Regulatory Analysis for Final Rule
Approval of American Society of Mechanical Engineers' Code Cases
NRC-2009-0359; RIN 3150-AI72

1. Introduction.

This document presents the regulatory analysis for the subject final rule (Accession No. ML14008A332 in the U.S. Nuclear Regulatory Commission's (NRC) Agencywide Documents Access and Management System (ADAMS)) and the three associated NRC regulatory guides (RG):

- RG 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III," Revision 36 (ADAMS Accession No. ML13339A515);

- RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 17 (ADAMS Accession No. ML13339A689); and

- RG 1.192, "Operation and Maintenance Code Acceptability, ASME OM Code," Revision 1 (ADAMS Accession No. ML13340A034).

This regulatory action (1) incorporates by reference the latest revisions of these three previously incorporated NRC RGs; (2) makes conforming changes to §§ 50.54, 50.55, and 50.55a of Title 10 of the *Code of Federal Regulations* (10 CFR) in order to align with the Office of the Federal Register's (OFR) guidelines for incorporating published standards by reference; and (3) makes changes to the NRC's regulations to address a petition for rulemaking (PRM) regarding alternatives to NRC-approved Code Cases.

2. Objective of the Regulatory Action.

This regulatory action incorporates by reference the latest revisions of three RGs that list Code Cases, published by the American Society of Mechanical Engineers (ASME) and approved by the NRC. These are RG 1.84, "Design, Fabrication, and Materials Code Case Acceptability, ASME Section III," Revision 36; RG 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1," Revision 17; and RG 1.192, "Operation and Maintenance Code Case Acceptability, ASME OM Code," Revision 1. These revisions supersede the incorporation by reference of RG 1.84, Revision 35; RG 1.147, Revision 16; and RG 1.192, Revision 0. The NRC believes that this regulatory action improves the effectiveness of future licensing actions.

This rule allows licensees and applicants to voluntarily apply the Code Cases listed in the RGs as alternatives to requirements in the ASME Boiler and Pressure Vessel Code (BPV Code) and ASME Operation and Maintenance of Nuclear Power Plants (OM Code) for the design, construction, inservice inspection (ISI), and inservice testing (IST) of nuclear power plant components without a request for the use of an alternative or an exemption.

The ASME develops and publishes the BPV Code, which contains provisions for design, construction, and ISI of nuclear power plant components; and the OM Code, which contains provisions for IST of certain pumps and valves and inservice examination and testing of dynamic restraints (snubbers).

The applicable portions of the BPV Code and the OM Code are incorporated by reference in the NRC's regulations. Section 50.55a of the NRC's regulations requires that nuclear power plant owners construct Class 1, Class 2, and Class 3 components in accordance with Section III, Division 1, of the ASME BPV Code. Section 50.55a also requires that owners perform ISI of Class 1, Class 2, Class 3, Class MC, and Class CC components in accordance with Section XI, Division 1, of the BPV Code and that they perform IST of Class 1, Class 2, and Class 3 safety-related pumps and valves and inservice examination and testing of snubbers in accordance with the OM Code.

Code Cases (Section III, Section XI, and OM Code) provide alternatives to existing code requirements developed and approved by ASME. Code Cases are developed to clarify the intent of existing requirements and utilize new technology when the need is urgent before the alternative requirements are incorporated into the ASME BPV and OM Codes. Code Cases also permit licensees to use advancements in ISI and IST and provide alternative examinations and testing for older plants, expeditious responses to user needs, and limited, clearly focused alternatives to specific ASME Code provisions.

This rulemaking also includes changes made in accordance with the guidance for incorporation by reference of multiple standards that is included in Chapter 6 of the OFR's Document Drafting Handbook, January 2011 Revision. This latest revision of the OFR's guidance provides several options for incorporating by reference consensus standards in regulations.

The NRC decided to incorporate by reference the multiple standards mentioned in § 50.55a in a single paragraph, the first paragraph of the section: paragraph (a). The NRC chose this option because it results in the least disruption to the existing structure of the section. Each standard is listed in a separate subparagraph. As a result, the regulatory language in §§ 50.54, 50.55, and 50.55a has been revised by moving existing paragraphs, creating new paragraphs, and revising introductory and regulatory text.

This rulemaking also includes conforming changes to references throughout § 50.55a to reflect this reorganization. A detailed discussion of the affected paragraphs is provided in Section VIII, "Paragraph-by-Paragraph Discussion," of the final rule *Federal Register* notice. The complete regulatory text of § 50.55a has been set out in its entirety in the *Federal Register* notice for the convenience of the reader in viewing these changes.

It is acknowledged that these changes will require licensees to revise their procedures for administrative changes. However, it should be noted that when a newly-issued statutory provision mandates a change for which the NRC has no discretion, the agency is not obligated to perform a regulatory analysis to address the costs and benefits associated with the change. Accordingly, this regulatory analysis does not include detailed discussion of the impact of the changes resulting from the NRC's compliance with the OFR's guidance for incorporation by reference. However, the impact of these changes should be considered as a legitimate cost of this rule. The reorganization of §§ 50.54, 50.55, and 50.55a will require administrative changes to a limited number of procedures for all operating U.S. nuclear power plants. An order of magnitude estimate of the cost impact is provided in Section 4.1.

