[7590-01-P]

NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

RIN 3150-AI35

NRC-2008-0554

American Society of Mechanical Engineers (ASME) Codes and New and Revised ASME Code Cases

AGENCY: Nuclear Regulatory Commission

ACTION: Final rule.

SUMMARY: The NRC is amending its regulations to incorporate by reference the 2005 Addenda (July 1, 2005) and 2006 Addenda (July 1, 2006) to the 2004 ASME Boiler and Pressure Vessel Code, Section III, Division 1; 2007 ASME Boiler and Pressure Vessel Code, Section III, Division 1, 2007 Edition (July 1, 2007), with 2008a Addenda (July 1, 2008); 2005 Addenda (July 1, 2005) and 2006 Addenda (July 1, 2006) to the 2004 ASME Boiler and Pressure Vessel Code, Section XI, Division 1; 2007 ASME Boiler and Pressure Vessel Code, Section XI, Division 1, 2007 Edition (July 1, 2007), with 2008a Addenda (July 1, 2008); and 2005 Addenda, ASME OMa Code-2005 (approved July 8, 2005) and 2006 Addenda, ASME OMb Code-2006 (approved July 6, 2006) to the 2004 ASME *Code for Operation and Maintenance of Nuclear Power Plants* (OM Code). The NRC is also incorporating by reference (with conditions on their use) ASME Boiler and Pressure Vessel 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," Supplement 8, ASME approval date: January 26, 2009, and ASME Boiler and Pressure Vessel 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 W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1," ASME

approval date: December 25, 2009.

DATES: This rule is effective **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].** The incorporation by reference of certain publications listed in the rule is approved by the Director of the Office of the Federal Register as of **[INSERT DATE 30 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER]**.

ADDRESSES: You can access publicly available documents related to this document using the following methods:

- **NRC's Public Document Room (PDR):** The public may examine and have copied for fee publicly available documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland.
- **NRC's Agencywide Documents Access and Management System (ADAMS):** Publicly available documents created or received at the NRC are available electronically at the NRC's Library at http://www.nrc.gov/reading-rm/adams.html. From this page, the public can gain entry into ADAMS, which provides text and image files of NRC's public documents. If you do not have access to ADAMS or if there are problems in accessing the documents located In ADAMS, contact the NRC's PDR reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov.
- **Federal rulemaking Web site:** Public comments and supporting materials related to this final rule can be found at http://www.regulations.gov by searching on Docket ID: **NRC-2008-0554.**

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SUPPLEMENTARY INFORMATION:

I. Background

The ASME develops and publishes the ASME Boiler and Pressure Vessel Code (B&PV Code), which contains requirements for the design, construction, and inservice inspection (ISI) of nuclear power plant components; and the ASME OM Code, which contains requirements for inservice testing (IST) of nuclear power plant components. The ASME issues new editions of the ASME B&PV Code every 3 years and issues addenda to the editions yearly, except in years when a new edition is issued. Periodically, the ASME publishes new editions and addenda of the ASME OM Code. The new editions and addenda typically revise provisions of the 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 Codes do not significantly change Code 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 B&PV and OM Codes (ASME Codes) in Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.55a. The NRC approves and/or mandates the use of certain parts of editions and addenda of these ASME Codes in 10 CFR 50.55a through the rulemaking process of "incorporation by reference." Upon incorporation by reference of the ASME Codes into 10 CFR 50.55a, the provisions of the ASME Codes are legally-binding NRC

requirements as delineated in 10 CFR 50.55a, and subject to the conditions on certain of the ASME Codes' provisions which are set forth in 10 CFR 50.55a. The editions and addenda of the ASME B&PV and OM Codes were last incorporated by reference into the regulations in a final rule dated September 10, 2008 (73 FR 52730), as corrected on October 2, 2008 (73 FR 57235), incorporating Section III of the 2004 Edition of the ASME B&PV Code, Section XI of the 2004 Edition of the ASME B&PV Code, and the 2004 Edition of the ASME OM Code, subject to NRC 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 conditions 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 10 CFR 50.55a, typically in paragraph (b) of that regulation. In an 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 which is not adopted. For this rulemaking, the provisions of the 2005 Addenda through 2008 Addenda of Section III, Division 1, and the 2005 Addenda through 2008 Addenda of Section XI, Division 1, of the ASME B&PV Code; and the 2005 Addenda and 2006 Addenda of the ASME OM Code that the NRC is not adopting, or partially adopting, are previously identified in Section III of this statement of considerations, and in the regulatory and backfit analysis for this rulemaking. The provisions of the ASME B&PV Code, OM Code, and Code Cases N-722-1 and N-770-1 that the NRC finds to be conditionally acceptable, along with the conditions under which they may be applied, are also identified in Section III of this statement of considerations and the regulatory and backfit analysis for this rulemaking.

The ASME Codes are voluntary consensus standards, and the NRC's incorporation by reference of these Codes is consistent with applicable requirements of the National Technology Transfer and Advancement Act (NTTAA). Additional discussion on NRC's compliance with the NTTAA is set forth in Section VII of this document, Voluntary Consensus Standards.

II. Response to Public Comments

A. Overview of Public Comments

The NRC published a proposed rule for public comments in the *Federal Register* on May 4, 2010 (75 FR 24324). The public comment period for the proposed rule closed on July 19, 2010. The NRC received 22 letters and e-mails from the following commenters (listed in order of receipt), providing about 454 comments on the proposed rule:

1. South Carolina Electric and Gas Company
2. Private citizen, Charles Wirtz
3. Private citizen, Gerry C. Slagis
4. Duke Energy
5. Electric Power Research Institute
6. Nextera Energy
7. IHI Southwest Technologies
8. Private citizen, Gary G. Elder
9. Performance Demonstration Initiative
10. Exelon Corporation
11. American Society of Mechanical Engineers

11a. American Society of Mechanical Engineers

12. Westinghouse
13. U.S. Department of Energy
14. Westinghouse
15. Progress Energy
16. PWR Owners Group
17. Nuclear Energy Institute
18. Entergy Operations, Inc. and Entergy Nuclear Operations, Inc.
19. Tennessee Valley Authority
20. Exelon Corporation
21. Dominion Resources Services, Inc.
22. Strategic Teaming and Resource Sharing (STARS)

The number assigned to each commenter is used to identify the sponsor of the comment in the NRC's comment summary in Part B, "NRC Responses to Public Comments," of this document. Most of these comments pertained to the following:

- suggested revising or rewording conditions to make them more clear
- supported incorporation of Code Case N-770 or N-770-1 into 10 CFR 50.55a
- supported the proposed changes to add or remove conditions
- opposed proposed conditions
- supplied additional information for NRC consideration
- proposed rewriting/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 statement of considerations (SOC) addresses: i) responses to the three questions raised by the NRC in the proposed rule; ii) comments resulting in changes to the proposed regulations; and iii) comments raising important issues of interest to stakeholders but which the NRC declined to adopt. A discussion of all comments and the NRC responses is available electronically at the NRC's Library, ADAMS Accession No. ML110280240.

