NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

[NRC–2011–0088]

RIN 3150–AI97

Incorporation by Reference of American Society of Mechanical Engineers Codes and Code Cases

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is amending its regulations to incorporate by reference recent editions and addenda to the American Society of Mechanical Engineers (ASME) Codes for nuclear power plants and a standard for quality assurance. The NRC is also incorporating by reference six ASME Code Cases. This action is in accordance with the NRC's policy to periodically update the regulations to incorporate by reference new editions and addenda of the ASME Codes and is intended to maintain the safety of nuclear power plants and to make NRC activities more effective and efficient.

DATES: This final rule is effective on August 17, 2017. The incorporation by reference of certain publications listed in the regulation is approved by the Director of the Federal Register as of August 17, 2017.

ADDRESSES: Please refer to Docket ID NRC–2011–0088 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 Web site:* Go to *http://www.regulations.gov* and search for Docket ID NRC–2011–0088. Address questions about NRC dockets to Carol Gallagher; telephone: 301–415–3463; email: *Carol.Gallagher@nrc.gov.* For technical questions, contact the individuals 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 *http://www.nrc.gov/reading-rm/adams.html.* To begin the search, select ''ADAMS Public Documents'' and then 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 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:* You may examine and purchase copies of public documents at the NRC's PDR, Room O1–F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: Daniel I. Doyle, Office of Nuclear Reactor Regulation, telephone: 301–415–3748, email: *Daniel.Doyle@nrc.gov;* or Keith Hoffman, Office of Nuclear Reactor Regulation, telephone: 301–415–1294, email: *Keith.Hoffman@nrc.gov.* Both are staff of the U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001.

SUPPLEMENTARY INFORMATION:

Executive Summary

A. Need for the Regulatory Action

The NRC is amending its regulations to incorporate by reference recent editions and addenda to the ASME Codes for nuclear power plants and an ASME standard for quality assurance. The NRC is also incorporating by reference six ASME Code Cases.

This final rule is the latest in a series of rulemakings to amend the NRC's regulations to incorporate by reference revised and updated ASME Codes for nuclear power plants. The ASME is a voluntary consensus standards body, and the ASME Codes are voluntary consensus standards. The ASME periodically revises and updates its codes for nuclear power plants by issuing new editions and addenda. The NRC's use of the ASME Codes is consistent with applicable requirements of the National Technology Transfer and Advancement Act (NTTAA). This rulemaking is in accordance with the NRC's policy to update the regulations to incorporate by reference those new editions and addenda. The incorporation by reference of the new editions and addenda will maintain the safety of nuclear power plants, make NRC activities more effective and efficient, and allow nuclear power plant licensees and applicants to take advantage of the latest ASME Codes. Additional discussion of voluntary consensus standards and the NRC's compliance with the NTTAA is set forth in Section XIV of this document, ''Voluntary Consensus Standards.''

B. Major Provisions

Major provisions of this final rule include:

- Incorporation by reference of ASME Codes into the NRC's regulations and delineation of the NRC's requirements for the use of these codes, including conditions.
- Incorporation by reference of various versions of quality assurance standard NQA–1 into NRC regulations and approval for their use.
- Incorporation by reference of six ASME Code Cases.

C. Costs and Benefits

The NRC prepared a regulatory analysis (ADAMS Accession No. ML16130A522) to identify the costs and benefits associated with this final rule. The regulatory analysis prepared for this rulemaking was used to determine if the rule is cost-effective, overall, and to help the NRC evaluate potentially costly conditions placed on specific provisions of the ASME Codes and Code Cases which are the subject of this rulemaking. Therefore, the regulatory analysis focuses on the marginal difference in benefits and costs for each provision of this final rule relative to the ''no action'' baseline alternative. The regulatory analysis identified costs and benefits in a quantitative fashion as well as in a qualitative fashion. An uncertainty analysis was performed to evaluate the effects of uncertainties in the quantitative estimation of both costs and benefits, and this analysis showed the rule alternative is cost effective with over 99 percent certainty. The standard deviation of the cost estimate net benefit is $4.1 million.

TABLE 1—COST-BENEFIT SUMMARY

Objective	Alternative 2—the rule alternative net benefits (costs) (million) (Net present value, 7% discount rate)
Industry	$11.5
NRC	3.28
Net benefit	14.7

Table 1 summarizes the costs and benefits for the alternative of proceeding with the final rule (Alternative 2) and shows that the final rule is quantitatively cost-beneficial with a net benefit of $14.7 million to both the industry and the NRC when compared to the regulatory baseline (Alternative 1). The regulatory analysis shows that implementing the final rule is quantitatively cost-effective and an efficient use of NRC and Industry resources. Uncertainty analysis shows a standard deviation of $4.08 million, resulting in a net benefit range of $8.19 million to $21.6 million. Because the

rulemaking alternative is cost-effective, the rulemaking approach is recommended.

There are several benefits associated with this final rule. The new motor-operated valve (MOV) provisions in this final rule result in over $25 million in averted costs (7-percent net present value) due to the removal of quarterly testing requirements and replacing those requirements with less frequent diagnostic and biannual testing requirements. Additionally, the provisions in this final rule will result in averted costs to the NRC and the industry from relief requests for the code cases in this final rule, in particular the ASME OMN–20 Code Case Time Period Extension provision, in excess of $5.1 million (7-percent net present value).

Qualitative factors which were considered include regulatory stability and predictability, regulatory efficiency, and consistency with the NTTAA. Table 50 in the regulatory analysis includes a discussion of the costs and benefits that were considered qualitatively. Considering non-quantified costs and benefits, the regulatory analysis shows that the rulemaking is justified because the number and significance of the non-quantified benefits outweigh the non-quantified costs. Certainly, if the qualitative benefits (including the safety benefit, regulatory efficiency, and other nonquantified benefits) are considered together with the quantified benefits, then the benefits would outweigh the identified quantitative and qualitative impacts. Therefore, integrating both quantified and non-quantified costs and benefits, the benefits of the final rule outweigh the identified quantitative and qualitative impacts attributable to the final rule.

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I. Background

The ASME develops and publishes the ASME *Boiler and Pressure Vessel Code* (BPV Code), which contains requirements for the design, construction, and inservice inspection (ISI) of nuclear power plant components; and the OM Code,[1] which contains requirements for inservice testing (IST) of nuclear power plant components. Until 2012, the ASME issued new editions of the ASME BPV Code every 3 years and addenda to the editions annually, except in years when a new edition was issued. Similarly, the ASME periodically published new editions and addenda of the OM Code. Starting in 2012, the ASME decided to issue editions of its BPV and OM Codes (no addenda) every 2 years. The new editions and addenda typically revise provisions of the ASME BPV and OM Codes (ASME Codes) to broaden their applicability, add specific elements to current provisions, delete specific provisions, and/or clarify them to narrow the applicability of the provision. The revisions to the editions and addenda of the ASME Codes do not significantly change philosophy or approach.

It has been the NRC's practice to establish requirements for the design, construction, operation, ISI examination, and IST of nuclear power plants by approving the use of editions and addenda of the ASME Codes in § 50.55a of title 10 of the *Code of Federal Regulations* (10 CFR), ''Codes and standards.'' The NRC approves and/or mandates the use of certain parts of editions and addenda of these ASME Codes in § 50.55a through the rulemaking process of ''incorporation by reference.'' Upon incorporation by reference of the ASME Codes into § 50.55a, the provisions of the ASME Codes are legally-binding NRC requirements as delineated in § 50.55a and subject to the conditions on certain specific ASME Code provisions that are set forth in § 50.55a. The editions and addenda of the ASME BPV and OM Codes were last incorporated by reference into the regulations in a final rule dated June 21, 2011 (76 FR 36232), subject to the NRC's conditions.

The ASME Codes are consensus standards developed by participants with broad and varied interests, including the NRC and licensees of nuclear power plants. The ASME's adoption of new editions of, and addenda to, the ASME Codes does not mean that there is unanimity on every provision in the ASME Codes. There may be disagreement among the technical experts, including NRC representatives, on the ASME Code committees and subcommittees, regarding the acceptability or desirability of a particular Code provision included in an ASME-approved Code edition or addenda. If the NRC believes that there is a significant technical or regulatory concern with a provision in an ASME-approved Code edition or addenda being considered for incorporation by reference, then the NRC will condition the use of that provision when it incorporates by reference that ASME Code edition or addenda. In some cases, the condition increases the level of safety afforded by the ASME Code provision or addresses a regulatory issue not considered by the ASME. In other instances, where research data or experience has shown that certain Code provisions are unnecessarily conservative, the condition may provide that the Code provision need not be complied with in some or all respects. The NRC's conditions are included in § 50.55a, typically in paragraph (b) of that regulation. In a Staff Requirements Memorandum (SRM) dated September 10, 1999, the Commission indicated that NRC rulemakings adopting (incorporating by reference) a voluntary consensus standard must identify and justify each part of the standard that is not adopted. For this rulemaking, the provisions of the 2009 Addenda, 2010 Edition, 2011 Addenda, and 2013 Edition of Section III, Division 1; and the 2009 Addenda, 2010 Edition, 2011 Addenda, and 2013 Edition of Section XI, Division 1, of the ASME BPV Code; and the 2009 Edition, 2011 Addenda, and 2012 Edition of the OM Code that the NRC is not adopting, or partially adopting, are identified in the Discussion, Regulatory Analysis, and Backfitting and Issue Finality sections of this document. The provisions of those specific editions and addenda and Code Cases that are the subject of this rulemaking that the NRC finds to be conditionally acceptable, together with the applicable conditions, are also identified in the Discussion, Regulatory Analysis, and Backfitting and Issue Finality sections of this document.

The ASME Codes are voluntary consensus standards, and the NRC's incorporation by reference of these Codes is consistent with applicable requirements of the NTTAA. Additional discussion on NRC's compliance with the NTTAA is set forth in Section XIV

[1] The editions and addenda of the ASME *Code for Operation and Maintenance of Nuclear Power Plants* have had different titles from 2005 to 2012 and are referred to collectively in this rule as the ''OM Code.''

of this document, ''Voluntary Consensus Standards.''

This final rule reflects the NRC's redesignation of paragraphs within § 50.55a set forth in a final rule dated November 5, 2014 (79 FR 65776), as corrected on December 11, 2014 (79 FR 73461). The re-designation of paragraphs was needed to address the Office of the Federal Register's requirements in 1 CFR part 51 for incorporation by reference. For additional information on the November 2014 final rule, please consult the statement of considerations (preamble) for that final rule.

II. Discussion

The NRC regulations incorporate by reference ASME Codes for nuclear power plants. The ASME periodically revises and updates its codes for nuclear power plants. This final rule is the latest in a series of rulemakings to amend the NRC's regulations to incorporate by reference revised and updated ASME Codes for nuclear power plants. The proposed rule which led to this final rule was published on September 18, 2015 (80 FR 56820). This rulemaking is intended to maintain the safety of nuclear power plants and make NRC activities more effective and efficient.

The NRC follows a three-step process to determine acceptability of new provisions in new editions and addenda to the Codes and the need for conditions on the uses of these Codes. This process was employed in the review of the Codes that are the subject of this rule. First, the NRC staff actively participates with other ASME committee members with full involvement in discussions and technical debates in the development of new and revised Codes. This includes a technical justification of each new or revised Code. Second, the NRC committee representatives discuss the Codes and technical justifications with other cognizant NRC staff to ensure an adequate technical review. Third, the NRC position on each Code is reviewed and approved by NRC management as part of the rule amending § 50.55a to incorporate by reference new editions and addenda of the ASME Codes and conditions on their use. This regulatory process, when considered together with the ASME's own process for developing and approving the ASME Codes, provides reasonable assurance that the NRC approves for use only those new and revised Code edition and addenda, with conditions as necessary, that provide reasonable assurance of adequate protection to public health and safety, and that do not have significant adverse impacts on the environment.

The NRC is amending its regulations to incorporate by reference:

- The 2009 Addenda, 2010 Edition, 2011 Addenda, and 2013 Edition of the ASME BPV Code, Section III, Division 1 and Section XI, Division 1, with conditions on their use.
- The 2009 Edition, the 2011 Addenda, and the 2012 Edition of Division 1 of the OM Code, with conditions on their use.
- ASME Standard NQA–1, ''Quality Assurance Requirements for Nuclear Facility Applications,'' including several editions and addenda to NQA–1 from previous years with slightly varying titles as identified in § 50.55a(a)(1)(v). More specifically, the NRC is incorporating by reference the 1983 Edition through the 1994 Edition, the 2008 Edition, and the 2009–1a Addenda to the 2008 Edition of ASME NQA–1, with conditions on their use.
- ASME BPV Code Case N–513–3, ''Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1,'' Mandatory Appendix I, ''Relations for F_m, F_b, and F for Through-Wall Flaws,'' Approval Date: January 26, 2009. This Code Case has already been approved for use by the NRC in Regulatory Guide (RG) 1.147 (75 FR 61321; October 5, 2010), but is now being incorporated by reference in order to adopt a condition on Nonmandatory Appendix U, which requires the use of this Code Case appendix.
- ASME BPV Code Case N–729–4, ''Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds Section XI, Division 1,'' ASME approval date: June 22, 2012, with conditions on its use.
- ASME BPV Code Case N–770–2, ''Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated with UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1,'' ASME approval date: June 9, 2011, with conditions on its use.
- ASME BPV Code Case N–824, ''Ultrasonic Examination of Cast Austenitic Piping Welds From the Outside Surface Section XI, Division 1,'' ASME approval date: October 16, 2012.
- ASME BPV Code Case N–852, ''Application of the ASME NPT Stamp, Section III, Division 1; Section III, Division 2; Section III, Division 3; Section III, Division 5,'' Approval Date: February 9, 2015.
- OM Code Case OMN–20, ''Inservice Test Frequency.''

The current regulations in § 50.55a(a)(1)(ii) incorporate by reference ASME BPV Code, Section XI, 1970 Edition through the 1976 Winter Addenda; and the 1977 Edition (Division 1) through the 2008 Addenda (Division 1), subject to the existing conditions in § 50.55a(b)(2)(i) through (xxix). This amendment revises § 50.55a(a)(1)(ii) to incorporate by reference the 2009 Addenda (Division 1) through the 2013 Edition (Division 1) of the ASME BPV Code, Section XI. It also clarifies the wording and adds, removes, or revises some of the conditions as explained in this document.

The NRC is revising § 50.55a(a)(1)(iv) to incorporate by reference the 2009 Edition, 2011 Addenda, and 2012 Edition of Division 1 of the OM Code. Based on this revision, the NRC regulations will incorporate by reference in § 50.55a the 1995 Edition through the 2012 Edition of the OM Code.

The NRC reviewed changes to the Codes in the editions and addenda of the Codes identified in this rulemaking, and published a proposed rule in the **Federal Register** setting forth the NRC's proposal to incorporate by reference the ASME Codes, together with proposed conditions on their use (80 FR 56820; September 18, 2015). After consideration of the public comments received on the proposed rule (public comments are discussed in Section IV of this document, ''NRC Responses to Public Comments''), the NRC concludes, in accordance with the process for review of changes to the Codes, that each of the editions and addenda of the Codes, and the 2008 Edition and the 2009–1a Addenda of NQA–1, are technically adequate, consistent with current NRC regulations, and approved for use with specified conditions set forth in this final rule. Each of the NRC conditions and the reasons for each condition are discussed in the following sections. The discussions are organized under the applicable ASME Code and Section.

There is not a separate heading for ASME quality assurance standard NQA–1 because there are three separate discussions of NQA–1—one under the heading for ASME BPV Code, Section III, one under the heading for ASME BPV Code, Section XI, and one under the heading for OM Code—because there are three conditions related to NQA–1, one in each of those areas (§ 50.55a(b)(1)(iv) for Section III, § 50.55a(b)(2)(x) for Section XI, and § 50.55a(b)(3)(i) for the OM Code). In addition, administrative and editorial changes to various paragraphs of § 50.55a are being adopted for accuracy, clarity, consistency, and general

administrative convenience. These editorial changes are not further discussed in this heading, but are described in Section V of this document, ''Section-by-Section Analysis.''

Four of the six ASME Code Cases being incorporated by reference in this rulemaking (N–729–4, N–770–2, N–824, and OMN–20) are discussed in Section II.D of this document, ''ASME Code Cases.'' A fifth ASME Code Case, N–852, is discussed in Section II.A, ''ASME BPV Code, Section III,'' because the NRC's approval of that Code Case relates to a provision of Section III, which is addressed in § 50.55a(b)(1)(ix). The sixth ASME Code Case, N–513–3, is discussed in Section II.B, ''ASME BPV Code, Section XI,'' because the NRC's approval of that Code Case relates to a provision of Section XI, which is addressed in § 50.55a(b)(2)(xxxiv).

A. ASME BPV Code, Section III

10 CFR 50.55a(a)(1)(i) ASME Boiler and Pressure Vessel Code, Section III

The NRC is clarifying that Section III Nonmandatory Appendices are not incorporated by reference. This language was originally added in a final rule published on June 21, 2011 (76 FR 36232); however, it was omitted from the final rule published on November 5, 2014 (79 FR 65776). The NRC is correcting the omission by inserting the parenthetical clause ''(excluding Nonmandatory Appendices)'' in § 50.55a(a)(1)(i).

10 CFR 50.55a(b)(1)(ii) Section III Condition: Weld Leg Dimensions

The NRC is identifying prohibited subparagraphs and notes for each ASME BPV Code edition and addenda in tabular form as opposed to the narrative form of the existing regulation. No substantive change to the requirements is intended by this revision. The NRC believes that presenting the information in tabular form will increase the clarity and understandability of the regulation.

The existing condition in § 50.55a(b)(1)(ii) prohibits, for welds with leg sizes less than 1.09 t_n, the use of certain Code provisions in ASME BPV Code, Section III, Division 1. The Code provisions provide stress indices for welded joints used in the design of Class 2 and Class 3 piping. The use of these indices is prohibited for welds with leg sizes less than 1.09 t_n, where t_n is the nominal pipe thickness because this would result in a weld that would be weaker than the pipe to which it is adjoined under these dimensions. The location of the prohibited provisions vary in the Code editions and addenda from the 1989 Addenda through the 2013 Edition, so in this final rule the NRC clearly identifies the prohibited code provisions in the editions and addenda in a tabular format.

As an editorial matter, this final rule identifies the prohibited ASME BPV Code provisions as ''notes,'' which is the term used by the ASME, rather than ''footnotes.'' The NRC is using the terminology used by the ASME for clarity.

10 CFR 50.55a(b)(1)(iv) Section III Condition: Quality Assurance

The NRC is approving for use the version of NQA–1 referenced in the 2010 Edition, 2011 Addenda, and 2013 Edition of the ASME BPV Code, Section III, Subsection NCA, Article 7000, which this rule is also incorporating by reference. This allows applicants and licensees to use the 2008 Edition and the 2009–1a Addenda of NQA–1 when using the 2010 and later editions and addenda of Section III.

In the 2010 Edition of ASME BPV Code, Section III, Subsection NCA, Article NCA–4000, ''Quality Assurance,'' was updated to require N-Type Certificate Holders to comply with the requirements of Part 1 of the 2008 Edition and the 2009–1a Addenda of ASME Standard NQA–1, ''Quality Assurance Requirements for Nuclear Facility Applications,'' as modified and supplemented in NCA–4120(b) and NCA–4134. In addition, NCA–4110(b) was revised to remove the reference to a specific edition and addenda of ASME NQA–1, and Table NCA–7100–2, ''Standards and Specifications Referenced in Division 1,'' was updated to require the 2008 Edition and 2009–1a Addenda of NQA–1 when using the 2010 Edition of Section III. In light of these changes, the NRC reviewed the 2008 Edition and the 2009–1a Addenda of NQA–1 and compared it to previously approved versions of NQA–1 and found that there were no significant differences. In addition, the NRC reviewed the changes to Subsection NCA that reference the 2008 Edition and 2009–1a Addenda of NQA–1, compared them to previously approved versions of Subsection NCA, and found that there were no significant differences. Therefore, the NRC has concluded that these editions and addenda of NQA–1 are acceptable for use.

The NRC is revising § 50.55a(b)(1)(iv) to clarify that an applicant's or licensee's commitments addressing those areas where NQA–1 either does not address a requirement in appendix B to 10 CFR part 50, ''Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants,'' or is less stringent than the comparable appendix B requirement govern the applicant's or licensee's Section III activities. The clarification is consistent with § 50.55a(b)(2)(x) and (b)(3)(i). The NQA–1 provides the ASME's method for establishing and implementing a quality assurance (QA) program for the design and construction of nuclear power plants and fuel reprocessing plants. However, NQA–1, as modified and supplemented in NCA–4120(b) and NCA–4134, does not address some of the requirements of appendix B to 10 CFR part 50. In some cases, the provisions of NQA–1 are less stringent than the comparable appendix B requirements. Therefore, in order to meet the requirements of appendix B, an applicant's or licensee's QA program description must contain commitments addressing those provisions of appendix B which are not covered by NQA–1, as well as provisions that supplement or replace the NQA–1 provisions where the appendix B requirement is more stringent.

Finally, the NRC is removing the reference in § 50.55a(b)(1)(iv) to versions of NQA–1 older than the 1994 Edition because the NRC did not receive any adverse comments from any applicant or licensee about removing versions of NQA–1 older than the 1994 Edition from the regulation. The NRC received only one comment regarding NQA–1. The comment expressed support for incorporation by reference of NQA–1 and did not respond to the NRC's request for comment regarding the removal of references to older versions of NQA–1.

10 CFR 50.55a(b)(1)(vii) Section III Condition: Capacity Certification and Demonstration of Function of Incompressible-Fluid Pressure-Relief Valves

The NRC is revising § 50.55a(b)(1)(vii) so that the existing condition prohibiting the use of paragraph NB–7742(a)(2) of the 2006 Addenda through the 2007 Edition, up to and including the 2008 Addenda, is extended to include the editions and addenda up to the 2013 Edition, which are the subject of this rulemaking.

10 CFR 50.55a(b)(1)(viii) Section III Condition: Use of ASME Certification Marks

The NRC is adding § 50.55a(b)(1)(viii) to allow licensees to use either the ASME BPV Code Symbol Stamps of editions and addenda earlier than the 2011 Addenda to the 2010 Edition of the ASME BPV Code or the ASME Certification Marks with the appropriate

certification designators and class designators as specified in the 2013 Edition through the latest edition and addenda incorporated by reference in § 50.55a.

The ASME BPV Code requires, in certain instances, that components be stamped. The stamp signifies that the component has been designed, fabricated, examined and tested, as specified in the ASME BPV Code. The stamp also signifies that the required ASME BPV Code data report forms have been completed, and the authorized inspector has inspected the item and authorized the application of the ASME BPV Code Symbol Stamp.

The ASME has instituted changes in the BPV Code to consolidate the different ASME BPV Code Symbol Stamps into a common ASME Certification Mark. This action was implemented in the 2011 Addenda to the 2010 Edition of the ASME BPV Code. As of the end of 2012, ASME no longer utilizes the ASME BPV Code Symbol Stamp. Licensees, however, may not have updated to the edition or addenda that identifies the use of the ASME Certification Mark. Nevertheless, licensees are legally required to implement the ASME BPV Code Edition and Addenda identified as their current code of record. As ASME components are procured, these components may be received with the ASME Certification Mark, while the licensee's current code of record may require the component to have the ASME BPV Code Symbol Stamp. Installation of a component under such circumstances would not be in compliance with the regulations that the licensees are required to meet.

Both the ASME Certification Mark and the ASME BPV Code Symbol Stamp are official ASME methods of certifying compliance with the Code. Although these ASME Certification Marks differ slightly in appearance, they serve the same purpose of certifying code compliance by the ASME Certificate Holder and continue to provide for the same level of quality assurance for the application of the ASME Certification Mark as was required for the application of the ASME BPV Code Symbol Stamp. The new ASME Certification Mark represents a small, non-safety significant modification of ASME's trademark. As such, it does not change the technical requirements of the Code. The ASME has confirmed that the Certification Mark with designator is equivalent to the corresponding BPV Code Symbol Stamp. Based on statements made by ASME in a letter dated August 17, 2012, the NRC has concluded that the ASME BPV Code Symbol Stamps and ASME Certification Mark with code-specific designators are equivalent with respect to their certification of compliance with the BPV Code. The NRC discussed this issue in Regulatory Issue Summary 2013–07, ''NRC Staff Position on the Use of American Society of Mechanical Engineers Certification Mark,'' dated May 28, 2013.

10 CFR 50.55a(b)(1)(ix) Section III Condition: NPT Code Symbol Stamps

The NRC is adding § 50.55a(b)(1)(ix) to allow licensees to use the NPT Code Symbol Stamp with the letters arranged horizontally as specified in ASME BPV Code Case N–852 for the service life of a component that had the NPT Code Symbol Stamp applied during the time period from January 1, 2005, through December 31, 2015.

Public comments on the use of the NPT Code Symbol requested that the NRC accept the NPT Code Symbol Stamp having the NPT letters arranged horizontally as an acceptable NPT Stamp to certify Code compliance for fabricated items that have already been stamped prior to receiving a replacement NPT Code Symbol Stamp from the ASME. The comments requested that the NRC include acceptance of Code Case N–852 in this final rule for this purpose. Within the context of its Code rules, ASME asserts that the NPT Code Symbol Stamp having the NPT letters arranged horizontally, although differing slightly in appearance from the NPT Code Symbol Stamp as illustrated in Section III, Table NCA–8100–1 of the ASME BPV Code, 2010 Edition and earlier editions and addenda, serves the same purpose of certifying Code compliance by the ASME NPT Certificate Holder with confirmation by the Authorized Nuclear Inspector and provides the same level of quality assurance. In addition, ASME indicated that on or after January 1, 2016, the ASME will no longer authorize use of the NPT Code Symbol Stamp having the NPT letters arranged horizontally. Accordingly, on or after January 1, 2016, fabricated items will only be stamped with the NPT Code Symbol Stamp as illustrated in Section III, Table NCA–8100–1 of the ASME BPV Code, 2010 Edition and earlier editions and addenda.

The NRC agrees in general with this comment, in which the ASME asserts that the ASME NPT Code Symbol Stamp with the letters arranged horizontally to be equivalent to the ''N over PT'' ASME NPT Code Symbol Stamp. Therefore, using either Code Symbol Stamp serves the same purpose of certifying code compliance by the ASME Certificate Holder with confirmation by the Authorized Nuclear Inspector and provides the same level of quality assurance. The NRC also notes that the same administrative and technical requirements in the ASME Code still apply whether an ASME NPT Code Symbol Stamp with the letters arranged horizontally or an ''N over PT'' ASME NPT Code Symbol Stamp is applied. However, since this NPT Code Symbol Stamp having the NPT letters arranged horizontally will only be applied onto fabricated components from the time period of January 1, 2005, through December 31, 2015, the time period for when this NPT Code Symbol Stamp was applied to the component should be limited to these dates to prevent inadvertent fraudulent material. Therefore, the NRC agrees that the ASME BPV Code Case N–852 is acceptable for the service life of the component that had the NPT Code Symbol stamp applied from the time period of January 1, 2005, through December 31, 2015. In response to this comment, the NRC added § 50.55a(b)(1)(ix) to include a statement that licensees may use the NPT Code Symbol Stamp with the letters arranged horizontally as specified in ASME BPV Code Case N–852 for the service life of a component that had the NPT Code Symbol Stamp applied during the time period from January 1, 2005, through December 31, 2015. The NRC is incorporating by reference ASME BPV Code Case N–852 in § 50.55a(a)(1)(iii)(F) because it is referenced in § 50.55a(b)(1)(ix).

Although the proposed rule did not include this Code Case, the NRC has determined that the incorporation by reference of this Code Case at the final rule stage is a logical outgrowth of the proposed rule. The NRC's intent to ensure that § 50.55a identify all ASME-approved methods for labelling Code components is apparent from the statement of considerations for the proposed rule. See 80 FR 56820 (September 18, 2015) at 56823–56824. The NRC did not entirely achieve that purpose, and this resulted in public comments seeking approval of this Code Case, which supports the proposition that the public had a reasonable opportunity to either propose the correction, with conditions as the commenter believes are necessary or desirable, or to indicate why the (anticipated) correction should not be made. Therefore, the NRC concludes that it may incorporate by reference ASME BPV Code Case N–852.

B. ASME BPV Code, Section XI

10 CFR 50.55a(a)(1)(ii) ASME Boiler and Pressure Vessel Code, Section XI

In the proposed rule, the NRC proposed a revision to § 50.55a(a)(1)(ii) that would have clarified that Section XI Nonmandatory Appendix U of the 2013 Edition of ASME BPV Code, Section XI was not incorporated by reference and therefore not approved for use. After considering public comments, the NRC has determined that it will not exclude Appendix U from the incorporation by reference because it is the integration of ASME BPV Code Cases N–513–3, ''Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1,'' and N–705, ''Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks Section XI, Division 1,'' into Section XI. The NRC has approved Code Cases N–513–3 and N–705 in RG 1.147. However, as described in the discussion for § 50.55a(b)(2)(xxxiv) in Section II.B, ''ASME BPV Code Section XI,'' the NRC has found it necessary to adopt two new conditions to the use of Nonmandatory Appendix U.

The NRC is adopting two conditions in the language of § 50.55a(a)(1)(ii)(C)(*52*) and (*53*) to address two inconsistencies that were identified between the NRC's position in a proposed rule regarding the acceptability of ASME Code Cases (81 FR 10780; March 2, 2016) (2016 Code Case proposed rule) and the proposed rule for this rulemaking (80 FR 56820; September 18, 2015). The first inconsistency is that the NRC's proposed conditions on ASME BPV Code Case N–799, ''Dissimilar Metal Welds Joining Vessel Nozzles to Components,'' in the 2016 Code Case proposed rule were not reflected in the 2015 proposed rule for this rulemaking, even though the technical content of ASME BPV Code Case N–799 has been incorporated into the 2011 Addenda and 2013 Edition of ASME BPV Code, Section XI. The second inconsistency is that the NRC's proposed disapproval of ASME BPV Code Case N–813, ''Alternative Requirements for Preservice Volumetric and Surface Examination,'' in the 2016 Code Case proposed rule was not reflected in the 2015 proposed rule for this rulemaking, even though the technical content of ASME BPV Code Case N–813 has been incorporated into the 2013 Edition of the ASME BPV Code, Section XI as IWB–3112(a)(3) and IWC–3112(a)(3). To address these two inconsistencies, the NRC is excluding these ASME BPV Code, Section XI items from incorporation by reference, as reflected in § 50.55a(a)(1)(ii)(C)(*52*) and (*53*) of the final rule. The NRC plans to complete the development of the regulatory approaches for examination of component-to-component welds for new construction plants and the acceptance of preservice flaws by analytical evaluation for operating plants and include them in a future rulemaking.

10 CFR 50.55a(b)(2)(vi) Section XI Condition: Effective Edition and Addenda of Subsection IWE and Subsection IWL

The NRC is revising § 50.55a(b)(2)(vi) to expressly state that licensees that implemented the expedited examination of containment during the 5-year period from September 9, 1996, to September 9, 2001, may use either the 1992 Edition with the 1992 Addenda or the 1995 Edition with the 1996 Addenda of Subsection IWE and Subsection IWL, as conditioned by the requirements in paragraphs (b)(2)(viii) and (ix), when implementing the initial 120-month inspection interval for the containment ISI requirements of this section.

The expedited examination involved the completion of the first set of examinations of the first or initial 120-month containment inspection interval. It is noted that all of the operating reactors in the previously stated class would have gone past their initial 120-month inspection interval by 2011. The change removes the possibility of misinterpretation of the provision as requiring plants that do not fall in the previously stated class, such as reactors licensed after September 9, 2001, to use the 1992 Edition with 1992 Addenda or the 1995 Edition with 1996 Addenda of Subsection IWE and Subsection IWL, Section XI for implementing the initial 120-month inspection interval of the containment ISI program. Applicants and licensees that do not fall in the previously stated class must use Code editions and addenda in accordance with § 50.55a(g)(4)(i) and (ii), respectively, for the initial and successive 120-month containment ISI intervals.

10 CFR 50.55a(b)(2)(viii) Section XI Condition: Concrete Containment Examinations

The NRC is revising § 50.55a(b)(2)(viii) by removing the condition for using the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWL requiring compliance with § 50.55a(b)(2)(viii)(E). To support the removal of the condition, the NRC is adding new requirements governing the performance and documentation of concrete containment examinations in § 50.55a(b)(2)(viii)(H) and (I), which are discussed separately in the next two headings.

Section 50.55a(b)(2)(viii)(E) is one of several conditions that apply to the inservice examination of concrete containments using Subsection IWL of various editions and addenda of the ASME BPV Code, Section XI, incorporated by reference in § 50.55a(a)(1)(ii). The NRC is removing the condition in § 50.55a(b)(2)(viii)(E) when applying the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWL because its intent has been incorporated into the Code in the new provision IWL–2512, ''Inaccessible Areas.''

10 CFR 50.55a(b)(2)(viii)(H) Concrete Containment Examinations: Eighth Provision

The NRC is adding § 50.55a(b)(2)(viii)(H) to specify the information that must be provided in the ISI Summary Report required by IWA–6000, when inaccessible concrete surfaces are evaluated under the new Code provision IWL–2512. This new condition replaces the existing condition in § 50.55a(b)(2)(viii)(E), when using the 2007 Edition with the 2009 Addenda through the 2013 Edition of Subsection IWL.

The existing condition in § 50.55a(b)(2)(viii)(E) of the current rule requires that, for Class CC applications, the licensee shall evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas, and provide the evaluation information required by § 50.55a(b)(2)(viii)(E)(*1*), (*2*), and (*3*) in the IWA–6000 ISI Summary Report.

In the 2009 Addenda Subsection IWL, the ASME revised existing provisions IWL–1220 and IWL–2510 and added the new provision IWL–2512 intended to incorporate the condition in § 50.55a(b)(2)(viii)(E) into Subsection IWL. The IWL–2510, ''Surface Examination,'' was restructured into new paragraphs in IWL–2511, ''Accessible Areas,'' with almost the same provisions as the previous IWL–2510 and IWL–2512, ''Inaccessible Areas,'' to be specific to examinations required for accessible areas, and differentiate between those and the new requirements for inaccessible areas. The inaccessible areas addressed by the new IWL–2512 are: (1) Concrete surfaces obstructed by adjacent structures, parts or appurtenances (*e.g.,* generally above-grade inaccessible areas); and (2)

concrete surfaces made inaccessible by foundation material or backfill (*e.g.,* below-grade inaccessible areas).

The revised IWL–2511(a) has a new requirement that states that, ''If the Responsible Engineer determines that observed suspect conditions indicate the presence of, or could result in, degradation of inaccessible areas, the requirements of IWL–2512(a) shall be met.'' The new IWL–2512(a) requires the ''Responsible Engineer'' to evaluate suspect conditions and specify the type and extent of examinations, if any, required to be performed on inaccessible surface areas described in the previous paragraph. The acceptability of the evaluated inaccessible area would be determined either based on the evaluation or based on the additional examinations, if determined to be required. The new IWL–2512(b) further requires a periodic technical evaluation of below-grade inaccessible areas of concrete to be performed to determine and manage its susceptibility to degradation regardless of whether suspect conditions exist in accessible areas that would warrant an evaluation of inaccessible areas based on the condition in § 50.55a(b)(2)(viii)(E). Therefore, the revised IWL–2511(a) and new IWL–2512 code provisions address the evaluation and acceptability of inaccessible areas consistent with the existing condition in § 50.55a(b)(2)(viii)(E), with one exception. The exception is that the new IWL–2512 provision does not explicitly require the information specified in § 50.55a(b)(2)(viii)(E)(*1*), (*2*), and (*3*) of the existing condition to be provided in the IWA–6000 ISI Summary Report.

For these reasons, the NRC is identifying the information that must be provided in the ISI Summary Report required by IWA–6000 when inaccessible concrete surfaces are evaluated under the new code provision IWL–2512. This new condition replaces the existing condition in § 50.55a(b)(2)(viii)(E) when using the 2007 Edition with the 2009 Addenda through the 2013 Edition of Subsection IWL. The information required by the new condition must be provided when inaccessible concrete areas are evaluated per IWL–2512(a) for degradation based on suspect conditions found in accessible areas, as well as when periodic technical evaluations of inaccessible below-grade concrete areas required by IWL–2512(b) are performed.

10 CFR 50.55a(b)(2)(viii)(I) Concrete Containment Examinations: Ninth Provision

The NRC is adding § 50.55a(b)(2)(viii)(I) to place a condition on the periodic technical evaluation requirements in the new IWL–2512(b), for consistency with NUREG–1801, Revision 2, ''Generic Aging Lessons Learned (GALL) Report,'' with regard to aging management of below-grade containment concrete surfaces. The new IWL–2512(b) provision is applicable to inaccessible below-grade concrete surfaces exposed to foundation soil, backfill, or groundwater. This condition would apply only during the period of extended operation of a renewed license under 10 CFR part 54, when using IWL–2512(b) of the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWL.

In the 2009 Addenda of Subsection IWL, the ASME added new Code provisions, IWL–2512(b) and (c) as well as a new line item L1.13 in Table IWL–2500–1, intended to specifically address aging management concerns with potentially unidentified degradation of inaccessible below-grade containment concrete areas and to be responsive to actions outlined in the GALL Report related to aging management of inaccessible below-grade concrete surfaces. It is noted that these new Code provisions are an enhancement to the requirement of the existing condition in § 50.55a(b)(2)(viii)(E) to specifically address aging management of inaccessible below-grade containment concrete areas and is generally acceptable to the NRC.

The new IWL–2512(b) provides requirements for systematically performing a periodic technical evaluation of concrete surfaces exposed to foundation soil, backfill, or groundwater to determine susceptibility of the concrete to deterioration that could affect its ability to perform its intended design function under conditions anticipated through the service life of the structure. It requires the technical evaluation to be performed and documented at periodic intervals not to exceed 10 years regardless of whether conditions exist in accessible areas that would warrant an evaluation of inaccessible areas by the existing condition in § 50.55a(b)(2)(viii)(E), which the NRC finds reasonable for the initial 40-year operating license period. The new IWL–2512(b) further provides the specific elements, including aging mechanisms considered, that the technical evaluation should include, as well as the definition of an aggressive below-grade environment. The new IWL–2512(c) requires that the evaluation results of IWL–2512(b) be used to define and document the condition monitoring program, if determined to be required, including required examinations and frequencies, to be implemented for the management of degradation and aging effects of the below-grade concrete surface areas. If it is determined that additional examinations are required, these examinations of inaccessible below-grade areas will be implemented in accordance with new line item L1.13 in Table IWL–2500–1 under Examination Category L–A, Concrete, with acceptance criteria based on IWL–3210. It should be noted that a technical evaluation approach, such as in IWL–2512(b), could be used, and is generally used, to determine acceptability of a below-grade inaccessible area to satisfy the condition in § 50.55a(b)(2)(viii)(E).

The technical evaluation requirements in IWL–2512(b) assist in determining the susceptibility to degradation and manage aging effects of inaccessible below-grade concrete surfaces, before the loss of intended function. The requirements are based on, and are generally consistent with, the guidance in the GALL Report, with the following two exceptions. The first exception is that IWL–2512(b) requires the technical evaluation to determine the susceptibility of the concrete to degradation and the ability to perform the intended design function through its service life at periodic intervals not to exceed 10 years. The aging management programs (AMPs) for safety-related structures (*e.g.,* Structures Monitoring) in the GALL Report require such evaluation to be performed at intervals not to exceed 5 years, which is also consistent with applicant commitments during review of license renewal applications. The second exception is that IWL–2512(b) requires that examination of representative samples of below-grade concrete be performed if excavated for any reason when an aggressive below-grade environment is present. However, the NRC notes that the AMPs (X1.S6 Structures Monitoring and X1.S7 Water Control Structures) in the GALL Report require the same examination even for a non-aggressive below-grade environment.