This rulemaking also includes changes to the NRC's regulations to address PRM-50-89 regarding alternatives to NRC-approved code cases. These changes are discussed in Section V, "Petition for Rulemaking (PRM-50-89)" in the *Federal Register* notice.

3. Identification and Analysis of the Alternative Approaches.

Two alternatives are identified by the NRC: (1) take no action; or (2) incorporate by reference NRC-approved ASME BPV Code Cases in RG 1.84, Revision 36; RG 1.147, Revision 17; and OM Code Cases in RG 1.192, Revision 1.

3.1. Alternative 1 – Take no action.

The no-action or status-quo alternative is not to update the incorporation by reference of RG 1.84, Revision 36; RG 1.147, Revision 17; and RG 1.192, Revision 1. This would mean that Revision 35 of RG 1.84; Revision 16 of RG 1.147; and Revision 0 of RG 1.192 would contain the latest ASME Code Cases that are incorporated by reference in the NRC's regulations. Licensees and applicants would not be able to use Code Cases in the next series of the RGs unless they request and receive approval for the use of alternatives under the new 10 CFR 50.55a(z). The NRC does not consider Alternative 1 as an acceptable approach for the following two reasons:

- Licensees and applicants would submit a large number of requests for alternatives to apply Code Cases through new paragraph 10 CFR 50.55a(z) since those Code Cases are not being approved in the RGs and are not being incorporated by reference in 10 CFR 50.55a. This process would be burdensome to licensees and applicants as well as to the NRC.

- The NRC's role as an effective industry regulator would be undermined because the ASME periodically publishes, revises, and annuls its Code Cases. Under Alternative 1, outdated material would remain incorporated by reference in the CFR.

3.2. Alternative 2 – Incorporate by Reference NRC-Approved ASME Code Cases in RG 1.84, Revision 36; RG 1.147, Revision 17; and RG 1.192, Revision 1.

Alternative 2 is to incorporate by reference the most recent RGs listing NRC-approved Code Cases into the CFR. This action would permit licensees and applicants to implement Code Cases that the NRC has approved since incorporating by reference the previous RGs without prior NRC approval under new 10 CFR 50.55a(z). This alternative would continue the NRC's policy of incorporating by reference the RGs that list NRC-approved alternatives to the provisions of the ASME BPV and OM Codes.

This alternative will meet the NRC's goal of ensuring the protection of public health and safety and the environment by approving new ASME Code Cases that allow the use of the most current methods and technology. In addition, it ensures that the NRC's actions are effective, efficient, realistic, and timely by eliminating the need for the NRC review of plant specific requests for alternatives in accordance with new 10 CFR 50.55a(z).

This alternative will also support the NRC's goal of maintaining an open regulatory process because approving ASME Code Cases demonstrates the agency's commitment to participate in the national consensus standard process.

The periodic rulemakings to update the regulations by incorporating by reference the editions and addenda of the ASME BPV and OM Codes creates additional burden on the NRC

but would reduce the need for the NRC review of plant specific requests for alternatives. The costs and benefits are discussed in more detail in the following section.

4. Regulatory Impact: Costs and Benefits.

This regulatory analysis has been prepared in accordance with the Regulatory Analysis Guidelines of the NRC, NUREG/BR-0058, Revision 4, dated September 2004 (ADAMS Accession No. ML042820192). This regulatory analysis examines the incremental costs and benefits of Alternative 2 relative to the baseline case, Alternative 1. First, this section addresses the guidelines on disaggregation. Second, it discusses the decision rationale and implementation schedule.

According to Section 4.3.2, "Criteria for the Treatment of Individual Requirements," of the Regulatory Analysis Guidelines, in evaluating a final regulatory initiative, the NRC usually performs a regulatory analysis for the entire rule to determine whether or not it is cost justified. However, aggregating or bundling different requirements in a single analysis could potentially mask the inclusion of an unnecessary individual requirement. In the case of a rule that provides a voluntary alternative to current requirements, the net benefit from the relaxation of one requirement could potentially support a second unnecessary requirement that is not cost justified. Therefore, under the Regulatory Analysis Guidelines, when analyzing and making decisions about regulatory initiatives that are composed of individual requirements, the NRC must determine if it is appropriate to include each individual requirement (disaggregation).

The Regulatory Analysis Guidelines further states that a special case involves the NRC's periodic review and endorsement of consensus standards such as new versions of the ASME Codes and associated Code Cases. This is because consensus standards have already undergone extensive external review and have been endorsed by industry. In addition, endorsement of the ASME Codes and Code Cases has been longstanding NRC policy. Licensees and applicants participate in the development of the ASME Codes and Code Cases and are aware that periodic updating of the ASME Code is part of the regulatory process. Code Cases are ASME-developed alternatives to the ASME BPV and OM Codes that licensees and applicants may voluntarily choose to adopt if approved through incorporation by reference in the NRC's regulations. Finally, endorsement of the ASME Codes and Code Cases is consistent with the National Technology Transfer and Advancement Act, inasmuch as the NRC has determined that there are sound regulatory reasons for establishing regulatory requirements for design, maintenance, ISI, IST, and examination by rulemaking.