B. NRC Responses to Public Comments

Responses to Specific Requests for Comments

The NRC requested comments on three NRC questions associated with its implementing 10 CFR 50.55a rulemaking process improvements to make incorporating by

reference ASME B&PV Code editions and addenda into 10 CFR 50.55a more predictable and consistent:

NRC Question 1. What should the scope of the ASME B&PV Code edition and addenda rulemaking be (i.e., how many editions and addenda should be compiled into a single rulemaking)?

Comment: One commenter stated that the NRC should address every other edition of the ASME Code in subsequent rulemakings (begin rulemaking once every 4 years) as the NRC's current 2-year rulemaking cycle is ambitious, and previous rulemakings have not occurred on this schedule. Three commenters indicated that starting with the 2013 Edition, editions of these Code sections will be published every 2 years (without addenda), and that future rulemakings should occur on a 2-year schedule, starting with the 2013 Edition of these Codes. [4-2, 11a-1; 14-1a; 19-1]

NRC Response: The NRC has decided that future 10 CFR 50.55a rulemakings should incorporate only one later edition of the B&PV and OM Codes at a time, starting with the 2013 Editions of the ASME B&PV Code and the ASME OM Code.

NRC Question 2. What should the frequency of ASME B&PV Code edition and addenda rulemaking be (i.e., how often should the NRC incorporate by reference Code editions and addenda into 10 CFR 50.55a)?

Comment: The regulation currently requires compliance with the latest ASME Section XI Code incorporated by reference in 10 CFR 50.55a just 12 months prior to the start date of subsequent inspection interval. A 4-year publication schedule for 10 CFR 50.55a final rules would be beneficial for the following reasons:

a. This schedule would not be overly burdensome for the NRC, and this may allow for a more predictable process and publication schedule for 10 CFR 50.55a. A 4-year

publication schedule would allow for more licensees to use the same Code of Record for multiple units at each site. This is particularly true for those sites where multiple units were completed within 4 years of the first unit. Use of a common Code of Record at each plant reduces administrative burden for licensees and reduces the risks associated with having to apply different Code requirements simultaneously at the same plant This recommendation would also benefit the NRC because fewer licensees would request relief to allow the use of a common Code of Record.

[4-2]

NRC Response: The NRC disagrees that a 4-year publication schedule to incorporate ASME B&PV Code edition and addenda into 10 CFR 50.55a is necessary for a more predictable process. The NRC performed a Lean Six Sigma review of its 10 CFR 50.55a rulemaking process and implemented improvements to make this rulemaking process more consistent and predictable. The NRC now believes that it can consistently and predictably publish 10 CFR 50.55a rulemakings on a 2-year interval.

The NRC agrees in principal that a 4-year review cycle could possibly reduce the number of requests for relief when licensees use a common code of record for multiple units at a site, and that it is less of an administrative burden to have a common code of record at multiple unit sites. However, reducing the number of requests would depend on the timing of when a particular plant was required to update its inservice inspection (ISI) program in accordance with §50.55a(g)(4). The option of using a common code of record at multiple units is still available through the use of an alternative in accordance with §50.55a(a)(3), and the NRC has approved the use of alternatives many times in the past for this purpose.

Comment: As indicated in the draft rule, NRC rulemaking activities are currently on a 2-year cycle. In order for each rulemaking to incorporate by reference the latest published

ASME Code editions, this cycle should be maintained and the next NRC new rulemaking would have to begin immediately upon publication of this proposed rule as a final 10 CFR 50.55a rule. [11a-1, 14-1b]

NRC Response: The NRC agrees that future 10 CFR 50.55a rulemakings should occur on a 2-year schedule, starting with the 2013 Editions of the ASME B&PV Code and the ASME OM Code. However, the NRC disagrees that it should begin the next NRC rulemaking upon publication of this final 10 CFR 50.55a rule. In order to assure that these rulemakings occur consistently and predictably, the NRC is initiating a pilot program to begin the next rulemaking when the camera-ready version of the 2011 Addenda to the 2010 Edition of Sections III and XI of the ASME B&PV Code becomes available. This start date is expected to be about 4 months earlier than the ASME's July 2011 publishing date, and should contribute towards assuring that the NRC is able to publish the rulemaking on a 2-year interval (from ASME's July publication date).

NRC Question 3. In what ways should the NRC communicate the scope, schedule for publishing the rulemakings in the *Federal Register,* and status of 10 CFR 50.55a rulemakings to external users?

Comment: Four commenters stated that the industry would benefit from a predictable publication schedule for final 10 CFR 50.55a rules, regardless of the frequency of subsequent rulemakings. One of these commenters also indicated that, as an alternative, the NRC could consider one of the following options to establishing a predictable publication schedule:

- *10 CFR 50.55a could be amended to allow the use of a limited number of Code editions that have been incorporated by reference in 10 CFR 50.55a, instead of only the latest, provided all applicable conditions are met when using the chosen Code edition*

- *10 CFR 50.55a could be amended to require that licensees update their programs to comply with the latest Code of Record incorporated by reference into 10 CFR 50.55a no more than 36 months prior to the start of the subsequent 120-month inspection interval. [4-2, 11a-1, 14-1c, 19-1]*

NRC Response: The NRC acknowledges the industry's representation that it would benefit from a predictable publication schedule for final 10 CFR 50.55a rules. As discussed, the NRC now believes that it can consistently and predictably publish 10 CFR 50.55a rulemakings on a 2-year interval. Thus, the NRC need not consider at this time the alternative options presented by one of the commenters.

Comment: If the NRC believes that a predictable schedule for publication of final 10 CFR 50.55a rules cannot be accomplished, the NRC may want to consider whether the provisions in 10 CFR 50.55a(f)(4)(ii) and (g)(4)(ii) should be amended to allow Owners/Licensees to update their programs to comply with the latest edition and addenda of the Code incorporated by reference as much as 24 months before the start of a subsequent 120 month interval. [11-1]

NRC Response: The NRC believes it can publish 10 CFR 50.55a rulemakings on a predictable schedule as a result of implementing rulemaking process improvements. Therefore, the NRC need not consider the commenter's proposal at this time.