Based on these reasons, the NRC is adding § 50.55a(b)(2)(viii)(I) to place a condition on the periodic technical evaluation requirements in IWL–2512(b) for consistency with the GALL Report, when addressing the two exceptions previously described with respect to aging management of inaccessible below-grade concrete components of the

containment. The new condition requires that, during the period of extended operation of a renewed license, the technical evaluation under IWL–2512(b) of inaccessible below-grade concrete surfaces exposed to foundation soil, backfill, or groundwater be performed at periodic intervals not to exceed 5 years, as opposed to the 10-year interval in IWL–2512. In addition, the condition requires the examination of representative samples of the exposed portions of the below-grade concrete be performed when excavated for any reason as opposed to IWL–2512, which limits the examination to excavations in aggressive, below-grade environments. Since the GALL Report is the technical basis document for license renewal, this new condition applies only during the period of extended operation of a renewed license under 10 CFR part 54, when using IWL–2512(b) of the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWL, Section XI.

10 CFR 50.55a(b)(2)(ix) Section XI Condition: Metal Containment Examinations

The NRC is extending the applicability of the existing conditions in § 50.55a(b)(2)(ix)(A)(*2*) and (b)(2)(ix)(B) and (J), governing examinations of metal containments and the liners of concrete containments under Subsection IWE, to the ASME BPV Code editions and addenda which are the subject of this rulemaking (*i.e.,* the 2007 Edition with 2009 Addenda through the 2013 Edition). The last sentence of § 50.55a(b)(2)(ix) prior to this final rule stated that the referenced conditions were applicable only to addenda, but not to editions, approved by the NRC after the 2007 Edition of the ASME BPV Code. To rectify this, the NRC is revising the last sentence of § 50.55a(b)(2)(ix) to refer to the latest ''edition and'' addenda after the 2007 Edition which are incorporated by reference into § 50.55a.

The NRC reviewed the Code changes in Subsection IWE of the 2009 Addenda through the 2013 Edition of ASME BPV Code, Section XI, and noted that all of the changes were editorial or administrative with the intent to improve the clarity of the existing requirements or correct errors by errata. There were no changes to Subsection IWE in the Code editions and addenda that are the subject of this rulemaking that the NRC believes would require new regulatory conditions to ensure safety, nor do the changes to Subsection IWE address the NRC's reasons for adopting the conditions on the use of Subsection IWE. Accordingly, the NRC is extending the applicability of the existing conditions (by adding the words ''edition and'' to § 50.55a(b)(2)(ix) as discussed) without any change to the provisions of the conditions.

10 CFR 50.55a(b)(2)(x) Section XI Condition: Quality Assurance

The NRC is approving for use the version of NQA–1 referenced in the 2009 Addenda, 2010 Edition, 2011 Addenda, and the 2013 Edition of the ASME BPV Code, Section XI, Table IWA 1600–1, ''Referenced Standards and Specifications,'' which this rule is also incorporating by reference. This allows, but does not require, licensees to use the 1994 Edition or the 2008 Edition and the 2009–1a Addenda of NQA–1 when using the 2009 Addenda and later editions and addenda of Section XI.

In the 2013 Edition of ASME BPV Code, Section XI, Table IWA 1600–1 was updated to allow licensees to use the 1994 Edition or the 2008 Edition with the 2009–1a Addenda of NQA–1 when using the 2013 Edition of Section XI. In the 2010 Edition of ASME BPV Code, Section XI, IWA–1400, ''Owner's Responsibilities,'' Subparagraph (n)(2) was updated to reference the NQA–1 Part I, Basic Requirements and Supplementary Requirements for Nuclear Facilities. In the 2009 Addenda of the 2007 Edition of ASME BPV Code, Section XI, Table IWA–1600–1, ''Referenced Standards and Specifications,'' was updated to allow licensees to use the 1994 Edition of NQA–1. The NRC reviewed the 2008 Edition and the 2009–1a Addenda of NQA–1 and compared it to previously approved versions of NQA–1 and found that there were no significant differences. Therefore, the NRC has concluded that these editions and addenda of NQA–1 are acceptable for use.

The NRC is amending § 50.55a(b)(2)(x) to clarify that a licensee's commitments addressing those areas where NQA–1 either does not address a requirements in appendix B to 10 CFR part 50 or is less stringent than the comparable appendix B requirement govern the licensee's Section XI activities. The clarification is consistent with § 50.55a(b)(1)(iv) and (b)(3)(i). The ASME's method for establishing and implementing a QA program for the design and construction of nuclear power plants and fuel reprocessing plants is described in NQA–1. However, NQA–1 does not address some of the requirements of appendix B to 10 CFR part 50. In some cases, the provisions of NQA–1 are less stringent than the comparable appendix B requirements. Therefore, in order to meet the requirements of appendix B, a licensee's QA program description must contain commitments addressing those provisions of appendix B which are not covered by NQA–1, as well as provisions that supplement or replace the NQA–1 provisions where the appendix B requirement is more stringent.

Finally, the NRC is removing the reference in § 50.55a(b)(2)(x) to versions of NQA–1 older than the 1994 Edition because the NRC did not receive any adverse comments from any applicant or licensee regarding concerns about removing versions of NQA–1 older than the 1994 Edition from the regulation. The NRC received only one comment regarding NQA–1. The comment expressed support for incorporation by reference of NQA–1 and did not respond to the NRC's request for comment regarding the removal of references to older versions of NQA–1.

10 CFR 50.55a(b)(2)(xii) Section XI Condition: Underwater Welding

The NRC is revising § 50.55a(b)(2)(xii) to allow underwater welding on irradiated materials in accordance with IWA–4660, ''Underwater Welding,'' of Section XI, 1997 Addenda through the latest edition and addenda incorporated by reference in § 50.55a(a)(1)(ii). The conditions for which underwater welding would be permitted without prior NRC approval are based on technical factors, such as neutron fluence and, for certain material classes, helium concentration.

The existing condition in § 50.55a(b)(2)(xii) does not allow underwater welding on irradiated materials by prohibiting the use of IWA–4660, ''Underwater Welding,'' of Section XI, 1997 Addenda through the latest edition and addenda incorporated by reference in § 50.55a(a)(1)(ii) on materials that are irradiated; however, there are two problems with the restriction in § 50.55a(b)(2)(xii). First, the neutron fluence threshold above which a material is considered to be irradiated is not defined in § 50.55a(b)(2)(xii). Second, studies such as those documented in Boiling Water Reactor Vessel and Internals Project (BWRVIP) Report 1003020 (BWRVIP–97) have shown that reactor internals can tolerate some neutron irradiation without suffering damage to weldability, as long as the helium concentration in the material does not exceed a certain threshold. The NRC completed its Safety Evaluation of BWRVIP–97 in May 2008 and concluded that implementation of the guidelines in the BWRVIP–97 report, with some modifications as documented in the

NRC Safety Evaluation dated June 30, 2008, will provide an acceptable technical basis for the design of weld repairs based on the helium content of irradiated reactor vessel internals. The current version of § 50.55a(b)(2)(xii) does not define a threshold of helium concentration below which the material is considered to be weldable.

The most recent editions of the ASME BPV Code state in Article IWA–4660 that underwater welding may not be performed on irradiated materials other than P-No. 8 materials containing less than 0.1 atomic parts per million (appm) measured or calculated helium content generated through irradiation. Some editions and addenda of the ASME BPV Code prior to 2010 state in Article IWA–4660 that underwater welding may only be performed in applications not predicted to exceed a thermal neutron fluence of 1×10^{17} n/cm^2. Other editions and addenda of the ASME BPV Code prior to 2010 do not restrict the underwater welding of irradiated materials. Therefore, there is inconsistent treatment among the various editions and addenda of the ASME BPV Code on the underwater welding of irradiated materials.

Current ASME BPV Code and Code Case requirements for welding on irradiated materials, other than the underwater welding requirements specified in IWA–4660, are inconsistent. Thresholds for weldability may be stated in terms of fast neutron fluence, thermal neutron fluence, or helium concentration. In some cases, thresholds are not defined and the Code or Code Case simply states that consideration must be given to irradiation effects when welding. The NRC believes that thresholds for welding on irradiated materials should be based on the current understanding of irradiation damage, as supported by technical studies (such as BWRVIP–97) which have been evaluated by the NRC. In addition, the NRC believes that these thresholds should be consistently applied for all Code and Code Case applications.

During the public comment period for this rulemaking, a representative of ASME recommended that § 50.55a(b)(2)(xii) be revised such that it applies only to those editions and addenda earlier than the 2010 Edition. The effect of such a revision would be to allow welding on P-No. 8 materials containing less than 0.1 appm measured or calculated helium content generated through irradiation. However, this proposed revision would not be consistent with other ASME BPV Code or Code Case requirements for welding on irradiated materials, and this proposed revision does not address standards for welding on material classes other than P-No. 8. Instead the NRC is adopting conditions that would apply to all materials and which can be consistently applied for all Code and Code Case applications. The first condition, § 50.55a(b)(2)(xii)(A), is based on fast neutron fluence and applies to ferritic materials. The second condition, § 50.55a(b)(2)(xii)(B), is based on helium content and/or thermal fluence and applies to austenitic materials. For P-No. 8 austenitic materials, the evaluation of BWRVIP–97 supports a weldability threshold based on helium content and thermal fluence. For austenitic materials other than P-No. 8, there are insufficient data to support a weldability threshold based on helium content, and, therefore, the NRC is adopting a weldability threshold based on thermal fluence only.

The conditions for which underwater welding are permitted, as stated in the revision of § 50.55a(b)(2)(xii), were determined, in part, based on technical discussions in a Category 2 public meeting with industry representatives held on January 19, 2016. The NRC later presented the new conditions at a public meeting held on March 2, 2016. There were no comments on this change from the attendees at the March 2, 2016, public meeting. Summaries of the January 19 and March 2, 2016, public meetings are available in ADAMS under Accession Nos. ML16050A383 and ML16069A408, respectively.

10 CFR 50.55a(b)(2)(xviii)(D) NDE Personnel Certification: Fourth Provision

The NRC is adding § 50.55a(b)(2)(xviii)(D) to prohibit applicants and licensees from using the ultrasonic examination nondestructive examination (NDE) personnel certification requirements in Section XI, Appendix VII and Subarticle VIII–2200 of the 2011 Addenda and 2013 Edition of the ASME BPV Code. Paragraph (b)(2)(xviii) currently includes conditions on the certification of NDE personnel. In addition, the new paragraph will require applicants and licensees to use the 2010 Edition, Table VII–4110–1 training hour requirements for Levels I, II, and III ultrasonic examination personnel, and the 2010 Edition, Subarticle VIII–2200 of Appendix VIII prerequisites for personnel requirements. In the 2011 Addenda and 2013 Edition, the ASME BPV Code added an accelerated Appendix VII training process for certification of ultrasonic examination personnel based on training and prior experience, and separated the Appendix VII training requirements from the Appendix VIII qualification requirements. These new ASME BPV Code provisions will provide personnel in training with less experience and exposure to representative flaws in representative materials and configurations common to operating nuclear power plants, and they would permit personnel with prior non-nuclear ultrasonic examination experience to qualify for examinations in nuclear power plants without exposure to the variety of defects, examination conditions, components, and regulations common to operating nuclear power plants.

The impact of reduced training and nuclear power plant familiarization is unknown. The ASME BPV Code supplants training hours and field experience without a technical basis, minimum defined training criteria, process details, or standardization. For these reasons, the NRC is prohibiting the use of Appendix VII and Subarticle VIII–2200 of the 2011 Addenda and 2013 Edition. The NRC is requiring applicants and licensees using the 2011 Addenda and 2013 Edition to use the prerequisites for ultrasonic examination personnel certifications in Table VII–4110–1 and Subarticle VIII–2200, Appendix VIII in the 2010 Edition.

10 CFR 50.55a(b)(2)(xxi)(A) Table IWB–2500–1 Examination Requirements: First Provision

The NRC is revising § 50.55a(b)(2)(xxi)(A) to modify the standard for visual magnification resolution sensitivity and contrast for visual examinations performed on Examination Category B–D components instead of ultrasonic examinations, making the rule conform with ASME BPV Code, Section XI requirements for VT–1 examinations. The character recognition rules are used in ASME BPV Code, Section XI, Table IWA–2211–1 for VT–1 tests, and are the standard tests used for resolution and contrast checks of the VT–1 equipment. This revision essentially removed a requirement that was an addition to ASME BPV Code that required 1-mil wires to be used in licensees' Sensitivity, Resolution, and Contrast Standard targets. In 2004, the NRC published NUREG/CR–6860, ''An Assessment of Visual Testing,'' showing that a linear target, such as a wire, is not an effective method for testing the resolution of a video camera system. In addition, Boiling Water Reactor Vessel and Internals Project Report 105696 (BWRVIP–03) was changed to eliminate a ½ mil wire from the Sensitivity, Resolution, and Contrast Standards due to similar concerns.

Simple line detection can be a poor performance standard, allowing detection of a highly blurred image. This does not emulate sharpness quality recognition for evaluation of weld discontinuities. The 750 μm (30 mil) and the even smaller 25 μm (1 mil) widths should not be used as performance standards because they do not determine image sharpness. This technique only measures the ''visible minimum'' for long linear indications, and does not measure a system's resolution or recognition limits. If the wire, or printed line, has a strong enough contrast against the background, then a linear feature well below the resolution of a system can be detected.

10 CFR 50.55a(b)(2)(xxiii) Section XI Condition: Evaluation of Thermally Cut Surfaces

The NRC is revising § 50.55a(b)(2)(xxiii) to clarify that this condition, prohibiting the ASME BPV Code provisions allowing elimination of mechanical processing of thermally cut surfaces under certain circumstances, only applies to the 2001 Edition through the 2009 Addenda.

10 CFR 50.55a(b)(2)(xxx) Section XI Condition: Steam Generator Preservice Examinations

In the proposed rule, the NRC proposed adding § 50.55a(b)(2)(xxx), with a condition regarding steam generator preservice examinations. The NRC received requests for clarification of the proposed condition, including elaboration on the kind of preservice examination that should be performed. The NRC agrees with the need for this clarification; however, during the development of the final rule, the NRC determined that additional time was needed to evaluate this proposed condition. Therefore, to ensure that this rulemaking is concluded as timely as possible, the NRC is not including this condition in this final rule and will address the need for a condition in a future rulemaking. The NRC has concluded that omitting this condition does not present a health or safety concern because licensees are currently performing appropriate steam generator preservice inspections under existing programs.

10 CFR 50.55a(b)(2)(xxxi) Section XI Condition: Mechanical Clamping Devices

The NRC is adding § 50.55a(b)(2)(xxxi) to require the use of Nonmandatory Appendix W when using a mechanical clamping device on an ASME BPV Code Class piping system. This condition, in part, clearly prohibits the use of mechanical clamping devices on small item Class 1 piping and portions of piping systems that form the containment boundary. This condition also maintains the previously required design and testing requirements for the implementation of mechanical clamping devices on ASME BPV Code Class piping systems.

In the 2010 Edition of the ASME BPV Code, a change was made to include mechanical clamping devices under the small items exclusion rules of IWA–4131. Currently in the 2007 Edition/2008 Addenda of Section XI under IWA–4133, ''Mechanical Clamping Devices Used as Piping Pressure Boundary,'' mechanical clamping devices may be used only if they meet the requirements of Mandatory Appendix IX of Section XI of the ASME BPV Code. Article IX–1000 (c) of Appendix IX prohibits the use of mechanical clamping devices on (1) Class 1 piping and (2) portions of a piping system that form the containment boundary.

In the 2010 Edition, IWA–4133 was modified to allow use of IWA–4131.1(c) for the installation of mechanical clamping devices. This change allowed the use of small items exclusion rules in the installation of mechanical clamping devices. Subparagraph IWA–4131.1(c) was added such that mechanical clamping devices installed on items classified as ''small items'' under IWA–4131, including Class 1 piping and portions of a piping system that form the containment boundary, would be allowed without a repair/replacement plan, pressure testing, services of an Authorized Inspection Agency, and completion of the NIS–2 form. The NRC, in accordance with the previously approved IWA–4133 of the 2007 Edition/2008 Addenda of the ASME BPV Code, does not believe that the ASME has provided a sufficient technical basis to support the use of mechanical clamping devices on Class 1 piping or portions of a piping system that form the containment boundary as a permanent repair. Furthermore, the NRC finds that the ASME has not provided any basis for the small item exemption allowing the installation of mechanical clamps on these components. In the 2011 Addenda of the ASME BPV Code, IWA–4131.1(c) was relocated to IWA–4131.1(d). To add clarity to the condition, the NRC has included statements such that the implementation of these paragraphs is now prohibited.

In the 2013 Edition, Mandatory Appendix IX of Section XI of the ASME BPV Code was changed to Nonmandatory Appendix W of Section XI of the ASME BPV Code. The NRC found insufficient basis to make this change, removing the mandatory requirements for the use of mechanical clamping devices on ASME BPV Code Class piping systems. By taking this action, the ASME BPV Code now allows mechanical clamping devices to be installed in various methods through interpretations of the ASME BPV Code that do not maintain the requirements for design and testing of the formerly mandatory Appendix IX. Therefore, to clarify the requirement for the implementation of mechanical clamps in ASME BPV Code Class systems, the NRC requires the use of Appendix W of Section XI when using mechanical clamping devices, and prohibits the use of mechanical clamping devices on small item Class 1 piping and portions of a piping system that form the containment boundary, as would otherwise be permitted under IWA–4131.1(c) in the 2010 Edition and IWA–4131.1(d) in the 2011 Addenda through 2013 Edition.

10 CFR 50.55a(b)(2)(xxxii) Section XI Condition: Summary Report Submittal

The NRC is adding § 50.55a(b)(2)(xxxii) to require licensees using the 2010 Edition and later editions and addenda of Section XI to continue to submit Summary Reports as required in IWA–6240 of the 2009 Addenda.

Prior to the 2010 Edition, Section XI required the preservice summary report to be submitted prior to the date of placement of the unit into commercial service, and the inservice summary report to be submitted within 90 calendar days of the completion of each refueling outage. In the 2010 Edition, IWA–6240 was revised to state, ''Summary reports shall be submitted to the enforcement and regulatory authorities having jurisdiction at the plant site, if required by these authorities.'' This change in the 2010 Edition could lead to confusion as to whether or not the summary reports need to be submitted to the NRC, as well as the time for submitting the reports, if they were required. The NRC concludes that summary reports must continue to be submitted to the NRC in a timely manner because they provide valuable information regarding examinations performed, conditions noted, corrective actions taken, and the implementation status of preservice inspection and ISI programs. Therefore, the NRC is adding § 50.55a(b)(2)(xxxii) to ensure that preservice and inservice summary reports will continue to be submitted within the timeframes currently

established in Section XI editions and addenda prior to the 2010 Edition.

10 CFR 50.55a(b)(2)(xxxiii) Section XI Condition: Risk-Informed Allowable Pressure

The NRC is adding § 50.55a(b)(2)(xxxiii) to prohibit the use of Appendix G, Paragraph G–2216, in the 2011 Addenda and later editions and addenda of the ASME BPV Code, Section XI. The 2011 Addenda of the ASME BPV Code included, for the first time, a risk-informed methodology to compute allowable pressure as a function of inlet temperature for reactor heat-up and cool-down at rates not to exceed 100 degrees F/hr (56 degrees C/hr). This methodology was developed based upon probabilistic fracture mechanics (PFM) evaluations that investigated the likelihood of reactor pressure vessel (RPV) failure based on specific heat-up and cool-down scenarios.

During the ASME's consideration of this change, the NRC staff noted that additional requirements would need to be placed on the use of this alternative. For example, the NRC staff indicated that it would be important for a licensee who wishes to utilize such a risk-informed methodology for determining plant-specific pressure-temperature limits to ensure that the material condition of its facility is consistent with assumptions made in the PFM evaluations that supported the development of the methodology. One aspect of this would be evaluating plant-specific ISI data to determine whether the facility's RPV flaw distribution was consistent with the flaw distribution assumed in the supporting PFM evaluations. This consideration is consistent with a similar requirement established by the NRC in § 50.61a, ''Alternative Fracture Toughness Requirements for Protection against Pressurized Thermal Shock Events.'' The PFM methodology that supports § 50.61a is very similar to that which was used to support ASME BPV Code, Section XI, Appendix G, Paragraph G–2216. These concerns with the Paragraph G–2216 methodology for computing allowable pressure as a function of inlet temperature for reactor heat-up and cooldown were not addressed by the ASME. Accordingly, the NRC is prohibiting the use of Paragraph G–2216 in Appendix G of the 2010 Edition. The continued use of the deterministic methodology of Section XI, Appendix G to generate Pressure-Temperature (P–T) limits remains acceptable.

10 CFR 50.55a(b)(2)(xxxiv) Section XI Condition: Nonmandatory Appendix U

The NRC is adding § 50.55a(b)(2)(xxxiv) to require that two conditions, (A) and (B), be satisfied when using Nonmandatory Appendix U of the 2013 Edition of the ASME BPV Code, Section XI. In the proposed rule, the NRC had proposed to exclude Nonmandatory Appendix U from the incorporation by reference and therefore not approve it for use. After considering public comments, the NRC has incorporated by reference Appendix U in this final rule because it integrates ASME BPV Code Cases N–513–3, ''Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1,'' and N–705, ''Evaluation Criteria for Temporary Acceptance of Degradation in Moderate Energy Class 2 or 3 Vessels and Tanks Section XI, Division 1,'' into Section XI. The NRC has approved the use of ASME BPV Code Cases N–513–3 and N–705 in RG 1.147, which allows licensees to use these code cases without prior permission from the NRC.

The first condition on the use of Appendix U is set forth in § 50.55a(b)(2)(xxxiv)(A) of this final rule and requires that an ASME BPV Code repair or replacement activity temporarily deferred under the provisions of Nonmandatory Appendix U to the 2013 Edition of the ASME BPV Code, Section XI, must be performed during the next scheduled outage. This condition is consistent with the NRC's condition on the use of ASME BPV Code Case N–513–3 in RG 1.147, Revision 17. Appendix U defines that the evaluation period is the operational time for which the temporary acceptance criteria are satisfied but not exceeding 26 months from the initial discovery of the condition. Original versions of ASME BPV Code Case N–513 stated, in part, that certain flaws may be acceptable without performing a repair/replacement activity for a limited time, not to exceed the time to the next scheduled outage. The NRC staff found that the acceptance of ASME BPV Code Case N–513 was based on allowing continued plant operation with a monitored and evaluated low safety significant degraded condition for a limited time until plant shutdown. By allowing use of this Appendix, this option is allowed rather than requiring an unnecessary plant shutdown to repair the degradation. However, the NRC believes once the plant is shut down, the degraded piping must be repaired.

The second condition on the use of Appendix U is set forth in § 50.55a(b)(2)(xxxiv)(B) of this final rule. This paragraph requires the use of the mandatory appendix in ASME BPV Code Case N–513–3 in lieu of the appendix referenced in paragraph U–S1–4.2.1(c) of Appendix U (which was inadvertently omitted from Appendix U). The NRC is incorporating by reference the mandatory appendix in ASME BPV Code Case N–513–3 in § 50.55a(a)(1)(iii)(A) because it is referenced in § 50.55a(b)(2)(xxxiv)(B).

A proposed condition on Disposition of Flaws in Class 3 Components, which was located in § 50.55a(b)(2)(xxxiv) of the proposed rule, is not included in this final rule based on public comments that the error has been corrected by ASME in published erratum.

10 CFR 50.55a(b)(2)(xxxv) Section XI Condition: Use of RT_{T0} in the K_{Ia} and K_{Ic} Equations

The NRC is adding § 50.55a(b)(2)(xxxv) to specify that when licensees use the 2013 Edition of the ASME BPV Code, Section XI, Appendix A, Paragraph A–4200, if T_0 is available, then RT_{T0} may be used in place of RT_{NDT} for applications using the K_{Ic} equation and the associated K_{Ic} curve, but not for applications using the K_{Ia} equation and the associated K_{Ia} curve.

Nonmandatory Appendix A provides a procedure based on linear elastic fracture mechanics (LEFM) for determining the acceptability of flaws that have been detected during inservice inspections that exceed the allowable flaw indication standards of IWB–3500. Sub-article A–4200 provides a procedure for determining fracture toughness of the material used in the LEFM analysis. The NRC staff's concern is related to the proposed insertion regarding an alternative based on the use of the Master Curve methodology to determine the nil-ductility transition reference temperature RT_{NDT}, which is an important parameter in determining the fracture toughness of the material. Specifically, the insertion proposed to use the Master Curve reference temperature RT_{T0}, which is defined as $RT_{T0} = T_0 + 35$ °F, where T_0 is a material-specific temperature value determined in accordance with ASTM E1921, ''Standard Test Method for Determination of Reference Temperature, T_0, for Ferritic Steels in the Transition Range,'' to index (shift) the fracture toughness K_{Ic} curve, based on the lower bound of static initiation critical stress intensity factor, as well as the K_{Ia} curve, based on the lower bound

of crack arrest critical stress intensity factor.

While use of RT_{T0} to index the K_{Ic} curve is acceptable, using RT_{T0} to index the K_{Ia} curve is questionable. This concern is based on the data analysis in ''A Physics-Based Model for the Crack Arrest Toughness of Ferritic Steels,'' written by NRC staff member Mark Kirk and published in ''Fatigue and Fracture Mechanics, 33rd Volume, ASTM STP 1417'' which indicated that the crack arrest data does not support using RT_{T0} as RT_{NDT} to index the K_{Ia} curve. This is also confirmed by industry data disclosed in a presentation, ''Final Results from the CARINA Project on Crack Initiation and Arrest of Irradiated German RPV Steels for Neutron Fluences in the Upper Bound,'' by AREVA at the 26th Symposium on Effects of Radiation on Nuclear Materials (June 12–13, 2013, Indianapolis, Indiana, USA). The NRC staff recognized that the proposed insertion is consistent with ASME BPV Code Case N–629, ''Use of Fracture Toughness Test Data to Establish Reference Temperature for Pressure Retaining Materials,'' which was accepted by the NRC without conditions. In addition to the current NRC effort, the appropriate ASME BPV Code committee is in the process of correcting this issue in a future revision of Appendix A of Section XI.

With this condition, users of Appendix A can avoid using an erroneous fracture toughness K_{Ia} value in their LEFM analysis for determining the acceptability of a detected flaw in applicable components. Therefore, the NRC is adding a condition which permits the use of RT_{T0} in place of RT_{NDT} in applications using the K_{Ic} equation and the associated K_{Ic} curve, but does not permit the use of RT_{T0} in place of RT_{NDT} in applications using the K_{Ia} equation and the associated K_{Ia} curve.

10 CFR 50.55a(b)(2)(xxxvi) Section XI Condition: Fracture Toughness of Irradiated Materials

The NRC is adding § 50.55a(b)(2)(xxxvi) to require licensees using ASME BPV Code, Section XI, 2013 Edition, Appendix A, Paragraph A–4400, to obtain NRC approval under § 50.55a(z) before using irradiated T_0 and the associated RT_{T0} in establishing fracture toughness of irradiated materials.

Sub-article A–4400 provides guidance for considering irradiation effects on materials. The NRC staff's concern is related to use of RT_{T0} based on measured T_0 of the irradiated materials. Specifically, the NRC staff has concerns over this sentence in the proposed insertion: ''Measurement of RT_{T0} of unirradiated or irradiated materials as defined in A–4200(b) is permitted, including use of the procedures given in ASTM E1921 to obtain direct measurement of irradiated T_0.''

Permission of measurement of RT_{T0} of irradiated materials, without providing guidelines regarding how to use the measured parameter in determining the fracture toughness of the irradiated materials, may mislead the users of Appendix A into adopting methodology that has not been accepted by the NRC. With this condition, users of Appendix A can avoid inappropriately using a fracture toughness K_{Ic} value based on the irradiated T_0 and the associated RT_{T0} in their LEFM analysis for determining the acceptability of a detected flaw in applicable components.

10 CFR 50.55a(g) Inservice and Preservice Inspection Requirements

The NRC is adding new paragraphs (g)(2)(i), (ii), and (iii) and revising current paragraphs (g) introductory text, (g)(2), (g)(3) introductory text, and (g)(3)(i), (ii), and (v) to distinguish the requirements for accessibility and preservice examination from those for inservice inspection in § 50.55a(g). In addition, consistent with other paragraphs of this section, headings are added to the subordinate paragraphs of (g) in order to enhance readability of the regulation. No substantive change to the requirements are intended by these revisions.

C. OM Code

10 CFR 50.55a(b)(3) Conditions on ASME OM Code

The NRC is revising § 50.55a(b)(3) to clarify that Subsections ISTA, ISTB, ISTC, ISTD, ISTE, and ISTF; Mandatory Appendices I, II, III, and V; and Nonmandatory Appendices A through H and J through M of the OM Code are each incorporated by reference into § 50.55a. The NRC is also clarifying that the OM Code Nonmandatory Appendices incorporated by reference into § 50.55a are approved for use, but are not mandated. The Nonmandatory Appendices may be used by applicants and licensees of nuclear power plants, subject to the conditions in § 50.55a(b)(3).

10 CFR 50.55a(b)(3)(i) OM Condition: Quality Assurance

The NRC is revising § 50.55a(b)(3)(i) to allow use of the 1994 Edition, 2008 Edition, and the 2009–1a Addenda of NQA–1, ''Quality Assurance Requirements for Nuclear Facility Applications.'' The NRC reviewed these editions and addenda, compared them to the previously approved versions of NQA–1, and found that there were no significant differences.

The NRC is removing the reference in § 50.55a(b)(3)(i) to versions of NQA–1 older than the 1994 Edition, inasmuch as these versions do not appear to be in use at any nuclear power plant. The NRC did not receive any adverse comments from any applicant or licensee regarding concerns about removing versions of NQA–1 older than the 1994 Edition from the regulation. The NRC received one comment regarding NQA–1, supporting incorporation by reference of NQA–1 but not responding to the NRC's request for comment regarding the removal of references to older versions of NQA–1. Accordingly, the NRC concludes that removal of NQA–1 versions older than the 1994 Edition will not have any adverse effect on licensees, and the final rule removes these older versions from § 50.55a(b)(3)(i).

10 CFR 50.55a(b)(3)(ii) OM Condition: Motor-Operated Valve (MOV) Testing

The NRC is revising § 50.55a(b)(3)(ii) to reflect the new Appendix III, ''Preservice and Inservice Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants,'' of the OM Code, 2009 Edition, 2011 Addenda, and 2012 Edition. Appendix III of the OM Code establishes provisions for periodic verification of the design-basis capability of MOVs within the scope of the IST program. Appendix III of the OM Code reflects the incorporation of OM Code Cases OMN–1, ''Alternative Rules for Preservice and Inservice Testing of Active Electric Motor-Operated Valve Assemblies in Light-Water Reactor Power Plants,'' and OMN–11, ''Risk-Informed Testing for Motor-Operated Valves.'' The NRC is adding four new conditions on the use of Mandatory Appendix III in new § 50.55a(b)(3)(ii)(A), (B), (C), and (D) to address periodic verification of MOV design-basis capability. These new conditions are discussed in the next four sections.

10 CFR 50.55a(b)(3)(ii)(A) MOV Diagnostic Test Interval (First Condition on Use of Mandatory Appendix III)

In the proposed rule, the NRC specified in § 50.55a(b)(3)(ii)(A) that licensees evaluate the adequacy of the diagnostic test interval for each MOV and adjust the interval as necessary, but not later than 5 years or three refueling outages (whichever is longer) from initial implementation of OM Code,

Appendix III. Paragraph III–3310(b) in Appendix III includes a provision stating that if insufficient data exist to determine the IST interval, then MOV inservice testing shall be conducted every two refueling outages or 3 years (whichever is longer) until sufficient data exist, from an applicable MOV or MOV group, to justify a longer IST interval. As discussed in a final rule published September 22, 1999 (64 FR 51386), with respect to the use of OM Code Case OMN–1, the NRC considers it appropriate to include a modification requiring licensees to evaluate the information obtained for each MOV, during the first 5 years or three refueling outages (whichever is longer) of the use of Appendix III to validate assumptions made in justifying a longer test interval.

In response to public comments, the NRC revised § 50.55a(b)(3)(ii)(A) to clarify its intent for licensees to evaluate the test interval within 5 years or three refueling outages (whichever is longer) following implementation of Appendix III to the OM Code, rather than implying that every MOV must be tested within 5 years or three refueling outages of the initial implementation of Appendix III. For example, the condition allows grouping of MOVs to share test information in the evaluation of the MOV periodic verification intervals within 5 years or three refueling outages (whichever is longer) of the implementation of OM Code, Appendix III. Therefore, § 50.55a(b)(3)(ii)(A) of this final rule states that licensees shall evaluate the adequacy of the diagnostic test intervals established for MOVs within the scope of OM Code, Mandatory Appendix III, not later than 5 years or three refueling outages (whichever is longer) from initial implementation of OM Code, Appendix III.

10 CFR 50.55a(b)(3)(ii)(B) MOV Testing Impact on Risk (Second Condition on Use of Mandatory Appendix III)

The NRC is adding § 50.55a(b)(3)(ii)(B) to require that when using Mandatory Appendix III, licensees ensure that the potential increase in core damage frequency (CDF) and large early release frequency (LERF) associated with the extension is acceptably small when extending exercise test intervals for high risk MOVs beyond a quarterly frequency. As discussed in a final rule published September 22, 1999 (64 FR 51386), with respect to the use of OM Code Case OMN–1, the NRC considers it important for licensees to have sufficient information from the specific MOV, or similar MOVs, to demonstrate that exercising on a refueling outage frequency does not significantly affect component performance. The information may be obtained by grouping similar MOVs and establishing periodic exercising intervals of MOVs in the group over the refueling interval.

Section 50.55a(b)(3)(ii)(B) requires that the increase in the overall plant CDF and LERF resulting from the extension be acceptably small. As presented in RG 1.174, ''An Approach for Using Probabilistic Risk Assessment [PRA] in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,'' the NRC considers acceptably small changes to be relative and to depend on the current plant CDF and LERF. For plants with total baseline CDF of 10^{-4} per year or less, acceptably small means CDF increases of up to 10^{-5} per year; and for plants with total baseline CDF greater than 10^{-4} per year, acceptably small means CDF increases of up to 10^{-6} per year. For plants with total baseline LERF of 10^{-5} per year or less, acceptably small LERF increases are considered to be up to 10^{-6} per year; and for plants with total baseline LERF greater than 10^{-5} per year, acceptably small LERF increases are considered to be up to 10^{-7} per year.

10 CFR 50.55a(b)(3)(ii)(C) MOV Risk Categorization (Third Condition on Use of Mandatory Appendix III)

The NRC is adding § 50.55a(b)(3)(ii)(C) to require, when applying Mandatory Appendix III, that licensees categorize MOVs according to their safety significance using the methodology described in OM Code Case OMN–3, ''Requirements for Safety Significance Categorization of Components Using Risk Insights for Inservice Testing of LWR Power Plants,'' subject to the conditions discussed in RG 1.192, or using an MOV risk ranking methodology accepted by the NRC on a plant-specific or industry-wide basis in accordance with the conditions in the applicable safety evaluation. Paragraph III–3720 in Appendix III to the OM Code states that when applying risk insights, each MOV shall be evaluated and categorized using a documented risk ranking methodology. Further, Appendix III only addresses risk ranking methodologies that include two risk categories. In light of the potential extension of quarterly test intervals for high risk MOVs and the relaxation of IST activities for low risk MOVs based on risk insights, the NRC has determined that the rule should specify that plant-specific or industry-wide risk ranking methodologies must have been accepted by the NRC through RG 1.192 (which accepts OM Code Case OMN–3 with the specified conditions) or the issuance of safety evaluations. As noted in the response to public comments, the intent of this condition is to indicate that when applying Appendix III to the OM Code, licensees may use either a two-risk category approach (high or low) or a three-risk category approach (high, medium, and low), provided the risk ranking method has been accepted by the NRC.

10 CFR 50.55a(b)(3)(ii)(D) MOV Stroke Time (Fourth Condition on Use of Mandatory Appendix III)

The NRC is adding § 50.55a(b)(3)(ii)(D) to require that when a licensee applies Paragraph III–3600, ''MOV Exercising Requirements,'' of Appendix III to the OM Code, the licensee verify that the stroke time of the MOV satisfies the assumptions in the plant's safety analyses. Previous editions and addenda of the OM Code specified that the licensee must perform quarterly MOV stroke time measurements that could be used to verify that the MOV stroke time satisfies the assumptions in the safety analyses consistent with plant TS. The need for verification of the MOV stroke time during periodic exercising is consistent with the NRC's lessons learned from the implementation of OM Code Case OMN–1. However, Paragraph III–3600 of Appendix III of the versions of the OM Code that will be incorporated by reference in this rulemaking no longer require the verification of MOV stroke time during periodic exercising. For this reason, the NRC is adopting this new condition, which will effectively retain the need to verify that the MOV stroke time during periodic exercising satisfies the assumptions in the plant's safety analyses.

Based on the discussion during the public webinar on March 2, 2016, the NRC revised the condition to clarify that it applies to MOVs referenced in the plant TS. In particular, the NRC revised the condition to indicate that when a licensee applies Paragraph III–3600 of Appendix III to the OM Code, the licensee shall verify that the stroke time of MOVs specified in plant technical specifications satisfies the assumptions in the plant's safety analyses.

10 CFR 50.55a(b)(3)(iii) OM Condition: New Reactors

The NRC is adding § 50.55a(b)(3)(iii) to apply specific conditions for IST programs applicable to licensees of new nuclear power plants in addition to the provisions of the OM Code as incorporated by reference with conditions in § 50.55a. Licensees of ''new reactors'' are, as identified in the paragraph: (1) Holders of operating

licenses for nuclear power reactors that received construction permits under this part on or after the date 12 months after August 17, 2017, and (2) holders of combined licenses (COLs) issued under 10 CFR part 52, whose initial fuel loading occurs on or after the date 12 months after August 17, 2017. This implementation schedule for new reactors is consistent with the NRC regulations governing inservice testing in § 50.55a(f)(4)(i).

Commission Papers SECY–90–016, ''Evolutionary Light Water Reactor (LWR) Certification Issues and Their Relationship to Current Regulatory Requirements;'' SECY–93–087, ''Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs;'' SECY–94–084, ''Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems (RTNSS) in Passive Plant Designs;'' and SECY–95–132, ''Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems (RTNSS) in Passive Plant Designs (SECY–94–084),'' discuss IST programs for new reactors licensed under 10 CFR part 52.

In recognition of new reactor designs and lessons learned from nuclear power plant operating experience, the ASME is updating the OM Code to incorporate improved IST provisions for components used in nuclear power plants that were issued (or will be issued) construction permits, or COLs, on or following January 1, 2000 (defined in the OM Code as post-2000 plants). The first phase of the ASME effort incorporated IST provisions that specify full flow pump testing and other clarifications for post-2000 plants in the OM Code beginning with the 2011 Addenda. The second phase of the ASME effort incorporated preservice and inservice inspection and surveillance provisions for pyrotechnic-actuated (squib) valves in the 2012 Edition of the OM Code. The ASME is considering further modifications to the OM Code to address additional lessons learned from valve operating experience and new reactor issues. As described in the following paragraphs, § 50.55a(b)(3)(iii) will include four specific conditions which are discussed in the following paragraphs.

10 CFR 50.55a(b)(3)(iii)(A) Power-Operated Valves

The NRC is adding § 50.55a(b)(3)(iii)(A) to require that licensees within the scope of § 50.55a(b)(3)(iii) periodically verify the capability of power-operated valves (POVs) to perform their design-basis safety functions. While Appendix III to the OM Code addresses this requirement for MOVs with the conditions specified in § 50.55a, applicable applicants and licensees will need to develop programs to periodically verify the design-basis capability of other POVs. The NRC's Regulatory Issue Summary 2000–03, ''Resolution of Generic Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis Conditions,'' provides attributes for a successful long-term periodic verification program for POVs by incorporating lessons learned from MOV performance at operating nuclear power plants and research programs. Implementation of Appendix III to the OM Code as accepted in § 50.55a(b)(3)(ii) satisfies § 50.55a(b)(3)(iii)(A) for MOVs.