In a typical incorporation by reference of Code Cases, the NRC endorsements can involve hundreds, if not thousands, of individual provisions. Evaluating the benefit vis-à-vis the cost of each individual provision in this regulatory analysis would be prohibitive, and the value gained by performing such an exercise would be limited. Therefore, this regulatory analysis does not evaluate individual requirements of the consensus standards.

4.1. Effect on Licensees and Applicants.

4.1.1. Revisions of Procedures.

It is estimated that the NRC's reorganization of 10 CFR 50.54, 50.55, and 50.55a, needed to implement the OFR's guidance on incorporation by reference, would result in administrative revisions of approximately 50 procedures for each nuclear power plant. It is

estimated that the total cost impact of this would be approximately $3.0 million ($3.0 million = 6 hours per procedure × 50 procedures per plant × 100 plants × $100 per hour). It should be noted that applicants would not have to revise their procedures like operating reactors. The number of plants in this calculation, 100, represents the number of individual commercial nuclear power plants (units) licensed to operate as of March 2014.

4.1.2. Requests for Alternatives.

The application of ASME BPV and OM Code Cases is attractive to NRC nuclear power plant licensees for several reasons. Applying Code Cases allows licensees to use advanced techniques, procedures, and measures on a trial basis to gain experience prior to the incorporation of the alternatives into the ASME Code and the NRC approval of the later editions and addenda. The experience is used to either refine or reject the new provisions. Code Cases are also suited for use in areas where the application of risk-informed principles indicates that there are too many examinations or tests or that occupational exposure can be reduced. Alternative 2 has the advantage that, on implementation of the final rule, licensees and applicants will be able to unilaterally use the latest Code Cases that have been generically approved by the NRC through RGs. Therefore, licensees and applicants will be permitted to apply the Code Cases listed in the subject RGs without the need to seek NRC approval through a request for use of alternatives under new 10 CFR 50.55a(z).

Once the Code Case is approved by the ASME, the licensees and or applicants must make a determination as to the applicability of the Code Case to its facility and the benefit to be derived. If the licensee or applicants determine that use of the Code Case would be beneficial and it has not been approved by the NRC, a request for the use of an alternative must be prepared, and all appropriate levels of licensee or applicant management must review and approve the request prior to submission to the NRC. The NRC estimates that this process would involve an average of 2 person-weeks, or 80 hours, of effort by a licensee or applicant. At an estimated labor rate of $100 per hour, this would result in a cost to the licensee of $8,000 per request for use of alternatives under 10 CFR 50.55a(z). It is expected that licensees or applicants deciding whether relief should be sought would weigh this cost against the benefit to be derived. In some cases, licensees would decide to forfeit the benefits of using a Code Case due to this additional burden. The NRC estimates that this would occur in the case of approximately 15 percent of new ASME Code Cases.

If it is assumed that each of the 105 commercial nuclear power reactor units including five reactor units under active construction would desire to implement two ASME Code Cases per year, then under Alternative 2, there would be 210 Code Cases implemented without incurring any cost for the use of alternatives under new 10 CFR 50.55a(z) (assuming that each of these Code Cases and their conditions have been incorporated by reference in 10 CFR 50.55a). Under Alternative 2, the preparation of 179 (i.e., 85 percent of 210 Code Cases) alternatives would be averted at an industry-wide cost reduction of approximately $1.4 million (210 requests × 85 percent × $8,000 per alternatives) per year.

4.2. NRC Implementation

The NRC would incur several implementation costs. The NRC incurs a cost in relation to developing the final rule and the associated regulatory guides. However, the burden is more than offset by reducing the number of requests for the use of alternatives under the 10 CFR 50.55a(z) that the NRC will need to process.

5. Decision Rationale.

The NRC determined to adopt Alternative 2. As previously discussed, this alternative meets the NRC's goal of ensuring the protection of public health and safety and the environment through the NRC's approval of new ASME Code Cases that allow the use of the most current methods and technology. In addition, this alternative would help ensure that the NRC's actions are effective, efficient, realistic, and timely by eliminating the need for the NRC review of plant-specific relief requests. This alternative would also support the NRC's goal of maintaining an open regulatory process because approving ASME Code Cases demonstrates the agency's commitment to participate in the national consensus standards process.

Other important considerations lead the NRC to recommend Alternative 2:

- The industry is familiar with the well-established process of approving Code Cases through NRC RGs.

- The public perceives that the Code Case approval process is consistent across the industry and that the NRC will continue to support the use of the most current technically sound techniques developed by ASME while adequately protecting the public.

6. Implementation Schedule.

The final rule will become effective 30 days after its publication in the *Federal Register*.