Re-designating 10 CFR 50.55a Paragraphs

The NRC proposed that several paragraphs under 10 CFR 50.55a(b)(2) be removed, which would cause gaps in the numbering between the remaining paragraphs. To address the creation of these gaps, the NRC proposed to re-designate (renumber) the remaining paragraphs

under 10 CFR 50.55a(b)(2). These proposed re-designations are outlined in Table 1 of this document.

Comment: The proposed renumbering of paragraphs should not be adopted. Renumbering all of the paragraphs, while helping to reduce the number of pages in the rulemaking, does not consider the effort it will take for each end user to update their procedures to reflect the new numbering sequence. Many implementing programs and procedures will include references to the specific paragraph for implementation. Renumbering them will cause many documents to be revised. Recommend that this type of cleanup be considered under a total rewrite of 10 CFR 50.55a rather than doing it under this proposed rule. Suggest that those paragraphs where conditions are removed be designated as "reserved." [4-1, 4-11a, 11-2, 14-2, 19-1, 20-1]

NRC Response: The NRC acknowledges the comments representing that the proposed renumbering of paragraphs under 10 CFR 50.55a(b)(2) will require end users to expend resources to update their procedures to reflect the new numbering sequence. Accordingly, the NRC did not renumber these paragraphs under 10 CFR 50.55a(b)(2) in the final rule. Where the NRC removed paragraphs in the final rule, those paragraphs are designated as “Reserved.” To assist readers in understanding the regulatory history of this final rule, Table 1 gives a cross-reference of proposed, current and final regulation paragraph numbering.

Table 1 ─ Cross Reference of Proposed, Current and Final Regulations

Proposed regulation	Current regulation	Description of proposed redesignations	Final regulation
Paragraph (b)(2)(i)	Paragraph (b)(2)(ii)	Redesignate paragraph (b)(2)(ii) as paragraph (b)(2)(i).	Paragraph (b)(2)(ii)
Paragraph (b)(2)(ii)	Paragraph (b)(2)(vi)	Redesignate paragraph	Paragraph (b)(2)(vi)

		(b)(2)(vi) as paragraph (b)(2)(ii).	
Paragraph (b)(2)(iii)	Paragraph (b)(2)(vii)	Redesignate paragraph (b)(2)(vii) as paragraph (b)(2)(iii).	Paragraph (b)(2)(vii)
Paragraph (b)(2)(iv)	Paragraph (b)(2)(viii)	Redesignate paragraph (b)(2)(viii) as paragraph (b)(2)(iv).	Paragraph (b)(2)(viii)
Paragraph (b)(2)(v)	Paragraph (b)(2)(ix)	Redesignate paragraph (b)(2)(ix) as paragraph (b)(2)(v).	Paragraph (b)(2)(ix)
Paragraph (b)(2)(vi)	Paragraph (b)(2)(x)	Redesignate paragraph (b)(2)(x) as paragraph (b)(2)(vi).	Paragraph (b)(2)(x)
Paragraph (b)(2)(vii)	Paragraph (b)(2)(xi)	Redesignate paragraph (b)(2)(xi) as paragraph (b)(2)(vii).	Paragraph (b)(2)(xi)
Paragraph (b)(2)(viii)	Paragraph (b)(2)(xii)	Redesignate paragraph (b)(2)(xii) as paragraph (b)(2)(viii).	Paragraph (b)(2)(xii)
Paragraph (b)(2)(ix)	Paragraph (b)(2)(xiii)	Redesignate paragraph (b)(2)(xiii) as paragraph (b)(2)(ix).	Paragraph (b)(2)(xiii)
Paragraph (b)(2)(x)	Paragraph (b)(2)(xiv)	Redesignate paragraph (b)(2)(xiv) as paragraph (b)(2)(x).	Paragraph (b)(2)(xiv)
Paragraph (b)(2)(xi)	Paragraph (b)(2)(xv)	Redesignate paragraph (b)(2)(xv) as paragraph (b)(2)(xi).	Paragraph (b)(2)(xv)
Paragraph (b)(2)(xii)	Paragraph (b)(2)(xvi)	Redesignate paragraph (b)(2)(xvi) as paragraph (b)(2)(xii).	Paragraph (b)(2)(xvi)
Paragraph (b)(2)(xiii)	Paragraph (b)(2)(xvii)	Redesignate paragraph (b)(2)(xvii) as paragraph (b)(2)(xiii).	Paragraph (b)(2)(xvii)
Paragraph (b)(2)(xiv)(A)	Paragraph (b)(2)(xviii)(A)	Redesignate paragraph (b)(2)(xviii)(A) as paragraph (b)(2)(xiv)(A).	Paragraph (b)(2)(xviii)(A)
Paragraph (b)(2)(xiv)(B)	Paragraph (b)(2)(xviii)(B)	Redesignate paragraph (b)(2)(xviii)(B) as paragraph (b)(2)(xiv)(B).	Paragraph (b)(2)(xviii)(B)
Paragraph (b)(2)(xiv)(C)	Paragraph (b)(2)(xviii)(C)	Redesignate paragraph (b)(2)(xviii)(C) as paragraph (b)(2)(xiv)(C).	Paragraph (b)(2)(xviii)(C)
Paragraph (b)(2)(xv)	Paragraph (b)(2)(xix)	Redesignate paragraph (b)(2)(xix) as paragraph (b)(2)(xv).	Paragraph (b)(2)(xix)

Paragraph (b)(2)(xvi)	Paragraph (b)(2)(xx)	Redesignate paragraph (b)(2)(xx) as paragraph (b)(2)(xvi).	Paragraph (b)(2)(xx)
Paragraph (b)(2)(xvii)	Paragraph (b)(2)(xxi)	Redesignate paragraph (b)(2)(xxi) as paragraph (b)(2)(xvii).	Paragraph (b)(2)(xxi)
Paragraph (b)(2)(xviii)	Paragraph (b)(2)(xxii)	Redesignate paragraph (b)(2)(xxii) as paragraph (b)(2)(xviii).	Paragraph (b)(2)(xxii)
Paragraph (b)(2)(xix)	Paragraph (b)(2)(xxiii)	Redesignate paragraph (b)(2)(xxiii) as paragraph (b)(2)(xix).	Paragraph (b)(2)(xxiii)
Paragraph (b)(2)(xx)	Paragraph (b)(2)(xxiv)	Redesignate paragraph (b)(2)(xxiv) as paragraph (b)(2)(xx).	Paragraph (b)(2)(xxiv)
Paragraph (b)(2)(xxi)	Paragraph (b)(2)(xxv)	Redesignate paragraph (b)(2)(xxv) as paragraph (b)(2)(xxi).	Paragraph (b)(2)(xxv)
Paragraph (b)(2)(xxii)	Paragraph (b)(2)(xxvi)	Redesignate paragraph (b)(2)(xxvi) as paragraph (b)(2)(xxii).	Paragraph (b)(2)(xxvi)
Paragraph (b)(2)(xxiii)	Paragraph (b)(2)(xxvii)	Redesignate paragraph (b)(2)(xxvii) as paragraph (b)(2)(xxiii).	Paragraph (b)(2)(xxvii)
Paragraph (b)(2)(xxiv)	NA	New Paragraph	Paragraph (b)(2)(xxviii)
Paragraph (b)(2)(xxv)	NA	New Paragraph	Eliminated
Paragraph (b)(2)(xxvi)	NA	New Paragraph	Paragraph (b)(2)(xxix)

Significant Public Comments on the Proposed Rule

A summary of the significant comments, and the NRC's responses to those comments for each 10 CFR 50.55a section or paragraph are set forth in this document. A more comprehensive summary of the comments and the NRC responses are set forth in the NRC's Analysis of Public Comments document (ADAMS Accession No. ML110280240).