Section 50.55a(b)(3)(iii)(A) is consistent with the Commission policy for new reactors summarized in an NRC Staff Memorandum, ''Consolidation of SECY–94–084 and SECY–95–132,'' dated July 24, 1995, that (a) the design capability of safety-related POVs should be demonstrated by a qualification test prior to installation; (b) prior to initial startup, POV capability under design-basis differential pressure and flow should be verified by a pre-operational test; and (c) during the operational phase, POV capability under design-basis differential pressure and flow should be verified periodically through a program similar to that developed for MOVs in Generic Letter 89–10, ''Safety-Related Motor-Operated Valve Testing and Surveillance,'' dated June 28, 1989.[2]

The condition in § 50.55a(b)(3)(iii)(A) specifies with the same level of detail as the condition in § 50.55a(b)(3)(ii) that nuclear power plant licensees must establish a program to ensure the continued capability of MOVs in performing their design-basis safety functions. When establishing the MOV periodic verification condition, the NRC provided guidance in the final rule published September 22, 1999 (64 FR 51370), for licensees to develop acceptable programs that would satisfy the MOV periodic verification condition. Similarly, the NRC staff is providing guidance herein for new reactor applicants and licensees to develop acceptable programs to periodically verify the capability of POVs to perform their design-basis safety functions.

In NUREG–2124, ''Final Safety Evaluation Report [FSER] Related to the Combined Licenses for Vogtle Electric Generating Plant, Units 3 and 4,'' the NRC staff found the provisions established by the COL applicant for Vogtle Units 3 and 4 in its Final Safety Analysis Report (FSAR), Revision 5, Section 3.9.6.2.2, ''Valve Testing,'' to periodically verify the capability of POVs (such as air-operated valves (AOVs), solenoid-operated valves (SOVs), and hydraulic-operated valves (HOVs)) to perform their design-basis safety functions to be acceptable. In particular, the Vogtle Units 3 and 4 FSAR specifies that:

> Power-operated valves other than active MOVs are exercised quarterly in accordance with OM ISTC, unless justification is provided in the inservice testing program for testing these valves at other than Code mandated frequencies. Although the design basis capability of power-operated valves is verified as part of the design and qualification process, power-operated valves that perform an active safety function are tested again after installation in the plant, as required, to ensure valve setup is acceptable to perform their required functions, consistent with valve qualification. These tests, which are typically performed under static (no flow or pressure) conditions, also document the ''baseline'' performance of the valves to support maintenance and trending programs. During the testing, critical parameters needed to ensure proper valve setup are measured. Depending on the valve and actuator type, these parameters may include seat load, running torque or thrust, valve travel, actuator spring rate, bench set and regulator supply pressure. Uncertainties associated with performance of these tests and use of the test results (including those associated with measurement equipment and potential degradation mechanisms) are addressed appropriately. Uncertainties may be considered in the specification of acceptable valve setup parameters or in the interpretation of the test results (or a combination of both). Uncertainties affecting both valve function and structural limits are addressed. Additional testing is performed as part of the air-operated valve (AOV) program, which includes the key elements for an AOV Program as identified in the JOG AOV program document, Joint Owners Group Air Operated Valve Program Document, Revision 1, December 13, 2000 (References 203 and 204) [JOG AOV Program Document, Revision 1, December 13, 2000 (ADAMS Accession No. ML010950310), and NRC comment letter dated October 8, 1999, to Nuclear Energy Institute (ADAMS Accession No. ML020360077)]. The AOV program incorporates the attributes for a successful power-operated valve long-term periodic verification program, as discussed in Regulatory Issue Summary 2000–03, Resolution of Generic Safety Issue 158: Performance of Safety-Related Power-Operated Valves Under Design Basis

[2] The NRC issued seven supplements to provide guidance for the implementation of the MOV testing program requested in Generic Letter 89–10. The supplements to Generic Letter 89–10 did not modify the substance of the MOV testing program requested in Generic Letter 89–10 to provide reasonable assurance in the capability of safety-related MOVs to perform their design-basis functions.

Conditions, by incorporating lessons learned from previous nuclear power plant operations and research programs as they apply to the periodic testing of air- and other power-operated valves included in the IST program.

For example, key lessons learned addressed in the AOV program include:

- Valves are categorized according to their safety significance and risk ranking.
- Setpoints for AOVs are defined based on current vendor information or valve qualification diagnostic testing, such that the valve is capable of performing its design-basis function(s).
- Periodic static testing is performed, at a minimum on high risk (high safety significance) valves, to identify potential degradation, unless those valves are periodically cycled during normal plant operation, under conditions that meet or exceed the worst case operating conditions within the licensing basis of the plant for the valve, which would provide adequate periodic demonstration of AOV capability. If required based on valve qualification or operating experience, periodic dynamic testing is performed to re-verify the capability of the valve to perform its required functions.
- Sufficient diagnostics are used to collect relevant data (*e.g.,* valve stem thrust and torque, fluid pressure and temperature, stroke time, operating and/or control air pressure, etc.) to verify the valve meets the functional requirements of the qualification specification.
- Test frequency is specified, and is evaluated each refueling outage based on data trends as a result of testing. Frequency for periodic testing is in accordance with References 203 and 204, with a minimum of 5 years (or 3 refueling cycles) of data collected and evaluated before extending test intervals.
- Post-maintenance procedures include appropriate instructions and criteria to ensure baseline testing is re-performed as necessary when maintenance on the valve, repair or replacement, have the potential to affect valve functional performance.
- Guidance is included to address lessons learned from other valve programs specific to the AOV program.
- Documentation from AOV testing, including maintenance records and records from the corrective action program are retained and periodically evaluated as a part of the AOV program.

* * * * *

The attributes of the AOV testing program described above, to the extent that they apply to and can be implemented on other safety-related power-operated valves, such as electro-hydraulic operated valves, are applied to those other power-operated valves.'' (Vogtle Electric Generating Plant, Units 3 and 4, Updated Final Safety Analysis Report (UFSAR), Section 3.9.6, ''Inservice Testing of Pumps and Valves'')

Applicable applicants and licensees may follow the method described in the Vogtle Units 3 and 4 FSAR in satisfying § 50.55a(b)(3)(iii)(A), or may establish a different method, subject to evaluation by the NRC during the licensing process or inspections.

10 CFR 50.55a(b)(3)(iii)(B) Check Valves

The NRC is adding § 50.55a(b)(3)(iii)(B) to require that licensees within the scope of § 50.55a(b)(3)(iii) perform bi-directional testing of check valves within the IST program where practicable. Nuclear power plant operating experience has revealed that testing check valves in only the flow direction can result in significant degradation, such as a missing valve disc, not being identified by the test. Nonmandatory Appendix M, ''Design Guidance for Nuclear Power Plant Systems and Component Testing,'' to OM Code, 2011 Addenda and 2012 Edition, includes guidance for the design of new reactors to enable bi-directional testing of check valves. New reactor designs will provide the capability for licensees of new nuclear power plants to perform bi-directional testing of check valves within the IST program. Bi-directional testing of check valves in new reactors, as required by § 50.55a(b)(3)(iii)(B), could be accomplished by valve-specific testing or condition monitoring activities in accordance with Appendix II to the OM Code as accepted in § 50.55a. The NRC is specifying this provision for bi-directional testing of check valves for new reactors in § 50.55a(b)(3)(iii)(B) to emphasize that new reactors should include the capability for bi-directional testing of check valves as part of their initial design.

10 CFR 50.55a(b)(3)(iii)(C) Flow-Induced Vibration

In the proposed rule, the NRC proposed adding § 50.55a(b)(3)(iii)(C) to require that licensees subject to § 50.55a(b)(3)(iii) monitor flow-induced vibration (FIV) from hydrodynamic loads and acoustic resonance during preservice testing and inservice testing to identify potential adverse flow effects that might impact components within the scope of the IST program.

Nuclear power plant operating experience has revealed the potential for adverse flow effects from vibration caused by hydrodynamic loads and acoustic resonance on components in the reactor coolant, steam, and feedwater systems. Therefore, the licensee will be required to address potential adverse flow effects on safety-related pumps, valves, and dynamic restraints within the IST program in the reactor coolant, steam, and feedwater systems from hydraulic loading and acoustic resonance during plant operation. In response to public comments, the NRC revised § 50.55a(b)(3)(iii)(C) to clarify its intent that FIV monitoring of components may be conducted during preservice testing or inservice testing. This requirement will confirm that piping, components, restraints, and supports have been designed and installed to withstand the dynamic effects of steady-state FIV and anticipated operational transient conditions. As part of preservice testing activities, the initial test program may be used to verify that safety-related piping and components are properly installed and supported such that vibrations caused by steady-state or dynamic effects do not result in excessive stress or fatigue in safety-related plant systems.

In the Vogtle Units 3 and 4 FSER, the NRC staff found the provisions established by the COL applicant for Vogtle Units 3 and 4 in its FSAR, Revision 5, Section 3.9, ''Mechanical Systems and Components,'' Section 14.2.9, ''Preoperational Test Descriptions,'' and Section 14.2.10, ''Startup Test Procedures,'' with incorporation by reference of corresponding sections of the AP1000 Design Control Document (DCD), to monitor FIV from hydrodynamic loads and acoustic resonance during preservice testing or inservice testing to be acceptable. In particular, the NRC staff stated in the Vogtle Units 3 and 4 FSER:

AP1000 DCD Tier 2, Section 3.9.2, ''Dynamic Testing and Analysis,'' describes tests to confirm that piping, components, restraints, and supports have been designed to withstand the dynamic effects of steady-state FIV and anticipated operational transient conditions. Section 14.2.9.1.7, ''Expansion, Vibration and Dynamic Effects Testing,'' in AP1000 DCD Tier 2, Chapter 14, ''Initial Test Program,'' states that the purpose of the expansion, vibration and dynamic effects testing is to verify that safety-related, high energy piping and components are properly installed and supported such that, in addition to other factors, vibrations caused by steady-state or dynamic effects do not result in excessive stress or fatigue to safety-related plant systems. Nuclear power plant operating experience has revealed the potential for adverse flow effects from vibration caused by hydrodynamic loads and acoustic resonance on reactor coolant, steam, and feedwater systems. . . . In its response, SNC [Vogtle Units 3 and 4 COL applicant] stated that it intended to use the overall Initial Test Program to demonstrate that the plant has been constructed as designed and the systems perform consistent with design requirements. SNC referenced the provisions in the AP1000 DCD for vibration monitoring and testing to be implemented at VEGP. For example, the applicant notes that AP1000 DCD Tier 2, Section 3.9.2.1, ''Piping Vibration, Thermal Expansion and Dynamic Effects,'' specifies that the preoperational test

program for ASME BPV Code, Section III, Class 1, 2, and 3 piping systems simulates actual operating modes to demonstrate that components comprising these systems meet functional design requirements and that piping vibrations are within acceptable levels. SNC indicates that the planned vibration testing program described in AP1000 DCD Tier 2, Sections 14.2.9 and 14.2.10, with the preservice and IST programs described in AP1000 DCD Tier 2, Sections 3.9.3.4.4 and 3.9.6, will confirm component installation in accordance with design requirements, and address the effects of steady-state (flow-induced) and transient vibration to ensure the operability of valves and dynamic restraints in the IST Program. The NRC staff considers the response by SNC clarifies its application of the provisions in the AP1000 DCD to ensure that potential adverse flow effects will be addressed at VEGP. Therefore, the NRC staff considers Standard Content Open Item 3.9–5 to be resolved for the VEGP COL application.'' (NUREG–2124, ''Final Safety Evaluation Report Related to the Combined Licenses for Vogtle Electric Generating Plant, Units 3 and 4,'' Section 3.9.6, ''Inservice Testing of Pumps and Valves (Related to RG 1.206, Section C.III.1, Chapter 3, C.I.3.9.6, 'Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints')'').

As clarified in the final rule in response to public comments, a licensee may monitor components for adverse FIV effects during preservice testing or IST activities.

Applicable applicants and licensees may either apply the methods described in the Vogtle Units 3 and 4 FSAR in satisfying § 50.55a(b)(3)(iii)(C) or develop their own plant-specific methods to satisfy § 50.55a(b)(3)(iii)(C) for NRC review during the licensing process.

10 CFR 50.55a(b)(3)(iii)(D) High-Risk Non-Safety Systems

The NRC is adding § 50.55a(b)(3)(iii)(D) to require that licensees within the scope of § 50.55a(b)(3)(iii) establish a program to assess the operational readiness of pumps, valves, and dynamic restraints within the scope of the Regulatory Treatment of Non-Safety Systems (RTNSS) for applicable reactor designs. As of the time of this final rule, these are designs which have been certified in a design certification rule under 10 CFR part 52. In SECY–94–084 and SECY–95–132, the Commission discusses RTNSS policy and technical issues associated with passive plant designs. Some new nuclear power plants have advanced light-water reactor (ALWR) designs that use passive safety systems that rely on natural forces, such as density differences, gravity, and stored energy to supply safety injection water and to provide reactor core and containment cooling. Active systems in passive ALWR designs are categorized as non-safety systems with limited exceptions. Active systems in passive ALWR designs provide the first line of defense to reduce challenges to the passive systems in the event of a transient at the nuclear power plant. Active systems that provide a defense-in-depth function in passive ALWR designs need not meet all of the acceptance criteria for safety-related systems. However, there should be a high level of confidence that these active systems will be available and reliable when needed. The combined activities to provide confidence in the capability of these active systems in passive ALWR designs to perform their functions important to safety are referred to as the RTNSS program. In the NRC Staff Memorandum, ''Consolidation of SECY–94–084 and SECY–95–132,'' dated July 24, 1995, the NRC staff provided a consolidated list of the approved policy and technical positions associated with RTNSS equipment in passive plant designs discussed in SECY–94–084 and SECY–95–132. This new paragraph specifies the need for licensees to assess the operational readiness of RTNSS pumps, valves, and dynamic restraints.

The July 24, 1995, staff memorandum summarizes the Commission policy positions related to inservice testing of RTNSS pumps and valves as follows:

> The staff also concluded that additional inservice testing requirements may be necessary for certain pumps and valves in passive plant designs. The unique passive plant design relies significantly on passive safety systems, but also depends on non-safety systems (which are traditionally safety-related systems in current light-water reactors) to prevent challenges to passive systems. Therefore, the reliable performance of individual components is a very significant factor in enhancing the safety of passive plant design. The staff recommends that the following provisions be applied to passive ALWR plants to ensure reliable component performance.
>
> 1. Important non-safety-related components are not required to meet criteria similar to safety-grade criteria. However, the non-safety-related piping systems with functions that have been identified as being important by the RTNSS process should be designed to accommodate testing of pumps and valves to assure that the components meet their intended functions. Specific positions on the inservice testing requirements for those components will be determined as a part of the staff's review of plant-specific implementation of the regulatory treatment of non-safety systems for passive reactor designs.
>
> 2. . . . The vendors for advanced passive reactors, for which the final designs are not complete, have sufficient time to include provisions in their piping system designs to allow testing at power. Quarterly testing is the base testing frequency in the Code and the original intent of the Code. Furthermore, the COL holder may need to test more frequently than during cold shutdowns or at every refueling outage to ensure that the reliable performance of components is commensurate with the importance of the safety functions to be performed and with system reliability goals. Therefore, to the extent practicable, the passive ALWR piping systems should be designed to accommodate the applicable Code requirements for the quarterly testing of valves. However, design configuration changes to accommodate Code-required quarterly testing should be done only if the benefits of the test outweigh the potential risk.
>
> 3. The passive system designs should incorporate provisions (1) to permit all critical check valves to be tested for performance, to the extent practicable, in both forward- and reverse-flow directions, although the demonstration of a non-safety direction test need not be as rigorous as the corresponding safety direction test, and (2) to verify the movement of each check valve's obturator during inservice testing by observing a direct instrumentation indication of the valve position such as a position indicator or by using nonintrusive test methods.
>
> 4. . . . Similarly, to the extent practicable, the design of non-safety-related piping systems with functions under design-basis condition that have been identified as being important by the RTNSS process should incorporate provisions to periodically test power-operated valves in the system during operations to assure that the valves meet their intended functions under design-basis conditions.
>
> 5. . . . Mispositioning may occur through actions taken locally (manual or electrical), at a motor control center, or in the control room, and includes deliberate changes of valve position to perform surveillance testing. The staff will determine if and the extent to which this concept should be applied to MOVs in important non-safety-related systems when the staff reviews the implementation of the regulatory treatment of non-safety systems.'' (NRC Staff Memorandum, ''Consolidation of SECY–94–084 and SECY–95–132,'' July 24, 1995, pages 26–28).

Consistent with the Commission policy for RTNSS equipment, § 50.55a(b)(3)(iii)(D) specifies that new reactor licensees shall assess the operational readiness of pumps, valves, and dynamic restraints within the RTNSS scope. This regulatory requirement will allow licensees flexibility in developing programs to assess operational readiness of RTNSS components that satisfy the Commission policy. Guidance on the implementation of the Commission policy for RTNSS equipment is set forth in NRC Inspection Procedure 73758, ''Part 52, Functional Design and Qualification, and Preservice and Inservice Testing Programs for Pumps, Valves and

Dynamic Restraints,'' dated April 19, 2013.

10 CFR 50.55a(b)(3)(iv) OM Condition: Check Valves (Appendix II)

The NRC is revising § 50.55a(b)(3)(iv) to address Appendix II, ''Check Valve Condition Monitoring Program,'' provided in the 2003 Addenda through the 2012 Edition of the OM Code. In the proposed rule, the NRC proposed a condition in § 50.55a(b)(3)(iv) to provide assurance that the valve or group of valves is capable of performing its intended function(s) over the entire interval. Public comments indicated that the proposed condition could be misinterpreted. Therefore, the NRC revised the proposed condition to clarify that the implementation of Appendix II must include periodic sampling of the check valves over the maximum interval allowed by Appendix II for the check valve condition monitoring program. A new table was added to the paragraph to specify the maximum intervals between check valve condition monitoring activities when applying interval extensions.

The conditions currently specified for the use of Appendix II, 1995 Edition with the 1996 and 1997 Addenda, and 1998 Edition through the 2002 Addenda, of the OM Code remain unchanged by this final rule.

10 CFR 50.55a(b)(3)(vii) OM Condition: Subsection ISTB

The NRC is adding a new condition, § 50.55a(b)(3)(vii), to prohibit the use of Subsection ISTB, ''Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants,'' in the 2011 Addenda of the OM Code. In the 2011 Addenda to the OM Code, the upper end of the ''Acceptable Range'' and the ''Required Action Range'' for flow and differential or discharge pressure for comprehensive pump testing in Subsection ISTB was raised to higher values. The NRC staff on the OM Code committee accepted the proposed increase of the upper end of the ''Acceptable Range'' and ''Required Action Range'' with the planned addition of a requirement for a pump periodic verification test program in the OM Code. However, the 2011 Addenda to the OM Code did not include the requirement for a pump periodic verification test program. Since then, the 2012 Edition of the OM Code has incorporated Mandatory Appendix V, ''Pump Periodic Verification Test Program,'' which supports the changes to the acceptable and required action ranges for comprehensive pump testing in Subsection ISTB. Therefore, the new § 50.55a(b)(3)(vii) prohibits the use of Subsection ISTB in the 2011 Addenda of the OM Code. Licensees will be allowed to apply Subsection ISTB with the revised acceptable and required action ranges in the 2012 Edition of the OM Code as incorporated by reference in § 50.55a.

10 CFR 50.55a(b)(3)(viii) OM Condition: Subsection ISTE

The NRC is adding § 50.55a(b)(3)(viii) to specify that licensees who wish to implement Subsection ISTE, ''Risk-Informed Inservice Testing of Components in Light-Water Reactor Nuclear Power Plants,'' of the OM Code, 2009 Edition, 2011 Addenda, and 2012 Edition, must request and obtain NRC approval in accordance with § 50.55a(z) to apply Subsection ISTE on a plant-specific basis as a risk-informed alternative to the applicable IST requirements in the OM Code.

In the 2009 Edition of the OM Code, the ASME included new Subsection ISTE that describes a voluntary risk-informed approach in developing an IST program for pumps and valves at nuclear power plants. If a licensee chooses to implement this risk-informed IST approach, Subsection ISTE indicates that all requirements in Subsection ISTA, ''General Requirements,'' Subsection ISTB, and Subsection ISTC, ''Inservice Testing of Valves in Light-Water Reactor Nuclear Power Plants,'' of the OM Code continue to apply, except those identified in Subsection ISTE. The ASME selected risk-informed guidance from OM Code Cases OMN–1, OMN–3, OMN–4, ''Requirements for Risk Insights for Inservice Testing of Check Valves at LWR Power Plants,'' OMN–7, ''Alternative Requirements for Pump Testing,'' OMN–11, and OMN–12, ''Alternative Requirements for Inservice Testing Using Risk Insights for Pneumatically and Hydraulically Operated Valve Assemblies in Light-Water Reactor Power Plants,'' in preparing Subsection ISTE of the OM Code.

During development of Subsection ISTE, the NRC staff participating on the OM Code committees indicated that the conditions specified in RG 1.192 for the use of the applicable OM Code Cases need to be considered when evaluating the acceptability of the implementation of Subsection ISTE. In addition, the NRC staff noted that several aspects of Subsection ISTE will need to be addressed on a case-by-case basis when determining the acceptability of its implementation. Therefore, the new condition in § 50.55a(b)(3)(viii) requires that licensees who wish to implement Subsection ISTE of the OM Code must request approval from the NRC to apply Subsection ISTE on a plant-specific basis as a risk-informed alternative to the applicable IST requirements in the OM Code.

Nuclear power plant applicants for construction permits under 10 CFR part 50, or combined licenses for construction and operation under 10 CFR part 52, may describe their proposed implementation of the risk-informed IST approach specified in Subsection ISTE of the OM Code for NRC review in their applications.

10 CFR 50.55a(b)(3)(ix) OM Condition: Subsection ISTF

The NRC is adding a condition on the use of Subsection ISTF in § 50.55a(b)(3)(ix). First, the condition states that Subsection ISTF, 2011 Addenda, is prohibited for use. Second, the condition specifies that licensees applying Subsection ISTF, ''Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants—Post-2000 Plants,'' in the 2012 Edition of the OM Code shall satisfy the requirements of Mandatory Appendix V, ''Pump Periodic Verification Test Program,'' of the OM Code, 2012 Edition.

As previously discussed regarding the new condition in § 50.55a(b)(3)(vii), the upper end of the ''Acceptable Range'' and the ''Required Action Range'' for flow and differential or discharge pressure for comprehensive pump testing in Subsection ISTB in the OM Code was raised to higher values in combination with the incorporation of Mandatory Appendix V, ''Pump Periodic Verification Test Program.'' However, the 2011 Addenda of the OM Code does not include Appendix V. In addition, Subsection ISTF in the 2011 Addenda and 2012 Edition of the OM Code does not include a requirement for a pump periodic verification test program. Therefore, the new condition in § 50.55a(b)(3)(ix) requires that the provisions of Appendix V be applied when implementing Subsection ISTF of the 2012 Edition of the OM Code to support the application of the upper end of the Acceptable Range and the Required Action Range for flow and differential or discharge pressure for inservice pump testing in Subsection ISTF.

10 CFR 50.55a(b)(3)(xi) OM Condition: Valve Position Indication

The NRC is adding § 50.55a(b)(3)(xi) to emphasize the provisions in OM Code, 2012 Edition, Subsection ISTC–3700, ''Position Verification Testing,'' to verify that valve obturator position is accurately indicated. Subsection ISTC–3700 of the OM Code requires that

valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated. Subsection ISTC–3700 states that where practicable, this local observation should be supplemented by other indications, such as the use of flow meters or other suitable instrumentation to verify obturator position. Subsection ISTC–3700 also states that where local observation is not possible, other indications shall be used for verification of valve operation. Nuclear power plant operating experience has revealed that reliance on indicating lights and stem travel are not sufficient to satisfy the requirement in ISTC–3700 to verify that valve operation is accurately indicated. Appendix A, ''General Design Criteria for Nuclear Power Plants,'' to 10 CFR part 50 requires that where generally recognized codes and standards are used, they shall be identified and evaluated to determine their applicability, adequacy, and sufficiency, and shall be supplemented or modified as necessary to assure a quality product in keeping with the required safety function. This new condition specifies that when implementing OM Code, Subsection ISTC–3700, licensees shall verify that valve operation is accurately indicated by supplementing valve position indicating lights with other indications, such as flow meters or other suitable instrumentation, to provide assurance of proper obturator position. The OM Code specifies obturator movement verification in order to detect certain internal valve failure modes consistent with the definition of 'exercising' found in ISTA–2000, ''Definitions,'' (*i.e.,* demonstration that the moving parts of a component function). Verification of the ability of an obturator to change or maintain position is an essential element of valve operational readiness determination, which is a fundamental aspect of the OM Code.

The NRC initially emphasized the ASME OM Code requirement for valve position indication in 1995 in the original issuance of NUREG–1482, ''Guidelines for Inservice Testing at Nuclear Power Plants,'' paragraph 4.2.5. The NRC's position is further elaborated in NUREG–1482 (Revision 2), ''Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants,'' paragraph 4.2.7. As discussed in NUREG–1482 (Revision 2), ISTC–3700 allows flexibility to licensees in verifying that operation of valves with remote position indicators is accurately indicated. For example, NUREG–1482 refers to various methods to verify valve operation, such as nonintrusive techniques, flow initiation or absence of flow, leak testing, and pressure testing. The extent of verification necessary for valve operation to satisfy ISTC–3700 will depend on the type of valve, the sophistication of the diagnostic equipment used in testing the valve, possible failure modes of the valve, and the operating history of the valve and similar valve types. To satisfy ISTC–3700, the licensee is responsible for developing and implementing a method to provide reasonable assurance that valve operation is accurately indicated.

The NRC is requiring this condition for the implementation of the 2012 Edition of the OM Code for the 120-month IST interval in order to allow additional time for licensees to comply with this condition.

10 CFR 50.55a(f): Preservice and Inservice Testing Requirements

The NRC is revising the introductory text of § 50.55a(f) to indicate that systems and components must meet the requirements for ''preservice and inservice testing'' in the applicable ASME Codes and that both activities are referred to as ''inservice testing'' in the remainder of paragraph (f). The change clarifies that the OM Code includes provisions for preservice testing of components as part of its overall provisions for IST programs. No expansion of IST program scope was intended by this clarification.

In the proposed rule, the NRC included references to the OM Code in § 50.55a(f)(3)(iii)(A), Class 1 Pumps and Valves: First Provision; § 50.55a(f)(3)(iii)(B), Class 1 Pumps and Valves: Second Provision; § 50.55a(f)(3)(iv)(A), Class 2 and 3 Pumps and Valves: First Provision; and § 50.55a(f)(3)(iv)(B): Second Provision; to align the regulatory language with the current ASME OM Code used for IST programs. Because § 50.55a(f)(3)(iii) and (iv) specifically reference Class 1, 2, or 3 pumps and valves, the proposed changes to these paragraphs referencing the OM Code are unnecessary and have not been adopted in this final rule.

10 CFR 50.55a(f)(4) Inservice Testing Standards Requirement for Operating Plants

The NRC is revising § 50.55a(f)(4) to clarify that this paragraph is applicable to pumps and valves that are within the scope of the OM Code. This revision aligns the scope of pumps and valves for inservice testing with the scope defined in the OM Code.

Public comments on the alignment of the IST program scope in § 50.55a(f)(4) indicated that the nuclear industry is addressing the requirements in 10 CFR part 50, appendices A and B, to establish an IST program for safety-related pumps and valves that are not classified as ASME BPV Code Class 1, 2, or 3 components through either the OM Code provisions or augmented IST programs. For example, one public commenter indicated that generally, augmented IST programs are designed to meet the OM Code where practicable, but relief requests are not required when alternate testing is necessary. The NRC regulations in § 50.55a address the concept of augmented IST programs for pumps and valves at nuclear power plants. For example, § 50.55a(f)(6)(ii), ''Augmented IST requirements,'' indicates that the licensee may follow an augmented IST program for pumps and valves for which the NRC deems that added assurance of operational readiness is necessary. The NRC finds that an augmented IST program as addressed in § 50.55a(f)(6)(ii) is acceptable for safety-related pumps and valves that are not classified as ASME BPV Code Class 1, 2, or 3 components.

Public commenters were concerned that the alignment of the scope of the OM Code and § 50.55a would cause a potential paperwork burden for the submittal of relief or alternative requests for safety-related pumps and valves that are not classified as ASME BPV Code Class 1, 2, or 3 components. In response to these comments, the NRC included a provision in § 50.55a(f)(4) that the IST requirements for pumps and valves that are within the scope of the OM Code but are not classified as ASME BPV Code Class 1, Class 2, or Class 3 may be satisfied as an augmented IST program in accordance with § 50.55a(f)(6)(ii) without requesting relief under § 50.55a(f)(5) or alternatives under § 50.55a(z). This use of an augmented IST program may be acceptable provided the basis for deviations from the OM Code, as incorporated by reference in this section, demonstrates an acceptable level of quality and safety, or that implementing the Code provisions would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, where documented and available for NRC review. This additional provision avoids the potential paperwork burden for the submittal of relief or alternative requests by allowing the licensee to maintain the documentation demonstrating an acceptable level of quality and safety on site for NRC review, as appropriate. The

documentation and availability of the basis for deviations from the OM Code for NRC review are acceptable for pumps and valves within the scope of the OM Code but not classified as ASME BPV Code Class 1, 2, or 3, based on their lower safety significance in comparison to ASME BPV Code Class 1, 2, and 3 pumps and valves.

10 CFR 50.55a(g)(4) Inservice Inspection Standards Requirement for Operating Plants

The NRC recognizes that updating an Appendix VIII program is a complex and time-consuming process. The NRC also recognizes that licensees would face the possibility of needing to maintain multiple Appendix VIII programs if units were to update their ISI programs on different dates. Maintaining certifications to multiple Appendix VIII programs would be very complicated, while not improving the effectiveness of the programs. Based on public comments, and to assist licensees in updating and coordinating their ISI programs, the NRC is adding two options to the regulations. First, the NRC is revising § 50.55a(g)(4)(i) and (ii) to clarify that a licensee whose ISI interval commences during the 12- to 18-month period after the approval date of this final rule, may delay the update of their Appendix VIII program by up to 18 months after the approval date of this final rule. This will provide licensees with enough time to incorporate the changes for the new Appendix VIII program. Second, the NRC is adding the option for licensees to update their ISI program to use the latest edition and addenda of Appendix VIII incorporated by reference in § 50.55a(a)(1) at any time in the licensee's ten-year interval. Licensees can normally update their ISI programs using all or portions of newer versions of ASME BPV Code Section XI under § 50.55a(g)(4)(iv), subject to NRC review and approval. While some requests to use portions of ASME BPV Code Section XI require a detailed review by the NRC, a licensee asking to use the entire latest incorporated-by-reference version of Appendix VIII would certainly be approved by the NRC staff in this process. This provision will, therefore, allow licensees to use the latest incorporated version of Appendix VIII, as long as it is coupled with the same edition and addenda of Appendix I, without the NRC review and approval process. This will allow licensees to coordinate their ISI programs and use the latest approved version of Appendix VIII without the delay imposed by submitting a relief request under § 50.55a (g)(4)(iv).

D. ASME Code Cases

Administrative Changes to References in § 50.55a to NRC Regulatory Guides Identifying ASME Code Cases Approved for Use by the NRC

The NRC is removing the revision number of the three RGs currently approved by the Office of the Federal Register for incorporation by reference throughout the substantive provisions of § 50.55a addressing the ASME Code Cases, *i.e.,* paragraphs (b) through (g). The revision numbers for the RGs approved for incorporation by reference (currently, RG 1.84, RG 1.147, and RG 1.192) will be retained in § 50.55a(a)(3)(i) through (iii), where the RGs are listed by full title, including revision number. These changes simplify the regulatory language containing cross-references to these RGs and reduce the possibility of NRC error in preparing future amendments to § 50.55a with respect to these RGs. These changes are administrative in nature and do not change substantive requirements with respect to the RGs and the Code Cases listed in the RGs.

Administrative Changes To Comply With Requirements for Incorporation by Reference

The NRC is revising § 50.55a(a)(1)(iii) to maintain the ASME Code Cases in alphanumeric order.

Organization of NRC's Discussion of the Six ASME Code Cases Incorporated by Reference in This Final Rule

The discussions under the following headings address four of the six ASME Code Cases being incorporated by reference in this rulemaking (N–729–4, N–770–2, N–824, and OMN–20). A fifth ASME Code Case, N–852, is discussed in Section II.A, ''ASME BPV Code, Section III,'' because the NRC's approval of that Code Case relates to a provision of Section III, which is addressed in § 50.55a(b)(1)(ix). The sixth ASME Code Case, N–513–3, is discussed in Section II.B, ''ASME BPV Code, Section XI,'' because the NRC's approval of that Code Case relates to a provision of Section XI, which is addressed in § 50.55a(b)(2)(xxxiv).

ASME BPV Code Case N–729–4

On September 10, 2008, the NRC issued a final rule to update § 50.55a to the 2004 Edition of the ASME BPV Code (73 FR 52730). As part of the final rule, § 50.55a(g)(6)(ii)(D) implemented an augmented ISI program for the examination of pressurized water reactor RPV upper head penetration nozzles and associated partial penetration welds. The program required the implementation of ASME BPV Code Case N–729–1, with certain conditions.

The application of ASME BPV Code Case N–729–1 was necessary because the inspections required by the 2004 Edition of the ASME BPV Code, Section XI were not written to address degradation of the RPV upper head penetration nozzles and associated welds by primary water stress corrosion cracking (PWSCC). The safety consequences of inadequate inspections can be significant. The NRC's determination that the ASME BPV Code required inspections are inadequate is based upon operating experience and analysis. The absence of an effective inspection regime could, over time, result in unacceptable circumferential cracking, or the degradation of the RPV upper head or other reactor coolant system components by leakage assisted corrosion. These degradation mechanisms increase the probability of a loss-of-coolant accident.

Examination frequencies and methods for RPV upper head penetration nozzles and welds are provided in ASME BPV Code Case N–729–1. The use of code cases is voluntary, so these provisions were developed, in part, with the expectation that the NRC would incorporate the code case by reference into the CFR. Therefore, the NRC adopted rule language in § 50.55a(g)(6)(ii)(D) requiring implementation of ASME BPV Code Case N–729–1, with conditions, in order to enhance the examination requirements in the ASME BPV Code, Section XI for RPV upper head penetration nozzles and welds. The examinations conducted in accordance with ASME BPV Code Case N–729–1 provide reasonable assurance that ASME BPV Code allowable limits will not be exceeded and that PWSCC will not lead to failure of the RPV upper head penetration nozzles or welds. However, the NRC concluded that certain conditions were needed in implementing the examinations in ASME BPV Code Case N–729–1. These conditions are set forth in § 50.55a(g)(6)(ii)(D).

On June 22, 2012, the ASME approved the fourth revision of ASME BPV Code Case N–729 (N–729–4). This revision changed certain requirements based on a consensus review of inspection techniques and frequencies. These changes were deemed necessary by the ASME to supersede the previous requirements under N–729–1 to establish an effective long-term inspection program for the RPV upper head penetration nozzles and associated welds in pressurized water reactors. The

major changes included incorporation of previous NRC conditions in the CFR. Minor changes were also made to address editorial issues, to correct figures or to add clarity.

The NRC is updating the requirements of § 50.55a(g)(6)(ii)(D) to require licensees to implement ASME BPV Code Case N–729–4, with conditions. One existing condition on ASME BPV Code Case N–729–1 has been modified, four existing conditions are being deleted in this final rule, one existing condition is being redesignated without substantive change, and two new conditions—in § 50.55a(g)(6)(ii)(D)(*3*) and (*4*)—are adopted in this final rule in order to address the changes in ASME BPV Code Case N–729–4. The NRC's revisions to the conditions are discussed under the next three headings. As discussed earlier, this final rule incorporates by reference ASME BPV Code Case N–729–4 into § 50.55a(a)(1)(iii)(C).

10 CFR 50.55a(g)(6)(ii)(D)(1) Implementation

The NRC is revising § 50.55a(g)(6)(ii)(D)(*1*) to change the version of ASME BPV Code Case N–729 from N–729–1 to N–729–4 for the reasons previously set forth. Due to the incorporation of N–729–4, the date to establish applicability for licensed pressurized water reactors will be changed to the effective date of this final rule.

10 CFR 50.55a(g)(6)(ii)(D)(2) Through (6) (Removed)

The NRC is removing the existing conditions in § 50.55a(g)(6)(ii)(D)(*2*) through (*5*) and redesignating the condition currently in § 50.55a(g)(6)(ii)(D)(*6*) as § 50.55a(g)(6)(ii)(D)(*2*) without any substantive change. The existing conditions in § 50.55a(g)(6)(ii)(D)(*2*) through (*5*) have all been incorporated either verbatim or more conservatively in the revisions to ASME BPV Code Case N–729, up to version N–729–4. Therefore, there is no reason to retain these conditions in § 50.55a.

10 CFR 50.55a(g)(6)(ii)(D)(3) Bare Metal Visual Frequency (New Condition)

The NRC is adopting a new condition in § 50.55a(g)(6)(ii)(D)(*3*) to modify the option in ASME BPV Code Case N–729–4 to extend bare metal visual inspections of the RPV upper head surface beyond the frequency listed in Table 1 of the Code Case. Previously, upper heads aged with less than eight effective degradation years were considered to have a low probability of initiating PWSCC, the cracking mechanism of concern. This ranking of effective degradation years was based on a simple time at temperature correlation. All of the upper heads within this category, with the exception of new heads using Alloy 600 penetration nozzles, were considered to have lower susceptibility to cracking due to the upper heads being at or near the cold leg operating temperature of the reactor coolant system. Therefore, these plants were referred to as having ''cold heads.'' All of the upper heads that had experienced cracking prior to 2006 were near the hot leg operating temperature of the reactor coolant system, which validated the time at temperature model.

In 2006, one of the 21 ''cold head'' plants identified two indications within a penetration nozzle and the associated partial penetration weld. Then, between 2006 and 2013, five of the 21 ''cold head'' plants identified multiple indications within fifteen different penetration nozzles and the associated partial penetration welds. None of these indications caused leakage, and volumetric examination of the penetration nozzles showed that no flaws in the nozzle material had grown through-wall; however, this increasing trend creates a reasonable safety concern.

Recent operational experience has shown that the volumetric inspection of penetration nozzles, at the current inspection frequency, is adequate to identify indications in the nozzle material prior to leakage; however, volumetric examinations cannot be performed on the partial penetration welds. Therefore, given the additional cracking identified at cold leg temperatures, the NRC staff has concerns about the adequacy of the partial penetration weld examinations.

Leakage from a partial penetration weld into the annulus between the nozzle and head material can cause corrosion of the low alloy steel head. While initially limited in leak rate, due to limited surface area of the weld being in contact with the annulus region, corrosion of the vessel head material can expose more of the weld surface to the annulus, allowing a greater leak rate. Since an indication in the weld cannot be identified by a volumetric inspection, a postulated crack through the weld, just about to cause leakage, could exist as a plant performed its last volumetric and/or bare metal visual examination of the upper head material. This gives the crack years to breach the surface and leak prior to the next scheduled visual examination.

Only a surface examination of the wetted surface of the partial penetration weld can reliably detect flaws in the weld. Unfortunately, this examination cannot size the flaws in the weld, and, if performed manually, requires significant radiological dose to examine all of the partial penetration welds on the upper head. As such, the available techniques are only able to detect a flaw after it has caused leakage. These techniques are a bare metal visual examination or a volumetric leak path assessment performed on the frequency of the volumetric examination.

