

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: **Revise**

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. 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. The nonconservative areas have been revised in ASME Section III, Division 5. The parts of the Code Case that have not been revised are still appropriate for use. 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 To briefly restate the above, the information contained in this RG is, in part, outdated and has been superseded by revised ASME's high temperature construction rules.

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).

In its response to ASME, the NRC stated that if the NRC found the standard acceptable (with conditions, if necessary), the NRC would endorse in a new regulatory guide the 2017 Edition of ASME BPVC Section III, Division 5 as one way of meeting the NRC's regulatory requirements. Since the issuance of the letter to ASME, the NRC staff determined that it would gain efficiencies in the regulatory guide development process by updating the existing guidance in

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RG 1.87 rather than developing a new RG and updated its guidance development plan accordingly.

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?

As described above, the information in RG 1.87, Revision 1 is, in part, outdated and has been superseded by revised ASME's high temperature construction rules. Such outdated guidance and the lack of established NRC position on the available updated ASME high temperature code provisions would hinder the quality of licensing applications for high temperature reactors and respective NRC review. Further, the NRC has been tasked with being prepared to support the review of future ANLWR design certifications and other licensing applications and is taking steps to develop its regulatory infrastructure for ANLWRs. To this end, one of the strategies in the NRC's action plan focuses on facilitating industry codes and standards needed to support the ANLWR life cycle. The update of RG 1.87 to endorse ASME Section III, Division 5, supports this strategy.

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. The staff plans to update RG 1.87 to endorse ASME Section III, Division 5 (with conditions, if necessary), as one way of meeting the NRC's regulatory requirements. The staff plans to issue the proposed Revision 2 to RG 1.87 for public comment by June 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)?

Revise.

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

The NRC is currently reviewing 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 update RG 1.87 to endorse ASME Section III, Division 5 (with conditions, if necessary), as one way of meeting the NRC's regulatory requirements. The staff plans to issue the proposed Revision 2 to RG 1.87 for public comment by June 2021.

NOTE: This review was conducted in February 2021 and reflects the staff's plans as of that date. These plans are tentative and are subject to change.