10 CFR 50.55a(b)(1)(iii) Seismic Design of Piping

Comment: The NRC received comments from a number of external stakeholders that stated the proposed condition in § 50.55a(b)(1)(A) should be deleted. The comments' bases for

deleting the proposed condition included the results of extensive research efforts on ferritic steels operating at high temperature. The results of this research were intended to provide sufficient bases to eliminate the NRC's concern on the B_2' stress indices for Class 1 elbows and tees, on which the proposed condition) would have centered. [11-6b; 14-6b; 19-1]

NRC Response: Based on the NRC's review of the information provided in the public comment, the NRC is not including the proposed condition in § 50.55a(b)(1)(A) on the B_2' stress index for Class 1 elbows and tees in this final rule. The information presented by the commenters adequately absolves the NRC's previously held concerns on the use of these stress indices in the seismic design of Class 1 piping.

Comment: A minor modification to the proposed condition in § 50.55a(b)(1)(iii)(B should be adopted to provide specificity on how the condition should be applied. [14-6c]

NRC Response: The NRC agrees with the comment and the final rule language includes the modification suggested by the comment. The NRC agrees with the comment given that the modification eliminates potential ambiguity by clearly articulating when the NRC's condition in § 50.55a(b)(1)(iii)(A) of the final rule language applies, with respect to the use of the provisions of Subarticle NB-3200 of the ASME Code.

Comment: The comments received on the proposed addition of the condition 10 CFR 50.55a(b)(1)(iii)(C) pertained to the D_o/t limitation for the seismic design of piping. The scope of the proposed condition in § 50.55a(b)(1)(iii)(e) should be limited based on the fact that the ASME Code inherently captures the proposed condition in many instances in its current revision. [11-6d; 14-6d; 19-1]

NRC Response: The NRC agrees with the comments based on the fact that the D_o/t limitation is apparent throughout a majority of the affected ASME Code sections. In the final rule, paragraph (b)(1)(iii)(C) is modified to limit the scope of the proposed condition to those

portions of the ASME Code which do not provide the inherent limitation on maintaining D_o/t to a value of less than 40.

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

Comment: The NRC should reconsider its position to prohibit the use of paragraph NB-7742. The commenter pointed out that NB-7742 addresses test pressures that will exceed the test facility limits and reduces the number of functional tests for specific valve designs. With advances in technology, specialty valves were being developed that would be a specific size, operate at a specific set pressure, and have a required capacity. When only one such valve is installed in a nuclear power plant, the manufacturer would have to build at least two additional production valves so three valves could be tested per NB-7732.2, and/or a multi-million dollar test facility would have to be built that had the required test pressure capability. Since NB-7732.2 covers a range of conditions/applications for valve testing, the need to address specialty valves that did not have a range in size and set pressure, or had minimal range became evident. NB-7742(a)(1) and NB-7742(a)(2) were added to address these applications. Manufacturing unnecessary production valves and building new test facilities are not economical options for the nuclear power industry. Therefore, the commenter requested that the NRC reconsider its position to prohibit the use of paragraph NB-7742. [14-8]

NRC Response: Upon reconsideration, the NRC agrees in general with the comment that NB-7742 provides an acceptable methodology to test incompressible-fluid, pressure-relief valves that will exceed the test facility limits and addresses reducing the number of functional tests for specific valve designs. The NRC has identified no issues with performing tests at less than the highest value of the set-pressure range for incompressible-fluid, pressure-relief valves and finds these new requirements for Class 2 and 3 components acceptable as described in

paragraphs NC-7742 and ND-7742. However, the NRC has identified words that were inadvertently left out of the Code during final printing of paragraph NB-7742 for Class 1 components. The parallel structure of the counterpart paragraphs (NC-7742 and ND-7742) reveal that the words “for the design and the maximum set pressure” are missing for paragraph NB-7742(a)(2). Without these words, paragraph NB-7742(a)(2) is confusing, illogical, and could lead to a non-conservative interpretation of the required test pressure for the new Class 1 incompressible-fluid, pressure-relief valve designs. For these reasons, paragraph (b)(1)(vii) of the final rule reflects a change to include a condition allowing use of paragraph NB-7742 when the corrected language intended by the Code is used.

10 CFR 50.55a(b)(2)(viii) Examination of Concrete Containments (proposed rule paragraph (b)(2)(iv))

Comment: Proposed rule paragraphs (b)(2)(iv)(B), (b)(2)(iv)(C), (b)(2)(iv)(D)(1), and (b)(2)(iv)(D)(2) should be deleted since they are not mandated by the introductory text of paragraph (b)(2)(iv). [20-4]

NRC Response: The NRC disagrees with the comment. The proposed rule inadvertently removed the language in the introductory text of paragraph (b)(2)(iv*)* that mandates the conditions in the mentioned paragraphs. Final rule paragraph 10 CFR 50.55a(b)(2)(viii) added back the removed language in the introductory text to correct this unintended administrative error.

10 CFR 50.55a(b)(2)(ix) Examination of Metal Containments and the Liners of Concrete Containments (proposed rule paragraph (b)(2)(v))

Comment: The first part of the condition in the proposed rule paragraph (b)(2)(v)(A) should not be applied to the 2006 through the 2008 Addenda, which incorporated requirements into IWE-2420(c) for evaluating the acceptability of inaccessible areas when conditions existed

in accessible areas that could indicate the presence or result in degradation to such inaccessible areas. Only the second part of the condition requiring specific information relative to inaccessible areas be submitted in the ISI Summary Report should apply to these addenda. [11-15b; 14-15b; 19-1]

NRC Response: The NRC agrees with the comment since the first part of the condition in proposed rule paragraph (b)(2)(v)(A) has been incorporated into the 2006 Addenda through 2008 Addenda of the Code. As a result of the comment, in final rule paragraph (b)(2)(ix)(A), the NRC has restructured the condition into two separate paragraphs designated (b)(2)(ix)(A)(1) and (b)(2)(ix)(A)(2) and revised the introductory text such that the condition in paragraph (b)(2)(ix)(A)(1) that addresses the requirement for the evaluation of inaccessible areas, is not required to be applied to Subsection IWE, 2006 Addenda through the 2008 Addenda.