Volumetric leak path examinations are only done during outages when a volumetric examination of the nozzle is performed. Therefore, under the current requirements allowed by Note 4 of ASME BPV Code Case N–729–4, leakage from a crack in the weld of a ''cold head'' plant could start and continue to grow for the 5 years between the required bare metal visual examinations to detect leakage through the partial penetration weld.

Given the additional cracking identified at cold leg temperatures of upper head penetration nozzles and associated welds, the NRC finds limited basis to continue to categorize these ''cold head'' plants as having a low susceptibility to crack initiation. The NRC is increasing the frequency of the bare metal visual examinations of ''cold heads'' to identify potential leakage as soon as reasonably possible due to the volumetric examination limitations. Therefore, the NRC is conditioning Note 4 of ASME BPV Code Case N–729–4 to require a bare metal visual exam during each outage in which a volumetric exam is not performed. The NRC also will allow ''cold head'' plants to extend their bare metal visual inspection frequency from once each refueling outage, as stated in Table 1 of N–729–1, to once every 5 years, but only if the licensee performed a wetted surface examination of all of the partial penetration welds during the previous volumetric examination. Applying the conditioned bare metal visual inspection frequency or a volumetric examination each outage will allow licensees to identify any potential leakage through the partial penetration welds prior to significant degradation of the low alloy steel head material, thereby providing reasonable assurance of the structural integrity of the reactor coolant pressure boundary.

These issues, including the operational experience, the fact that volumetric examination is not available to interrogate the partial penetration welds, and potential regulatory options, were discussed publicly at multiple ASME BPV Code meetings, at the annual Materials Programs Technical Information Exchange public meeting

held at the NRC Headquarters in June 2013, and at the 2013 NRC Regulatory Information Conference.

10 CFR 50.55a(g)(6)(ii)(D)(4) Surface Exam Acceptance Criteria (New Condition)

The NRC is adopting a new condition in § 50.55a(g)(6)(ii)(D)(*4*) to define surface examination acceptance criteria. Paragraph –3132(b) of ASME BPV Code Case N–729–4 sets forth the acceptance criteria for surface examinations. In general, throughout Section XI of the ASME BPV Code, the acceptance criteria for surface examinations default to Section III, Paragraph NB–5352, ''Acceptance Standards.'' Typically, for rounded indications, the indication was only unacceptable if it was greater than 3⁄16-inch in size. The NRC requested that the code case authors include a requirement that any size rounded indication causing nozzle leakage is unacceptable due to operating experience identifying PWSCC under rounded indications less than 3⁄16-inch in size.

Recently, the ASME BPV Code Committee approved an interpretation of the language in Paragraph –3132(b), which implied that any size rounded indication is acceptable unless there is relevant indication of nozzle leakage, even those greater than 3⁄16-inch. The NRC does not agree with the interpretation and maintains its original position on rounded indications that any size rounded indication is unacceptable if there is an indication of leakage. Since the adoption of ASME BPV Code Case N–729–1 into § 50.55a(g)(6)(ii)(D), all licensees have used the NRC's position in implementing Paragraph –3132(b), even after the recent ASME BPV Code Committee interpretation approval over NRC objection.

Therefore, in order to ensure compliance with the previous and ongoing requirement, the NRC is revising condition § 50.55a(g)(6)(ii)(D)(*4*) to include clarity within the acceptance criteria for surface examinations. The current edition requirements of NB–5352 of ASME BPV Code, Section III for the licensee's ongoing 10-year inservice inspection interval shall be met.

ASME BPV Code Case N–770–2

On June 21, 2011 (76 FR 36232), the NRC issued a final rule, which included § 50.55a(g)(6)(ii)(F) that requires the implementation of ASME BPV Code Case N–770–1, ''Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated with UNS N06082 or UNS N86182 Weld Filler Material With or Without Application of Listed Mitigation Activities,'' with certain conditions.

On June 9, 2011, the ASME approved the second revision of ASME BPV Code Case N–770 (N–770–2). The major changes from N–770–1 to N–770–2 included establishing new ASME BPV Code Case, Table 1, inspection item classifications for optimized weld overlays and allowing alternatives when complete inspection coverage cannot be met. Minor changes were also made to address editorial issues, to correct figures, or to add clarity. The NRC found that the updates and improvements in N–770–2 are sufficient to update § 50.55a(g)(6)(ii)(F).

The NRC, therefore, is updating the requirements of § 50.55a(g)(6)(ii)(F) to require licensees to implement ASME BPV Code Case N–770–2, with conditions. The NRC conditions have been modified to address the changes in ASME BPV Code Case N–770–2 and to ensure that this regulatory framework will provide adequate protection of public health and safety. The following sections discuss each of the NRC's changes to the conditions on ASME BPV Code Case N–770–2. As discussed earlier, this final rule incorporates by reference ASME BPV Code Case N–770–2 into § 50.55a(a)(1)(iii)(D).

10 CFR 50.55a(g)(6)(ii)(F)(1) Implementation

The NRC is revising § 50.55a(g)(6)(ii)(F)(*1*) to change the version of ASME BPV Code Case N–770 from N–770–1 to N–770–2 and to require its implementation, with conditions, to incorporate the updates and improvements contained in N–770–2. The NRC will allow licensees to begin using N–770–2 on the effective date of this rule.

10 CFR 50.55a(g)(6)(ii)(F)(2) Categorization

The NRC is revising § 50.55a(g)(6)(ii)(F)(*2*) to provide clarification regarding categorization of each Alloy 82/182 butt weld, mitigated or not, under N–770–2. This paragraph also clarifies the NRC's position that Paragraph –1100(e) shall not be used to exempt welds that rely on Alloy 82/182 for structural integrity from more frequent ISI schedules until the NRC has reviewed and authorized an alternative categorization for the weld. Additionally, the NRC will change the inspection item categories for full structural weld overlays from C to C–1 and F to F–1 due to reclassification under ASME BPV Code Case N–770–2.

10 CFR 50.55a(g)(6)(ii)(F)(3) Baseline Examinations

The NRC is revising § 50.55a(g)(6)(ii)(F)(*3*) to clarify the baseline examination requirements by stating that previously-conducted examinations, in order to count as baseline examinations, must meet the requirements of ASME BPV Code Case N–770–2, as conditioned in this section. The 2011 rule required the use of ASME BPV Code Section XI Appendix VIII qualifications for baseline examinations, which is stricter than N–770–2 and does not provide requirements for optimized weld overlays. The revision also updates the deadline for baseline examination requirements, since the January 20, 2012, deadline from the previous rule has passed. Finally, upon implementation of this rule, if a licensee is currently in an outage, then the baseline inspection requirement can be met by performing the inspections in accordance with the previous regulatory requirements of § 50.55a(g)(6)(ii)(F), in lieu of the examination requirements of Paragraphs –2500(a) or –2500(b) of ASME BPV Code Case N–770–2.

10 CFR 50.55a(g)(6)(ii)(F)(4) Examination Coverage

The NRC is revising § 50.55a(g)(6)(ii)(F)(*4*) to define examination coverage for circumferential flaws and to prohibit the use of Paragraph –2500(d) of ASME BPV Code Case N–770–2 which, in some circumstances, allows unacceptably low examination coverage. Paragraph –2500(d) of N–770–2 would allow the reduction of circumferential volumetric examination coverage with analytical evaluation. Paragraph –2500(c) was previously prohibited from use, and it continues to be prohibited. The NRC is establishing an essentially 100 percent volumetric examination coverage requirement, including greater than 90 percent of the required volumetric examination coverage, for circumferential flaws to provide reasonable assurance of structural integrity of all ASME BPV Code Class 1 butt welds susceptible to PWSCC. Therefore, the NRC is adopting a condition prohibiting the use of Paragraphs –2500(c) and –2500(d). A licensee may request approval for use of these paragraphs under 10 CFR 50.55a(z).

10 CFR 50.55a(g)(6)(ii)(F)(5) Inlay/Onlay Inspection Frequency

The NRC is revising § 50.55a(g)(6)(ii)(F)(*5*) to add the explanatory heading, ''Inlay/onlay

inspection frequency,'' and to make minor editorial corrections.

10 CFR 50.55a(g)(6)(ii)(F)(6) Reporting Requirements

The NRC is revising § 50.55a(g)(6)(ii)(F)(*6*) to add the explanatory heading, ''Reporting requirements.''

10 CFR 50.55a(g)(6)(ii)(F)(7) Defining ''t''

The NRC is revising § 50.55a(g)(6)(ii)(F)(*7*) to add the explanatory heading, ''Defining 't'.''

10 CFR 50.55a(g)(6)(ii)(F)(8) Optimized Weld Overlay Examination

The NRC is revising § 50.55a(g)(6)(ii)(F)(*8*) to add the explanatory heading, ''Optimized weld overlay examination,'' and to maintain the requirement for the timing of the initial inservice examination of optimized weld overlays.

Uncracked welds mitigated with optimized weld overlays were re-categorized by ASME BPV Code Case N–770–2 from Inspection Item D to Inspection Item C–2; however, the initial inspection requirement was not incorporated into the Code Case for Inspection Item C–2. The NRC has determined that uncracked welds mitigated with an optimized weld overlay must have an initial inservice examination no sooner than the third refueling outage and no later than 10 years following the application of the weld overlay to identify unacceptable crack growth. Optimized weld overlays establish compressive stress on the inner half thickness of the weld, but the outer half thickness may also be under tensile stress. The requirement for an initial inservice examination no sooner than the third refueling outage and no later than 10 years following the application of the weld overlay is based on the design of optimized weld overlays, which require the outer quarter thickness of the susceptible material to provide structural integrity for the weld. Therefore, the NRC is continuing adoption of the condition, which requires the initial inservice examination of uncracked welds mitigated by optimized weld overlay (*i.e.,* the welds which are subject to Inspection Item C–2 of ASME BPV Code Case N–770–2) within the specified timeframe.

10 CFR 50.55a(g)(6)(ii)(F)(9) Deferral

The NRC is revising § 50.55a(g)(6)(ii)(F)(*9*) to add the explanatory heading, ''Deferral,'' and to address changes in ASME BPV Code Case N–770–2 which allow the deferral of the first inservice examination of uncracked welds mitigated with optimized weld overlays, Inspection Item C–2.

Previously, under N–770–1, the initial inservice examination of these welds was not allowed to be deferred. Allowing deferral of the initial inservice examination in accordance with N–770–2 could, in certain circumstances, allow the initial inservice examination to be performed up to 20 years after installation. Therefore, the NRC is adopting a condition which would preclude the deferral of the initial inservice examination of uncracked welds mitigated by optimized weld overlays.

10 CFR 50.55a(g)(6)(ii)(F)(10) Examination Technique

The NRC is revising § 50.55a(g)(6)(ii)(F)(*10*) to add the explanatory heading, ''Examination technique,'' and to address changes in ASME BPV Code Case N–770–2. Note 14(a) of Table 1 of ASME BPV Code Case N–770–2 provides the previously required full examination requirement for optimized weld overlays. The language of ASME BPV Code Case N–770–2, however, does not require the implementation of the full examination requirements of Note 14(a) of Table 1, if possible, before implementing the reduced examination coverage requirements of Note 14(b) of Table 1 or Note (b) of Figure 5(a). The NRC agrees that reduced examination coverage is the best alternative if the full examination cannot be met; however, the full examination requirement should be implemented, if possible, before the option of reduced examination coverage is allowed. Therefore, the NRC is modifying the current condition in § 50.55a(g)(6)(ii)(F)(*10*) to allow the use of Note 14(b) of Table 1 and Note (b) of Figure 5(a) of ASME BPV Code Case N–770–2 only after the determination that the requirements of Note 14(a) of Table 1 of ASME BPV Code Case N–770–2 cannot be met.

10 CFR 50.55a(g)(6)(ii)(F)(11) Cast Stainless Steel

The NRC is adding § 50.55a(g)(6)(ii)(F)(*11*) to address examination requirements through cast stainless steel materials by requiring the use of Appendix VIII qualifications to meet the inspection requirements of Paragraph –2500(a) of ASME BPV Code Case N–770–2. The requirements for volumetric examination of butt welds through cast stainless steel materials are currently being developed as Supplement 9 to the ASME BPV Code, Section XI, Appendix VIII. In accordance with Appendix VIII for supplements that have not been developed, the requirements of Appendix III apply. Appendix III requirements are not equivalent to Appendix VIII requirements. For the volumetric examination of ASME BPV Code Class 1 welds, the NRC has established the requirement for examination qualification under the Appendix VIII. Therefore, the NRC is adopting a condition requiring the use of Appendix VIII qualifications to meet the inspection requirements of Paragraph –2500(a) of ASME BPV Code Case N–770–2 by January 1, 2022.

The development of a sufficient number of mockups would be required to establish an Appendix VIII program for examination of ASME BPV Code Class 1 piping and vessel nozzle butt welds through cast stainless steel materials. The NRC recognizes that significant time and resources are required to create mockups and to allow for qualification of equipment, procedures and personnel. Therefore, the NRC is requiring licensees to use these Appendix VIII qualifications no later than their first scheduled weld examinations involving cast stainless steel materials occurring after January 1, 2022.

10 CFR 50.55a(g)(6)(ii)(F)(12) Stress Improvement Inspection Coverage

The NRC is adding § 50.55a(g)(6)(ii)(F)(*12*) to clarify the examination coverage requirements allowed under Appendix I of ASME BPV Code Case N–770–2 for butt welds joining cast stainless steel material. Under current ASME BPV Code, Section XI, Appendix VIII requirements, the volumetric examination of butt welds through cast stainless steel materials is under Supplement 9. Supplement 9 rules are still being developed by the ASME BPV Code. Therefore, it is currently impossible to meet the requirement of Paragraph I.5.1 for butt welds joining cast stainless steel material.

The material of concern is the weld material susceptible to PWSCC adjoining the cast stainless steel material. Appendix VIII qualified procedures are available to perform the inspection of the susceptible weld material, but they are not qualified to inspect the cast stainless steel materials. Therefore, the NRC is adopting a condition changing the inspection volume for stress-improved dissimilar metal welds with cast stainless steel from the ASME BPV Code Section XI requirements to ''the maximum extent practical including 100 percent of the susceptible material volume.'' This will

remain applicable until an Appendix VIII qualified procedure for the inspection through cast stainless steel materials is available in accordance with the new condition in § 50.55a(g)(6)(ii)(F)(*11*).

10 CFR 50.55a(g)(6)(ii)(F)(13) Encoded Ultrasonic Examination

The NRC is adding § 50.55a(g)(6)(ii)(F)(13) to require the encoding of ultrasonic volumetric examinations of Inspection Items A–1, A–2, B, E, F–2, J, and K in Table 1 of N–770–2. A human performance gap has been found between some ultrasonic testing procedures, as demonstrated during ASME BPV Code, Section XI, Appendix VIII qualification versus as applied in the field.

The human factors that contributed to the licensee-performed examinations which failed to identify significant flaws at North Anna Power Station, Unit 1 in 2012 (Licensee Event Report 50–338/2012–001–00) and at Diablo Canyon Nuclear Power Plant in 2013 (Relief Request REP–1 U2, Revision 2) can be avoided by the use of encoded ultrasonic examinations. Encoded ultrasonic examinations electronically store both the positional and ultrasonic information from the inspections. Encoded examinations allow for the inspector to evaluate the data and search for indications outside of a time limited environment to assure that the inspection was conducted properly and to allow for sufficient time to analyze the data. Additionally, the encoded examination would allow for an independent review of the data by other inspectors or an independent third party. Finally, the encoded examination could be compared to previous and/or future encoded examinations to determine if flaws are present and flaw growth rates. Therefore, the NRC is adopting a condition requiring the use of encoding for ultrasonic volumetric examinations of non-mitigated or cracked mitigated dissimilar metal butt welds in the reactor coolant pressure boundary which are within the scope of ASME BPV Code Case N–770–2.

ASME BPV Code Case N–824

10 CFR 50.55a(b)(2)(xxxvii) Section XI Condition: ASME BPV Code Case N–824

The NRC is adding § 50.55a(b)(2)(xxxvii) to allow licensees to use the provisions of ASME BPV Code Case N–824, ''Ultrasonic Examination of Cast Austenitic Piping Welds From the Outside Surface Section XI, Division 1,'' subject to four conditions in § 50.55a(b)(2)(xxxvii)(A) through (D), when implementing inservice examinations in accordance with the ASME BPV Code, Section XI requirements.

During the construction of nuclear power plants, it was recognized that the grain structure of cast austenitic stainless steel (CASS) could prevent effective ultrasonic inspections of piping welds where one or both sides of the welds were constructed of CASS. The high strength and toughness of CASS (prior to thermal embrittlement) made it desirable as a building material despite this known inspection issue. This choice of construction materials has rendered many pressure boundary components without a means to reliably inspect them volumetrically. While there is no operational experience of a CASS component failing, as part of the reactor pressure boundary, inservice volumetric inspection of these components is necessary to provide reasonable assurance of their structural integrity.

The current regulatory requirements for the examination of CASS, provided in § 50.55a, do not provide sufficient guidance to assure that the CASS components are being inspected adequately. To illustrate that ASME BPV Code does not provide adequate guidance, ASME BPV Code, Section XI, Appendix III, Supplement 1 states, ''Cast materials may preclude meaningful examinations because of geometry and attenuation variables.'' For this reason, over the past several decades, licensees have been unable to perform effective inspections of welds joining CASS components. To allow for continued operation of their plants, licensees submitted hundreds of requests for relief from the ASME BPV Code requirements for inservice inspection of CASS components to the NRC, resulting in a significant regulatory burden.

The recent advances in inspection technology are driving renewed work at ASME BPV Code meetings to produce Section XI, Appendix VIII, Supplement 9 to resolve the CASS inspection issue, but it will be years before these code updates will be published, as well as additional time to qualify and approve procedures for use in the field. Until then, licensees would still use the requirements of ASME BPV Code Section XI, Appendix III, Supplement 1, which states that inspection of CASS materials meeting the ASME BPV Code requirements may not be meaningful. Consequently, less effective examinations would continue to be used in the field, and more relief requests would be generated between now and the implementation of Supplement 9.

The NRC commissioned a research program to determine the effectiveness of the new technologies for inspections of CASS components in an effort to resolve some of the known inspection issues. The result of this work is published in NUREG/CR–6933, ''Assessment of Crack Detection in Heavy-Walled Cast Stainless Steel Piping Welds Using Advanced Low-Frequency Ultrasonic Methods'', March 2007, and NUREG/CR–7122, ''An Evaluation of Ultrasonic Phased Array Testing for Cast Austenitic Stainless Steel Pressurizer Surge Line Piping Welds,'' March 2012. Based on the improvements in ultrasonic inspection technology and techniques for CASS components, the ASME approved BPV Code Case N–824 (N–824) on October 16, 2012, which describes how to develop a procedure capable of meaningfully inspecting welds in CASS components.

Effective examinations of CASS components require the use of lower frequencies and larger transducers than are typically used for ultrasonic inspections of piping welds and would require licensees to modify their inspection procedures. The NRC recognizes that requiring the use of spatial encoding will limit the full implementation of ASME BPV Code Case N–824, as spatial encoding is not practical for many weld configurations.

At this time, the use of ASME BPV Code Case N–824, as conditioned, is the most effective known method for adequately examining welds with one or more CASS components. With the use of ASME BPV Code Case N–824, as conditioned, licensees will be able to take full credit for completion of the § 50.55a required inservice volumetric inspection of welds involving CASS components. The implementation of ASME BPV Code Case N–824, as conditioned, will have the dual effect of improving the rigor of required volumetric inspections and reducing the number of uninspectable Class 1 and Class 2 pressure retaining welds.

The NRC concludes that incorporation of ASME BPV Code Case N–824, subject to the four conditions in § 50.55a(b)(2)(xxxvii)(A) through (D), will significantly improve the flaw detection capability of ultrasonic inspection of CASS components until Supplement 9 is implemented, thereby providing reasonable assurance of leak tightness and structural integrity. Additionally, it will reduce the regulatory burden on licensees and allow licensees to submit fewer relief requests for welds in CASS materials. The four conditions on the use of ASME BPV Code Case N–824,

§ 50.55a(b)(2)(xxxvii)(A) through (D), are discussed in the next four headings.

10 CFR 50.55a(b)(2)(xxxvii)(A) (First Condition on Use of ASME BPV Code Case N–824)

The NRC, based upon NUREG/CR–6933 and NUREG/CR–7122, has determined that inspections of CASS materials are very challenging, and sufficient technical basis exists to condition the code case to bring the code case into agreement with the NUREG/CR reports. The NUREG/CR reports also show that CASS materials produce high levels of coherent noise. The noise signals can be confusing and mask flaw indications. Use of encoded inspection data allows the inspector to mitigate this problem through the ability to electronically manipulate the data, which allows for discrimination between coherent noise and flaw indications. The NRC found that encoding CASS inspection data provides significant detection benefits. Therefore, the NRC is adding a condition in § 50.55a(b)(2)(xxxvii)(A) to require the use of encoded data when utilizing N–824 for the examination of CASS components.

10 CFR 50.55a(b)(2)(xxxvii)(B) (Second Condition on Use of ASME BPV Code CaseN–824)

The use of dual element phased-array search units showed the most promise in obtaining meaningful responses from flaws. For this reason, the NRC is adding a condition in § 50.55a(b)(2)(xxxvii)(B) to require the use of dual, transmit-receive, refracted longitudinal wave, multi-element phased array search units when utilizing N–824 for the examination of CASS components.

10 CFR 50.55a(b)(2)(xxxvii)(C) (Third Condition on Use of ASME BPV Code CaseN–824)

The optimum inspection frequencies for examining CASS components of various thicknesses are described in NUREG/CR–6933 and NUREG/CR–7122. For this reason, the NRC is adding a condition in § 50.55a(b)(2)(xxxvii)(C) to require that ultrasonic examinations performed to implement ASME BPV Code Case N–824 on piping greater than 1.6 inches (41 mm) thick shall use a phased array search unit with a center frequency of 500 kHz with a tolerance of + / − 20 percent.

10 CFR 50.55a(b)(2)(xxxvii)(D) (Fourth Condition on Use of ASME BPV Code CaseN–824)

NUREG/CR–6933 shows that the grain structure of CASS can reduce the effectiveness of some inspection angles. For this reason, the NRC is adding a condition in § 50.55a(b)(2)(xxxvii)(D) to require that ultrasonic examinations performed to implement ASME BPV Code Case N–824 shall use a phased array search unit which produces angles including, but not limited to, 30 to 55 degrees with a maximum increment of 5 degrees.

OM Code Case OMN–20

10 CFR 50.55a(b)(3)(x) OM Condition: ASME OM Code Case OMN–20

The NRC is adding § 50.55a(b)(3)(x) to allow licensees to implement OM Code Case OMN–20, ''Inservice Test Frequency,'' in the OM Code, 2012 Edition, for the editions and addenda of the OM Code that are listed in § 50.55a(a)(1)(iv) as being approved for incorporation by reference. As a conforming change, § 50.55a(a)(1)(iii)(G) is being added to incorporate by reference OM Code Case OMN–20 into § 50.55a.

Surveillance Requirement (SR) 3.0.3 from TS 5.5.6, ''Inservice Testing Program,'' allows licensees to apply a delay period before declaring the SR for TS equipment ''not met'' when the licensee inadvertently exceeds or misses the time limit for performing TS surveillance. Licensees have been applying SR 3.0.3 to inservice tests. The NRC has determined that licensees cannot use TS 5.5.6 to apply SR 3.0.3 to inservice tests under § 50.55a(f) that are not associated with a TS surveillance. To invoke SR 3.0.3, the licensee shall first discover that a TS surveillance was not performed at its specified frequency. Therefore, the delay period that SR 3.0.3 provides does not apply to non-TS support components tested under § 50.55a(f). The OM Code does not provide for any inservice test frequency reductions or extensions. In order to provide inservice test frequency reductions or extensions that can no longer be provided by SR 3.0.3 from TS 5.5.6, the ASME has developed OM Code Case OMN–20. The NRC has reviewed OM Code Case OMN–20 and has found it acceptable for use. The NRC determined that OM Code Case OMN–20 may be safely used for all licensees using editions and addenda of the OM Code that are listed in § 50.55a(a)(1)(iv). The NRC will include OM Code Case OMN–20 in the next revision of RG 1.192, at which time a conforming change will be made to delete both this paragraph and § 50.55a(a)(1)(iii)(G).

III. Opportunities for Public Participation

The proposed rule was published on September 18, 2015, for a 75-day comment period (80 FR 56820). The public comment period closed on December 2, 2015.

After the close of the public comment period, the NRC held a public meeting on March 2, 2016, to discuss the proposed rule, to answer questions on specific provisions of the proposed rule, and to discuss public comments received on the proposed rule in order to enhance the NRC's understanding of the comments. The public meeting summary is available in ADAMS under Accession No. ML16069A408.

IV. NRC Responses to Public Comments

The NRC received 27 letters and emails in response to the opportunity for public comment on the proposed rule. These comment submissions were submitted by the following commenters (listed in order of receipt):

1. Private citizen, Edward Cavey
2. Private citizen, Dale Matthews
3. Private citizen, Ron Clow
4. ASME
5. Iddeal Solutions, LLC
6. Electric Power Research Institute (EPRI)
7. Private citizen, William Taylor
8. ASME
9. Private citizen, Dan Nowakowski
10. Wolf Creek Nuclear Operating Corporation
11. Northern States Power Company—Minnesota
12. FirstEnergy Nuclear Operating Company
13. PSEG Nuclear
14. Dominion Resources Services, Inc.
15. Private citizen, Terence Chan
16. Nuclear Energy Institute
17. EPRI
18. Duke Energy
19. Private Citizen, William Taylor
20. Dominion Engineering, Inc.
21. Tennessee Valley Authority
22. Southern Nuclear Operating Company
23. Prairie Island Nuclear Plant
24. Inservice Test Owners Group
25. Exelon Generation Company
26. EPRI
27. EPRI

In general, the comments:

- Suggested revising or rewording conditions to make them clearer.
- Supported incorporation of Code Cases N–729–4, N–770–2, N–824, or OMN–20 into § 50.55a.
- Supported the proposed changes to add or remove conditions.
- Opposed proposed conditions.
- Supplied additional information for NRC consideration.
- Proposed rewriting or renumbering of paragraphs.

• Asked questions or requested information from the NRC.

Due to the large number of comments received and the length of the NRC's responses, this document summarizes the NRC's response to comments in areas of particular interest to stakeholders that prompted the NRC to make changes in this final rule from what was proposed. A discussion of all comments and complete NRC responses are presented in a separate document, ''2017 Final Rule (10 CFR 50.55a) American Society of Mechanical Engineers Codes and Code Cases: Analysis of Public Comments,'' (ADAMS Accession No. ML16130A531).

10 CFR 50.55a(a)(1)(ii), (b)(2); Nonmandatory Appendix U

Public commenters were concerned that the NRC was proposing to exclude incorporating by reference Nonmandatory Appendix U because Nonmandatory Appendix U is the incorporation of the provisions of ASME BPV Code Cases N–513–3 and N–705, without any technical changes, into the Section XI Code. The NRC agrees with this comment, in that ASME BPV Code Cases N–513–3 and N–705 have been approved in RG 1.147. Based on these comments, the NRC has removed the proposed exclusion of Nonmandatory Appendix U from this final rule. However, the NRC has found it necessary to apply two new conditions in § 50.55a(b)(2)(xxxiv)(A) and (B) to Nonmandatory Appendix U. The first condition provides regulatory consistency with the approval of the code cases in RG 1.147. The second condition requires the use of an Appendix from ASME BPV Code Case N–513–3 that was unintentionally omitted from Appendix U. The NRC discussed these changes at the March 2, 2016, public meeting, and the NRC considered the public feedback from that meeting when developing this final rule.

10 CFR 50.55a(b)(2)(xii), Underwater Welding

Public commenters were concerned that the proposed rule continued to prohibit the use of underwater welding in § 50.55a(b)(2)(xii), when changes were made to address this condition in the 2010 Edition of Section XI. The NRC agrees that the condition should be modified to address the changes in the Code. After consideration of the public comments, the NRC noted other inconsistencies for addressing welding on irradiated materials that appear in the Code and in some Code Cases. Section 50.55a(b)(2)(xii) of this final rule reflects a change to include two conditions that provide consistency for welding of irradiated materials. The NRC discussed these changes at the March 2, 2016, public meeting, and the NRC considered the public feedback from that meeting when developing this final rule.

10 CFR 50.55a(b)(2)(xxxi), Mechanical Clamping Devices

Public commenters were concerned that the wording of the proposed condition in § 50.55a(b)(2)(xxxi) was unclear and that citing the specific paragraphs of Section XI to which the NRC is taking exception would be clearer. The NRC agrees. To clarify the requirement for the implementation of mechanical clamps, the condition was changed to require the use of Appendix W of Section XI when using mechanical clamps. Additionally, use of IWA–4131.1(c) of the 2010 Edition of Section XI and IWA–4131.1(d) of the 2011 Addenda of the 2010 Edition and later versions of Section XI is prohibited. Identifying these specific subparagraphs was deemed necessary, as they may have caused confusion with the intended purpose of the original proposed condition in maintaining the previous regulatory requirements for mechanical clamping devices. Section 50.55a(b)(2)(xxxi) of this final rule reflects this change.

10 CFR 50.55a(b)(2)(xxxvii), ASME BPV Code Case N–824

Public commenters had concerns with conditions proposed on ASME BPV Code Case N–824, ''Ultrasonic Examination of Cast Austenitic Piping Welds From the Outside Surface Section XI, Division 1,'' in § 50.55a(b)(2)(xxxvii)(A) through (E). There were concerns that the conditions would limit the use of Code Case N–824 and that some conditions did not have a sufficient technical basis. The NRC partially agreed with the comments requesting the removal and modification of some conditions in § 50.55a(b)(2)(xxxvii) restricting the frequencies and angles usable on some cast austenitic welds. Based on the public comments, one condition was removed entirely and two others were modified. Section 50.55a(b)(2)(xxxvii)(A) through (D) of this final rule contain the modified and reduced conditions on the use of ASME BPV Code Case N–824. The NRC discussed these changes at the March 2, 2016, public meeting, and the NRC considered the public feedback from that meeting when developing this final rule.

10 CFR 50.55a(b)(3)(xi), OM Condition: Valve Position Indication

Public commenters raised concerns regarding the proposed condition in § 50.55a(b)(3)(xi) to emphasize the OM Code provisions in Subsection ISTC–3700, ''Position Verification Testing,'' to verify that valve operation is accurately indicated. Public commenters indicated that because of the significance of implementing the condition, some licensees might need time to revise or create procedures to govern the implementation of this condition. Public commenters also suggested that the condition be limited to active valves. The NRC partially agrees and partially disagrees with these comments. The NRC agrees that additional time to implement the condition regarding valve position verification is appropriate. Therefore, the NRC has revised the condition to indicate that it will be effective with implementation of the 2012 Edition of the OM Code. The NRC staff does not agree with the suggestion to limit the condition to active valves because the OM Code requires that passive valves undergo periodic verification of position indication.

V. Section-by-Section Analysis

Administrative Changes

The NRC is removing the revision number of the three RGs currently approved by the Office of the Federal Register for incorporation by reference throughout the substantive provisions of § 50.55a addressing the ASME Code Cases, *i.e.,* paragraphs (b) through (g). The revision numbers for the RGs approved for incorporation by reference (currently, RG 1.84, RG 1.147, and RG 1.192) will be retained in § 50.55a(a)(3)(i) through (iii), where the RGs are listed by full title, including revision number. That paragraph identifies the specific materials which the Office of the Federal Register has approved for incorporation by reference, as required by Office of the Federal Register requirements in 1 CFR 51.9. Readers would need to refer to § 50.55a(a) to determine the specific revision of the relevant RG that is approved for incorporation by reference by the Office of the Federal Register. These changes are administrative in nature and do not change substantive requirements with respect to the RGs and the Code Cases listed in the RGs.

10 CFR 50.55a(a) Documents Approved for Incorporation by Reference

The NRC is revising the incorporation by reference language to update the

contact information for the NRC Technical Library.

10 CFR 50.55a(a)(1)(i) ASME Boiler and Pressure Vessel Code, Section III

The NRC is revising § 50.55a(a)(1)(i) to clarify that Section III Nonmandatory Appendices of the listed editions and addenda are excluded from the incorporation by reference. The exclusion was originally added in a final rule published on June 21, 2011 (76 FR 36232); however, it was erroneously omitted from the final rule published on November 5, 2014 (79 FR 65776). The NRC is correcting the omission in this final rule by inserting ''(excluding Nonmandatory Appendices)'' in § 50.55a(a)(1)(i). The NRC is relocating the definition of the term ''BPV Code,'' which is used throughout the section, from § 50.55a(b) to § 50.55a(a)(1)(i).

10 CFR 50.55a(a)(1)(i)(E) ''Rules for Construction of Nuclear Facility Components—Division 1''

The NRC is revising § 50.55a(a)(1)(i)(E) to add ASME BPV Code, Section III 2009 Addenda, 2010 Edition, 2011 Addenda, and 2013 Edition.

10 CFR 50.55a(a)(1)(ii) ASME Boiler and Pressure Vessel Code, Section XI

The NRC is revising § 50.55a(a)(1)(ii) to include two minor editorial changes: to replace ''Boiler and Pressure Vessel Code'' with ''BPV Code'' and to replace ''limited to'' with ''limited by.''

10 CFR 50.55a(a)(1)(ii)(C)(52) and (53) ''Rules for Inservice Inspection of Nuclear Power Plant Components—Division 1''

The NRC is revising § 50.55a(a)(1)(ii)(C)(*52*) and (*53*) to add ASME BPV Code, Section XI 2009 Addenda, 2010 Edition, 2011 Addenda, and 2013 Edition. The examination requirements for Examination Category B–F, Item Numbers B5.11 and B5.71, Nozzle-to-Component Butt Welds in the 2011 Addenda and the 2013 Edition of ASME BPV Code, Section XI are expressly excluded from the incorporation by reference in § 50.55a(a)(1)(ii)(C)(*52*) and, therefore, not approved for use. Similarly, the requirements of IWB–3112(a)(3) and IWC–3112(a)(3) in the 2013 Edition of ASME BPV Code, Section XI are expressly excluded from the incorporation by reference in § 50.55a(a)(1)(ii)(C)(*53*) and are not approved for use.

10 CFR 50.55a(a)(1)(iii)(A) ASME BPV Code Case N–513–3 Mandatory Appendix I

The NRC is revising § 50.55a(a)(1)(iii)(A) to include information for a new standard that is being incorporated by reference, entitled, ''ASME BPV Code Case N–513–3 Mandatory Appendix I.''

10 CFR 50.55a(a)(1)(iii)(B) ASME BPV Code Case N–722–1

The NRC is revising § 50.55a(a)(1)(iii)(B) to maintain alphanumeric order for the ASME Code Cases listed in § 50.55a(a)(1)(iii). ASME BPV Code Case N–722–1 was previously approved for incorporation by reference.

10 CFR 50.55a(a)(1)(iii)(C) ASME BPV Code Case N–729–4

The NRC is revising § 50.55a(a)(1)(iii)(C) to add the title ''ASME BPV Code Case N–729–4,'' and include information for the standard that is being incorporated by reference.

10 CFR 50.55a(a)(1)(iii)(D) ASME BPV Code Case N–770–2

The NRC is adding § 50.55a(a)(1)(iii)(D) to add the title ''ASME BPV Code Case N–770–2,'' and include information for the standard that is being incorporated by reference.

10 CFR 50.55a(a)(1)(iii)(E) ASME BPV Code Case N–824

The NRC is adding § 50.55a(a)(1)(iii)(E) to include information for a new standard that is being incorporated by reference, entitled, ''ASME BPV Code Case N–824.''

10 CFR 50.55a(a)(1)(iii)(F) ASME BPV Code Case N–852

The NRC is adding § 50.55a(a)(1)(iii)(F) to include information for a new standard that is being incorporated by reference, entitled, ''ASME BPV Code Case N–852.''

10 CFR 50.55a(a)(1)(iii)(G) ASME OM Code Case OMN–20

The NRC is adding § 50.55a(a)(1)(iii)(G) to include information for a new standard that is being incorporated by reference, entitled, ''ASME OM Code Case OMN–20.''

10 CFR 50.55a(a)(1)(iv) ASME Operation and Maintenance Code

The NRC is revising § 50.55a(a)(1)(iv) to correct the title of the OM Code and to relocate the definition of the term ''OM Code,'' which is used throughout the section, from § 50.55a(b) to § 50.55a(a)(1)(iv).

10 CFR 50.55a(a)(1)(iv)(B) ''Operation and Maintenance of Nuclear Power Plants, Division 1: Section IST Rules for Inservice Testing of Light-Water Reactor Power Plants''

The NRC is adding new § 50.55a(a)(1)(iv)(B) to include ASME OM Code 2009 Edition and 2011 Addenda.

10 CFR 50.55a(a)(1)(iv)(C) ''Operation and Maintenance of Nuclear Power Plants, Division 1: OM Code: Section IST''

The NRC is adding new § 50.55a(a)(1)(iv)(C) to include ASME OM Code 2012 Edition.

10 CFR 50.55a(a)(1)(v) ASME Quality Assurance Requirements

The NRC is adding new § 50.55a(a)(1)(v) to include information regarding NQA–1 standards and add the title ''ASME Quality Assurance Requirements'' for ASME NQA–1 Code as part of NRC titling convention.

10 CFR 50.55a(b) Use and Conditions on the Use of Standards

The NRC is revising § 50.55a(b) to correct the title of the ASME OM Code.

10 CFR 50.55a(b)(1) Conditions on ASME BPV Code Section III

The NRC is revising § 50.55a(b)(1) to reflect the latest edition incorporated by reference, the 2013 Edition.

10 CFR 50.55a(b)(1)(ii) Section III Condition: Weld Leg Dimensions

The NRC is revising § 50.55a(b)(1)(ii) to clarify rule language and add Table I, which clarifies prohibited Section III provisions for welds with leg size less than 1.09 t_n in tabular form.

10 CFR 50.55a(b)(1)(iv) Section III Condition: Quality Assurance

The NRC is revising § 50.55a(b)(1)(iv) to clarify that it allows, but does not require, applicants and licensees to use the 2008 Edition through the 2009–1a Addenda of NQA–1 when applying the 2010 Edition and later editions of the ASME BPV Code, Section III, up to the 2013 Edition. Applicants and licensees are required to meet appendix B of 10 CFR part 50, and NQA–1 is one way of meeting portions of appendix B. An applicant or licensee may select any version of NQA–1 that has been approved for use in § 50.55a, but they must also use the administrative, quality, and technical provisions contained in the version of NCA–4000 referencing that Edition or Addenda of

NQA–1 selected by the applicant or licensee.

NQA–1 provides a method for establishing and implementing a QA program for the design and construction of nuclear power plants and fuel reprocessing plants; however, NQA–1, as modified and supplemented by NCA–4000, does not meet all of the requirements of appendix B to 10 CFR part 50.

Section 50.55a(b)(1)(iv) clarifies that applicants and licensees using NQA–1 are also required to meet appendix B to 10 CFR part 50 and the commitments contained in their QA program descriptions. To meet the requirements of appendix B, when using NQA–1 during the design and construction phase, applicants and licensees must address, in their quality program description, those areas where NQA–1 is insufficient to meet appendix B. Additional guidance and regulatory positions on how to meet appendix B when using NQA–1 are provided in RG 1.28, ''Quality Assurance Program Criteria (Design and Construction).''

10 CFR 50.55a(b)(1)(vii) Section III Condition: Capacity Certification and Demonstration of Function of Incompressible-Fluid Pressure-Relief Valves

The NRC is revising § 50.55a(b)(1)(vii) to reflect the editions and addenda of the ASME BPV Code incorporated by reference in this rulemaking.

