

Regulatory Guide Periodic Review

Regulatory Guide Number: **1.87, Revision 1**

Title: **Guidance for Construction of Class 1 Components in Elevated-Temperature Reactors**

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Recommended Action: **Withdraw**

1. What are the known technical or regulatory issues with the current version of the Regulatory Guide (RG)?

Regulatory Guide (RG) 1.87, Revision 1, dated June 1975 approves, with conditions, the initial revisions of five American Society of Mechanical Engineers (ASME) Code Cases (1592-0, 1593-0, 1594-0, 1595-0, and 1596-0). These Code Cases are the precursors to the other iterations of ASME's high temperature construction rules – Code Cases N-47 through N-51; ASME Section III, Subsection NH; and currently ASME Section III, Division 5. NRC staff are currently reviewing the 2017 Edition of ASME Section III, Division 5 for endorsement in a new RG. As part of the endorsement effort, NRC staff performed a reconciliation between Code Case 1592-0 and ASME Section III, Division 5 and determined that several areas in Code Case 1592-0 were no longer conservative. These changes, in many instances significant, have been made based on over 40 years of Code development, research, and, most importantly, operating experience. Code Cases 1593-0, 1594-0, 1595-0, and 1596-0 have also been updated over the last 40 years with operating experience, modern fabrication; inspection; testing; and overpressure rules. None of the other iterations of ASME's high temperature construction rules have been formally reviewed or endorsed by the NRC. To briefly restate the above, the information contained in this RG is obsolete.

In the 2016 Periodic Review of RG 1.87, Revision 1, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML16229A104), NRC staff thought that a decision to update or withdraw RG 1.87 would be made following the issuance of RG 1.232, "Developing Principal Design Criteria for Non-Light Water Reactors," Revision 0, dated April 2018. However, RG 1.232 does not address RG 1.87, Revision 1, or ASME Section III, Division 5. In 2018, ASME requested that NRC endorse the 2017 Edition of ASME Section III, Division 5. The following are ASME's request letter and the NRC response letter:

1. Letter from ASME to Brian E. Thomas - Request for NRC Endorsement of ASME Boiler and Pressure Vessel Code, Section III, Division 5 (ADAMS Accession Number ML18184A065).
2. Letter to ASME from Brian E. Thomas - NRC Response to ASME Letter of Request for NRC Endorsement of ASME Boiler and Pressure Vessel Code, Section III, Division 5 (ADAMS Accession Number ML18211A571).

2. What is the impact on internal and external stakeholders of not updating the RG for the known issues, in terms of anticipated numbers of licensing and inspection activities over the next several years?

The objective of RG 1.87, Revision 1 is to provide guidance for the construction of components subject to high temperature service. However, the guidance in RG 1.87, Revision 1 is obsolete and nonconservative as evidenced by the development of the ASME Section III, Division 5. The RG was created for the Clinch River Breeder Reactor Project, and a Construction Permit was not issued (ML18064A893). While the NRC does not expect any applicant to use RG 1.87, since these five obsolete and nonconservative Code Cases are the only high temperature construction rules currently endorsed by the NRC, the RG should be withdrawn to prevent use by an applicant.

3. What is an estimate of the level of effort needed to address identified issues in terms of full-time equivalent (FTE) and contractor resources?

As noted in the NRC's response letter to ASME referenced in Question 1 above, NRC staff have already initiated efforts to review the 2017 Edition of ASME Section III, Division 5. Resources have already been allocated for this separate effort. If the NRC finds ASME Section III, Division 5 acceptable (with conditions, if necessary), the NRC will endorse the 2017 Edition in a new RG as one way of meeting the NRC's regulatory requirements. The staff plans to develop a new draft guide by the end of the third quarter of CY 2020 and issue it for public comment by the end of the first quarter of CY 2021.

4. Based on the answers to the questions above, what is the staff action for this guide (Reviewed with no issues identified, Reviewed with issues identified for future consideration, Revise, or Withdraw)?

Withdraw.

5. Provide a conceptual plan and timeframe to address the issues identified during the review.

As noted in the NRC's response letter to ASME referenced in Question 1 above, NRC staff have already initiated separate efforts to review the 2017 Edition of ASME Section III, Division 5. As necessary and appropriate, the NRC staff will engage with the relevant ASME Code Committees if additional information is needed in the process of this review. The NRC staff will provide any insights gained through the course of the review to the cognizant ASME Section III, Division 5 Code Committees. The staff plans to develop a new draft guide by the end of the third quarter of CY 2020 and issue it for public comment by the end of the first quarter of CY 2021.

NOTE: This preliminary review was conducted from April 2019 through August 2019 and reflects the staff's plans as of that date. These plans are tentative and are subject to change.