Comment: The new condition in the proposed rule paragraph (b)(2)(v)(J), applicable to the use of IWE-5000 of the 2007 Edition with the 2008 Addenda, should not apply to metallic shell and penetration liners of Class CC components because these liners do not serve a structural integrity function which, for Class CC containments, is provided by the reinforced or post-tensioned concrete structure. The containment pressure test requirements in IWL-5000 are sufficient to ensure that the structural integrity of the Class CC component is demonstrated following major modifications. [4-12c; 4-12f; 11-15c; 11-15g; 14-15c; 14-15g; 19-1]

NRC Response: The NRC agrees with the basis of the comment that the system pressure test requirements of IWL-5000 are adequate to demonstrate both structural and leak-tight integrity of the repaired Class CC containment pressure retaining components following a major modification. Specifically, the requirements in IWL-5200 to perform a containment pressure test at design basis accident pressure, and to perform surface examinations of the repaired area and specified additional/extended examinations and response

measurements, will demonstrate structural integrity of the repaired Class CC concrete containment. The leakage test requirements in IWL-5230 will demonstrate leak-tight integrity of the repaired area of the metallic shell or penetration liner of Class CC containments. As a result of the comment, the final rule paragraph (b)(2)(ix)(J) is revised to indicate that the condition applies only to Class MC pressure-retaining components and not to Class CC components.

Comment: The new condition in proposed rule paragraph (b)(2)(v)(J), applicable to use of IWE-5000 of the 2007 Edition with the 2008 Addenda for major containment modifications, allows for an alternative to an Appendix J Type A test required by the condition following "major" modifications. However, performing a "short-duration structural test" as proposed would satisfy the condition in 10 CFR 50.55a, but would not satisfy the requirements imposed by 10 CFR Part 50, Appendix J, Option A. As a result, a "short duration structural test" cannot be performed in lieu of a Type A Test, unless a licensee seeks an exemption from the Appendix J test requirement, or 10 CFR Part 50, Appendix J, Option A is revised to address the proposed alternative "short-duration structural test." [4-12b; 11-15i; 14-15i; 19-1]

NRC Response: The NRC agrees with the comment to the extent that when a licensee is implementing Option A of 10 CFR Part 50, Appendix J, the alternative short duration structural test in the new condition in proposed rule paragraph (b)(2)(v)(J) cannot be performed in lieu of the Type A test required by the condition without seeking an exemption. The NRC's agreement is based on the fact that an inconsistency would exist between the requirement in the proposed rule paragraph (b)(2)(v)(J) and the existing requirements under Special Testing Requirements in paragraph IV.A of 10 CFR Part 50, Appendix J, Option A. This inconsistency would exist due to the fact that the current requirements in Appendix J, Option A, would require a Type A test following a major containment modification, while the proposed requirement would also allow an alternative "short duration structural test." The latter cannot be performed in lieu of

a Type A test, thus leading to an inconsistency which could only be reconciled by an exemption. Paragraph IV.A of 10 CFR Part 50, Appendix J, Option A does not specify any alternative structural test because the Type A test would demonstrate both structural and leak tight integrity of the repaired containment.

The NRC disagrees with the comment, in part, given that for the vast majority of licensees implementing Option B of 10 CFR Part 50, Appendix J, the argument could be made that containment modifications are implemented under the Inservice Inspection Program in accordance with ASME Section XI, Subsection IWE (for Class MC containments) pursuant to 10 CFR 50.55a(g)(4). Therefore, it could be argued that the system pressure testing requirements in IWE-5000 apply following containment modifications and not those in paragraph IV.A of 10 CFR Part 50, Appendix J, Option A. Prior to the 2007 Edition of Section XI of the ASME B&PV Code, Article IWE-5000 referenced paragraph IV.A of 10 CFR Part 50, Appendix J, Option A, for the leakage test requirements following containment modifications. By referencing the Appendix J, Option A, requirements, Article IWE-5000 indirectly required a Type A test to be performed following a major containment modification. Since the Type A test requires pressurization of the entire containment to the design basis accident pressure (P_a), it would provide a verification of both the leakage integrity and structural integrity of repaired containment. However, Article IWE-5000, as modified in the 2007 Edition and later addenda, provides a licensee the option of performing only a local bubble test of the brazed joints and welds affected by the repair even for major modifications. This provides a verification of local leak-tightness of the repaired area, but does not provide a verification of global structural integrity of the repaired structure, and hence, the need for the new condition to perform a Type A test following a major modification.

Based on this discussion, the NRC has determined that the new condition in the final rule paragraph (b)(2)(ix)(J) only addresses the deficiency identified in Article IWE-5000, and does not include the provisions for an alternate short-duration structural test in the new condition.

Comment: The actions specified in (b)(2)(v)(J)(1), (b)(2)(v)(J)(2) and (b)(2)(v)(J)(3), as part of the alternate short duration structural test, of the new condition in the proposed rule paragraph (b)(2)(v)(J), applicable to the use of IWE-5000 of the 2007 Edition with the 2008 Addenda for Class MC components, should be modified as below.

- *The actions described in (b)(2)(v)(J)(1) should not apply to the 2007 Edition with the 2008 Addenda of ASME Code, Section XI.*

- *The condition in (b)(2)(v)(J)(2) should not apply because IWE-5223 and IWE-5224 already provide adequate test requirements to assure essentially zero leakage.*

- *The actions described in (b)(2)(v)(J)(3) would prohibit the conduct of the pressure test at a pressure less than Pa. The 10 CFR Part 50, Appendix J, Type A Test is permitted to be conducted at a test pressure of at least 0.96Pa.*

[4-12d, 4-12e, 11-15d, 11-15e, 11-15f, 14-15d, 14-15e, 14-15f, 19-1]

NRC Response: The NRC agrees with the comment because:

i) The nondestructive examination of the repair welds specified in paragraph (b)(2)(v)(J)(1) is typically required to be performed as part of the repair process;

ii) The provisions of IWE-5223 and IWE-5224 of the 2007 Edition with the 2008 Addenda include the soap bubble or equivalent leakage test specified in paragraph (b)(2)(v)(J)(2) and are adequate to assure essentially zero leakage through the repair welds or joints; and

iii) The action specified in paragraph (b)(2)(v)(J)(3) required the entire containment to be pressurized to the peak calculated design basis accident pressure (P_a) whereas a Type A test conducted in accordance with ANSI/ANS 56.8 may be performed at a pressure between $0.96P_a$ and $1.1P_a$.

