor coolant pump shutdown seal design (which has limited risk impact during low-power and shutdown conditions).

As documented in Section 2 of the Volume 5 overview report, the results of the original Level 3 PRA project analyses and the reevaluation both show that the combination of this plant design and site location has substantial margin to the quantitative health objectives related to the NRC's safety goal policy when considering internal events during reactor shutdown, though the margins are noticeably less for the surrogate risk metrics of core damage frequency and large, early release frequency. Even though these margins can vary for other plants due to variations in their design and siting, the estimates derived for the reference plant, when adjusted for siting and design variations, would provide useful qualitative risk insights for other U.S. operating plants.

III. Availability of Documents

The documents identified in the following table are available to interested persons through ADAMS, as indicated.

DOCUMENT DESCRIPTION	ADAMS ACCESSION NO.
SRM-SECY-11-0089, "Options for Proceeding with Future Level 3 Probabilistic Risk Assessment (PRA) Activities," dated September 21, 2011	ML112640419
Level 3 PRA Project, Volume 5: Overview of Reactor, Low-Power and Shutdown, Level 1, 2, and 3 PRAs for Internal Events (draft for public comment), published September 2025	ML25157A084
Level 3 PRA Project, Volume 5a: Reactor, At-Shutdown, Level 1 PRA for Internal Events, published September 2025	ML25157A085

Level 3 PRA Project, Volume 5b: Reactor, At-Shutdown, Level 2 PRA for Internal Events, published September 2025	ML25157A086
Level 3 PRA Project, Volume 5c: Reactor, At-Shutdown, Level 3 PRA for Internal Events, published September 2025	ML25157A087

Dated: August 28, 2025.

For the Nuclear Regulatory Commission.

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