



[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[NRC-2016-0233]

Pressurized-Water Reactor Control Rod Ejection and Boiling-Water Reactor Control Rod Drop Accidents

AGENCY: Nuclear Regulatory Commission.

ACTION: Regulatory guide; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is issuing regulatory guide (RG) 1.236, "Pressurized-Water Reactor Control Rod Ejection and Boiling-Water Reactor Control Rod Drop Accidents." This is a new RG that provides guidance for analyzing control rod accidents. It defines fuel cladding failure thresholds for ductile failure, brittle failure, and pellet-clad mechanical interaction. It also describes analytical limits and guidance for demonstrating compliance with regulations governing reactivity limits. RG 1.236 supersedes the guidance for control rod ejection accidents in RG 1.77, "Assumptions Used for Evaluation a Control Rod Ejection Accident for Pressurized Water Reactors," which is being withdrawn in conjunction with the issuance of RG 1.236.

DATES: RG 1.236 is available on **[INSERT DATE OF PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: Please refer to Docket ID NRC-2016-0233 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 <https://www.regulations.gov> and search for Docket ID NRC-2016-0233. Address questions about NRC dockets IDs in Regulations.gov to Jennifer Borges; telephone: 301-287-9127; e-mail:

Jennifer.Borges@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, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. RG 1.236 and the regulatory analysis may be found in ADAMS under Accession Nos. ML20055F490 and ML16124A198, respectively.

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SUPPLEMENTARY INFORMATION:

I. Discussion

The NRC is issuing a new guide in the NRC's "Regulatory Guide" series. This series was developed to describe and make available to the public information regarding methods that are acceptable to the NRC staff for implementing specific parts of the NRC's regulations, techniques that the staff uses in evaluating specific issues or postulated events, and information that the staff needs in its review of applications for permits and licenses.

The RG, titled “Pressurized-Water Reactor Control Rod Ejection and Boiling-Water Reactor Control Rod Drop Accidents,” describes one acceptable method for demonstrating compliance with appendix A of part 50 of title 10 of the *Code of Federal Regulations* (10 CFR), General Design Criteria (GDC) 28, “Reactivity Limit,” with respect to control rod ejection (CRE) accidents for pressurized-water reactors and control rod drop (CRD) accidents for boiling-water reactors. RG 1.236 provides guidance for analyzing these reactivity-initiated accidents. It defines fuel cladding failure thresholds for ductile failure, brittle failure, and pellet-clad mechanical interaction. It also describes analytical limits and guidance for demonstrating compliance with regulations governing reactivity limits.

The guide incorporates new empirical data from in-pile, prompt power pulse test programs and analyses from several international publications that examine fuel rod performance under reactivity-initiated accident conditions to provide guidance on acceptable analytical methods, assumptions, and limits for evaluating a CRE and CRD accidents. The guide supersedes the guidance for control rod ejection accidents in RG 1.77, “Assumptions Used for Evaluation a Control Rod Ejection Accident for Pressurized Water Reactors,” which is being withdrawn in conjunction with the issuance of RG 1.236.

II. Additional Information

The NRC issued RG 1.236 as Draft Guide (DG)-1327 for public comment on November 21, 2016 (81 FR 83288), with a 60 day comment period that expired on February 21, 2017. A public meeting was held at NRC Headquarters on January 25, 2017, while the guide was issued for public comment. During the meeting NRC made a commitment to hold a second public meeting to discuss the staff’s proposed resolution of key comments prior to finalization of the guide. Following the public meeting the NRC extended the comment period to April 21, 2017 (82 FR 8998), to allow more time for

comment. A second public meeting was held at NRC Headquarters on June 5, 2018, to discuss resolution of the public comments. To facilitate discussion at the meeting, drafts of the guide (ADAMS Accession No. ML18138A459) and a table showing resolution of the public comments (ADAMS Accession No. ML18138A458) were made publicly available.

As a result of the written public comments and discussion at the two public meetings, the NRC made several changes to the draft guide and it was released a second time for public comment on July 30, 2019 (84 FR 36961). That comment period ended November 18, 2019. The guide was further revised to address the second round of public comments. The response to this second round of public comments is located in ADAMS under Accession No. ML20055F489. Among the changes resulting from the two public meetings and the two rounds of public comments were: (1) the pellet-clad mechanical interaction cladding failure thresholds were revised; (2) the appendix that provided acceptable steady-state and transient fission product releases was removed; and (3) the implementation section was revised to be consistent with recent Commission direction on backfitting and forward fitting as found in Management Directive 8.4 “Management of Backfitting, Forward Fitting, Issue Finality, and Information Requests.”

III. Congressional Review Act

This RG is a rule as defined in the Congressional Review Act (5 U.S.C. 801-808). However, the Office of Management and Budget has not found it to be a major rule as defined in the Congressional Review Act.

IV. Backfitting, Forward Fitting, and Issue Finality

RG 1.236 describes one acceptable method for demonstrating compliance with 10 CFR part 50, appendix A, GDC 28 with respect to CRE accidents for pressurized-water reactors and CRD accidents for boiling-water reactors. In general, issuance of this

RG does not constitute backfitting as defined in 10 CFR 50.109, “Backfitting,” and as described in NRC Management Directive 8.4; does not constitute forward fitting as that term is defined and described in Management Directive 8.4; and does not affect the issue finality of any approval issued under 10 CFR part 52, “Licenses, Certificates, and Approvals for Nuclear Power Plants.” As explained in this regulatory guide, applicants and licensees are not required to comply with the positions set forth in this RG.

Licensees using RG 1.77 may continue using that RG. In future requests or applications for NRC licensing actions related to the guidance in RG 1.77, those licensees should use RG 1.236, which contains the guidance in RG 1.77. Further information on the staff’s use of the RG is contained in the RG under Section D., “Implementation.”

Dated June 16, 2020.

For the Nuclear Regulatory Commission.

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