10 CFR 50.55a(b)(1)(viii) Section III Condition: Use of ASME Certification Marks

The NRC is adding § 50.55a(b)(1)(viii) to allow licensees to use either the ASME BPV Code Symbol Stamp or ASME Certification Mark with the appropriate certification designator and class designator as specified in the 2013 Edition through the latest edition and addenda incorporated by reference in § 50.55a.

10 CFR 50.55a(b)(1)(ix) Section III Condition: NPT Code Symbol Stamps

The NRC is adding § 50.55a(b)(1)(ix) to allow licensees to use the NPT Code Symbol Stamp with the letters arranged horizontally as specified in ASME BPV Code Case N–852 for the service life of a component that had the NPT Code Symbol Stamp applied during the time period from January 1, 2005, through December 31, 2015.

10 CFR 50.55a(b)(2) Conditions on ASME BPV Code, Section XI

The NRC is revising § 50.55a(b)(2) to reflect the editions and addenda of the ASME BPV Code incorporated by reference in this rulemaking.

10 CFR 50.55a(b)(2)(vi) Section XI Condition: Effective Edition and Addenda of Subsection IWE and Subsection IWL

The NRC is revising § 50.55a(b)(2)(vi) to clarify that the provision applies only to the class of licensees of operating reactors that were required by previous versions of § 50.55a to develop and implement a containment ISI program in accordance with Subsection IWE and Subsection IWL, and complete an expedited examination of containment during the 5-year period from September 9, 1996 to September 9, 2001.

10 CFR 50.55a(b)(2)(viii) Section XI Condition: Concrete Containment Examinations

The NRC is revising § 50.55a(b)(2)(viii) by removing the condition for using the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWL requiring compliance with § 50.55a(b)(2)(viii)(E). To support the removal of the condition, the NRC is adding new requirements governing the performance and documentation of concrete containment examinations in § 50.55a(b)(2)(viii)(H) and (I), which are discussed separately in the next two headings.

10 CFR 50.55a(b)(2)(viii)(H) Concrete Containment Examinations: Eighth Provision

The NRC is adding § 50.55a(b)(2)(viii)(H) to require licensees to provide the applicable information specified in paragraphs (b)(2)(viii)(E)(*1*), (*2*), and (*3*) of this section in the ISI Summary Report required by IWA–6000 for each inaccessible concrete surface area evaluated under the new code provision IWL–2512 of the 2009 Addenda up to and including the 2013 Edition.

10 CFR 50.55a(b)(2)(viii)(I) Concrete Containment Examinations: Ninth Provision

The NRC is adding § 50.55a(b)(2)(viii)(I) to provide a new condition requiring the technical evaluation required by IWL–2512(b) of the 2009 Addenda up to and including the 2013 Edition of inaccessible below-grade concrete surfaces exposed to foundation soil, backfill, or groundwater be performed at periodic intervals not to exceed 5 years. In addition, the licensee must examine representative samples of the exposed portions of the below-grade concrete, when such below-grade concrete is excavated for any reason. The condition applies only to holders of renewed licenses under 10 CFR part 54 during the period of extended operation (*i.e.,* beyond the expiration date of the original 40-year license) of a renewed license when using IWL–2512(b) of the 2007 Edition with 2009 Addenda through the latest edition and addenda in § 50.55a(a)(1)(ii)—the 2013 Edition under this final rule.

10 CFR 50.55a(b)(2)(ix) Section XI Condition: Metal Containment Examinations

The NRC is revising § 50.55a(b)(2)(ix) to continue to apply the existing conditions in § 50.55a(b)(2)(ix)(A)(*2*) and (b)(2)(ix)(B) and (J) with respect to the metal containment examination requirements in Subsection IWE up to and including the 2013 Edition (and all future editions and addenda of the ASME BPV Code which the NRC incorporates by reference into § 50.55a). The NRC is accomplishing this by adding the words ''edition and'' to the last sentence in § 50.55a(b)(2)(ix).

10 CFR 50.55a(b)(2)(ix)(D) Metal Containment Examinations: Fourth Provision

The NRC is revising the rule text in § 50.55a(b)(2)(ix)(D) to improve clarity. Section 50.55a(b)(2)(ix)(D) introductory text and (b)(2)(ix)(D)(1) are combined. The information required to be included in the ISI Summary report is now all on the same paragraph level. No substantive change to the requirements is intended by this revision.

10 CFR 50.55a(b)(2)(x) Section XI Condition: Quality Assurance

The NRC is revising § 50.55a(b)(2)(x) to clarify that it allows, but does not require, licensees to use the 1994 Edition or the 2008 Edition through the 2009–1a Addenda of NQA–1 when applying the 2009 Addenda and later editions and addenda of the ASME BPV Code, Section XI, up to the 2013 Edition. Licensees are required to meet appendix B of 10 CFR part 50, and NQA–1 is one way of meeting portions of appendix B. A licensee may select any version of NQA–1 that has been approved for use in § 50.55a.

NQA–1 provides a method for establishing and implementing a QA program for the design and construction of nuclear power plants and fuel reprocessing plants; however, NQA–1 does not meet all of the requirements of appendix B to 10 CFR part 50. Section 50.55a(b)(2)(x) clarifies that licensees using NQA–1 are also required to meet appendix B to 10 CFR part 50 and the commitments contained in their QA program descriptions. To meet the

requirements of appendix B, when using NQA–1 during ISI phase, licensees must address, in their quality program description, those areas where NQA–1 is insufficient to meet appendix B. Additional guidance and regulatory positions on how to meet appendix B when using NQA–1 are provided in RG 1.28.

10 CFR 50.55a(b)(2)(xii) Section XI Condition: Underwater Welding

The NRC is revising § 50.55a(b)(2)(xii) to allow underwater welding on irradiated materials in accordance with IWA–4660 under certain conditions. Licensees are allowed to perform welding on irradiated materials if certain neutron fluence criteria and, for certain material classes, helium concentration criteria are not exceeded. If these criteria are exceeded, the licensee is prohibited from performing welding on irradiated materials unless the licensee obtains NRC approval in accordance with § 50.55a(z).

10 CFR 50.55a(b)(2)(xviii)(D) NDE Personnel Certification: Fourth Provision

The NRC is adding § 50.55a(b)(2)(xviii)(D) to provide a new condition prohibiting the use of Appendix VII and Subarticle VIII–2200 of the 2011 Addenda and 2013 Edition of Section XI of the ASME BPV Code. Licensees are required to implement Appendix VII and Subarticle VIII–2200 of the 2010 Edition of Section XI.

10 CFR 50.55a(b)(2)(xxi)(A) Table IWB–2500–1 Examination Requirements: First Provision

The NRC is revising § 50.55a(b)(2)(xxi)(A) to modify the standard for visual magnification resolution sensitivity and contrast for visual examinations performed on Examination Category B–D components instead of ultrasonic examinations. A visual examination with magnification that has a resolution sensitivity to resolve 0.044 inch (1.1 mm) lower case characters without an ascender or descender (*e.g.,* a, e, n, v), utilizing the allowable flaw length criteria in Table IWB–3512–1, 1997 Addenda through the latest edition and addenda incorporated by reference in § 50.55a(a)(1)(ii), with a limiting assumption on the flaw aspect ratio (*i.e.,* a/l = 0.5), may be performed instead of an ultrasonic examination. This revision removes a requirement that was in addition to the ASME BPV Code that required 1-mil wires to be used in licensees' Sensitivity, Resolution, and Contrast Standard targets.

10 CFR 50.55a(b)(2)(xxiii) Section XI Condition: Evaluation of Thermally Cut Surfaces

The NRC is revising § 50.55a(b)(2)(xxiii) to modify the applicability of the condition. The condition will only apply to the 2001 Edition through the 2009 Addenda IWA–4461.4, which was revised in the 2010 Edition to remove paragraph IWA–4461.4.2, which permitted an application specific evaluation of thermally cut surfaces in lieu of a thermal metal removal process qualification.

10 CFR 50.55a(b)(2)(xxxi) Section XI Condition: Mechanical Clamping Devices

The NRC is adding § 50.55a(b)(2)(xxxi) to provide a new condition maintaining the requirement to use Appendix IX, now renumbered as Appendix W, when installing a mechanical clamping device on an ASME BPV Code Class piping system. Additionally, the condition prohibits the use of mechanical clamping devices in accordance with the changes made to IWA–4131.1(c) in the 2010 Edition and IWA–4131.1(d) in the 2011 Addenda through 2013 Edition on small item Class 1 piping and portions of a piping system that form the containment boundary.

10 CFR 50.55a(b)(2)(xxxii) Section XI Condition: Summary Report Submittal

The NRC is adding § 50.55a(b)(2)(xxxii) to provide a new condition requiring licensees using the 2010 Edition or later editions and addenda of Section XI to follow the requirements of IWA–6240 of the 2009 Addenda of Section XI for the submittal of Preservice and Inservice Summary Reports. The condition also describes the timing of the submission of the Summary Reports by referencing the specific Section XI paragraph IWA–6240(b) in the regulation.

10 CFR 50.55a(b)(2)(xxxiii) Section XI Condition: Risk-Informed Allowable Pressure

The NRC is adding § 50.55a(b)(2)(xxxiii) to provide a new condition to prohibit the use of Appendix G, Paragraph G–2216, in the 2011 Addenda and later editions and addenda of the ASME BPV Code, Section XI.

10 CFR 50.55a(b)(2)(xxxiv) Section XI Condition: Nonmandatory Appendix U

The NRC is adding § 50.55a(b)(2)(xxxiv)(A) and (B) to require that two conditions be satisfied when using Nonmandatory Appendix U of the 2013 Edition of the ASME BPV Code, Section XI. Paragraph (b)(2)(xxxiv)(A) requires that an ASME BPV Code repair or replacement activity temporarily deferred under the provisions of Nonmandatory Appendix U to the 2013 Edition of the ASME BPV Code, Section XI, shall be performed during the next scheduled refueling outage. Paragraph (b)(2)(xxxiv)(B) requires the use of the mandatory appendix in ASME BPV Code Case N–513–3, in lieu of the appendix referenced in paragraph U–S1–4.2.1(c) of Appendix U, which was inadvertently omitted from Appendix U.

10 CFR 50.55a(b)(2)(xxxv) Section XI Condition: Use of RT_{T0} in the K_{Ia} and K_{Ic} Equations

The NRC is adding § 50.55a(b)(2)(xxxv) to provide a new condition to specify that when licensees use ASME BPV Code, Section XI, 2013 Edition, Appendix A, paragraph A–4200, if T_0 is available, then RT_{T0} may be used in place of RT_{NDT} for applications using the K_{Ic} equation and the associated K_{Ic} curve, but not for applications using the K_{Ia} equation and the associated K_{Ia} curve.

10 CFR 50.55a(b)(2)(xxxvi) Section XI Condition: Fracture Toughness of Irradiated Materials

The NRC is adding § 50.55a(b)(2)(xxxvi) to provide a new condition requiring licensees using ASME BPV Code, Section XI, 2013 Edition, Appendix A, paragraph A–4400, to obtain NRC approval under § 50.55a(z) before using irradiated T_0 and the associated RT_{T0} in establishing fracture toughness of irradiated materials.

10 CFR 50.55a(b)(2)(xxxvii) Section XI Condition: ASME BPV Code Case N–824

The NRC is adding § 50.55a(b)(2)(xxxvii) to provide a new provision that allows licensees to implement ASME BPV Code Case N–824, ''Ultrasonic Examination of Cast Austenitic Piping Welds From the Outside Surface Section XI, Division 1,'' subject to four conditions in paragraphs (b)(2)(xxxvii)(A) through (D). Each of these paragraphs are discussed in the following headings.

10 CFR 50.55a(b)(2)(xxxvii)(A) Section XI Condition: ASME BPV Code Case N–824

The NRC is adding § 50.55a(b)(2)(xxxvii)(A) to add a new condition that requires ultrasonic examinations performed to implement ASME BPV Code Case N–824 to be spatially encoded.

10 CFR 50.55a(b)(2)(xxxvii)(B) Section XI Condition: ASME BPV Code Case N–824

The NRC is adding § 50.55a(b)(2)(xxxvii)(B) to add a new condition that requires that ultrasonic examinations performed to implement ASME BPV Code Case N–824 shall use dual, transmit-receive, refracted longitudinal wave, multi-element phased array search units instead of the requirements of Paragraph 1(c)(1)(–a) of N–824.

10 CFR 50.55a(b)(2)(xxxvii)(C) Section XI Condition: ASME BPV Code Case N–824

The NRC is adding § 50.55a(b)(2)(xxxvii)(C) to add a new condition that requires that ultrasonic examinations performed to implement ASME BPV Code Case N–824 on piping greater than 1.6 inches (41 mm) thick shall use a phased array search unit with a center frequency of 500 kHz with a tolerance of + / − 20 percent instead of the requirements of Paragraph 1(c)(1)(–c)(–2).

10 CFR 50.55a(b)(2)(xxxvii)(D) Section XI Condition: ASME BPV Code Case N–824

The NRC is adding § 50.55a(b)(2)(xxxvii)(D) to add a new condition that requires that ultrasonic examinations performed to implement ASME BPV Code Case N–824 shall use a phased array search unit which produces angles including, but not limited to, 30 to 55 degrees with a maximum increment of 5 degrees instead of the requirements of Paragraph 1(c)(1)(–d).

10 CFR 50.55a(b)(3) Conditions on ASME OM Code

The NRC is revising § 50.55a(b)(3) to clarify that Subsections ISTA, ISTB, ISTC, ISTD, ISTE, and ISTF; Mandatory Appendices I, II, III, and V; and Nonmandatory Appendices A through H and J through M of the OM Code are each incorporated by reference into § 50.55a. The NRC is also clarifying that the OM Code Nonmandatory Appendices incorporated by reference into § 50.55a are approved for use, but are not mandated. The Nonmandatory Appendices may be used by applicants and licensees of nuclear power plants, subject to the conditions in § 50.55a(b)(3).

10 CFR 50.55a(b)(3)(i) OM Condition: Quality Assurance

The NRC is revising § 50.55a(b)(3)(i) to allow licensees to use the 1994 Edition, 2008 Edition, and 2009–1a Addenda of NQA–1 when using the 1995 Edition through the 2012 Edition of the OM Code. Licensees are required to meet appendix B to 10 CFR part 50, and NQA–1 is one way of meeting portions of appendix B.

NQA–1 provides a method for establishing and implementing a QA program for the design and construction of nuclear power plants and fuel reprocessing plants; however, NQA–1 does not meet all of the requirements of appendix B to 10 CFR part 50. Section 50.55a(b)(3)(i) clarifies that licensees using NQA–1 are also required to meet appendix B to 10 CFR part 50 and the commitments contained in their QA program descriptions. To meet the requirements of appendix B, licensees must address, in their quality program description, those areas where NQA–1 is insufficient to meet appendix B. Additional guidance and regulatory positions on how to meet appendix B when using NQA–1 are provided in RG 1.28.

10 CFR 50.55a(b)(3)(ii) OM Condition: Motor-Operated Valve (MOV) Testing

The NRC is revising § 50.55a(b)(3)(ii) to set forth four conditions on the use of mandatory Appendix III, ''Preservice and Inservice Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants,'' in the OM Code, 2009 Edition, 2011 Addenda, and 2012 Edition. The four conditions, which are set forth in paragraphs (b)(3)(ii)(A) through (D), are discussed in the next four headings.

10 CFR 50.55a(b)(3)(ii)(A) MOV Diagnostic Test Interval

The NRC is adding § 50.55a(b)(3)(ii)(A) to require that licensees evaluate the adequacy of the diagnostic test intervals established for MOVs within the scope of OM Code, Appendix III, not later than 5 years or three refueling outages (whichever is longer) from initial implementation of OM Code, Appendix III.

10 CFR 50.55a(b)(3)(ii)(B) MOV Testing Impact on Risk

The NRC is adding § 50.55a(b)(3)(ii)(B) to require that licensees ensure that the potential increase in CDF and LERF associated with the extension is acceptably small when extending exercise test intervals for high risk MOVs beyond a quarterly frequency. As specified in RG 1.192, when extending exercise test intervals for high risk MOVs beyond a quarterly frequency, licensees must ensure that the potential increase in CDF and risk associated with the extension is small and consistent with the intent of the Commission's Safety Goal Policy Statement. As discussed earlier in Section II, the NRC provides guidance in RG 1.174 that acceptably small changes are relative and depend on the current plant CDF and LERF. For plants with total baseline CDF of 10^{-4} per year or less, acceptably small means CDF increases of up to 10^{-5} per year; and for plants with total baseline CDF greater than 10^{-4} per year, acceptably small means CDF increases of up to 10^{-6} per year. For plants with total baseline LERF of 10^{-5} per year or less, acceptably small LERF increases are considered to be up to 10^{-6} per year; and for plants with total baseline LERF greater than 10^{-5} per year, acceptably small LERF increases are considered to be up to 10^{-7} per year.

10 CFR 50.55a(b)(3)(ii)(C) MOV Risk Categorization

The NRC is adding § 50.55a(b)(3)(ii)(C) to require, when applying Appendix III to the OM Code, that licensees categorize MOVs according to their safety significance using the methodology described in OM Code Case OMN–3 subject to the conditions discussed in RG 1.192, or using an MOV risk ranking methodology accepted by the NRC on a plant-specific or industry-wide basis in accordance with the conditions in the applicable safety evaluation.

10 CFR 50.55a(b)(3)(ii)(D) MOV Stroke Time

The NRC is adding § 50.55a(b)(3)(ii)(D) to require, when applying Paragraph III–3600, ''MOV Exercising Requirements,'' of Appendix III to the OM Code, licensees shall verify that the stroke time of MOVs specified in plant technical specifications satisfies the assumptions in the plant's safety analyses.

10 CFR 50.55a(b)(3)(iii) OM Condition: New Reactors

The NRC is adding § 50.55a(b)(3)(iii) to specify that, in addition to complying with the provisions in the OM Code as required with the conditions specified in § 50.55a(b)(3), holders of operating licenses for nuclear power reactors that received construction permits under this part on or after the date 12 months after August 17, 2017, and holders of COLs issued under 10 CFR part 52, whose initial fuel loading occurs on or after the date 12 months after August 17, 2017, shall also comply with four condition on power-operated valves, check valves, flow-induced vibration, and operational readiness of high-risk non-safety systems, to the extent applicable. These four conditions, which are set forth in

§ 50.55a(b)(3)(iii)(A), (B), (C), and (D), are discussed in the next four headings.

10 CFR 50.55a(b)(3)(iii)(A) Power-Operated Valves (First Condition on New Reactors)

The NRC is adding § 50.55a(b)(3)(iii)(A) to require that licensees subject to § 50.55a(b)(3)(iii) periodically verify the capability of power-operated valves (POVs) to perform their design-basis safety functions.

10 CFR 50.55a(b)(3)(iii)(B) Check Valves (Second Condition on New Reactors)

The NRC is adding § 50.55a(b)(3)(iii)(B) to require that licensees subject to § 50.55a(b)(3)(iii) perform bi-directional testing of check valves within the IST program where practicable.

10 CFR 50.55a(b)(3)(iii)(C) Flow-Induced Vibration (Third Condition on New Reactors)

The NRC is adding § 50.55a(b)(3)(iii)(C) to require that licensees subject to § 50.55a(b)(3)(iii) monitor flow-induced vibration (FIV) from hydrodynamic loads and acoustic resonance during preservice testing or inservice testing to identify potential adverse flow effects that might impact components within the scope of the IST program.

10 CFR 50.55a(b)(3)(iii)(D) High Risk Non-Safety Systems (Fourth Condition on New Reactors)

The NRC is adding § 50.55a(b)(3)(iii)(D) to require that licensees subject to § 50.55a(b)(3)(iii) establish a program to assess the operational readiness of pumps, valves, and dynamic restraints within the scope of the Regulatory Treatment of Non-Safety Systems for applicable reactor designs. As of the time of this final rule, these are designs which have been certified in a design certification rule under 10 CFR part 52. This final rule refers to these RTNSS components using the term, ''high risk non-safety systems.''

As noted by the public commenters, ASME is preparing guidance for new reactor licensees to use in developing programs for the treatment of RTNSS equipment. The NRC staff is participating on the OM Code committees to assist in developing guidance for the treatment of RTNSS equipment that is consistent with Commission policy. Guidance on the implementation of the Commission policy for RTNSS equipment is set forth in NRC Inspection Procedure 73758, ''Part 52, Functional Design and Qualification, and Preservice and Inservice Testing Programs for Pumps, Valves and Dynamic Restraints,'' dated April 19, 2013.

10 CFR 50.55a(b)(3)(iv) OM Condition: Check Valves (Appendix II)

The NRC is revising § 50.55a(b)(3)(iv) to extend the existing conditions on the use of Appendix II to the new Editions and Addenda which are the subject of this rulemaking. These conditions are that: (i) Trending and evaluation shall support the determination that the valve or group of valves is capable of performing its intended function(s) over the entire interval; and (ii) at least one of the Appendix II condition monitoring activities for a valve group shall be performed on each valve of the group at approximate equal intervals not to exceed the maximum interval shown in the following table:

MAXIMUM INTERVALS FOR USE WHEN APPLYING INTERVAL EXTENSIONS

Group size	Maximum interval between activities of member valves in the groups (years)	Maximum interval between activities of each valve in the group (years)
≥4	4.5	16
3	4.5	12
2	6	12
1	Not applicable	10

The conditions currently specified for the use of Appendix II, 1995 Edition with the 1996 and 1997 Addenda, and 1998 Edition through the 2002 Addenda, of the OM Code remain the same in this final rule.

10 CFR 50.55a(b)(3)(vii) OM Condition: Subsection ISTB

The NRC is adding § 50.55a(b)(3)(vii) to prohibit the use of Subsection ISTB in the 2011 Addenda to the OM Code.

10 CFR 50.55a(b)(3)(viii) OM Condition: Subsection ISTE

The NRC is adding § 50.55a(b)(3)(viii) to specify that licensees who wish to implement Subsection ISTE, ''Risk-Informed Inservice Testing of Components in Light-Water Reactor Nuclear Power Plants,'' of the OM Code, 2009 Edition, 2011 Addenda, and 2012 Edition, must first request and obtain NRC approval in accordance with § 50.55a(z) to apply Subsection ISTE on a plant-specific basis as a risk-informed alternative to the applicable IST requirements in the OM Code.

The NRC will evaluate § 50.55a(z) requests for approval to implement Subsection ISTE in accordance with the following considerations. These considerations are consistent with the guidance provided in RG 1.174.

1. Scope of Risk-Informed IST Program

Subsection ISTE–1100, ''Applicability,'' establishes the component safety categorization methodology and process for dividing the population of pumps and valves, as identified in the IST Program Plan, into high safety significant component (HSSC) and low safety significant component (LSSC) categories. When establishing a risk-informed IST program, the licensee should address a wide range of components important to safety at the nuclear power plant that includes both safety-related and nonsafety-related components. These components might extend beyond the scope of the OM Code.

2. Risk-Ranking Methodology

The licensee should specify, in its request for authorization to implement a risk-informed IST program, the methodology to be applied in risk ranking its components. ISTE–4000, ''Specific Component Categorization Requirements,'' incorporates OM Code Case OMN–3 for the categorization of pumps and valves in developing a risk-informed IST program. The OMN–3 Code Case methodology for risk ranking uses two categories of safety

significance. The NRC staff has also accepted other methodologies for risk ranking that use three categories of safety significance.

3. Safety Significance Categorization

The licensee should categorize components according to their safety significance based on the methodology described in Subsection ISTE with the applicable conditions on the use of OM Code Case OMN–3 specified in RG 1.192, or use other risk ranking methodologies accepted by the NRC on a plant-specific or industry-wide basis with applicable conditions specified by the NRC for their acceptance. The licensee should address the seven conditions in RG 1.192 for the use of OM Code Case OMN–3, as appropriate, in developing the risk-informed IST program described in Subsection ISTE. With respect to the provisions in Subsection ISTE, these conditions are:

(a) The implementation of ISTE–1100 should include within the scope of a licensee's risk-informed IST program non-ASME OM Code pumps and valves categorized as HSSCs that might not currently be included in the IST program at the nuclear power plant.

(b) The decision criteria discussed in ISTE–4410, ''Decision Criteria,'' and Nonmandatory Appendix L, ''Acceptance Guidelines,'' of the OM Code for evaluating the acceptability of aggregate risk effects (*i.e.,* for CDF and LERF) should be consistent with the guidance provided in RG 1.174, ''An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis.''

(c) The implementation of ISTE–4440, ''Defense in Depth,'' should be consistent with the guidance contained in Section 2.2.1, ''Defense-in-Depth Evaluation,'' and Section 2.2.2, ''Safety Margin Evaluation,'' of RG 1.175, ''An Approach for Plant-Specific, Risk-Informed Decisionmaking: Inservice Testing.''

(d) The implementation of ISTE–4500, ''Inservice Testing Program,'' and ISTE–6100, ''Performance Monitoring,'' should be consistent with the guidance contained in Section 3.2, ''Program Implementation,'' and Section 3.3, ''Performance Monitoring,'' of RG 1.175.

(e) The implementation of ISTE–3210, ''Plant-Specific PRA,'' should be consistent with the guidance that the Owner is responsible for demonstrating and justifying the technical adequacy of the PRA analyses used as the basis to perform component risk ranking and for estimating the aggregate risk impact. For example, RG 1.200, ''An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities,'' and RG 1.201, ''Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to their Safety Significance,'' provide guidance for PRA technical adequacy and component risk ranking.

(f) The implementation of ISTE–4240, ''Reconciliation,'' should specify that the expert panel may not classify components that are ranked HSSC by the results of a qualitative or quantitative PRA evaluation (excluding the sensitivity studies) or the defense-in-depth assessment to LSSC.

(g) The implementation of ISTE–3220, ''Living PRA,'' should be consistent with the following: (i) To account for potential changes in failure rates and other changes that could affect the PRA, changes to the plant must be reviewed and, as appropriate, the PRA updated; (ii) when the PRA is updated, the categorization of structures, systems, and components must be reviewed and changed, if necessary, to remain consistent with the categorization process; and (iii) the review of the plant changes must be performed in a timely manner and must be performed once every two refueling outages, or as required by § 50.71(h)(2) for COL holders.

4. Pump Testing

Subsection ISTE–5100, ''Pumps,'' incorporates OM Code Case OMN–7 for risk-informed testing of pumps categorized as LSSCs. Subsection ISTE–5100 allows the interval for Group A and Group B testing of LSSC pumps specified in Subsection ISTB of the OM Code to be extended from the current 3-month interval to intervals of 6 months or 2 years. Subsection ISTE–5100 eliminates the requirement in Subsection ISTB to perform comprehensive pump testing for LSSC pumps. Table ISTE–5121–1, ''LSSC Pump Testing,'' specifies that pump operation may be required more frequently than the specified test frequency (6 months) to meet vendor recommendations. Subsection ISTE–4500, ''Inservice Testing Program,'' specifies in ISTE–4510, ''Maximum Testing Interval,'' that the maximum testing interval shall be based on the more limiting of (a) the results of the aggregate risk, or (b) the performance history of the component. ISTE–5130, ''Maximum Test Interval—Pre-2000 Plants,'' specifies that the most limiting interval for LSSC pump testing shall be determined from ISTE–4510 and ISTE–5120, ''Low Safety Significant Pump Testing.'' The ASME developed the comprehensive pump test requirements in the OM Code to address weaknesses in the Code requirements to assess the operational readiness of pumps to perform their design-basis safety function. Therefore, the licensee should ensure that testing under Subsection ISTE will provide assurance of the operational readiness of pumps in each safety significant categorization to perform their design-basis safety function as described in RGs 1.174 and 1.175.

5. Motor-Operated Valve Testing

Subsection ISTE–5300, ''Motor Operated Valve Assemblies,'' provides a risk-informed IST approach instead of the IST requirements for MOVs in Mandatory Appendix III to the OM Code. The ASME prepared Appendix III to the OM Code to replace the requirement for quarterly stroke-time testing of MOVs with a program of periodic exercising and diagnostic testing to address lessons learned from nuclear power plant operating experience and industry and regulatory research programs for MOV performance. Subsection ISTC of the OM Code specifies the implementation of Appendix III for periodic exercising and diagnostic testing of MOVs to replace quarterly stroke-time testing previously required for MOVs. Appendix III incorporates provisions that allow a risk-informed IST approach for MOVs as described in OM Code Cases OMN–1 and OMN–11. Subsection ISTE–5300 is not consistent with the provisions for the risk-informed IST program for MOVs specified in Appendix III to the OM Code (and Code Cases OMN–1 and 11). Therefore, licensees who wish to implement Subsection ISTE should address the provisions in paragraph III–3700, ''Risk-Informed MOV Inservice Testing,'' of Appendix III to the OM Code as incorporated by reference in § 50.55a, with the applicable conditions, instead of ISTE–5300.

6. Pneumatically and Hydraulically Operated Valve Testing

Subsection ISTE–5400, ''Pneumatically and Hydraulically Operated Valves,'' specifies that licensees test their AOVs and HOVs in accordance with Appendix IV to the OM Code. Subsection ISTE–5400 indicates that Appendix IV is in the course of preparation. The NRC staff will need to review Appendix IV prior to accepting its use as part of Subsection ISTE. Therefore, licensees who wish to implement Subsection ISTE should describe the planned IST provisions for AOVs and HOVs in its request for approval to implement Subsection ISTE.

7. Pump Periodic Verification Test

Subsection ISTE does not include a requirement to implement the pump periodic verification test program specified in Mandatory Appendix V to the OM Code, 2012 Edition. Therefore, licensee should address the consideration of a pump periodic verification test program in its risk-informed IST program, proposed as part of the authorization request to implement Subsection ISTE.

10 CFR 50.55a(b)(3)(ix) OM Condition: Subsection ISTF

The NRC is adding § 50.55a(b)(3)(ix) to specify that licensees applying Subsection ISTF, ''Inservice Testing of Pumps in Light-Water Reactor Nuclear Power Plants—Post-2000 Plants,'' in the 2012 Edition of the OM Code shall satisfy the requirements of Mandatory Appendix V, ''Pump Periodic Verification Test Program,'' of the OM Code, 2012 Edition. The paragraph also states that Subsection ISTF, 2011 Addenda, is not acceptable for use.

10 CFR 50.55a(b)(3)(x) OM Condition: ASME OM Code Case OMN–20

The NRC is adding § 50.55a(b)(3)(x) to allow licensees to implement OM Code Case OMN–20, ''Inservice Test Frequency,'' in the OM Code, 2012 Edition, for the editions and addenda of the OM Code that are listed in § 50.55a(a)(1)(iv).

10 CFR 50.55a(b)(3)(xi) OM Condition: Valve Position Indication

The NRC is adding § 50.55a(b)(3)(xi) to emphasize the provisions in the OM Code, 2012 Edition, Subsection ISTC–3700, ''Position Verification Testing,'' to verify that valve obturator position is accurately indicated. The OM Code, Subsection ISTC–3700 requires valves with remote position indicators shall be observed locally at least once every 2 years to verify that valve operation is accurately indicated. Licensees will be required to implement the condition when adopting the 2012 Edition of the OM Code as their Code of Record for the applicable 120-month IST interval.

10 CFR 50.55a(f) Preservice and Inservice Testing Requirements

The NRC is revising the heading for § 50.55a(f) and clarifying that the OM Code includes provisions for preservice testing of components as part of its overall provisions for IST programs.

10 CFR 50.55a(f)(4) Inservice Testing Standards Requirement for Operating Plants

The NRC is revising § 50.55a(f)(4) to ensure that the paragraph is applicable to pumps and valves that are within the scope of the OM Code. The NRC is also including an additional provision in § 50.55a(f)(4) stating that the IST requirements for pumps and valves that are within the scope of the OM Code but are not classified as ASME BPV Code Class 1, Class 2, or Class 3 may be satisfied as an augmented IST program, in accordance with § 50.55a(f)(6)(ii), without requesting relief under § 50.55a(f)(5) or alternatives under § 50.55a(z). This use of an augmented IST program may be acceptable provided the basis for deviations from the OM Code, as incorporated by reference in this section, demonstrates an acceptable level of quality and safety, or that implementing the Code provisions would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, where documented and available for NRC review. These changes align the scope of pumps and valves for inservice testing with the scope defined in the OM Code without imposing an unnecessary paperwork burden on nuclear power plant licensees for the submittal of relief and alternative requests for pumps and valves within the scope of the OM Code but not classified as ASME BPV Code Class 1, Class 2, or Class 3 components.

10 CFR 50.55a(g) Preservice and Inservice Inspection Requirements

The NRC is revising the heading in § 50.55a(g), adding new paragraphs (g)(2)(i), (ii), and (iii), and revising current paragraphs (g) introductory text, (g)(2), (g)(3) introductory text, and (g)(3)(i), (ii), and (v) to distinguish the requirements for accessibility, preservice examination, and inservice inspection. No substantive change to the requirements is intended by these revisions.

10 CFR 50.55a(g)(4) Inservice Inspection Standards Requirement for Operating Plants

The NRC is revising § 50.55a(g)(4)(ii) to add an implementation period of 18-months for licensees whose ISI interval commences during the 12 through 18-month period after the publication of this final rule. The NRC is also revising § 50.55a(g)(4)(i) and (ii) to add a provision allowing licensees to adopt the latest version of Appendix VIII of the ASME BPV Code edition or addenda listed in § 50.55a(a)(1) at any time in the licensee's 120-month ISI interval.

10 CFR 50.55a(g)(6)(ii)(D) Augmented ISI Requirements: Reactor Vessel Head Inspections

The NRC is revising § 50.55a(g)(6)(ii)(D) to reflect the NRC's approval of ASME BPV Code Case N–729–4, which supersedes the NRC's earlier approval of ASME BPV Code Case N–729–1. The revisions include changes to the conditions governing the use of the Code Case to reflect the change from N–729–1 to N–729–4. The effect of these changes is to require licensees to implement an augmented ISI program for the examination of the pressurized water reactor RPV upper head penetrations. The following discussions provide a more detailed discussion of the revisions to § 50.55a(g)(6)(ii)(D).

10 CFR 50.55a(g)(6)(ii)(D)(1) Implementation

The NRC is revising § 50.55a(g)(6)(ii)(D)(*1*) to require licensees to implement an augmented ISI program for the examination of the pressurized water reactor RPV upper head penetrations meeting ASME BPV Code Case N–729–4 instead of the previously approved requirements to use ASME BPV Code Case N–729–1, as conditioned by the NRC.

Removal of Existing Conditions in 10 CFR 50.55a(g)(6)(ii)(D)(2) Through (5)

The NRC is removing the existing conditions in § 50.55a(g)(6)(ii)(D)(*2*) through (*5*) and redesignating the existing condition in § 50.55a(g)(6)(ii)(D)(*6*) as § 50.55a(g)(6)(ii)(D)(*2*).

10 CFR 50.55a(g)(6)(ii)(D)(2) Appendix I Use

The NRC is revising the existing condition in § 50.55a(g)(6)(ii)(D)(*6*), which is redesignated as § 50.55a(g)(6)(ii)(D)(*2*) in this final rule, to require NRC approval prior to implementing Appendix I of ASME BPV Code Case N–729–4.

10 CFR 50.55a(g)(6)(ii)(D)(3) Bare Metal Visual Frequency

The NRC is adding a new condition in § 50.55a(g)(6)(ii)(D)(*3*) which requires cold head plants with less than eight effective degradation years (EDY<8) without PWSCC flaws to perform a bare metal visual examination (VE) each outage a volumetric exam is not performed and allows these plants to extend the bare metal visual inspection frequency from once each refueling outage, as stated in Table 1 of N–729–4, to once every 5 years, only if the licensee performed a wetted surface examination of all of the partial

penetration welds during the previous volumetric examination. In addition, this new condition clarifies that a bare metal visual examination is not required during refueling outages when a volumetric or surface examination is performed of the partial penetration welds.

10 CFR 50.55a(g)(6)(ii)(D)(4) Surface Exam Acceptance Criteria

The NRC is adding a new condition in § 50.55a(g)(6)(ii)(D)(*4*) clarifying that rounded indications found by surface examinations of the partial-penetration or associated fillet welds in accordance with N–729–4 must meet the acceptance criteria for surface examinations of paragraph NB–5352 of ASME 2013 Edition of Section III for the licensee's ongoing 10-year ISI interval.

10 CFR 50.55a(g)(6)(ii)(F)(1) Implementation

The NRC is revising § 50.55a(g)(6)(ii)(F)(*1*) to require licensees to implement an augmented ISI program for the examination of ASME Class 1 piping and nozzle butt welds meeting ASME BPV Code Case N–770–2 instead of the previously approved ASME BPV Code Case N–770–1.

Furthermore, the NRC is revising § 50.55a(g)(6)(ii)(F)(*1*) to update the date of applicability for pressurized water reactors, to note the change to implement ASME BPV Code Case N–770–2 instead of N–770–1, and to reflect the number of conditions which must be applied.

10 CFR 50.55a(g)(6)(ii)(F)(2) Categorization

The NRC is revising § 50.55a(g)(6)(ii)(F)(*2*) to clarify the requirements for licensees to establish the initial categorization of each weld and modify the wording to reflect the ASME BPV Code Case N–770–2 change in the inspection item category for full structural weld overlays (C to C–1 and F to F–1). Additionally, the NRC is adding a sentence which clarifies the NRC position that Paragraph –1100(e) of ASME BPV Code Case N–770–2 shall not be used to exempt welds that rely on Alloy 82/182 for structural integrity from any requirement of § 50.55a(g)(6)(ii)(F).

10 CFR 50.55a(g)(6)(ii)(F)(3) Baseline Examinations

The NRC is revising § 50.55a(g)(6)(ii)(F)(*3*) to clarify the current requirement in this paragraph to complete baseline examinations by stating that previously-conducted examinations, in order to count as baseline examinations, must meet the requirements of ASME BPV Code Case N–770–2, as conditioned in this section. Additionally, this condition clarifies that the examination coverage requirements, for a licensee to count previous inspections as baseline examinations, must meet the examination coverage requirements described in Paragraphs –2500(a) or –2500(b) of ASME BPV Code Case N–770–2, as conditioned by the NRC in this section. Upon implementation of this rule, if a licensee is currently in an outage, then the baseline inspection requirement can be met by performing the inspections in accordance with the previous regulatory requirements of § 50.55a(g)(6)(ii)(F), in lieu of the examination requirements of Paragraphs –2500(a) or –2500(b) of ASME BPV Code Case N–770–2.

10 CFR 50.55a(g)(6)(ii)(F)(4) Examination Coverage

The NRC is revising § 50.55a(g)(6)(ii)(F)(*4*) to clarify that when licensees are implementing paragraph –2500(a) of ASME BPV Code Case N–770–2, essentially 100 percent of the required volumetric examination coverage shall be obtained, including greater than 90 percent volumetric examination coverage is obtained for circumferential flaws, to continue the restriction on the licensee's use of Paragraph –2500(c) and to continue the restriction that the use of new Paragraph –2500(d) of ASME BPV Code Case N–770–2 is not allowed without prior NRC review and approval in accordance with § 50.55a(z), as it would permit a reduction in volumetric examination coverage for circumferential flaws. However, a licensee may request approval for use of these paragraphs under § 50.55a(z), and the NRC may approve the request if technically justified.

10 CFR 50.55a(g)(6)(ii)(F)(5) Inlay/Onlay Inspection Frequency

The NRC is revising § 50.55a(g)(6)(ii)(F)(*5*) to add an explanatory heading, ''Inlay/onlay inspection frequency,'' and to make minor editorial corrections without substantive changes in the requirement.

10 CFR 50.55a(g)(6)(ii)(F)(6) Reporting Requirements

The NRC is revising § 50.55a(g)(6)(ii)(F)(*6*) to add an explanatory heading, ''Reporting requirements.''