However, the testing provisions of IWE-5223 and IWE-5224 of the 2007 Edition with the 2008 Addenda are not adequate to demonstrate global structural integrity of the repaired Class MC containment, which is essentially the deficiency that is sought to be addressed by the new condition. In the context of IWE-5000, it is the Type A test that would provide a verification of both structural and leak-tight integrity following a major modification. As such, the NRC determined that the new condition only addresses the deficiency in the provisions of Article IWE-5000 and did not include the proposed alternate short-duration structural test provision in the condition in the final rule.

Comment: The new condition in proposed rule paragraph (b)(2)(v)(J) provides a general definition of "major" containment modifications as repair/replacement activities such as replacing a large penetration, cutting a large opening in the containment pressure boundary to replace major equipment such as steam generators, reactor vessel heads, pressurizers, or other similar modifications. This new condition does not clearly define what constitutes a "major" modification or repair/replacement activity for containment structures and that the lack of a clear

definition will cause potential confusion and possible conflict with requirements of 10 CFR Part 50, Appendix J, paragraph IV.A. [4-12a, 11-15h, 14-15h, 19-1]

NRC Response: The NRC disagrees with the comment. The proposed rule paragraph (b)(2)(v)(J) provides a definition of a "major" modification, which is qualitative but based on citing specific examples of repair/replacement activities that have typically been performed extensively among operating power reactors historically and have been consistently considered as major modifications by the NRC staff as well as licensees. The NRC acknowledges that the definition provided for "major" modification in the proposed rule is somewhat more explicit than the language used in 10 CFR Part 50, Appendix J, Option A, paragraph IV.A, in that the cited paragraph IV.A simply uses the term "major modification" without any explicit description, but the intent is consistent. Based on this discussion, the NRC has retained the qualitative definition of major modifications in the final rule. No change was made to the final rule as a result of this comment.

10 CFR 50.55a(b)(2)(xi) (proposed rule paragraph (b)(2)(vii))

Comment: Referencing later versions of Appendix VIII should be delayed and replaced with a mandatory, industry wide, version and implementation date. In a December public meeting with the one of the commenters (PDI), the commenter clarified his comment as requesting the NRC to delay by 18 months the date on which Appendix VIII of the 2007 Edition and 2008 Addenda becomes effective for purposes of updating licensees' 10-year inservice inspection interval. The commenter explained that an 18-month delay is necessary to avoid an undue burden on those licensees who have only 12 months to update their inservice inspection program for the next 10-year inservice inspection interval (as is required under § 50.55a). [9-1; 9-2; 10-1; 10-2; 20-2]

NRC Response: The NRC agrees with the comments that there may be an undue burden on those licensees who have only 12 months to update their inservice inspection program to comply with Appendix VIII for the next 10-year inservice inspection interval. Accordingly, the NRC is revising the language of the final rule to provide at least 18 months for a specified set of licensees to update and begin implementation of the 2007 Edition and 2008 Addenda versions of Appendix VIII in their next inservice inspection interval. This set of licensees are those whose next inservice inspection interval must begin to be implemented during the period between 12 through 18 months after the effective date of the final rule, and therefore would otherwise be required to implement the 2007 Edition and 2008 Addenda versions of Appendix VIII (providing them less than 18 months to comply with the provisions of the 2007 Edition and 2008 Addenda versions of Appendix VIII). For these licensees, the final rule provides a delay of 6 months in the implementation of Appendix VIII *only* (*i.e*., these licensees will still be required to update and implement the inservice inspection program during the next inspection interval without delay). Other licensees, whose next inservice inspection interval commences more than 18 months after the final date of the rule, will have sufficient time to develop their programs for the next inservice inspection interval and are not affected by this provision of the final rule.

The NRC disagrees with the portions of the comments requesting that the NRC mandate the use of later versions of Appendix VIII for all licensees. The comments did not provide a technical or regulatory justification for imposing such a backfit (a uniform date of implementation would be regarded as a backfit because it departs from the current regulatory approach of a ten-year inservice inspection program interval). In addition, the NRC notes that § 50.55a(g)(4)(iv) currently allows licensees to voluntarily comply with the inservice inspection requirements of more recent editions and addenda which the NRC has approved (via incorporation by reference

into § 50.55a). Accordingly, the NRC declines to adopt the proposal. No change was made to the final rule as a result of this portion of the comment.

Comment: The requirements for scanning from the austenitic side of the weld should be revised to accommodate certain exceptions such as austenitic welds with no austenitic sides or austenitic welds attached to cast austenitic components. [20-3]

NRC Response: NRC agrees that paragraph (b)(2)(xv)(A)(2) should address the case of an austenitic weld which has no austenitic base material side. An austenitic weld with no austenitic sides cannot be qualified from an austenitic side. However, qualification from the austenitic side of the weld demonstrates a higher degree of proficiency than from the ferritic side of the weld. Therefore, an existing ASME Code, Section XI, Appendix VIII, Supplement 10, Qualification Requirements for Dissimilar (DM) Metal Welds, qualification may be expanded for austenitic welds with no austenitic sides. This expansion of the Supplement 10 qualification would require implementing a separate performance demonstration add-on to include samples where the austenitic weld is flanked by ferritic base material. The NRC disagrees that special consideration should be given to components with cast austenitic material on one side because single-side examination of austenitic welds attached to cast stainless steel components is outside the scope of the current qualification program. For these reasons, paragraph (b)(2)(xv)(A)(2) in the final rule is revised to include an add-on qualification for austenitic welds with no austenitic side to an existing Supplement 10 qualification.

<u>10 CFR 50.55a(b)(2)(xii) (proposed rule paragraph (b)(2)(viii))</u>

Comment: The condition on Appendix VIII single-side ferritic vessel and piping and stainless steel piping examinations was addressed in the 2005 Addenda of ASME Code and should be removed. [11-17; 14-17a; 19-1]

NRC Response: The NRC agrees that the condition should not apply to the 2007 Edition and 2008 Addenda because the condition was fully addressed in the 2007 Edition of Section XI. However, the condition is necessary through the 2006 Addenda because of changes within referenced Supplements 5 and 7 in I-3000. For these reasons, paragraph (b)(2)(xvi) is revised in this final rule to remove the condition from the 2007 Edition and 2008 Addenda but retains the condition through the 2006 Addenda.