10 CFR 50.55a(g)(6)(ii)(F)(7) Defining ''t''

The NRC is revising § 50.55a(g)(6)(ii)(F)(*7*) to add an explanatory heading, ''Defining 't'.''

10 CFR 50.55a(g)(6)(ii)(F)(8) Optimized Weld Overlay Examination

The NRC is revising § 50.55a(g)(6)(ii)(F)(*8*) to add an explanatory heading, ''Optimized weld overlay examination,'' and to continue the current condition located in § 50.55a(g)(6)(ii)(F)(*9*) which requires that the initial examination of optimized weld overlays (*i.e.,* Inspection Item C–2 of ASME BPV Code Case N–770–2) be performed between the third refueling outage and no later than 10 years after application of the overlay and delete the other current examination requirements for optimized weld overlay examination frequency, as these requirements were included in the revision from N–770–1 to N–770–2.

10 CFR 50.55a(g)(6)(ii)(F)(9) Deferral

The NRC is revising § 50.55a(g)(6)(ii)(F)(*9*) to add an explanatory heading, ''Deferral,'' and to modify the current condition to continue denial of the deferral of the initial inservice examination of uncracked welds mitigated by optimized weld overlays. These welds shall continue to have their initial inservice examinations as prescribed in N–770–1 within 10 years of the application of the optimized weld overlay and not allow deferral of this initial examination. Subsequent inservice examinations may be deferred as allowed by N–770–2. Additionally, the modified condition will delete the current condition on examination requirements for the deferral of welds mitigated by inlay, onlay, stress improvement and optimized weld overlay, as these requirements were, with one exception (*i.e.,* optimized weld overlay), included in the revision from N–770–1 to N–770–2.

10 CFR 50.55a(g)(6)(ii)(F)(10) Examination Technique

The NRC is revising § 50.55a(g)(6)(ii)(F)(*10*) to add an explanatory heading, ''Examination technique,'' and to modify the current condition to allow the previously prohibited alternate examination requirements of Note (b) of Figure 5(a) of ASME BPV Code Cases N–770–1 and N–770–2 and the same requirements in Note 14(b) of Table 1 of ASME BPV Code Case N–770–2 for optimized weld overlays only if the full examination requirements of Note 14(a) of Table 1 of

ASME BPV Code Case N–770–2 cannot be met.

10 CFR 50.55a(g)(6)(ii)(F)(11) Cast Stainless Steel

The NRC is adding § 50.55a(g)(6)(ii)(F)(*11*) to provide a new condition requiring licensees to establish a Section XI, Appendix VIII, qualification requirement for ultrasonic inspection of cast stainless steel and through cast stainless steel to meet the examination requirements of Paragraph –2500(a) of ASME BPV Code Case N–770–2 by January 1, 2022.

10 CFR 50.55a(g)(6)(ii)(F)(12) Stress Improvement Inspection Coverage

The NRC is adding § 50.55a(g)(6)(ii)(F)(*12*) to provide a new condition that would allow licensees to implement a stress improvement mitigation technique for items containing cast stainless steel that would meet the requirements of Appendix I of ASME BPV Code Case N–770–2, if the required examination volume can be examined by Appendix VIII procedures to the maximum extent practical including 100 percent of the susceptible material volume.

10 CFR 50.55a(g)(6)(ii)(F)(13) Encoded Ultrasonic Examination

The NRC is adding § 50.55a(g)(6)(ii)(F)(*13*) to provide a new condition requiring licensees to perform encoded examinations of 100 percent of the required inspection volume when required to perform volumetric examinations of all non-mitigated and cracked mitigated butt welds in the reactor coolant pressure boundary in accordance with ASME BPV Code Case N–770–2.

VI. Generic Aging Lessons Learned Report

Background

In December 2010, the NRC issued NUREG–1801, Revision 2, for applicants to use in preparing their license renewal applications. The GALL Report provides aging management programs (AMPs) that the NRC staff has concluded are sufficient for aging management in accordance with the license renewal rule, as required in § 54.21(a)(3). In addition, NUREG–1800, Revision 2, ''Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants,'' was issued in December 2010 to ensure the quality and uniformity of NRC staff reviews of license renewal applications and to present a well-defined basis on which the NRC staff evaluates the applicant's aging management programs and activities. In April 2011, the NRC issued NUREG–1950, ''Disposition of Public Comments and Technical Bases for Changes in the License Renewal Guidance Documents NUREG–1801 and NUREG–1800,'' which describes the technical bases for the changes in Revision 2 of the GALL Report and Revision 2 of the SRP for review of license renewal applications. Revision 2 of the GALL Report, in Sections XI.M1, XI.S1, XI.S2, and XI.S3, describes the evaluation and technical bases for determining the sufficiency of ASME BPV Code Subsections IWB, IWC, IWD, IWE, IWF, and IWL for managing aging during the period of extended operation. In addition, many other AMPs in the GALL Report rely, in part but to a lesser degree, on the requirements specified in the ASME BPV Code, Section XI. Revision 2 of the GALL Report also states that the 1995 Edition through the 2004 Edition of the ASME BPV Code, Section XI, Subsections IWB, IWC, IWD, IWE, IWF, and IWL, as modified and limited by § 50.55a, were found to be acceptable editions and addenda for complying with the requirements of § 54.21(a)(3), unless specifically noted in certain sections of the GALL Report. The GALL Report further states that the future **Federal Register** notices that amend § 50.55a will discuss the acceptability of editions and addenda more recent than the 2004 edition for their applicability to license renewal.

In a final rule issued on June 21, 2011 (76 FR 36232), subsequent to Revision 2 of the GALL Report, the NRC found that the 2004 Edition with the 2005 Addenda through the 2007 Edition with the 2008 Addenda of Section XI of the ASME BPV Code, Subsections IWB, IWC, IWD, IWE, IWF, and IWL, as subject to the conditions in § 50.55a, are acceptable for the AMPs in the GALL Report and the conclusions of the GALL Report remain valid with the augmentations specifically noted in the GALL Report.

Evaluation With Respect to Aging Management

As part of this rulemaking, the NRC evaluated whether those AMPs in Revision 2 of the GALL Report which rely upon Subsections IWB, IWC, IWD, IWE, IWF, and IWL of Section XI in the editions and addenda of the ASME BPV Code incorporated by reference into § 50.55a, continue to be acceptable if the AMP relies upon the versions of these Subsections in the 2007 Edition with the 2009 Addenda through the 2013 Edition. The NRC finds that the 2007 Edition with the 2009 Addenda through the 2013 Edition of Section XI of the ASME BPV Code, Subsections IWB, IWC, IWD, IWE, IWF, and IWL, as subject to the conditions of this rule, are acceptable for the AMPs in the GALL Report and the conclusions of the GALL Report remain valid with the augmentations specifically noted in the GALL Report. Accordingly, an applicant for license renewal may use, in its plant-specific license renewal application, Subsections IWB, IWC, IWD, IWE, IWF, and IWL of Section XI of the 2007 Edition with the 2009 Addenda through the 2013 Edition of the ASME BPV Code, as subject to the conditions in this rule, without additional justification.

Similarly, a licensee approved for license renewal that relied on the GALL AMPs may use Subsections IWB, IWC, IWD, IWE, IWF, and IWL of Section XI of the 2007 Edition with the 2009 Addenda through the 2013 Edition of the ASME BPV Code. However, a licensee must assess and follow applicable NRC requirements with regard to changes to its licensing basis. Some of the AMPs in the GALL Report recommend augmentation of certain Code requirements in order to ensure adequate aging management for license renewal. The technical and regulatory aspects of the AMPs for which augmentations are recommended also apply if the editions or addenda from the 2007 Edition with the 2009 Addenda through the 2013 Edition of Section XI of the ASME BPV Code are used to meet the requirements of § 54.21(a)(3). The NRC staff evaluated the changes in the 2007 Edition with the 2009 Addenda through the 2013 Edition of Section XI of the ASME BPV Code to determine if the augmentations described in the GALL Report remain necessary. The NRC staff's evaluation has concluded that the augmentations described in the GALL Report are necessary to ensure adequate aging management. For example, Table IWB–2500–1, in the 2007 Edition with the 2009 Addenda of ASME BPV Code, Section XI, Subsection IWB, requires surface examination of ASME BPV Code Class 1 branch pipe connection welds less than nominal pipe size (NPS) 4 under Examination Category B–J. However, the NRC staff finds that volumetric or opportunistic destructive examination, rather than surface examination, is necessary to adequately detect and manage the aging effect due to stress corrosion cracking or thermal, mechanical and vibratory loadings in the components for the period of extended operation. Therefore, GALL Report Section XI.M35, ''One-Time Inspection of ASME BPV Code Class 1 Small-Bore Piping,'' includes the augmentation of the requirements in ASME BPV Code, Section XI,

Subsection IWB to perform a one-time inspection of a sample of ASME BPV Code Class 1 piping less than NPS 4 and greater than or equal to NPS 1 using volumetric or opportunistic destructive examination. The GALL Report addresses this augmentation to confirm that there is no need to manage age-related degradation through periodic volumetric inspections or that an existing AMP (for example, Water Chemistry AMP) is effective to manage the aging effect due to stress corrosion cracking or thermal, mechanical and vibratory loadings for the period of extended operation. A license renewal applicant may either augment its AMPs as described in the GALL Report, or propose alternatives for the NRC to review as part of the applicant's plant-specific justification for its AMPs.

VII. Regulatory Flexibility Certification

Under the Regulatory Flexibility Act (5 U.S.C. 605(b)), the NRC certifies that this rule does not have a significant economic impact on a substantial number of small entities. This final rule affects only the licensing and operation of nuclear power plants. The companies that own these plants do not fall within the scope of the definition of ''small entities'' set forth in the Regulatory Flexibility Act or the size standards established by the NRC (§ 2.810).

VIII. Regulatory Analysis

The NRC has prepared a final regulatory analysis on this regulation. The analysis examines the costs and benefits of the alternatives considered by the NRC. The regulatory analysis is available as indicated in the ''Availability of Documents'' section of this document.

IX. Backfitting and Issue Finality

Introduction

The NRC's Backfit Rule in § 50.109 states that the NRC shall require the backfitting of a facility only when it finds the action to be justified under specific standards stated in the rule. Section 50.109(a)(1) defines backfitting as the modification of or addition to systems, structures, components, or design of a facility; the design approval or manufacturing license for a facility; or the procedures or organization required to design, construct, or operate a facility. Any of these modifications or additions may result from a new or amended provision in the NRC's rules or the imposition of a regulatory position interpreting the NRC's rules that is either new or different from a previously applicable NRC position after issuance of the construction permit or the operating license or the design approval.

Section 50.55a requires nuclear power plant licensees to:

- Construct ASME BPV Code Class 1, 2, and 3 components in accordance with the rules provided in Section III, Division 1, of the ASME BPV Code (''Section III'').
- Inspect Class 1, 2, 3, Class MC, and Class CC components in accordance with the rules provided in Section XI, Division 1, of the ASME BPV Code (''Section XI'').
- Test Class 1, 2, and 3 pumps, valves, and dynamic restraints (snubbers) in accordance with the rules provided in the OM Code.

This final rule is incorporating by reference the 2009 Addenda, 2010 Edition, 2011 Addenda, and the 2013 Edition of the ASME BPV Code, Section III, Division 1 and ASME BPV Code, Section XI, Division 1, including NQA–1 (with conditions on its use), as well as the 2009 Edition and 2011 Addenda and 2012 Edition of the OM Code and Code Cases N–770–2 and N–729–4.

The ASME BPV and OM Codes are national consensus standards developed by participants with broad and varied interests, in which all interested parties (including the NRC and utilities) participate. A consensus process involving a wide range of stakeholders is consistent with the NTTAA, inasmuch as the NRC has determined that there are sound regulatory reasons for establishing regulatory requirements for design, maintenance, ISI, and IST by rulemaking. The process also facilitates early stakeholder consideration of backfitting issues. Therefore, the NRC believes that the NRC need not address backfitting with respect to the NRC's general practice of incorporating by reference updated ASME Codes.

Overall Backfitting Considerations: Section III of the ASME BPV Code

Incorporation by reference of more recent editions and addenda of Section III of the ASME BPV Code does not affect a plant that has received a construction permit or an operating license or a design that has been approved. This is because the edition and addenda to be used in constructing a plant are, under § 50.55a, determined based on the date of the construction permit, and are not changed thereafter, except voluntarily by the licensee. The incorporation by reference of more recent editions and addenda of Section III ordinarily applies only to applicants after the effective date of a final rule incorporating these new editions and addenda. Therefore, incorporation by reference of a more recent edition and addenda of Section III does not constitute ''backfitting'' as defined in § 50.109(a)(1).

Overall Backfitting Considerations: Section XI of the ASME BPV Code and the OM Code

Incorporation by reference of more recent editions and addenda of Section XI of the ASME BPV Code and the OM Code affects the ISI and IST programs of operating reactors. However, the Backfit Rule generally does not apply to incorporation by reference of later editions and addenda of the ASME BPV Code (Section XI) and OM Code. As previously mentioned, the NRC's longstanding regulatory practice has been to incorporate later versions of the ASME Codes into § 50.55a. Under § 50.55a, licensees shall revise their ISI and IST programs every 120 months to the latest edition and addenda of Section XI of the ASME BPV Code and the OM Code incorporated by reference into § 50.55a 12 months before the start of a new 120-month ISI and IST interval. Therefore, when the NRC approves and requires the use of a later version of the Code for ISI and IST, it is implementing this longstanding regulatory practice and requirement.

Other circumstances where the NRC does not apply the Backfit Rule to the approval and requirement to use later Code editions and addenda are as follows:

1. When the NRC takes exception to a later ASME BPV Code or OM Code provision but merely retains the current existing requirement, prohibits the use of the later Code provision, limits the use of the later Code provision, or supplements the provisions in a later Code. The Backfit Rule does not apply because the NRC is not imposing new requirements. However, the NRC explains any such exceptions to the Code in the statement of considerations and regulatory analysis for the rule.

2. When an NRC exception relaxes an existing ASME BPV Code or OM Code provision but does not prohibit a licensee from using the existing Code provision. The Backfit Rule does not apply because the NRC is not imposing new requirements.

3. The NRC's consideration of backfitting for modifications and limitations imposed during previous routine updates of § 50.55a have established a precedent for determining the kinds of modifications or limitations which should be considered backfitting, or require a backfit analysis (*e.g.,* final rule dated September 10, 2008 (73 FR 52730), and a correction dated October 2, 2008 (73 FR 57235)). The consideration of backfitting and issue

finality with respect to the modifications and limitations in this rulemaking are consistent with the consideration and application of backfitting and issue finality requirements to analogous modifications and limitations in previous § 50.55a rulemakings.

The incorporation by reference and adoption of a requirement mandating the use of a later ASME BPV Code or OM Code may constitute backfitting in some circumstances. In these cases, the NRC would perform a backfit analysis or documented evaluation in accordance with § 50.109. These include the following:

1. When the NRC endorses a later provision of the ASME BPV Code or OM Code that takes a substantially different direction from the existing requirements, the action is treated as a backfit (*e.g.,* 61 FR 41303 (August 8, 1996)).

2. When the NRC requires implementation of a later ASME BPV Code or OM Code provision on an expedited basis, the action is treated as a backfit. This applies when implementation is required sooner than it would be required if the NRC simply endorsed the Code without any expedited language (*e.g.,* 64 FR 51370 (September 22, 1999)).

3. When the NRC takes an exception to an ASME BPV Code or OM Code provision and imposes a requirement that is substantially different from the existing requirement as well as substantially different from the later Code (*e.g.,* 67 FR 60529 (September 26, 2002)).

Detailed Backfitting Discussion: Changes Beyond Those Necessary To Incorporate by Reference the New ASME BPV and OM Code Provisions

This section discusses the backfitting considerations for all the changes to § 50.55a that go beyond the minimum changes necessary and required to adopt the new ASME Code Addenda into § 50.55a.

ASME BPV Code, Section III

1. Revise § 50.55a(b)(1)(ii), ''Weld leg dimensions,'' to clarify rule language and add Table I, which clarifies prohibited Section III provisions for welds with leg sizes less than 1.09 t_n in tabular form. This change does not alter the original intent of this requirement and, therefore, does not impose a new requirement. Therefore, this change is not a backfit.

2. Revise § 50.55a(b)(1)(iv), ''Quality assurance,'' to require that when applying editions and addenda later than the 1989 Edition of Section III, the requirements of NQA–1, 1994 Edition, 2008 Edition, and the 2009–1a Addenda are acceptable for use, provided that the edition and addenda of NQA–1 specified in either NCA–4000 or NCA–7000 is used in conjunction with the administrative, quality, and technical provisions contained in the edition and addenda of Section III being used. This revision clarifies the current requirements, and is considered to be consistent with the meaning and intent of the current requirements, and therefore is not considered to result in a change in requirements. Therefore, this change is not a backfit.

3. Add a new condition as § 50.55a(b)(1)(viii), ''Use of ASME Certification Marks,'' to allow licensees to use either the ASME BPV Code Symbol Stamp or ASME Certification Mark with the appropriate certification designator and class designator as specified in the 2013 Edition through the latest edition and addenda incorporated by reference in § 50.55a. This condition does not result in a change in requirements previously approved in the Code and, therefore, is not a backfit.

ASME BPV Code, Section XI

1. Revise § 50.55a(b)(2)(vi), ''Effective edition and addenda of Subsection IWE and Subsection IWL,'' to clarify that the provision applies only to the class of licensees of operating reactors that were required by previous versions of § 50.55a to develop, implement a containment ISI program in accordance with Subsection IWE and Subsection IWL, and complete an expedited examination of containment during the 5-year period from September 9, 1996, to September 9, 2001. This revision clarifies the current requirements, is considered to be consistent with the meaning and intent of the current requirements, and is not considered to result in a change in requirements. Therefore, this change is not a backfit.

2. Revise § 50.55a(b)(2)(viii), ''Concrete containment examinations,'' so that when using the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWL, the conditions in § 50.55a(b)(2)(viii)(E) do not apply, but the new conditions in § 50.55a(b)(2)(viii)(H) and (I) do apply. This revision does not require § 50.55a(b)(2)(viii)(E) to be used when following the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWL because most of its requirements have been included in IWL–2512, ''Inaccessible Areas.'' Therefore, this change is not a backfit because the requirements have not changed. The revision to add the condition in § 50.55a(b)(2)(viii)(H) captures the reporting requirements of the current § 50.55a(b)(2)(viii)(E) which were not included in IWL–2512. Therefore, this change is not a backfit because the requirements have not changed. The revision to add the condition in § 50.55a(b)(2)(viii)(I) addresses a new code provision in IWL–2512(b) for evaluation of below-grade concrete surfaces during the period of extended operation of a renewed license. The condition assures consistency with the GALL Report, Revision 2, and applies to plants going forward using the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWL. The requirements remain unchanged from the recommendations in the GALL Report and, therefore, this change is not a backfit.

3. Revise § 50.55a(b)(2)(ix), ''Metal containment examinations,'' to extend the applicability of the existing conditions in § 50.55a(b)(2)(ix)(A)(2) and (b)(2)(ix)(B) and (J) to the 2007 Edition with 2009 Addenda through the 2013 Edition of Subsection IWE. This condition does not result in a change to current requirements, and is therefore not a backfit.

4. Revise § 50.55a(b)(2)(x), ''Quality assurance,'' to require that when applying the editions and addenda later than the 1989 Edition of ASME BPV Code, Section XI, the requirements of NQA–1, 1994 Edition, the 2008 Edition, and the 2009–1a Addenda specified in either IWA–1400 or Table IWA 1600–1, ''Referenced Standards and Specifications,'' of that edition and addenda of Section XI are acceptable for use, provided the licensee uses its appendix B to 10 CFR part 50 QA program in conjunction with Section XI requirements. This revision clarifies the current requirements, which the NRC considers to be consistent with the meaning and intent of the current requirements. Therefore, the NRC does not consider the clarification to be a change in requirements. Therefore, this change is not a backfit.

5. Revise § 50.55a(b)(2)(xii), ''Underwater welding,'' to allow underwater welding on irradiated materials under certain conditions. The revision eliminates the prohibition on welding on irradiated materials. Therefore, this change is not a backfit.

6. Add a new condition as § 50.55a(b)(2)(xviii)(D), ''NDE personnel certification: Fourth provision,'' to prohibit the use of Appendix VII and Subarticle VIII–2200 of the 2011 Addenda and 2013 Edition of Section XI of the ASME BPV Code. Licensees are required to implement Appendix VII

and Subarticle VIII–2200 of the 2010 Edition of Section XI. This condition does not constitute a change in NRC position because the use of the subject provisions is not currently allowed by § 50.55a. Therefore, the addition of this new condition is not a backfit.

7. Revise § 50.55a(b)(2)(xxi)(A), ''Table IWB–2500–1 examination requirements: First provision,'' to modify the standard for visual magnification resolution sensitivity and contrast for visual examinations of Examination Category B–D components, making the rule conform with ASME BPV Code, Section XI requirements for VT–1 examinations. This revision removes a condition that was in addition to the ASME BPV Code requirements and does not impose a new requirement. Therefore, this change is not a backfit.

8. Add a new condition as § 50.55a(b)(2)(xxxi), ''Mechanical clamping devices;'' to prohibit the use of mechanical clamping devices in accordance with IWA–4131.1(c) in the 2010 Edition and IWA–4131.1(d) in the 2011 Addenda through 2013 Edition on small item Class 1 piping and portions of a piping system that forms the containment boundary. This condition does not constitute a change in NRC position and does not affect licensees because the use of the subject provisions is not currently allowed by § 50.55a. Therefore, the addition of this new condition is not a backfit.

9. Add a new condition as § 50.55a(b)(2)(xxxii), ''Summary report submittal,'' to clarify that licensees using the 2010 Edition or later editions and addenda of Section XI must continue to submit to the NRC the Preservice and Inservice Summary Reports required by IWA–6240 of the 2009 Addenda of Section XI. This condition does not result in a change in the NRC's requirements insomuch as these reports have been required in the 2009 Addenda of Section XI and all previous editions and addenda. Therefore, the addition of this new condition is not a backfit.

10. Add a new condition as § 50.55a(b)(2)(xxxiii), ''Risk-Informed allowable pressure,'' to prohibit the use of ASME BPV Code, Section XI, Appendix G, Paragraph G–2216. The use of Paragraph G–2216 is not currently allowed by § 50.55a. Therefore, the condition does not constitute a new or changed NRC position on the lack of acceptability of Paragraph G–2216. Therefore, the addition of this new condition is not a backfit.

11. Add a new condition as § 50.55a(b)(2)(xxxiv), ''Nonmandatory Appendix U.'' Paragraph (b)(2)(xxxiv)(A) requires that repair or replacement activities temporarily deferred under the provisions of Nonmandatory Appendix U shall be performed during the next scheduled refueling outage. This condition is imposed to ensure that repairs/replacements are performed on degraded components when a unit is shutdown for refueling. This change is consistent with the condition previously placed on ASME BPV Code Case N–513–3 and, therefore, does not impose a new requirement. This change is not a backfit. Paragraph (b)(2)(xxxiv)(B) requires that the mandatory appendix in ASME BPV Code Case N–513–3 be used in lieu of the appendix referenced in Paragraph U–S1–4.2.1(c) of Appendix U. This change is required because the appendix referenced in Appendix U was unintentionally omitted. This change is not a backfit.

12. Add a new condition as § 50.55a(b)(2)(xxxv), ''Use of RT_{T0} in the K_{Ia} and K_{Ic} equations,'' to specify that when licensees use ASME BPV Code, Section XI 2013 Edition Nonmandatory Appendix A, Paragraph A–4200, if T_0 is available, then RT_{T0} may be used in place of RT_{NDT} for applications using the K_{Ic} equation and the associated K_{Ic} curve, but not for applications using the K_{Ia} equation and the associated K_{Ia} curve. Conditions on the use of ASME BPV Code, Section XI, Nonmandatory Appendices do not constitute backfitting inasmuch as those provisions apply to voluntary actions initiated by the licensee to use the ''nonmandatory compliance'' provisions in these Appendices of the rule.

13. Add a new condition as § 50.55a(b)(2)(xxxvi), ''Fracture toughness of irradiated materials,'' to require licensees using ASME BPV Code, Section XI 2013 Edition Nonmandatory Appendix A, Paragraph A–4400, to obtain NRC approval before using irradiated T_0 and the associated RT_{T0} in establishing fracture toughness of irradiated materials. Conditions on the use of ASME BPV Code, Section XI, Nonmandatory Appendices do not constitute backfitting inasmuch as those provisions apply to voluntary actions initiated by the licensee to use the ''nonmandatory compliance'' provisions in these Appendices of the rule.

14. Add a new condition as § 50.55a(b)(2)(xxxvii), ''ASME BPV Code Case N–824,'' to allow the use of the code case as conditioned. Conditions on the use of ASME BPV Code Case N–824 do not constitute backfitting, inasmuch as the use of this code case is not required by the NRC but instead is an alternative which may be voluntarily used by the licensee (*i.e.,* a ''voluntary alternative'').

OM Code

1. Add a new condition as § 50.55a(b)(3)(ii)(A), ''MOV diagnostic test interval,'' to require that licensees evaluate the adequacy of the diagnostic test intervals established for MOVs within the scope of OM Code, Appendix III, not later than 5 years or three refueling outages (whichever is longer) from initial implementation of Appendix III of the OM Code. This condition represents an exception to a later OM Code provision but merely retains the current NRC condition on ASME OM Code Case OMN–1, and is therefore not a backfit because the NRC is not imposing a new requirement.

2. Add a new condition as § 50.55a(b)(3)(ii)(B), ''MOV testing impact on risk,'' to require that licensees ensure that the potential increase in core damage frequency and large early release frequency associated with the extension is acceptably small when extending exercise test intervals for high risk MOVs beyond a quarterly frequency. This condition represents an exception to a later OM Code provision but merely retains the current NRC condition on ASME OM Code Case OMN–1, and is therefore not a backfit because the NRC is not imposing a new requirement.

3. Add a new condition as § 50.55a(b)(3)(ii)(C), ''MOV risk categorization,'' to require, when applying Appendix III to the OM Code, that licensees categorize MOVs according to their safety significance using the methodology described in OM Code Case OMN–3 subject to the conditions discussed in RG 1.192, or using an MOV risk ranking methodology accepted by the NRC on a plant-specific or industry-wide basis in accordance with the conditions in the applicable safety evaluation. This condition represents an exception to a later OM Code provision but merely retains the current NRC condition on ASME OM Code Case OMN–1, and is therefore not a backfit because the NRC is not imposing a new requirement.

4. Add a new condition as § 50.55a(b)(3)(ii)(D), ''MOV stroke time,'' to require that, when applying Paragraph III–3600, ''MOV Exercising Requirements,'' of Appendix III to the OM Code, licensees shall verify that the stroke time of the MOVs specified in plant technical specifications satisfies the assumptions in the plant's safety analyses. This condition retains the MOV stroke time requirement for a smaller set of MOVs than was specified in previous editions and addenda of the

OM Code. The retention of this requirement is not a backfit.

5. Add new conditions as § 50.55a(b)(3)(iii)(A) through (D), ''New reactors,'' to apply specific conditions for IST programs applicable to licensees of new nuclear power plants in addition to the provisions of the OM Code as incorporated by reference with conditions in § 50.55a. Licensees of ''new reactors'' are, as identified in the paragraph: (1) Holders of operating licenses for nuclear power reactors that received construction permits under this part on or after the date 12 months after August 17, 2017, and (2) holders of COLs issued under 10 CFR part 52, whose initial fuel loading occurs on or after the date 12 months after August 17, 2017. This implementation schedule for new reactors is consistent with the NRC regulations in § 50.55a(f)(4)(i). These conditions represent an exception to a later OM Code provision but merely retain a current NRC requirement, and are therefore not a backfit because the NRC is not imposing a new requirement.

6. Revise § 50.55a(b)(3)(iv), ''Check valves (Appendix II),'' to specify that Appendix II, ''Check Valve Condition Monitoring Program,'' of the OM Code, 2003 Addenda through the 2012 Edition, is acceptable for use with the following clarification: Trending and evaluation shall support the determination that the valve or group of valves is capable of performing its intended function(s) over the entire interval. At least one of the Appendix II condition monitoring activities for a valve group shall be performed on each valve of the group at approximate equal intervals not to exceed the maximum interval shown in the following table:

MAXIMUM INTERVALS FOR USE WHEN APPLYING INTERVAL EXTENSIONS

Group size	Maximum interval between activities of member valves in the groups (years)	Maximum interval between activities of each valve in the group (years)
≥4	4.5	16
3	4.5	12
2	6	12
1	Not applicable	10

The regulation is being revised to extend the applicability of this existing NRC condition on the OM Code to the 2012 Edition of the OM Code and to update the clarification for the use of Appendix II. This does not represent a change in the NRC's position that the condition is needed with respect to the OM Code. Therefore, this condition is not a backfit.

7. Add a new condition as § 50.55a(b)(3)(vii), ''Subsection ISTB,'' to prohibit the use of Subsection ISTB in the 2011 Addenda to the OM Code because the complete set of planned Code modifications to support the changes to the comprehensive pump test acceptance criteria was not made in that addenda. This condition represents an exception to a later OM Code provision but merely limits the use of the later Code provision, and is therefore not a backfit because the NRC is not imposing a new requirement.

8. Add a new condition as § 50.55a(b)(3)(viii), ''Subsection ISTE,'' to allow licensees to implement Subsection ISTE, ''Risk-Informed Inservice Testing of Components in Light-Water Reactor Nuclear Power Plants,'' in the OM Code, 2009 Edition, 2011 Addenda and 2012 Edition, where the licensee has obtained authorization to implement Subsection ISTE as an alternative to the applicable IST requirements in the OM Code on a case-by-case basis in accordance with § 50.55a(z). This condition represents an exception to a later OM Code provision but merely limits the use of the later Code provision, and is therefore not a backfit because the NRC is not imposing a new requirement.

9. Add a new condition as § 50.55a(b)(3)(ix), ''Subsection ISTF,'' to specify that licensees applying Subsection ISTF, 2012 Edition, shall satisfy the requirements of Mandatory Appendix V, ''Pump Periodic Verification Test Program,'' of the OM Code, 2012 Edition. The condition also specifies that Subsection ISTF, 2011 Addenda, is not acceptable for use. This condition represents an exception to a later OM Code provision but merely limits the use of the later Code provision, and is therefore not a backfit because the NRC is not imposing a new requirement.

10. Add a new condition as § 50.55a(b)(3)(x), ''ASME OM Code Case OMN–20,'' to allow licensees to implement OM Code Case OMN–20, ''Inservice Test Frequency,'' in the OM Code, 2012 Edition. This condition allows voluntary action initiated by the licensee to use the code case and is, therefore, not a backfit.

11. Add a new condition as § 50.55a(b)(3)(xi), ''Valve Position Indication,'' to emphasize, when implementing OM Code (2012 Edition), Subsection ISTC–3700, ''Position Verification Testing,'' licensees shall implement the OM Code provisions to verify that valve operation is accurately indicated. This condition emphasizes the OM Code requirements for valve position indication and is not a change to those requirements. As such, this condition is not a backfit.

12. Revise § 50.55a(f), ''Preservice and inservice testing requirements,'' to clarify that the OM Code includes provisions for preservice testing of components as part of its overall provisions for IST programs. No expansion of IST program scope is intended by this clarification. This condition does not result in a change in requirements previously approved in the Code and is, therefore, not a backfit.

13. Revise § 50.55a(f)(4), ''Inservice testing standards for operating plants,'' to state that the paragraph is applicable to pumps and valves that are within the scope of the OM Code. Also, revise § 50.55a(f)(4) to state that the IST requirements for pumps and valves that are within the scope of the OM Code but are not classified as ASME BPV Code Class 1, Class 2, or Class 3 may be satisfied as an augmented IST program in accordance with § 50.55a(f)(6)(ii) without requesting relief under § 50.55a(f)(5) or alternatives under § 50.55a(z). This use of an augmented IST program may be acceptable provided the basis for deviations from the OM Code as incorporated by reference in this section demonstrates an acceptable level of quality and safety, or that implementing the Code provisions would result in hardship or

unusual difficulty without a compensating increase in the level of quality and safety, where documented and available for NRC review. These changes align the scope of pumps and valves for inservice testing with the scope defined in the OM Code. These changes do not result in a change in requirements previously approved in the Code, and is therefore not a backfit.

ASME BPV Code Case N–729–4

Revise § 50.55a(g)(6)(ii)(D), ''Reactor vessel head inspections.''

On June 22, 2012, the ASME approved the fourth revision of ASME BPV Code Case N–729 (N–729–4). The NRC proposed to update the requirements of § 50.55a(g)(6)(ii)(D) to require licensees to implement ASME BPV Code Case N–729–4, with conditions. The ASME BPV Code Case N–729–4 contains similar requirements as N–729–1; however, N–729–4 also contains new requirements to address previous NRC conditions, including changes to inspection frequency and qualifications. The new NRC conditions on the use of ASME BPV Code Case N–729–4 address operational experience, clarification of implementation, and the use of alternatives to the code case.

The current regulatory requirements for the examination of pressurized water reactor upper RPV heads that use nickel-alloy materials are provided in § 50.55a(g)(6)(ii)(D). This section was first created by rulemaking, dated September 10, 2008 (73 FR 52730), to require licensees to implement ASME BPV Code Case N–729–1, with conditions, instead of the inspections previously required by the ASME BPV Code, Section XI. The action did constitute a backfit; however, the NRC concluded that imposition of ASME BPV Code Case N–729–1, as conditioned, constituted an adequate protection backfit.

The General Design Criteria (GDC) for nuclear power plants (appendix A to 10 CFR part 50) or, as appropriate, similar requirements in the licensing basis for a reactor facility, provide bases and requirements for NRC assessment of the potential for, and consequences of, degradation of the reactor coolant pressure boundary (RCPB). The applicable GDC include GDC 14 (Reactor Coolant Pressure Boundary), GDC 31 (Fracture Prevention of Reactor Coolant Pressure Boundary), and GDC 32 (Inspection of Reactor Coolant Pressure Boundary). General Design Criterion 14 specifies that the RCPB be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture. General Design Criterion 31 specifies that the probability of rapidly propagating fracture of the RCPB be minimized. General Design Criterion 32 specifies that components that are part of the RCPB have the capability of being periodically inspected to assess their structural and leak-tight integrity.

The NRC concludes that ASME BPV Code Case N–729–4, as conditioned, shall be mandatory in order to ensure that the requirements of the GDC are satisfied. Imposition of ASME BPV Code Case N–729–4, with conditions, ensures that the ASME BPV Code-allowable limits will not be exceeded, leakage will likely not occur, and potential flaws will be detected before they challenge the structural or leak-tight integrity of the RPV upper head within current nondestructive examination limitations. The NRC concludes that the regulatory framework for providing adequate protection of public health and safety is accomplished by the incorporation of ASME BPV Code Case N–729–4 into § 50.55a, as conditioned. All current licensees of U.S. pressurized water reactors will be required to implement ASME BPV Code Case N–729–4, as conditioned. The Code Case provisions on examination requirements for RPV upper heads are essentially the same as those established under ASME BPV Code Case N–729–1, as conditioned. One exception is the condition in § 50.55a(g)(6)(ii)(D)(*3*), which will require, for upper heads with Alloy 600 penetration nozzles, that bare metal visual examinations be performed each outage in accordance with Table 1 of ASME BPV Code Case N–729–4. Accordingly, the NRC imposition of the ASME BPV Code Case N–729–4, as conditioned, may be deemed to be a modification of the procedures to operate a facility resulting from the imposition of the new regulation, and as such, this rulemaking provision may be considered backfitting under § 50.109(a)(1).

The NRC continues to find that inspections of RPV upper heads, their penetration nozzles, and associated partial penetration welds are necessary for adequate protection of public health and safety and that the requirements of ASME BPV Code Case N–729–4, as conditioned, represent an acceptable approach, developed, in part, by a voluntary consensus standards body for performing future inspections. The NRC concludes that approval of ASME BPV Code Case N–729–4, as conditioned, by incorporation by reference of the Code Case into § 50.55a, is necessary to ensure that the facility provides adequate protection to the health and safety of the public and constitutes a redefinition of the requirements necessary to provide reasonable assurance of adequate protection of public health and safety. Therefore, a backfit analysis need not be prepared for this portion of the rule in accordance with § 50.109(a)(4)(ii) and (iii).

ASME BPV Code Case N–770–2

Revise § 50.55a(g)(6)(ii)(F), ''Examination requirements for Class 1 piping and nozzle dissimilar metal butt welds.''

On June 9, 2011, the ASME approved the second revision of ASME BPV Code Case N–770 (N–770–2). The NRC is updating the requirements of § 50.55a(g)(6)(ii)(F) to require licensees to implement ASME BPV Code Case N–770–2, with conditions. The ASME BPV Code Case N–770–2 contains similar baseline and ISI requirements for unmitigated nickel-alloy butt welds, and preservice and ISI requirements for mitigated butt welds as N–770–1. However, N–770–2 also contains new requirements for optimized weld overlays, a specific mitigation technique and volumetric inspection coverage. Further, the NRC conditions on the use of ASME BPV Code Case N–770–2 have been modified to address the changes in the code case, clarify inspection coverage requirements and require the development of inspection qualifications to allow complete weld inspection coverage in the future.

The current regulatory requirements for the examination of ASME Class 1 piping and nozzle dissimilar metal butt welds that use nickel-alloy materials is provided in § 50.55a(g)(6)(ii)(F). This section was first created by rulemaking, dated June 21, 2011 (76 FR 36232), to require licensees to implement ASME BPV Code Case N–770–1, with conditions. The NRC added § 50.55a(g)(6)(ii)(F) to require licensees to implement ASME BPV Code Case N–770–1, with conditions, instead of the inspections previously required by the ASME BPV Code, Section XI. The action did constitute a backfit; however, the NRC concluded that imposition of ASME BPV Code Case N–770–1, as conditioned, constituted an adequate protection backfit.

The GDC for nuclear power plants (appendix A to 10 CFR part 50) or, as appropriate, similar requirements in the licensing basis for a reactor facility, provide bases and requirements for NRC assessment of the potential for, and consequences of, degradation of the RCPB. The applicable GDC include GDC 14 (Reactor Coolant Pressure Boundary), GDC 31 (Fracture Prevention of Reactor Coolant Pressure Boundary) and GDC 32 (Inspection of Reactor Coolant Pressure

Boundary). General Design Criterion 14 specifies that the RCPB be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture. General Design Criterion 31 specifies that the probability of rapidly propagating fracture of the RCPB be minimized. General Design Criterion 32 specifies that components that are part of the RCPB have the capability of being periodically inspected to assess their structural and leak-tight integrity.

The NRC concludes that ASME BPV Code Case N–770–2, as conditioned, must be imposed in order to ensure that the requirements of the GDC are satisfied. Imposition of ASME BPV Code Case N–770–2, with conditions, ensures that the requirements of the GDC are met for all mitigation techniques currently in use for Alloy 82/182 butt welds because ASME BPV Code-allowable limits will not be exceeded, leakage would likely not occur and potential flaws will be detected before they challenge the structural or leak-tight integrity of piping welds. All current licensees of U.S. pressurized water reactors will be required to implement ASME BPV Code Case N–770–2, as conditioned. The Code Case provisions on examination requirements for ASME Class 1 piping and nozzle nickel-alloy dissimilar metal butt welds are somewhat different from those established under ASME BPV Code Case N–770–1, as conditioned, and will require a licensee to modify its procedures for inspection of ASME Class 1 nickel-alloy welds to meet these requirements. Accordingly, the NRC imposition of the ASME BPV Code Case N–770–2, as conditioned, may be deemed to be a modification of the procedures to operate a facility resulting from the imposition of the new regulation, and as such, this rulemaking provision may be considered backfitting under § 50.109(a)(1).

The NRC continues to find that ASME Class 1 nickel-alloy dissimilar metal weld inspections are necessary for adequate protection of public health and safety, and that the requirements of ASME BPV Code Case N–770–2, as conditioned, represent an acceptable approach developed by a voluntary consensus standards body for performing future ASME Class 1 nickel-alloy dissimilar metal weld inspections. The NRC concludes that approval of ASME BPV Code Case N–770–2, as conditioned, by incorporation by reference of the Code Case into § 50.55a, is necessary to ensure that the facility provides adequate protection to the health and safety of the public and constitutes a redefinition of the requirements necessary to provide reasonable assurance of adequate protection of public health and safety. Therefore, a backfit analysis need not be prepared for this portion of the rule in accordance with § 50.109(a)(4)(ii) and (iii).

Conclusion

The NRC finds that incorporation by reference into § 50.55a of the 2009 Addenda through 2013 Edition of Section III, Division 1, of the ASME BPV Code, subject to the identified conditions; the 2009 Addenda through 2013 Edition of Section XI, Division 1, of the ASME BPV Code, subject to the identified conditions; and the 2009 Edition through the 2012 Edition of the OM Code, subject to the identified conditions, does not constitute backfitting or represent an inconsistency with any issue finality provisions in 10 CFR part 52.

The NRC finds that the incorporation by reference of Code Cases N–824 and OMN–20 does not constitute backfitting or represent an inconsistency with any issue finality provisions in 10 CFR part 52.

The NRC finds that the inclusion of a new condition on Code Case N–729–4 and a new condition on Code Case N–770–2 constitutes backfitting necessary for adequate protection.

X. Plain Writing

The Plain Writing Act of 2010 (Pub. L. 111–274) requires Federal agencies to write documents in a clear, concise, and well-organized manner. The NRC has written this document to be consistent with the Plain Writing Act as well as the Presidential Memorandum, ''Plain Language in Government Writing,'' published June 10, 1998 (63 FR 31883).

XI. Finding of No Significant Environmental Impact: Environmental Assessment

This final rule is in accordance with the NRC's policy to incorporate by reference in § 50.55a new editions and addenda of the ASME BPV and OM Codes to provide updated rules for constructing and inspecting components and testing pumps, valves, and dynamic restraints (snubbers) in light-water nuclear power plants. The ASME Codes are national voluntary consensus standards and are required by the NTTAA to be used by government agencies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. The National Environmental Policy Act (NEPA) requires Federal agencies to study the impacts of their ''major Federal actions significantly affecting the quality of the human environment,'' and prepare detailed statements on the environmental impacts of the proposed action and alternatives to the proposed action (42 U.S.C. 4332(C); NEPA Sec. 102(C)).

The NRC has determined under NEPA, as amended, and the NRC's regulations in subpart A of 10 CFR part 51, that this rule is not a major Federal action significantly affecting the quality of the human environment and, therefore, an environmental impact statement is not required. The rulemaking does not significantly increase the probability or consequences of accidents, no changes are being made in the types of effluents that may be released off-site, and there is no significant increase in public radiation exposure. The NRC estimates the radiological dose to plant personnel performing the inspections required by ASME BPV Code Case N–770–2 would be about 3 rem per plant over a 10-year interval, and a one-time exposure for mitigating welds of about 30 rem per plant. The NRC estimates the radiological dose to plant personnel performing the inspections required by ASME BPV Code Case N–729–4 would be about 3 rem per plant over a 10-year interval and a one-time exposure for mitigating welds of about 30 rem per plant. As required by 10 CFR part 20, and in accordance with current plant procedures and radiation protection programs, plant radiation protection staff will continue monitoring dose rates and would make adjustments in shielding, access requirements, decontamination methods, and procedures as necessary to minimize the dose to workers. The increased occupational dose to individual workers stemming from the ASME BPV Code Case N–770–2 and N–729–4 inspections must be maintained within the limits of 10 CFR part 20 and as low as reasonably achievable. Therefore, the NRC concludes that the increase in occupational exposure would not be significant. This final rule does not involve non-radiological plant effluents and has no other environmental impacts. Therefore, no significant non-radiological impacts are associated with this action. The determination of this environmental assessment is that there will be no significant off-site impact to the public from this action.

XII. Paperwork Reduction Act Statement

This final rule amends collections of information subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501

et seq.). The collections of information were approved by the Office of Management and Budget (OMB), approval number 3150–0011.

Because the rule will reduce the burden for existing information collections, the public burden for the information collections is expected to be decreased by 58.5 hours per response. This reduction includes the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection.

The information collection is being conducted to document the plans for and the results of ISI and IST programs. The records are generally historical in nature and provide data on which future activities can be based. The practical utility of the information collection for the NRC is that appropriate records are available for auditing by NRC personnel to determine if ASME BPV and OM Code provisions for construction, inservice inspection, repairs, and inservice testing are being properly implemented in accordance with § 50.55a, or whether specific enforcement actions are necessary. Responses to this collection of information are generally mandatory under 10 CFR 50.55a.

You may submit comments on any aspect of the information collection(s), including suggestions for reducing the burden, by the following methods:

- *Federal Rulemaking Web site:* Go to *http://www.regulations.gov* and search for Docket ID NRC–2011–0088.
- *Mail comments to:* Information Services Branch, Office of the Chief Information Officer, Mail Stop: T–2F43, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001 or to Aaron Szabo, Desk Officer, Office of Information and Regulatory Affairs (3150–0011), NEOB–10202, Office of Management and Budget, Washington, DC 20503; telephone: 202–395–3621, email: *oira_submission@omb.eop.gov.*

Public Protection Notification

The NRC may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the document requesting the collection displays a currently valid OMB control number.

XIII. Congressional Review Act

This final rule is a rule as defined in the Congressional Review Act (5 U.S.C. 801–808). However, OMB has not found it to be a major rule as defined in the Congressional Review Act.

XIV. Voluntary Consensus Standards

Section 12(d)(3) of the National Technology Transfer and Advancement Act of 1995, Public Law 104–113 (NTTAA), and implementing guidance in OMB Circular A–119 (February 10, 1998), requires each Federal government agency (should it decide that regulation is necessary) to use a voluntary consensus standard instead of developing a government-unique standard. An exception to using a voluntary consensus standard is allowed where the use of such a standard is inconsistent with applicable law or is otherwise impractical. The NTTAA requires Federal agencies to use industry consensus standards to the extent practical; it does not require Federal agencies to endorse a standard in its entirety. Neither the NTTAA nor OMB Circular A–119 prohibit an agency from adopting a voluntary consensus standard while taking exception to specific portions of the standard, if those provisions are deemed to be ''inconsistent with applicable law or otherwise impractical.'' Furthermore, taking specific exceptions furthers the Congressional intent of Federal reliance on voluntary consensus standards because it allows the adoption of substantial portions of consensus standards without the need to reject the standards in their entirety because of limited provisions which are not acceptable to the agency.

In this final rule, the NRC is continuing its existing practice of establishing requirements for the design, construction, operation, ISI (examination), and IST of nuclear power plants by approving the use of the latest editions and addenda of the ASME Codes in § 50.55a. The ASME Codes are voluntary consensus standards, developed by participants with broad and varied interests, in which all interested parties (including the NRC and licensees of nuclear power plants) participate. Therefore, the NRC's incorporation by reference of the ASME Codes is consistent with the overall objectives of the NTTAA and OMB Circular A–119.

In this final rule, the NRC is also continuing its existing practice of approving the use of ASME BPV and OM Code Cases, which are ASME-approved alternatives to compliance with various provisions of the ASME BPV and OM Codes. The ASME Code Cases are national consensus standards as defined in the NTTAA and OMB Circular A–119. The ASME Code Cases constitute voluntary consensus standards, in which all interested parties (including the NRC and licensees of nuclear power plants) participate. Therefore, the NRC's approval of the use of the ASME Code Cases in this final rule is consistent with the overall objectives of the NTTAA and OMB Circular A–119.

As discussed in Section II of this document, ''Discussion,'' the NRC is conditioning the use of certain provisions of the 2009 Addenda, 2010 Edition, 2011 Addenda, and 2013 Edition of the ASME BPV Code Section III, Division 1 and Section XI, Division 1. The NRC is also conditioning the use of certain provisions of the 2009 Edition, the 2011 Addenda, and the 2012 Edition of the OM Code, Division 1. This final rule also includes various versions of quality assurance standard NQA–1 and Code Cases N–729–4, N–770–2, N–824, OMN–20, N–513–3 Mandatory Appendix I, and N–852. In addition, this final rule does not adopt (''excludes'') certain provisions of the ASME Codes, as discussed in this statement of considerations and in the regulatory analysis for this rulemaking. The NRC staff's position is that this final rule complies with the NTTAA and OMB Circular A–119 despite these conditions and ''exclusions.''

If the NRC did not conditionally accept ASME editions, addenda, and code cases, the NRC would disapprove these entirely. The effect would be that licensees and applicants would submit a larger number of requests for use of alternatives under § 50.55a(z), requests for relief under § 50.55a(f) and (g), or requests for exemptions under § 50.12 and/or § 52.7. These requests would likely include broad scope requests for approval to issue the full scope of the ASME Code editions and addenda which would otherwise be approved in this final rule (*i.e.,* the request would not be simply for approval of a specific ASME Code provision with conditions). These requests would be an unnecessary additional burden for both the licensee and the NRC, inasmuch as the NRC has already determined that the ASME Codes and Code Cases which are the subject of this final rule are acceptable for use (in some cases with conditions). For these reasons, the NRC concludes that this final rule's treatment of ASME Code editions and addenda, and code cases and any conditions placed on them does not conflict with any policy on agency use of consensus standards specified in OMB Circular A–119.

The NRC did not identify any other voluntary consensus standards, developed by U.S. voluntary consensus standards bodies for use within the United States, which the NRC could incorporate by reference instead of the ASME Codes. The NRC also did not

identify any voluntary consensus standards, developed by multinational voluntary consensus standards bodies for use on a multinational basis, which the NRC could incorporate by reference instead of the ASME Codes. The NRC identified codes addressing the same subject as the ASME Codes for use in individual countries. At least one country, Korea, directly translated the ASME Code for use in that country. In other countries (*e.g.,* Japan), ASME Codes were the basis for development of the country's codes, but the ASME Codes were substantially modified to accommodate that country's regulatory system and reactor designs. Finally, there are countries (*e.g.,* the Russian Federation) where that country's code was developed without regard to the ASME Code. However, some of these codes may not meet the definition of a voluntary consensus standard because they were developed by the state rather than a voluntary consensus standards body. The NRC's evaluation of other countries' codes to determine whether each code provides a comparable or enhanced level of safety, when compared against the level of safety provided under the ASME Codes, would require a significant expenditure of agency resources. This expenditure does not seem justified, given that substituting another country's code for the U.S. voluntary consensus standard does not appear to substantially further the apparent underlying objectives of the NTTAA.

In summary, this final rule satisfies the requirements of Section 12(d)(3) of the NTTAA and OMB Circular A–119.

XV. Incorporation by Reference—Reasonable Availability to Interested Parties

The NRC is incorporating by reference recent editions and addenda to the ASME Codes for nuclear power plants and a standard for quality assurance. The NRC is also incorporating by reference six ASME Code Cases. As described in the ''Background'' and ''Discussion'' sections of this document, these materials provide rules for safety governing the design, fabrication, and inspection of nuclear power plant components.

The NRC is required by law to obtain approval for incorporation by reference from the Office of the Federal Register (OFR). The OFR's requirements for incorporation by reference are set forth in 1 CFR part 51. On November 7, 2014, the OFR adopted changes to its regulations governing incorporation by reference (79 FR 66267). The OFR regulations require an agency to include in a final rule a discussion of the ways that the materials the agency incorporates by reference are reasonably available to interested parties and how interested parties can obtain the materials. The discussion in this section complies with the requirement for final rules as set forth in § 51.5(b).

The NRC considers ''interested parties'' to include all potential NRC stakeholders, not only the individuals and entities regulated or otherwise subject to the NRC's regulatory oversight. These NRC stakeholders are not a homogenous group, so the considerations for determining ''reasonable availability'' vary by class of interested parties. The NRC identifies six classes of interested parties with regard to the material to be incorporated by reference in an NRC rule:

- Individuals and small entities regulated or otherwise subject to the NRC's regulatory oversight who are subject to the material to be incorporated by reference by rulemaking. This class also includes applicants and potential applicants for licenses and other NRC regulatory approvals. In this context, ''small entities'' has the same meaning as a ''small entity'' under § 2.810.
- Large entities otherwise subject to the NRC's regulatory oversight who are subject to the material to be incorporated by reference by rulemaking. This class also includes applicants and potential applicants for licenses and other NRC regulatory approvals. In this context, ''large entities'' are those which do not qualify as a ''small entity'' under § 2.810.
- Non-governmental organizations with institutional interests in the matters regulated by the NRC.
- Other Federal agencies, states, local governmental bodies (within the meaning of § 2.315(c)).
- Federally-recognized and State-recognized [3] Indian tribes.
- Members of the general public (*i.e.,* individual, unaffiliated members of the public who are not regulated or otherwise subject to the NRC's regulatory oversight) who may wish to gain access to the materials that the NRC proposes to incorporate by reference in order to participate in the rulemaking.

The NRC makes the materials to be incorporated by reference available for inspection to all interested parties, by appointment, at the NRC Technical Library, which is located at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland 20852; telephone: 301–415–7000; email: *Library.Resource@nrc.gov.*

Interested parties may purchase a copy of the materials from ASME at Three Park Avenue, New York, NY 10016, or at the ASME Web site *https://www.asme.org/shop/standards.* The materials are also accessible through third-party subscription services such as IHS (15 Inverness Way East, Englewood, CO 80112; *https://global.ihs.com*) and Thomson Reuters Techstreet (3916 Ranchero Dr., Ann Arbor, MI 48108; *http://www.techstreet.com*). The purchase prices for individual documents range from $225 to $720 and the cost to purchase all documents is approximately $9,000.

For the class of interested parties constituting members of the general public who wish to gain access to the materials to be incorporated by reference in order to participate in the rulemaking, the NRC recognizes that the $9,000 cost may be so high that the materials could be regarded as not reasonably available for purposes of commenting on this rulemaking, despite the NRC's actions to make the materials available at the NRC's PDR.

Accordingly, the NRC sent a letter to the ASME on April 9, 2015, requesting that they consider enhancing public access to these materials during the public comment period. In an April 21, 2015, letter to the NRC, the ASME agreed to make the materials available online in a read-only electronic access format during the public comment period.

During the public comment period, the ASME made publicly-available the editions and addenda to the ASME Codes for nuclear power plants, the ASME standard for quality assurance, and the ASME Code Cases which the NRC proposed to incorporate by reference. The ASME made the materials publicly-available in read-only format at the ASME Web site *http://go.asme.org/NRC.*

The materials are available to all interested parties in multiple ways and in a manner consistent with their interest in this rulemaking. Therefore, the NRC concludes that the materials the NRC is incorporating by reference in this rulemaking are reasonably available to all interested parties.

XVI. Availability of Guidance

The NRC will not be issuing guidance for this rulemaking. The ASME BPV Code and OM Code provide direction for the performance of activities to satisfy the Code requirements for design, inservice inspection, and inservice testing of nuclear power plant SSCs. In addition, the NRC provides

[3] State-recognized Indian tribes are not within the scope of § 2.315(c). However, for purposes of the NRC's compliance with 1 CFR 51.5, ''interested parties'' includes a broad set of stakeholders including State-recognized Indian tribes.

guidance in this **Federal Register** notice for the implementation of the new conditions on the ASME BPV Code and OM Code, as necessary. The NRC has a number of standard review plans (SRPs), which provide guidance to NRC reviewers and make communication and understanding of NRC review processes available to members of the public and the nuclear power industry. NUREG–0800, ''Review of Safety Analysis Reports for Nuclear Power Plants,'' has numerous sections which discuss implementation of various aspects of the ASME BPV Code and OM Code (*e.g.,* Sections 3.2.2, 3.8.1, 3.8.2, 3.9.3, 3.9.6, 3.9.7, 3.9.8, 3.13, 5.2.1.1, 5.2.1.2, 5.2.4, and 6.6). The NRC also publishes Regulatory Guides and Generic Communications (*i.e.,* Regulatory Issue Summaries, Information Notices) to communicate and clarify NRC technical or policy positions on regulatory matters which may contain guidance relative to this rulemaking.

Revision 2 of NUREG–1482, ''Guidelines for Inservice Testing at Nuclear Power Plants,'' provides guidance for the development and implementation of IST programs at nuclear power plants. With direction provided in the ASME BPV and OM Codes, and guidance in this **Federal Register** notice, the NRC has determined that preparation of a separate guidance document is not necessary for this update to § 50.55a. However, the NRC will consider preparation of a revision to NUREG–1482 in the future to address the latest edition of the ASME OM Code incorporated by reference in § 50.55a.

XVII. Availability of Documents

The NRC is making the documents identified in Table 2 available to interested persons through one or more of the following methods, as indicated. To access documents related to this action, see the **ADDRESSES** section of this document.

TABLE 2—AVAILABILITY OF DOCUMENTS

Document	ADAMS Accession No./ FEDERAL REGISTER citation/Web link
Proposed Rule Documents:	
Proposed Rule—Federal Register Notice	80 FR 56820 (September 18, 2015).
Draft Regulatory Analysis	ML14170B104.
Final Rule Documents:	
Final Regulatory Analysis	ML16130A522.
2017 Final Rule (10 CFR 50.55a) American Society of Mechanical Engineers Codes and Code Cases: Analysis of Public Comments.	ML16130A531.
Related Documents:	
Fatigue and Fracture Mechanics: 33rd Volume, ASTM STP 1417, W.G. Reuter and R.S. Piascik, Eds., ASTM International, West Conshohocken, PA, 2002.	*https://www.astm.org/DIGITAL_LIBRARY/STP/SOURCE_PAGES/STP1417.htm.*
Final Results from the CARINA Project on Crack Initiation and Arrest of Irradiated German RPV Steels for Neutron Fluences in the Upper Bound, H. Hein et al., ASTM International, West Conshohocken, PA, June 2014.	*http://www.astm.org/DIGITAL_LIBRARY/STP/PAGES/STP157220130113.htm.*
Letter from Brian Thomas, NRC, to Michael Merker, ASME, ''Public Access to Material the NRC Seeks to Incorporate by Reference into its Regulations,'' April 9, 2015.	ML15085A206.
Letter from Mark Maxin, NRC, to Rick Libra, BWRVIP Chairman, ''Safety Evaluation for Electric Power Research Institute (EPRI) Boiling Water Reactor (BWR) Vessel and Internals Project (BWRVIP) Report 1003020 (BWRVIP–97), 'BWR Vessel and Internals Project, Guidelines for Performing Weld Repairs to Irradiated BWR Internals' (TAC No. MC3948),'' June 30, 2008.	ML081680730.
Letter from Michael Merker, ASME, to Brian Thomas, NRC; April 21, 2015	ML15112A064.
Licensee Event Report 50–338/2012–001–00	ML12151A441.
NUREG–0800, ''Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants, LWR Edition''.	ML070660036.
NUREG–0800, Section 3.9.6, Revision 3, ''Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints,'' March 2007.	ML070720041.
NUREG–1482, Revision 2, ''Guidelines for Inservice Testing at Nuclear Power Plants: Inservice Testing of Pumps and Valves and Inservice Examination and Testing of Dynamic Restraints (Snubbers) at Nuclear Power Plants,'' October 2013.	ML13295A020.
NUREG–1800, Revision 2, ''Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants,'' December 2010.	ML103490036.
NUREG–1801, Revision 2, ''Generic Aging Lessons Learned (GALL) Report,'' December 2010	ML103490041.
NUREG–1950, ''Disposition of Public Comments and Technical Bases for Changes in the License Renewal Guidance Documents NUREG–1801 and NUREG–1800,'' April 2011.	ML11116A062.
NUREG–2124, ''Final Safety Evaluation Report Related to the Combined Licenses for Vogtle Electric Generating Plant, Units 3 and 4,'' Section 3.9.6, ''Inservice Testing of Pumps and Valves (Related to RG 1.206, Section C.III.1, Chapter 3, C.I.3.9.6, 'Functional Design, Qualification, and Inservice Testing Programs for Pumps, Valves, and Dynamic Restraints')''.	ML12271A045.
NUREG/CR–6860, ''An Assessment of Visual Testing,'' November 2004	ML043630040.
NUREG/CR–6933, ''Assessment of Crack Detection in Heavy-Walled Cast Stainless Steel Piping Welds Using Advanced Low-Frequency Ultrasonic Methods,'' March 2007.	ML071020410 and ML071020414.
NUREG/CR–7122, ''An Evaluation of Ultrasonic Phased Array Testing for Cast Austenitic Stainless Steel Pressurizer Surge Line Piping Welds,'' March 2012.	ML12087A004.
NRC Generic Letter 89–10, ''Safety-Related Motor-Operated Valve Testing and Surveillance,'' June 1989.	ML031150300.
NRC Generic Letter 90–05, ''Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping (Generic Letter 90–05),'' June 1990.	ML031140590.
NRC Meeting Summary of June 5–7, 2013, Annual Materials Programs Technical Information Exchange Public Meeting.	ML14003A230.
NRC Meeting Summary of January 19, 2016, Category 2 Public Meeting with Industry Representatives to Discuss Welding on Neutron Irradiated Ferritic and Austenitic Materials.	ML16050A383.

TABLE 2—AVAILABILITY OF DOCUMENTS—Continued

Document	ADAMS Accession No./ FEDERAL REGISTER citation/Web link
NRC Meeting Summary of March 2, 2016, Public Meeting on Stakeholder Comments on the Proposed Rule.	ML16069A408.
NRC Staff Memorandum, ''Consolidation of SECY–94–084 and SECY–95–132,'' July 24, 1995	ML003708048.
NRC Memorandum, ''Staff Requirements—Affirmation Session, 11:30 a.m., Friday, September 10, 1999, Commissioners' Conference Room, One White Flint North, Rockville, Maryland (Open to Public Attendance),'' September 10, 1999.	ML003755050.
NRC Regulatory Guide 1.28, Revision 4, ''Quality Assurance Program Criteria (Design and Construction),'' June 2010.	ML100160003.
NRC Regulatory Guide 1.147, Revision 17, ''Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1,'' August 2014.	ML13339A689.
NRC Regulatory Guide 1.174, Revision 2, ''An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis,'' May 2011.	ML100910006.
NRC Regulatory Guide 1.175, ''An Approach for Plant-Specific, Risk-Informed Decisionmaking: Inservice Testing,'' August 1998.	ML003740149.
NRC Regulatory Guide 1.192, Revision 1, ''Operation and Maintenance Code Case Acceptability, ASME OM Code,'' August 2014.	ML13340A034.
NRC Regulatory Guide 1.200, Revision 2, ''An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities,'' March 2009.	ML090410014.
NRC Regulatory Guide 1.201, Revision 1, ''Guidelines for Categorizing Structures, Systems, and Components in Nuclear Power Plants According to Their Safety Significance,'' May 2006.	ML061090627.
NRC Regulatory Information Conference, Recent Operating Reactors Materials Issues, Presentation Materials, 2013.	*http://www.nrc.gov/public-involve/conference-symposia/ric/past/2013/docs/abstracts/sessionabstract-19.html.*
NRC Regulatory Issue Summary 2013–07, ''NRC Staff Position on the Use of American Society of Mechanical Engineers Certification Mark,'' May 28, 2013.	ML13003A207.
Relief Request REP–1 U2, Revision 2	ML13232A308.
SECY–90–016, ''Evolutionary Light Water Reactor (LWR) Certification Issues and Their Relationship to Current Regulatory Requirements''.	ML003707849.
SECY–93–087, ''Policy, Technical, and Licensing Issues Pertaining to Evolutionary and Advanced Light-Water Reactor (ALWR) Designs''.	ML003708021.
SECY–94–084, ''Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems in Passive Plant Designs''.	ML003708068.
SECY–95–132, ''Policy and Technical Issues Associated with the Regulatory Treatment of Non-Safety Systems (RTNSS) in Passive Plant Designs (SECY–94–084)''.	ML003708005.
Vogtle Electric Generating Plant, Units 3 and 4, Updated Final Safety Analysis Report, Revision 3, Chapter 3, Section 3.9, Mechanical Systems and Components.	ML14183B276.

List of Subjects in 10 CFR Part 50

Administrative practice and procedure, Antitrust, Classified information, Criminal penalties, Education, Fire prevention, Fire protection, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Penalties, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements, Whistleblowing.

For the reasons set forth in the preamble, and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 552 and 553, the NRC is adopting the following amendments to 10 CFR part 50.

PART 50—DOMESTIC LICENSING OF PRODUCTION AND UTILIZATION FACILITIES

■ 1. The authority citation for part 50 continues to read as follows:

Authority: Atomic Energy Act of 1954, secs. 11, 101, 102, 103, 104, 105, 108, 122, 147, 149, 161, 181, 182, 183, 184, 185, 186, 187, 189, 223, 234 (42 U.S.C. 2014, 2131, 2132, 2133, 2134, 2135, 2138, 2152, 2167, 2169, 2201, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2239, 2273, 2282); Energy Reorganization Act of 1974, secs. 201, 202, 206, 211 (42 U.S.C. 5841, 5842, 5846, 5851); Nuclear Waste Policy Act of 1982, sec. 306 (42 U.S.C. 10226); National Environmental Policy Act of 1969 (42 U.S.C. 4332); 44 U.S.C. 3504 note; Sec. 109, Pub. L. 96–295, 94 Stat. 783.

■ 2. In § 50.55a:

■ a. Revise paragraphs (a) introductory text, (a)(1)(i) introductory text and (a)(1)(i)(E)(*12*) and (*13*) and add paragraphs (a)(1)(i)(E)(*14*) through (*17*);

■ b. Revise paragraphs (a)(1)(ii) introductory text and (a)(1)(ii)(C)(*48*) and (*49*) and add paragraphs (a)(1)(ii)(C)(*50*) through (*53*);

■ c. Revise paragraphs (a)(1)(iii)(A) through (C) and add paragraphs (a)(1)(iii)(D) through (G);

■ d. Revise paragraph (a)(1)(iv) introductory text and add paragraphs (a)(1)(iv)(B) and (C);

■ e. Add paragraph (a)(1)(v);

■ f. Revise paragraphs (b) introductory text, (b)(1) introductory text and (b)(1)(ii), (iv), and (vii) and add paragraphs (b)(1)(viii) and (ix);

■ g. Revise paragraphs (b)(2) introductory text, (b)(2)(vi), and (b)(2)(viii) introductory text, add paragraphs (b)(2)(viii)(H) and (I), revise paragraphs (b)(2)(ix) introductory text, (b)(2)(ix)(D), and (b)(2)(x) and (xii), add paragraph (b)(2)(xviii)(D), revise paragraphs (b)(2)(xxi)(A) and (b)(2)(xxiii), add and reserve paragraph (b)(2)(xxx), and add paragraphs (b)(2)(xxxi) through (xxxvii);

■ h. Revise paragraphs (b)(3) introductory text and (b)(3)(i) and (ii), add paragraph (b)(3)(iii), revise paragraph (b)(3)(iv) introductory text, and add paragraphs (b)(3)(vii) through (xi);

■ i. Revise paragraphs (b)(4) introductory text and (b)(5) and (6);

■ j. Revise paragraphs (f) heading and introductory text, (f)(2), (f)(3)(iii)(A) and (B), (f)(3)(iv)(A) and (B), (f)(4) introductory text, and (f)(4)(i) and (ii); and

■ k. Revise paragraphs (g) heading and introductory text, (g)(2), and (g)(3)

heading, remove paragraph (g)(3) introductory text, revise paragraphs (g)(3)(i), (ii), and (v), (g)(4)(i) and (ii), and (g)(6)(ii)(D)(*1*) through (*4*), remove paragraphs (g)(6)(ii)(D)(*5*) and (*6*), revise paragraphs (g)(6)(ii)(F)(*1*) through (*10*), and add paragraphs (g)(6)(ii)(F)(*11*) through (*13*).

The revisions and additions read as follows:

§ 50.55a Codes and standards.

(a) *Documents approved for incorporation by reference.* The standards listed in this paragraph (a) have been approved for incorporation by reference by the Director of the Federal Register pursuant to 5 U.S.C. 552(a) and 1 CFR part 51. The standards are available for inspection, by appointment, at the NRC Technical Library, which is located at Two White Flint North, 11545 Rockville Pike, Rockville, Maryland 20852; telephone: 301–415–7000; email: *Library.Resource@nrc.gov;* or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030 or go to *http://www.archives.gov/federal-register/cfr/ibr-locations.html.*

(1) * * *

(i) *ASME Boiler and Pressure Vessel Code, Section III.* The editions and addenda for Section III of the ASME Boiler and Pressure Vessel Code (excluding Nonmandatory Appendices) (referred to herein as ASME BPV Code) are listed in this paragraph (a)(1)(i), but limited by those provisions identified in paragraph (b)(1) of this section.

* * * * *

(E) * * *

(*12*) 2007 Edition,

(*13*) 2008 Addenda,

(*14*) 2009b Addenda (including Subsection NCA; and Division 1 subsections NB through NH and Appendices),

(*15*) 2010 Edition (including Subsection NCA; and Division 1 subsections NB through NH and Appendices),

(*16*) 2011a Addenda (including Subsection NCA; and Division 1 subsections NB through NH and Appendices), and

(*17*) 2013 Edition (including Subsection NCA; and Division 1 subsections NB through NH and Appendices).

(ii) *ASME Boiler and Pressure Vessel Code, Section XI.* The editions and addenda for Section XI of the ASME BPV Code are listed in this paragraph (a)(1)(ii), but limited by those provisions identified in paragraph (b)(2) of this section.

* * * * *

(C) * * *

(*48*) 2007 Edition,

(*49*) 2008 Addenda,

(*50*) 2009b Addenda,

(*51*) 2010 Edition,

(*52*) 2011a Addenda (Excluding Article IWB–2000: IWB–2500 ''Examination and Inspection: Examination and Pressure Test Requirements,'' Table IWB–2500–1 ''Examination Categories,'' Item numbers B5.11 and B5.71), and

(*53*) 2013 Edition (Excluding Article IWB–2000: IWB–2500 ''Examination and Inspection: Examination and Pressure Test Requirements,'' Table IWB–2500–1 (B–F) ''Examination Category B–F, Pressure Retaining Dissimilar Metal Welds in Vessel Nozzles,'' Item numbers B5.11 and B5.71; Article IWB–3000 ''Acceptance Standards,'' IWB–3100 ''Evaluation of Examination Results,'' IWB–3110 ''Preservice Volumetric and Surface Examinations,'' IWB–3112 ''Acceptance,'' paragraph (a)(3); and Article IWC–3000 ''Acceptance Standards,'' IWC–3100 ''Evaluation of Examination Results,'' IWC–3110 ''Preservice Volumetric and Surface Examinations,'' IWC–3112 ''Acceptance,'' paragraph (a)(3)).

(iii) * * *

(A) *ASME BPV Code Case N–513–3 Mandatory Appendix I.* ASME BPV Code Case N–513–3, ''Evaluation Criteria for Temporary Acceptance of Flaws in Moderate Energy Class 2 or 3 Piping Section XI, Division 1,'' Mandatory Appendix I, ''Relations for F_m, F_b, and F for Through-Wall Flaws'' (Approval Date: January 26, 2009). ASME BPV Code Case N–513–3 Mandatory Appendix I is referenced in paragraph (b)(2)(xxxiv)(B) of this section.

(B) *ASME BPV Code Case N–722–1.* ASME BPV Code Case N–722–1, ''Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials, Section XI, Division 1'' (Approval Date: January 26, 2009), with the conditions in paragraph (g)(6)(ii)(E) of this section.

(C) *ASME BPV Code Case N–729–4.* ASME BPV Code Case N–729–4, ''Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds Section XI, Division 1'' (Approval Date: June 22, 2012), with the conditions in paragraph (g)(6)(ii)(D) of this section.

(D) *ASME BPV Code Case N–770–2.* ASME BPV Code Case N–770–2, ''Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated with UNS N06082 or UNS W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities Section XI, Division 1'' (Approval Date: June 9, 2011), with the conditions in paragraph (g)(6)(ii)(F) of this section.

(E) *ASME BPV Code Case N–824.* ASME BPV Code Case N–824, ''Ultrasonic Examination of Cast Austenitic Piping Welds From the Outside Surface Section XI, Division 1'' (Approval Date: October 16, 2012), with the conditions in paragraphs (b)(2)(xxxvii)(A) through (D) of this section.

(F) *ASME BPV Code Case N–852.* ASME BPV Code Case N–852, ''Application of the ASME NPT Stamp, Section III, Division 1; Section III, Division 2; Section III, Division 3; Section III, Division 5'' (Approval Date: February 9, 2015). ASME BPV Code Case N–852 is referenced in paragraph (b)(1)(ix) of this section.

(G) *ASME OM Code Case OMN–20.* ASME OM Code Case OMN–20, ''Inservice Test Frequency,'' in the 2012 Edition of the ASME OM Code. OMN–20 is referenced in paragraph (b)(3)(x) of this section.

(iv) *ASME Operation and Maintenance Code.* The editions and addenda for the ASME Operation and Maintenance of Nuclear Power Plants (various edition titles referred to herein as ASME OM Code) are listed in this paragraph (a)(1)(iv), but limited by those provisions identified in paragraph (b)(3) of this section.

* * * * *

(B) ''Operation and Maintenance of Nuclear Power Plants, Division 1: Section IST Rules for Inservice Testing of Light-Water Reactor Power Plants:''

(*1*) 2009 Edition; and

(*2*) 2011 Addenda.

(C) ''Operation and Maintenance of Nuclear Power Plants, Division 1: OM Code: Section IST:''

(*1*) 2012 Edition.

(*2*) [Reserved]

(v) *ASME Quality Assurance Requirements.* (A) ASME NQA–1, ''Quality Assurance Program Requirements for Nuclear Facilities:''

(*1*) NQA–1—1983 Edition;

(*2*) NQA–1a—1983 Addenda;

(*3*) NQA–1b—1984 Addenda;

(*4*) NQA–1c—1985 Addenda;

(*5*) NQA–1—1986 Edition;

(*6*) NQA–1a—1986 Addenda;

(*7*) NQA–1b—1987 Addenda;

(*8*) NQA–1c—1988 Addenda;

(*9*) NQA–1—1989 Edition;

(*10*) NQA–1a—1989 Addenda;
(*11*) NQA–1b—1991 Addenda; and
(*12*) NQA–1c—1992 Addenda.
(B) ASME NQA–1, ''Quality Assurance Requirements for Nuclear Facility Applications:''
(*1*) NQA–1—1994 Edition;
(*2*) NQA–1—2008 Edition; and
(*3*) NQA–1a—2009 Addenda.
* * * * *

(b) *Use and conditions on the use of standards.* Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME BPV Code and the ASME OM Code as specified in this paragraph (b). Each combined license for a utilization facility is subject to the following conditions.

(1) *Conditions on ASME BPV Code Section III.* Each manufacturing license, standard design approval, and design certification under 10 CFR part 52 is subject to the following conditions. As used in this section, references to Section III refer to Section III of the ASME BPV Code and include the 1963 Edition through 1973 Winter Addenda and the 1974 Edition (Division 1) through the 2013 Edition (Division 1), subject to the following conditions:

* * * * *

(ii) *Section III condition: Weld leg dimensions.* When applying the 1989 Addenda through the latest edition and addenda incorporated by reference in paragraph (a)(1) of this section, applicants and licensees may not apply the Section III provisions identified in Table I of this section for welds with leg size less than 1.09 t_n:

TABLE I—PROHIBITED CODE PROVISIONS

Editions and addenda	Code provision
1989 Addenda through 2013 Edition	Subparagraph NB–3683.4(c)(1); Subparagraph NB–3683.4(c)(2).
1989 Addenda through 2003 Addenda	Note 11 to Figure NC–3673.2(b)–1; Note 11 to Figure ND–3673.2(b)–1.
2004 Edition through 2010 Edition	Note 13 to Figure NC–3673.2(b)–1; Note 13 to Figure ND–3673.2(b)–1.
2011 Addenda through 2013 Edition	Note 11 to Table NC–3673.2(b)–1; Note 11 to Table ND–3673.2(b)–1.

* * * * *

(iv) *Section III condition: Quality assurance.* When applying editions and addenda later than the 1989 Edition of Section III, the requirements of NQA–1, ''Quality Assurance Requirements for Nuclear Facility Applications,'' 1994 Edition, 2008 Edition, and the 2009–1a Addenda specified in either NCA–4000 or NCA–7000 of that edition and addenda of Section III may be used by an applicant or licensee, provided that the administrative, quality, and technical provisions contained in that edition and addenda of Section III are used in conjunction with the applicant's or licensee's appendix B to this part quality assurance program; and that the applicant's or licensee's Section III activities comply with those commitments contained in the applicant's or licensee's quality assurance program description. Where NQA–1 and Section III do not address the commitments contained in the applicant's or licensee's appendix B quality assurance program description, those licensee commitments must be applied to Section III activities.
* * * * *

(vii) *Section III condition: Capacity certification and demonstration of function of incompressible-fluid pressure-relief valves.* When applying the 2006 Addenda through the 2013 Edition, applicants and licensees may use paragraph NB–7742, except that paragraph NB–7742(a)(2) may not be used. For a valve design of a single size to be certified over a range of set pressures, the demonstration of function tests under paragraph NB–7742 must be conducted as prescribed in NB–7732.2 on two valves covering the minimum set pressure for the design and the maximum set pressure that can be accommodated at the demonstration facility selected for the test.

(viii) *Section III condition: Use of ASME certification marks.* When applying editions and addenda earlier than the 2011 Addenda to the 2010 Edition, licensees may use either the ASME BPV Code Symbol Stamps or the ASME Certification Marks with the appropriate certification designators and class designators as specified in the 2013 Edition through the latest edition and addenda incorporated by reference in paragraph (a)(1) of this section.

(ix) *Section III Condition: NPT Code Symbol Stamps.* Licensees may use the NPT Code Symbol Stamp with the letters arranged horizontally as specified in ASME BPV Code Case N–852 for the service life of a component that had the NPT Code Symbol Stamp applied during the time period from January 1, 2005, through December 31, 2015.

(2) *Conditions on ASME BPV Code, Section XI.* As used in this section, references to Section XI refer to Section XI, Division 1, of the ASME BPV Code, and include the 1970 Edition through the 1976 Winter Addenda and the 1977 Edition through the 2013 Edition, subject to the following conditions:
* * * * *

(vi) *Section XI condition: Effective edition and addenda of Subsection IWE and Subsection IWL.* Licensees that implemented the expedited examination of containment, in accordance with Subsection IWE and Subsection IWL, during the period from September 9, 1996, to September 9, 2001, may use either the 1992 Edition with the 1992 Addenda or the 1995 Edition with the 1996 Addenda of Subsection IWE and Subsection IWL, as conditioned by the requirements in paragraphs (b)(2)(viii) and (ix) of this section, when implementing the initial 120-month inspection interval for the containment inservice inspection requirements of this section. Successive 120-month interval updates must be implemented in accordance with paragraph (g)(4)(ii) of this section.
* * * * *

(viii) *Section XI condition: Concrete containment examinations.* Applicants or licensees applying Subsection IWL, 1992 Edition with the 1992 Addenda, must apply paragraphs (b)(2)(viii)(A) through (E) of this section. Applicants or licensees applying Subsection IWL, 1995 Edition with the 1996 Addenda, must apply paragraphs (b)(2)(viii)(A), (b)(2)(viii)(D)(*3*), and (b)(2)(viii)(E) of this section. Applicants or licensees applying Subsection IWL, 1998 Edition through the 2000 Addenda, must apply paragraphs (b)(2)(viii)(E) and (F) of this section. Applicants or licensees applying Subsection IWL, 2001 Edition through the 2004 Edition, up to and including the 2006 Addenda, must apply paragraphs (b)(2)(viii)(E) through (G) of this section. Applicants or licensees applying Subsection IWL, 2007 Edition up to and including the 2008 Addenda must apply paragraph (b)(2)(viii)(E) of this section. Applicants or licensees applying Subsection IWL, 2007 Edition with the 2009 Addenda through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section, must apply paragraphs (b)(2)(viii)(H) and (I) of this section.
* * * * *

(H) *Concrete containment examinations: Eighth provision.* For each inaccessible area of concrete identified for evaluation under IWL–2512(a), or identified as susceptible to deterioration under IWL–2512(b), the licensee must provide the applicable information specified in paragraphs (b)(2)(viii)(E)(*1*), (*2*), and (*3*) of this section in the ISI Summary Report required by IWA–6000.