10 CFR 50.55a(b)(2)(xiv)(C) (proposed rule paragraph (b)(2)(x))

Comment: 10 CFR 50.55a(b)(2)(xiv)(C) should be revised to read: 'When applying editions and addenda prior to the 2005 Addenda of Section XI licensees qualifying visual examination personnel for VT-3 visual examination under paragraph IWA-2317 of Section XI." The basis for this recommendation is that IWA-2317 of the 2004 Edition does not contain the requirements to demonstrate the proficiency of the training by administering an initial qualification examination and administering subsequent examinations on a 3-year interval. [20-5]

NRC Response: The NRC agrees with the commenter that the 2004 Edition and earlier editions and addenda do not contain the requirements to demonstrate the proficiency of the training and the commenter's proposed wording is clearer. Paragraph (b)(2)(xviii)(C) of the final rule has been revised to reflect the commenter's proposed wording.

10 CFR 50.55a(b)(2)(xv) (proposed rule paragraph (b)(2)(xi))

Comment: Substitution of ultrasonic (UT) examinations performed in accordance with Section XI, Appendix VIII for radiographic (RT) examinations should be acceptable for repairs. ASME Code has already approved three Code Cases for UT in lieu of RT and is in the process of approving a fourth Code Case. [4-16; 7-1; 11-20b; 14-20; 19-1]

NRC Response: The NRC disagrees with the comment. Section III RT examinations are for verifying the soundness of the full weld volume. In Section XI, some welds do not have defined examination volumes, and for the welds having defined examination volumes, only portions of the volume are examined. Appendix VIII qualifications are demonstrated on the weld volume defined in Section XI; the qualifications are tailored for detection and sizing cracks propagating from the inner vessel or pipe surfaces. The NRC's concerns with UT in lieu of RT are presented in the statement of considerations published in the *Federal Register* on October 27, 2006, (71 FR 62947) pertaining to Code Case N-659 which was not approved for use in Regulatory Guide (RG) 1.193, Revision 2. The NRC did not review the other two ASME approved code cases. The NRC will review the fourth code case and associated documentation after ASME approval. No change was made to the final rule as a result of this comment.

Comment: The proposed rule implied UT was better suited for detecting planar flaws associated with inservice degradation than volumetric flaws, and not effective for volumetric flaws with large openings. Further, few studies have been done to demonstrate effectiveness of RT in a manner comparable to the way the effectiveness of UT has been demonstrated via ASME, Section XI, Appendix VIII. [7-2]

NRC Response: The NRC agrees that few studies have been done to demonstrate the effectiveness of RT in a manner comparable to the way the effectiveness of UT has been demonstrated via ASME, Section XI, Appendix VIII. In particular, there are limited studies that compare the effectiveness of UT vs. RT on fabrication type flaws vs. service-induced flaws for welds found in nuclear power plants. Until such time as studies are complete, the NRC will remain silent on the ability of UT to detect fabrication type (i.e., volumetric) flaws, as well as comparing the abilities of UT and RT. No change was made to the final rule as a result of this comment.

Comment: UT should be allowed for materials where it is as effective, or more effective, than RT. The comment is specifically targeted at UT on cast stainless steel components. [7-3]

NRC Response: Based on a recent study PNNL-19086, "Replacement of Radiography with Ultrasonics for the Nondestructive Inspection of Welds – Evaluation of Technical Gaps – An Interim Report," (ADAMS Accession No. ML101031254), the NRC believes that the effectiveness of UT in lieu of RT has not been established. To address the NRC's concerns, the NRC believes research must be conducted to:

- Compare the flaw detection capabilities of UT and RT;
- Assess parameters such as false call rates;
- Assess qualification and acceptance standards;
- Assess the effectiveness and reliability of UT and RT for construction, preservice and inservice inspection;
- Assess the interchangeability of UT and RT; and
- Determine the state-of-the-art with regard to digital radiography.

Therefore, no change was made to the final rule as a result of this comment.

Comment: While UT requires more access and may require more weld surface preparation area than RT, consideration should be given to peripheral benefits of using UT associated with less work area restrictions, no risk of radiation exposure, no RT source storage issues, and reduced examination time. [7-4]

NRC Response: The NRC disagrees with this comment. While benefits may exist, the NRC believes that examination and qualifications concerns must be addressed first to establish effectiveness and reliability of UT in lieu of RT. No change was made to the final rule as a result of this comment.

Comment: UT systems needing to undergo a Section XI, Appendix VIII-style demonstration and qualification program for construction flaws prior to use is illogical for replacing RT systems that have not been subjected to a similar demonstration and qualification program. [7-5]

NRC Response: The NRC disagrees with the comment. Based on study PNNL-19086, the NRC believes that the effectiveness of UT in lieu of RT has not been established. Accordingly, the NRC will be conducting research as explained in the NRC response to comment 7-3. Though RT is not subject to a rigorous qualification program at this time, implementation of RT on new construction or repair welds in conjunction with application of the qualified UT often performed for pre-service inspections, provides a greater assurance of quality and safety than if only one examination technique was implemented. Until such time as the NRC has completed its evaluation of UT and RT for nuclear power plant components, the NRC will not allow substitution of UT when RT is prescribed for the examination. No change was made to the final rule as a result of this comment.

Comment: V-path application with UT examination may not be applicable for all metals where UT examinations are allowed. The NRC should consider approving the substitution of UT for RT with specific conditions or limitations, such as:

1) *UT may not be used in lieu of RT for examination of cast stainless steel or austenitic stainless steels and nickel alloys where only single-sided access is available*;
2) *When UT is used in lieu of RT, the acceptance standards of ASME Section XI IWA- 3000 shall be used in lieu of the construction code acceptance standards*; *and*

3) *Encoded or automated UT shall be used to create a permanent record which would allow multiple analysis reviews as well as document the results for comparison with future examinations.*

[7-6]

NRC Response: The NRC believes that the effectiveness of UT in lieu of RT has not been established. Industry studies have been initiated to evaluate NRC concerns with UT in lieu of RT. The NRC will consider the results from these studies in future reviews. Therefore, proposed paragraph (b)(2)(xv) pertaining to IWA-4520(b)(2) and IWA-4521 is adopted without change in final rule paragraph (b)(2)(xix). No change was made to the final rule as a result of this comment.

Comment: With regard to paragraph (b)(2)(xv), clarify whether the substitution of ASME Section V ultrasonic examination method by an Appendix VIII ultrasonic examination method is allowed by the provisions of IWA-2240 of the 1997 Addenda as specified in this paragraph's condition. [20-6]

NRC Response: The NRC disagrees with the comment, because it is not the NRC's regulatory responsibility to clarify the ASME Code. No change was made to the final rule as a result of this comment.