(I) *Concrete containment examinations: Ninth provision.* During the period of extended operation of a renewed license under part 54 of this chapter, the licensee must perform the technical evaluation under IWL–2512(b) of inaccessible below-grade concrete surfaces exposed to foundation soil, backfill, or groundwater at periodic intervals not to exceed 5 years. In addition, the licensee must examine representative samples of the exposed portions of the below-grade concrete, when such below-grade concrete is excavated for any reason.

(ix) *Section XI condition: Metal containment examinations.* Applicants or licensees applying Subsection IWE, 1992 Edition with the 1992 Addenda, or the 1995 Edition with the 1996 Addenda, must satisfy the requirements of paragraphs (b)(2)(ix)(A) through (E) of this section. Applicants or licensees applying Subsection IWE, 1998 Edition through the 2001 Edition with the 2003 Addenda, must satisfy the requirements of paragraphs (b)(2)(ix)(A) and (B) and (F) through (I) of this section. Applicants or licensees applying Subsection IWE, 2004 Edition, up to and including the 2005 Addenda, must satisfy the requirements of paragraphs (b)(2)(ix)(A) and (B) and (F) through (H) of this section. Applicants or licensees applying Subsection IWE, 2004 Edition with the 2006 Addenda, must satisfy the requirements of paragraphs (b)(2)(ix)(A)(*2*) and (b)(2)(ix)(B) of this section. Applicants or licensees applying Subsection IWE, 2007 Edition through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section, must satisfy the requirements of paragraphs (b)(2)(ix)(A)(*2*) and (b)(2)(ix)(B) and (J) of this section.

* * * * *

(D) *Metal containment examinations: Fourth provision.* This paragraph (b)(2)(ix)(D) may be used as an alternative to the requirements of IWE–2430. If the examinations reveal flaws or areas of degradation exceeding the acceptance standards of Table IWE–3410–1, an evaluation must be performed to determine whether additional component examinations are required. For each flaw or area of degradation identified that exceeds acceptance standards, the applicant or licensee must provide the following in the ISI Summary Report required by IWA–6000:

(*1*) A description of each flaw or area, including the extent of degradation, and the conditions that led to the degradation;

(*2*) The acceptability of each flaw or area and the need for additional examinations to verify that similar degradation does not exist in similar components;

(*3*) A description of necessary corrective actions; and

(*4*) The number and type of additional examinations to ensure detection of similar degradation in similar components.

* * * * *

(x) *Section XI condition: Quality assurance.* When applying the editions and addenda later than the 1989 Edition of ASME BPV Code, Section XI, the edition and addenda of NQA–1, ''Quality Assurance Requirements for Nuclear Facility Applications,'' 1994 Edition, the 2008 Edition, and the 2009–1a Addenda specified in either IWA–1400 or Table IWA 1600–1 of that edition and addenda of Section XI, may be used by a licensee provided that the licensee uses its appendix B to this part quality assurance program in conjunction with Section XI requirements and the commitments contained in the licensee's quality assurance program description. Where NQA–1 and Section XI do not address the commitments contained in the licensee's appendix B quality assurance program description, those licensee commitments must be applied to Section XI activities.

* * * * *

(xii) *Section XI condition: Underwater welding.* The provisions in IWA–4660, ''Underwater Welding,'' of Section XI, 1997 Addenda through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section, are approved for use on irradiated material with the following conditions:

(A) *Underwater welding: First provision.* Licensees must obtain NRC approval in accordance with paragraph (z) of this section regarding the welding technique to be used prior to performing welding on ferritic material exposed to fast neutron fluence greater than 1×10^{17} n/cm^2 (E > 1 MeV).

(B) *Underwater welding: Second provision.* Licensees must obtain NRC approval in accordance with paragraph (z) of this section regarding the welding technique to be used prior to performing welding on austenitic material other than P-No. 8 material exposed to thermal neutron fluence greater than 1×10^{17} n/cm^2 (E < 0.5 eV). Licensees must obtain NRC approval in accordance with paragraph (z) regarding the welding technique to be used prior to performing welding on P-No. 8 austenitic material exposed to thermal neutron fluence greater than 1×10^{17} n/cm^2 (E < 0.5 eV) and measured or calculated helium concentration of the material greater than 0.1 atomic parts per million.

* * * * *

(xviii) * * *

(D) *NDE personnel certification: Fourth provision.* The use of Appendix VII and Subarticle VIII–2200 of the 2011 Addenda and 2013 Edition of Section XI of the ASME BPV Code is prohibited. When using ASME BPV Code, Section XI editions and addenda later than the 2010 Edition, licensees and applicants must use the prerequisites for ultrasonic examination personnel certifications in Table VII–4110–1 and Subarticle VIII–2200, Appendix VIII in the 2010 Edition.

* * * * *

(xxi) * * *

(A) *Table IWB–2500–1 examination requirements: First provision.* The provisions of Table IWB 2500–1, Examination Category B–D, Full Penetration Welded Nozzles in Vessels, Items B3.40 and B3.60 (Inspection Program A) and Items B3.120 and B3.140 (Inspection Program B) of the 1998 Edition must be applied when using the 1999 Addenda through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section. A visual examination with magnification that has a resolution sensitivity to resolve 0.044 inch (1.1 mm) lower case characters without an ascender or descender (*e.g.,* a, e, n, v), utilizing the allowable flaw length criteria in Table IWB–3512–1, 1997 Addenda through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section, with a limiting assumption on the flaw aspect ratio (*i.e.,* a/l = 0.5), may be performed instead of an ultrasonic examination.

* * * * *

(xxiii) *Section XI condition: Evaluation of thermally cut surfaces.* The use of the provisions for eliminating mechanical processing of thermally cut surfaces in IWA–4461.4.2 of Section XI, 2001 Edition through the 2009 Addenda, is prohibited.

* * * * *

(xxx) [Reserved]

(xxxi) *Section XI condition: Mechanical clamping devices.* When

installing a mechanical clamping device on an ASME BPV Code class piping system, Appendix W of Section XI shall be treated as a mandatory appendix and all of the provisions of Appendix W shall be met for the mechanical clamping device being installed. Additionally, use of IWA–4131.1(c) of the 2010 Edition of Section XI and IWA–4131.1(d) of the 2011 Addenda of the 2010 Edition and later versions of Section XI is prohibited on small item Class 1 piping and portions of a piping system that form the containment boundary.

(xxxii) *Section XI condition: Summary report submittal.* When using ASME BPV Code, Section XI, 2010 Edition through the latest edition and addenda incorporated by reference in paragraph (a)(1)(ii) of this section, Summary Reports described in IWA–6000 must be submitted to the NRC as described in IWA–6240(a) and IWA–6240(b). Preservice inspection summary reports shall be submitted prior to the date of placement of the unit into commercial service and inservice inspection summary reports shall be submitted within 90 calendar days of the completion of each refueling outage.

(xxxiii) *Section XI condition: Risk-Informed allowable pressure.* The use of Paragraph G–2216 in Appendix G in the 2011 Addenda and later editions and addenda of the ASME BPV Code, Section XI is prohibited.

(xxxiv) *Section XI condition: Nonmandatory Appendix U.* When using Nonmandatory Appendix U of the 2013 Edition of the ASME BPV Code, Section XI the following conditions apply:

(A) The repair or replacement activities temporarily deferred under the provisions of Nonmandatory Appendix U must be performed during the next scheduled refueling outage.

(B) In lieu of the appendix referenced in paragraph U–S1–4.2.1(c) of Appendix U the mandatory appendix in ASME BPV Code Case N–513–3 must be used.

(xxxv) *Section XI condition: Use of RT_{T0} in the K_{Ia} and K_{Ic} equations.* When using the 2013 Edition of the ASME BPV Code, Section XI, Appendix A, paragraph A–4200, if T_0 is available, then RT_{T0} may be used in place of RT_{NDT} for applications using the K_{Ic} equation and the associated K_{Ic} curve, but not for applications using the K_{Ia} equation and the associated K_{Ia} curve.

(xxxvi) *Section XI condition: Fracture toughness of irradiated materials.* When using the 2013 Edition of the ASME BPV Code, Section XI, Appendix A paragraph A–4400, the licensee shall obtain NRC approval under paragraph (z) of this section before using irradiated T_0 and the associated RT_{T0} in establishing fracture toughness of irradiated materials.

(xxxvii) *Section XI condition: ASME BPV Code Case N–824.* Licensees may use the provisions of ASME BPV Code Case N–824, ''Ultrasonic Examination of Cast Austenitic Piping Welds From the Outside Surface Section XI, Division 1,'' subject to the following conditions.

(A) Ultrasonic examinations must be spatially encoded.

(B) Instead of Paragraph 1(c)(1)(–a), licensees shall use dual, transmit-receive, refracted longitudinal wave, multi-element phased array search units.

(C) Instead of Paragraph 1(c)(1)(–c)(–2), licensees shall use a phased array search unit with a center frequency of 500 kHz with a tolerance of ± 20 percent.

(D) Instead of Paragraph 1(c)(1)(–d), the phased array search unit must produce angles including, but not limited to, 30 to 55 degrees with a maximum increment of 5 degrees.

(3) *Conditions on ASME OM Code.* As used in this section, references to the ASME OM Code are to the ASME OM Code, Subsections ISTA, ISTB, ISTC, ISTD, ISTE, and ISTF; Mandatory Appendices I, II, III, and V; and Nonmandatory Appendices A through H and J through M, in the 1995 Edition through the 2012 Edition, as specified in paragraph (a)(1)(iv) of this section. Mandatory appendices must be used if required by the OM Code; nonmandatory appendices are approved for use by the NRC but need not be used. The following conditions are applicable when implementing the ASME OM Code:

(i) *OM condition: Quality assurance.* When applying editions and addenda of the ASME OM Code, the requirements of ASME Standard NQA–1, ''Quality Assurance Requirements for Nuclear Facility Applications,'' 1994 Edition, 2008 Edition, and 2009–1a Addenda, are acceptable as permitted by either ISTA 1.4 of the 1995 Edition through 1997 Addenda or ISTA–1500 of the 1998 Edition through the latest edition and addenda of the ASME OM Code incorporated by reference in paragraph (a)(1)(iv) of this section, provided the licensee uses its appendix B to this part quality assurance program in conjunction with the ASME OM Code requirements and the commitments contained in the licensee's quality assurance program description. Where NQA–1 and the ASME OM Code do not address the commitments contained in the licensee's appendix B quality assurance program description, the commitments must be applied to ASME OM Code activities.

(ii) *OM condition: Motor-Operated Valve (MOV) testing.* Licensees must comply with the provisions for testing MOVs in ASME OM Code, ISTC 4.2, 1995 Edition with the 1996 and 1997 Addenda, or ISTC–3500, 1998 Edition through the latest edition and addenda incorporated by reference in paragraph (a)(1)(iv) of this section, and must establish a program to ensure that MOVs continue to be capable of performing their design basis safety functions. Licensees implementing ASME OM Code, Mandatory Appendix III, ''Preservice and Inservice Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants,'' of the 2009 Edition, 2011 Addenda, and 2012 Edition shall comply with the following conditions:

(A) *MOV diagnostic test interval.* Licensees shall evaluate the adequacy of the diagnostic test intervals established for MOVs within the scope of ASME OM Code, Appendix III, not later than 5 years or three refueling outages (whichever is longer) from initial implementation of ASME OM Code, Appendix III.

(B) *MOV testing impact on risk.* Licensees shall ensure that the potential increase in core damage frequency and large early release frequency associated with the extension is acceptably small when extending exercise test intervals for high risk MOVs beyond a quarterly frequency.

(C) *MOV risk categorization.* When applying Appendix III to the ASME OM Code, licensees shall categorize MOVs according to their safety significance using the methodology described in ASME OM Code Case OMN–3, ''Requirements for Safety Significance Categorization of Components Using Risk Insights for Inservice Testing of LWR Power Plants,'' subject to the conditions applicable to OMN–3 which are set forth in Regulatory Guide 1.192, or using an MOV risk ranking methodology accepted by the NRC on a plant-specific or industry-wide basis in accordance with the conditions in the applicable safety evaluation.

(D) *MOV stroke time.* When applying Paragraph III–3600, ''MOV Exercising Requirements,'' of Appendix III to the ASME OM Code, licensees shall verify that the stroke time of MOVs specified in plant technical specifications satisfies the assumptions in the plant's safety analyses.

(iii) *OM condition: New reactors.* In addition to complying with the provisions in the ASME OM Code with the conditions specified in paragraph (b)(3) of this section, holders of

operating licenses for nuclear power reactors that received construction permits under this part on or after the date 12 months after August 17, 2017, and holders of combined licenses issued under 10 CFR part 52, whose initial fuel loading occurs on or after the date 12 months after August 17, 2017, shall also comply with the following conditions, as applicable:

(A) *Power-operated valves.* Licensees shall periodically verify the capability of power-operated valves to perform their design-basis safety functions.

(B) *Check valves.* Licensees must perform bi-directional testing of check valves within the IST program where practicable.

(C) *Flow-induced vibration.* Licensees shall monitor flow-induced vibration from hydrodynamic loads and acoustic resonance during preservice testing or inservice testing to identify potential adverse flow effects on components within the scope of the IST program.

(D) *High risk non-safety systems.* Licensees shall assess the operational readiness of pumps, valves, and dynamic restraints within the scope of the Regulatory Treatment of Non-Safety Systems for applicable reactor designs.

(iv) *OM condition: Check valves (Appendix II).* Licensees applying Appendix II, ''Check Valve Condition Monitoring Program,'' of the ASME OM Code, 1995 Edition with the 1996 and 1997 Addenda, shall satisfy the requirements of paragraphs (b)(3)(iv)(A) through (C) of this section. Licensees applying Appendix II, 1998 Edition through the 2012 Edition, shall satisfy the requirements of paragraphs (b)(3)(iv)(A), (B), and (D) of this section. Appendix II of the ASME OM Code, 2003 Addenda through the 2012 Edition, is acceptable for use with the following requirements. Trending and evaluation shall support the determination that the valve or group of valves is capable of performing its intended function(s) over the entire interval. At least one of the Appendix II condition monitoring activities for a valve group shall be performed on each valve of the group at approximate equal intervals not to exceed the maximum interval shown in the following table:

TABLE II—MAXIMUM INTERVALS FOR USE WHEN APPLYING INTERVAL EXTENSIONS

Group size	Maximum interval between activities of member valves in the groups (years)	Maximum interval between activities of each valve in the group (years)
≥4	4.5	16
3	4.5	12
2	6	12
1	Not applicable	10

* * * * *

(vii) *OM condition: Subsection ISTB.* Subsection ISTB, 2011 Addenda, is prohibited for use.

(viii) *OM condition: Subsection ISTE.* Licensees may not implement the risk-informed approach for inservice testing (IST) of pumps and valves specified in Subsection ISTE, ''Risk-Informed Inservice Testing of Components in Light-Water Reactor Nuclear Power Plants,'' in the ASME OM Code, 2009 Edition, 2011 Addenda, or 2012 Edition, without first obtaining NRC authorization to use Subsection ISTE as an alternative to the applicable IST requirements in the ASME OM Code, pursuant to paragraph (z) of this section.

(ix) *OM condition: Subsection ISTF.* Licensees applying Subsection ISTF, 2012 Edition, shall satisfy the requirements of Mandatory Appendix V, ''Pump Periodic Verification Test Program,'' of the ASME OM Code, 2012 Edition. Subsection ISTF, 2011 Addenda, is prohibited for use.

(x) *OM condition: ASME OM Code Case OMN–20.* Licensees may implement ASME OM Code Case OMN–20, ''Inservice Test Frequency,'' which is incorporated by reference in paragraph (a)(1)(iii)(G) of this section, for editions and addenda of the ASME OM Code listed in paragraph (a)(1)(iv) of this section.

(xi) *OM condition: Valve Position Indication.* When implementing ASME OM Code, 2012 Edition, Subsection ISTC–3700, ''Position Verification Testing,'' licensees shall verify that valve operation is accurately indicated by supplementing valve position indicating lights with other indications, such as flow meters or other suitable instrumentation, to provide assurance of proper obturator position.

(4) *Conditions on Design, Fabrication, and Materials Code Cases.* Each manufacturing license, standard design approval, and design certification application under part 52 of this chapter is subject to the following conditions. Licensees may apply the ASME BPV Code Cases listed in NRC Regulatory Guide 1.84, as incorporated by reference in paragraph (a)(3)(i) of this section, without prior NRC approval, subject to the following conditions:

* * * * *

(5) *Conditions on inservice inspection Code Cases.* Licensees may apply the ASME BPV Code Cases listed in NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section, without prior NRC approval, subject to the following:

(i) *ISI Code Case condition: Applying Code Cases.* When a licensee initially applies a listed Code Case, the licensee must apply the most recent version of that Code Case incorporated by reference in paragraph (a) of this section.

(ii) *ISI Code Case condition: Applying different revisions of Code Cases.* If a licensee has previously applied a Code Case and a later version of the Code Case is incorporated by reference in paragraph (a) of this section, the licensee may continue to apply, to the end of the current 120-month interval, the previous version of the Code Case, as authorized, or may apply the later version of the Code Case, including any NRC-specified conditions placed on its use. Licensees who choose to continue use of the Code Case during subsequent 120-month ISI program intervals will be required to implement the latest version incorporated by reference into this section as listed in Tables 1 and 2 of NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section.

(iii) *ISI Code Case condition: Applying annulled Code Cases.* Application of an annulled Code Case is prohibited unless a licensee previously applied the listed Code Case prior to it being listed as annulled in NRC

Regulatory Guide 1.147. If a licensee has applied a listed Code Case that is later listed as annulled in NRC Regulatory Guide 1.147, the licensee may continue to apply the Code Case to the end of the current 120-month interval.

(6) *Conditions on ASME OM Code Cases.* Licensees may apply the ASME OM Code Cases listed in NRC Regulatory Guide 1.192, as incorporated by reference in paragraph (a)(3)(iii) of this section, without prior NRC approval, subject to the following:

(i) *OM Code Case condition: Applying Code Cases.* When a licensee initially applies a listed Code Case, the licensee must apply the most recent version of that Code Case incorporated by reference in paragraph (a) of this section.

(ii) *OM Code Case condition: Applying different revisions of Code Cases.* If a licensee has previously applied a Code Case and a later version of the Code Case is incorporated by reference in paragraph (a) of this section, the licensee may continue to apply, to the end of the current 120-month interval, the previous version of the Code Case, as authorized, or may apply the later version of the Code Case, including any NRC-specified conditions placed on its use. Licensees who choose to continue use of the Code Case during subsequent 120-month ISI program intervals will be required to implement the latest version incorporated by reference into this section as listed in Tables 1 and 2 of NRC Regulatory Guide 1.192, as incorporated by reference in paragraph (a)(3)(iii) of this section.

(iii) *OM Code Case condition: Applying annulled Code Cases.* Application of an annulled Code Case is prohibited unless a licensee previously applied the listed Code Case prior to it being listed as annulled in NRC Regulatory Guide 1.192. If a licensee has applied a listed Code Case that is later listed as annulled in NRC Regulatory Guide 1.192, the licensee may continue to apply the Code Case to the end of the current 120-month interval.

* * * * *

(f) *Preservice and inservice testing requirements.* Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements for preservice and inservice testing (referred to in this paragraph (f) collectively as inservice testing) of the ASME BPV Code and ASME OM Code as specified in this paragraph (f). Each operating license for a boiling or pressurized water-cooled nuclear facility is subject to the following conditions. Each combined license for a boiling or pressurized water-cooled nuclear facility is subject to the following conditions, but the conditions in paragraphs (f)(4) through (6) of this section must be met only after the Commission makes the finding under § 52.103(g) of this chapter. Requirements for inservice inspection of Class 1, Class 2, Class 3, Class MC, and Class CC components (including their supports) are located in paragraph (g) of this section.

* * * * *

(2) *Design and accessibility requirements for performing inservice testing in plants with CPs issued between 1971 and 1974.* For a boiling or pressurized water-cooled nuclear power facility whose construction permit was issued on or after January 1, 1971, but before July 1, 1974, pumps and valves that are classified as ASME BPV Code Class 1 and Class 2 must be designed and provided with access to enable the performance of inservice tests for operational readiness set forth in editions and addenda of Section XI of the ASME BPV Code incorporated by reference in paragraph (a)(1)(ii) of this section (or the optional ASME Code Cases listed in NRC Regulatory Guide 1.147 or NRC Regulatory Guide 1.192, as incorporated by reference in paragraphs (a)(3)(ii) and (iii) of this section, respectively) in effect 6 months before the date of issuance of the construction permit. The pumps and valves may meet the inservice test requirements set forth in subsequent editions of this Code and addenda that are incorporated by reference in paragraph (a)(1)(ii) of this section (or the optional ASME Code Cases listed in NRC Regulatory Guide 1.147 or NRC Regulatory Guide 1.192, as incorporated by reference in paragraphs (a)(3)(ii) and (iii) of this section, respectively), subject to the applicable conditions listed therein.

* * * * *

(3) * * *

(iii) * * *

(A) *Class 1 pumps and valves: First provision.* In facilities whose construction permit was issued before November 22, 1999, pumps and valves that are classified as ASME BPV Code Class 1 must be designed and provided with access to enable the performance of inservice testing of the pumps and valves for assessing operational readiness set forth in the editions and addenda of Section XI of the ASME BPV Code incorporated by reference in paragraph (a)(1)(ii) of this section (or the optional ASME Code Cases listed in NRC Regulatory Guide 1.147 or NRC Regulatory Guide 1.192, as incorporated by reference in paragraphs (a)(3)(ii) and (iii) of this section, respectively) applied to the construction of the particular pump or valve or the summer 1973 Addenda, whichever is later.

(B) *Class 1 pumps and valves: Second provision.* In facilities whose construction permit under this part, or design certification, design approval, combined license, or manufacturing license under part 52 of this chapter, issued on or after November 22, 1999, pumps and valves that are classified as ASME BPV Code Class 1 must be designed and provided with access to enable the performance of inservice testing of the pumps and valves for assessing operational readiness set forth in editions and addenda of the ASME OM Code (or the optional ASME OM Code Cases listed in NRC Regulatory Guide 1.192, as incorporated by reference in paragraph (a)(3)(iii) of this section), incorporated by reference in paragraph (a)(1)(iv) of this section at the time the construction permit, combined license, manufacturing license, design certification, or design approval is issued.

(iv) * * *

(A) *Class 2 and 3 pumps and valves: First provision.* In facilities whose construction permit was issued before November 22, 1999, pumps and valves that are classified as ASME BPV Code Class 2 and Class 3 must be designed and be provided with access to enable the performance of inservice testing of the pumps and valves for assessing operational readiness set forth in the editions and addenda of Section XI of the ASME BPV Code incorporated by reference in paragraph (a)(1)(ii) of this section (or the optional ASME BPV Code Cases listed in NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section) applied to the construction of the particular pump or valve or the Summer 1973 Addenda, whichever is later.

(B) *Class 2 and 3 pumps and valves: Second provision.* In facilities whose construction permit under this part, or design certification, design approval, combined license, or manufacturing license under part 52 of this chapter, issued on or after November 22, 1999, pumps and valves that are classified as ASME BPV Code Class 2 and 3 must be designed and provided with access to enable the performance of inservice testing of the pumps and valves for assessing operational readiness set forth in editions and addenda of the ASME OM Code (or the optional ASME OM Code Cases listed in NRC Regulatory Guide 1.192, as incorporated by reference in paragraph (a)(3)(iii) of this section), incorporated by reference in paragraph (a)(1)(iv) of this section at the

time the construction permit, combined license, or design certification is issued.

* * * * *

(4) *Inservice testing standards requirement for operating plants.* Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, pumps and valves that are within the scope of the ASME OM Code must meet the inservice test requirements (except design and access provisions) set forth in the ASME OM Code and addenda that become effective subsequent to editions and addenda specified in paragraphs (f)(2) and (3) of this section and that are incorporated by reference in paragraph (a)(1)(iv) of this section, to the extent practical within the limitations of design, geometry, and materials of construction of the components. The inservice test requirements for pumps and valves that are within the scope of the ASME OM Code but are not classified as ASME BPV Code Class 1, Class 2, or Class 3 may be satisfied as an augmented IST program in accordance with paragraph (f)(6)(ii) of this section without requesting relief under paragraph (f)(5) of this section or alternatives under paragraph (z) of this section. This use of an augmented IST program may be acceptable provided the basis for deviations from the ASME OM Code, as incorporated by reference in this section, demonstrates an acceptable level of quality and safety, or that implementing the Code provisions would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety, where documented and available for NRC review.

(i) *Applicable IST Code: Initial 120-month interval.* Inservice tests to verify operational readiness of pumps and valves, whose function is required for safety, conducted during the initial 120-month interval must comply with the requirements in the latest edition and addenda of the ASME OM Code incorporated by reference in paragraph (a)(1)(iv) of this section on the date 12 months before the date of issuance of the operating license under this part, or 12 months before the date scheduled for initial loading of fuel under a combined license under part 52 of this chapter (or the optional ASME OM Code Cases listed in NRC Regulatory Guide 1.192, as incorporated by reference in paragraph (a)(3)(iii) of this section, subject to the conditions listed in paragraph (b) of this section).

(ii) *Applicable IST Code: Successive 120-month intervals.* Inservice tests to verify operational readiness of pumps and valves, whose function is required for safety, conducted during successive 120-month intervals must comply with the requirements of the latest edition and addenda of the ASME OM Code incorporated by reference in paragraph (a)(1)(iv) of this section 12 months before the start of the 120-month interval (or the optional ASME Code Cases listed in NRC Regulatory Guide 1.147 or NRC Regulatory Guide 1.192 as incorporated by reference in paragraphs (a)(3)(ii) and (iii) of this section, respectively), subject to the conditions listed in paragraph (b) of this section.

* * * * *

(g) *Preservice and inservice inspection requirements.* Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME BPV Code as specified in this paragraph. Each operating license for a boiling or pressurized water-cooled nuclear facility is subject to the following conditions. Each combined license for a boiling or pressurized water-cooled nuclear facility is subject to the following conditions, but the conditions in paragraphs (g)(4) through (6) of this section must be met only after the Commission makes the finding under § 52.103(g) of this chapter. Requirements for inservice testing of Class 1, Class 2, and Class 3 pumps and valves are located in paragraph (f) of this section.

* * * * *

(2) *Accessibility requirements*—(i) *Accessibility requirements for plants with CPs issued between 1971 and 1974.* For a boiling or pressurized water-cooled nuclear power facility whose construction permit was issued on or after January 1, 1971, but before July 1, 1974, components that are classified as ASME BPV Code Class 1 and Class 2 and supports for components that are classified as ASME BPV Code Class 1 and Class 2 must be designed and be provided with the access necessary to perform the required preservice and inservice examinations set forth in editions and addenda of Section III or Section XI of the ASME BPV Code incorporated by reference in paragraph (a)(1) of this section (or the optional ASME BPV Code Cases listed in NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section) in effect 6 months before the date of issuance of the construction permit.

(ii) *Accessibility requirements for plants with CPs issued after 1974.* For a boiling or pressurized water-cooled nuclear power facility, whose construction permit under this part, or design certification, design approval, combined license, or manufacturing license under part 52 of this chapter, was issued on or after July 1, 1974, components that are classified as ASME BPV Code Class 1, Class 2, and Class 3 and supports for components that are classified as ASME BPV Code Class 1, Class 2, and Class 3 must be designed and provided with the access necessary to perform the required preservice and inservice examinations set forth in editions and addenda of Section III or Section XI of the ASME BPV Code incorporated by reference in paragraph (a)(1) of this section (or the optional ASME BPV Code Cases listed in NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section) applied to the construction of the particular component.

(iii) *Accessibility requirements: Meeting later Code requirements.* All components (including supports) may meet the requirements set forth in subsequent editions of codes and addenda or portions thereof that are incorporated by reference in paragraph (a) of this section, subject to the conditions listed therein.

(3) *Preservice examination requirements*—(i) *Preservice examination requirements for plants with CPs issued between 1971 and 1974.* For a boiling or pressurized water-cooled nuclear power facility whose construction permit was issued on or after January 1, 1971, but before July 1, 1974, components that are classified as ASME BPV Code Class 1 and Class 2 and supports for components that are classified as ASME BPV Code Class 1 and Class 2 must meet the preservice examination requirements set forth in editions and addenda of Section III or Section XI of the ASME BPV Code incorporated by reference in paragraph (a)(1) of this section (or the optional ASME BPV Code Cases listed in NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section) in effect 6 months before the date of issuance of the construction permit.

(ii) *Preservice examination requirements for plants with CPs issued after 1974.* For a boiling or pressurized water-cooled nuclear power facility, whose construction permit under this part, or design certification, design approval, combined license, or manufacturing license under part 52 of this chapter, was issued on or after July 1, 1974, components that are classified as ASME BPV Code Class 1, Class 2, and Class 3 and supports for components that are classified as ASME BPV Code Class 1, Class 2, and Class 3 must meet the preservice examination requirements set forth in the editions

and addenda of Section III or Section XI of the ASME BPV Code incorporated by reference in paragraph (a)(1) of this section (or the optional ASME BPV Code Cases listed in NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section) applied to the construction of the particular component.

* * * * *

(v) *Preservice examination requirements: Meeting later Code requirements.* All components (including supports) may meet the requirements set forth in subsequent editions of codes and addenda or portions thereof that are incorporated by reference in paragraph (a) of this section, subject to the conditions listed therein.

* * * * *

(4) * * *

(i) *Applicable ISI Code: Initial 120-month interval.* Inservice examination of components and system pressure tests conducted during the initial 120-month inspection interval must comply with the requirements in the latest edition and addenda of the ASME Code incorporated by reference in paragraph (a) of this section on the date 12 months before the date of issuance of the operating license under this part, or 12 months before the date scheduled for initial loading of fuel under a combined license under part 52 of this chapter (or the optional ASME Code Cases listed in NRC Regulatory Guide 1.147, when using ASME BPV Code, Section XI, or NRC Regulatory Guide 1.192, when using the ASME OM Code, as incorporated by reference in paragraphs (a)(3)(ii) and (iii) of this section, respectively), subject to the conditions listed in paragraph (b) of this section. Licensees may, at any time in their 120-month ISI interval, elect to use the Appendix VIII in the latest edition and addenda of the ASME BPV Code incorporated by reference in paragraph (a) of this section, subject to any applicable conditions listed in paragraph (b) of this section. Licensees using this option must also use the same edition and addenda of Appendix I as Appendix VIII, including any applicable conditions listed in paragraph (b) of this section.

(ii) *Applicable ISI Code: Successive 120-month intervals.* Inservice examination of components and system pressure tests conducted during successive 120-month inspection intervals must comply with the requirements of the latest edition and addenda of the ASME Code incorporated by reference in paragraph (a) of this section 12 months before the start of the 120-month inspection interval (or the optional ASME Code Cases listed in NRC Regulatory Guide 1.147, when using ASME BPV Code, Section XI, or NRC Regulatory Guide 1.192, when using the ASME OM Code, as incorporated by reference in paragraphs (a)(3)(ii) and (iii) of this section), subject to the conditions listed in paragraph (b) of this section. However, a licensee whose inservice inspection interval commences during the 12 through 18-month period after August 17, 2017, may delay the update of their Appendix VIII program by up to 18 months after August 17, 2017. Alternatively, licensees may, at any time in their 120-month ISI interval, elect to use the Appendix VIII in the latest edition and addenda of the ASME BPV Code incorporated by reference in paragraph (a) of this section, subject to any applicable conditions listed in paragraph (b) of this section. Licensees using this option must also use the same Edition and Addenda of Appendix I as Appendix VIII, including any applicable conditions listed in paragraph (b) of this section.

* * * * *

(6) * * *

(ii) * * *

(D) * * *

(*1*) *Implementation.* Holders of operating licenses or combined licenses for pressurized-water reactors as of or after August 17, 2017 shall implement the requirements of ASME BPV Code Case N–729–4 instead of ASME BPV Code Case N–729–1, subject to the conditions specified in paragraphs (g)(6)(ii)(D)(*2*) through (*4*) of this section, by the first refueling outage starting after August 17, 2017.

(*2*) *Appendix I use.* Appendix I of ASME BPV Code Case N–729–4 shall not be implemented without prior NRC approval.

(*3*) *Bare metal visual frequency.* Instead of Note 4 of ASME BPV Code Case N–729–4, the following shall be implemented. If effective degradation years (EDY) < 8 and if no flaws are found that are attributed to primary water stress corrosion cracking:

(*i*) A bare metal visual examination is not required during refueling outages when a volumetric or surface examination is performed; and

(*ii*) If a wetted surface examination has been performed of all of the partial penetration welds during the previous non-visual examination, the reexamination frequency may be extended to every third refueling outage or 5 calendar years, whichever is less, provided an IWA–2212 VT–2 visual examination of the head is performed under the insulation through multiple access points in outages that the VE is not completed. This IWA–2212 VT–2 visual examination may be performed with the reactor vessel depressurized.

(*4*) *Surface exam acceptance criteria.* In addition to the requirements of Paragraph –3132.1(b) of ASME BPV Code Case N–729–4, a component whose surface examination detects rounded indications greater than allowed in Paragraph NB–5352 in size on the partial-penetration or associated fillet weld shall be classified as having an unacceptable indication and corrected in accordance with the provisions of paragraph–3132.2 of ASME BPV Code Case N–729–4.

* * * * *

(F) * * *

(*1*) *Implementation.* Holders of operating licenses or combined licenses for pressurized-water reactors as of or after August 17, 2017, shall implement the requirements of ASME BPV Code Case N–770–2 instead of ASME BPV Code Case N–770–1, subject to the conditions specified in paragraphs (g)(6)(ii)(F)(*2*) through (*13*) of this section, by the first refueling outage starting after August 17, 2017.

(*2*) *Categorization.* Full structural weld overlays, authorized by the NRC staff in accordance with the alternatives approval process of this section, may be categorized as Inspection Items C–1 or F–1, as appropriate. Welds that have been mitigated by the Mechanical Stress Improvement Process (MSIP™) may be categorized as Inspection Items D or E, as appropriate, provided the criteria in Appendix I of the code case have been met. For the purpose of determining ISI frequencies, all other butt welds that rely on Alloy 82/182 for structural integrity shall be categorized as Inspection Items A–1, A–2, or B until the NRC staff has reviewed the mitigation and authorized an alternative code case Inspection Item for the mitigated weld, or an alternative code case Inspection Item is used based on conformance with an ASME mitigation code case endorsed in NRC Regulatory Guide 1.147 with any applying conditions specified in NRC Regulatory Guide 1.147, as incorporated by reference in paragraph (a)(3)(ii) of this section. Paragraph –1100(e) of ASME BPV Code Case N–770–2 shall not be used to exempt welds that rely on Alloy 82/182 for structural integrity from any requirement of paragraph (g)(6)(ii)(F) of this section.

(*3*) *Baseline examinations.* Baseline examinations for welds in Table 1 of ASME BPV Code Case N–770–2, Inspection Items A–1, A–2, and B, if not

previously performed or currently scheduled to be performed in an ongoing refueling outage as of August 17, 2017, in accordance with paragraph (g)(6)(ii)(F) of this section, shall be completed by the end of the next refueling outage. Previous examinations of these welds can be credited for baseline examinations only if they were performed within the re-inspection period for the weld item in Table 1 of ASME BPV Code Case N–770–2 and the examination of each weld meets the examination requirements of paragraphs –2500(a) or –2500(b) of ASME BPV Code Case N–770–2 as conditioned in this section. Other previous examinations that do not meet these requirements can be used to meet the baseline examination requirement, provided NRC approval in accordance with paragraph (z)(1) or (2) of this section, is granted prior to the end of the next refueling outage.

(*4*) *Examination coverage.* When implementing Paragraph –2500(a) of ASME BPV Code Case N–770–2, essentially 100 percent of the required volumetric examination coverage shall be obtained, including greater than 90 percent of the volumetric examination coverage for circumferential flaws. Licensees are prohibited from using Paragraphs –2500(c) and –2500(d) of ASME BPV Code Case N–770–2 to meet examination requirements.

(*5*) *Inlay/onlay inspection frequency.* All hot-leg operating temperature welds in Inspection Items G, H, J, and K shall be inspected each inspection interval. A 25 percent sample of Inspection Items G, H, J, and K cold-leg operating temperature welds shall be inspected whenever the core barrel is removed (unless it has already been inspected within the past 10 years) or within 20 years, whichever is less.

(*6*) *Reporting requirements.* For any mitigated weld whose volumetric examination detects growth of existing flaws in the required examination volume that exceed the previous IWB–3600 flaw evaluations or new flaws, a report summarizing the evaluation, along with inputs, methodologies, assumptions, and causes of the new flaw or flaw growth is to be provided to the NRC prior to the weld being placed in service other than modes 5 or 6.

(*7*) *Defining ''t''.* For Inspection Items G, H, J, and K, when applying the acceptance standards of ASME BPV Code, Section XI, IWB–3514, for planar flaws contained within the inlay or onlay, the thickness ''t'' in IWB–3514 is the thickness of the inlay or onlay. For planar flaws in the balance of the dissimilar metal weld examination volume, the thickness ''t'' in IWB–3514 is the combined thickness of the inlay or onlay and the dissimilar metal weld.

(*8*) *Optimized weld overlay examination.* Initial inservice examination of Inspection Item C–2 welds shall be performed between the third refueling outage and no later than 10 years after application of the overlay.

(*9*) *Deferral.* Note (11)(b)(1) in ASME BPV Code Case N–770–2 shall not be used to defer the initial inservice examination of optimized weld overlays (*i.e.,* Inspection Item C–2 of ASME BPV Code Case N–770–2).

(*10*) *Examination technique.* Note 14(b) of Table 1 and Note (b) of Figure 5(a) of ASME BPV Code Case N–770–2 may only be implemented if the requirements of Note 14(a) of Table 1 of ASME BPV Code Case N–770–2 cannot be met.

(*11*) *Cast stainless steel.* Examination of ASME BPV Code Class 1 piping and vessel nozzle butt welds involving cast stainless steel materials, shall be performed with Appendix VIII, Supplement 9 qualifications, or qualifications similar to Appendix VIII, Supplement 2 or 10 using cast stainless steel mockups no later than the next scheduled weld examination after January 1, 2022, in accordance with the requirements of Paragraph –2500(a).

(*12*) *Stress improvement inspection coverage.* Under Paragraph I.5.1, for cast stainless steel items, the required examination volume shall be examined by Appendix VIII procedures to the maximum extent practical including 100 percent of the susceptible material volume.

(*13*) *Encoded ultrasonic examination.* Ultrasonic examinations of non-mitigated or cracked mitigated dissimilar metal butt welds in the reactor coolant pressure boundary must be performed in accordance with the requirements of Table 1 for Inspection Item A–1, A–2, B, E, F–2, J, and K for 100 percent of the required inspection volume using an encoded method.

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Dated at Rockville, Maryland, this 30th day of June 2017.

For the Nuclear Regulatory Commission.

Michele G. Evans,

Acting Director, Office of Nuclear Reactor Regulation.

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