10 CFR 50.55a(b)(2)(xvii)(B) (proposed rule paragraph (b)(2)(xiii))

Comment: Consideration should be given to deleting this condition entirely as it is inconsistent with the unconditional approval of Code Case N-652-1 in NRC RG 1.147, Rev 15, which does not include Item B7.80 or any provisions for examination of CRD bolting. [2-2]

NRC Response: The NRC agrees that Item No. B7.80 was deleted in the 1995 Addenda of Section XI. The NRC also agrees that the existing condition is inconsistent with the NRC unconditional approval of Code Case N-652-1 which eliminates Item No. B7.80

requirements. The NRC also believes that Examination Category B-G-2 contains examination requirements for all Class 1 pressure retaining bolting 2 inches and less in diameter to provide reasonable assurance of their structural integrity. For these reasons the NRC agrees with the comment. Final rule paragraph (b)(2)(xxi) reflects a change to eliminate the condition that provisions of Table IWB-2500-1, Examination Category B-G-2, Item B7.80, that are in the 1995 Edition are applicable only to reused bolting when using the 1997 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section.

10 CFR 50.55a(b)(2)(xxiv) (proposed rule paragraph (b)(2)(xx))

Comment: The NRC condition, which would place conditions on the use of Equation (2) in A-4300(b)(1) of Nonmandatory Appendix A of Section XI, should be removed because the condition would result in more conservative crack growth rates to be computed when R-ratio (i.e., K_{min}/K_{max}) is negative. The basis for 1.12 S_f factor was established from lab data for R < 0 and considers crack closure effects. [11-23; 14-23; 19-1]

NRC Response: The NRC disagrees with the comment. The NRC has reviewed the laboratory test data upon which this provision was based, and concludes that it is insufficient to firmly establish the Section XI, Appendix A approach when the R-ratio is negative.

The test data reported in the 1977 ASME Pressure Vessels and Piping Conference paper, “High Stress Crack Growth - Part II, Predictive Methodology Using a Crack Closure Model,” which serves as the basis for the ASME Code, Section XI, Appendix A approach, consists of only 10 test data points for $-1.5 < R < 0$, and one of those data points shows a trend opposite of the others. Although this data was produced from tests covering a limited R value range, it is used to support the application of the ASME Code, Section XI, Appendix A approach for a much wider range of R, (i.e., all $R < 0$).

Further, in ASME Code, Section XI, Appendix A applications, the generic, lower-bound material property values from ASME Code, Section II may be used. If the lower bound ASME Code, Section II generic flow stress (σ_f) for a material is less than the material's actual σ_f, the calculation in accordance with ASME Code, Section XI, Appendix A for $R < 0$ will show that $K_{max} - K_{min} \leq 1.12\ \sigma_f \sqrt{(\pi a)}$ and prompt a wrongful reduction of ΔK_I where full ΔK_I should be used. This potential non-conservatism in the use of the ASME Code, Section XI, Appendix A approach, along with the issues cited above regarding the available test data, calls into question the generic applicability of the ASME Code, Section XI, Appendix A approach.

For these reasons, the NRC disagrees with the comment. No change was made to the final rule as a result of the comment.

10 CFR 50.55a(b)(2)(xxv) (proposed rule paragraph (b)(2)(xxi))

Comment: Qualitative arguments based on a deterministic approach stated the current provision in Table E-2 for a crack size up to 1 inch deep is sufficient based on:

1) *Real flaw sizes in vessels are closer to a depth of approximately 0.10 inch deep or less based on actual vessel inspection data;*

2) *Use of ASME Code, Section XI, Appendix VIII, and Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) provides continuous verification that the beltline region welds are either free of defects larger than approximately 0.10 inch or that they are documented and recorded, and;*

3) *Additional conservatism exists in the use of a lower bound reference toughness curve for prevention of crack initiation for these reference flaws.*

[11-24; 11-24; 16-17;16-18; 16-19; 16-20; 17-2; 17-3; 17-4; 17-5; 17-9; 17-11; 19-1; 20-8; 20-11; 20-12; 20-13; 21-2; 21-3; 21-4; 21-5; 21-6 and 21-7]

Quantitative results based on a probabilistic approach demonstrate that the current Appendix E approach provides an appropriate conservative methodology following an unanticipated transient. The Pressurized Water Reactor Owners Group (PWROG) has provided a risk-informed assessment of Appendix E, which indicated that by setting the core damage frequency (CDF) to 1E-6, the resulting pressure versus (T - RT_{NDT}) curve bounds the corresponding Appendix E curve for both the PWR unanticipated isothermal pressure events and the pressurized cool-down events, where T is the reactor pressure vessel (RPV) coolant temperature and RT_{NDT} is the nil-ductility reference temperature of the limiting RPV material. [16-21]

NRC Response: The commenter's qualitative arguments based on the deterministic approach involve extensive discussions. However, the bottom line is the same as for Comments 11 and 14. Hence, the NRC will respond to only selective parts of the comments based on the deterministic approach to clarify its position. This is appropriate because the NRC's final position is not based on the qualitative, deterministic fracture mechanics (FM) arguments, but on the quantitative, probabilistic fracture mechanics (PFM) results provided by the PWROG.

The NRC agrees with most of the qualitative arguments based on the deterministic FM approach. However, the NRC's final position to accept ASME Code, Section XI, Appendix E without the proposed conditions is not because of these arguments, but rather because of the supporting quantitative PFM results provided by the PWROG.

Although most of the qualitative arguments based on the deterministic FM approach have merit, they can only demonstrate that the probability of having a flaw close to 1/4T in size is very low. They cannot rule out that such a large flaw could exist. This observation is consistent with a key statement regarding a large flaw in NUREG-1806, "Technical Basis for Revision of the Pressurized Thermal Shock (PTS) Screening Limit in the PTS Rule (10 CFR 50.61)." NUREG-1806 states "It should also be noted that the empirical data used as the primary evidence to establish the distribution of embedded weld flaws do not, and cannot, provide any information about the maximum size a flaw can be."

The final PTS rule (75 FR 13) published on January 4, 2010, is based on a PFM analysis using a weld flaw distribution with a cutoff flaw depth close to 1/4T of the RPV wall, indicating that although the 1/4T flaw has a low probability of existence it is prudent to still consider it.

The FM analyses in both ASME Code, Section XI, Appendix G and ASME Code, Section XI, Appendix E are based on postulated flaws using linear elastic FM in a deterministic approach. It is appropriate to assume different margins for these two types of analyses to account for the very different occurrence frequencies of the two events. However, it is too aggressive to change the fundamental flaw size assumption simply based on different event frequencies. Further, both appendices are for all RPVs, including the one with the worst combination of transients (for the Appendix E analysis), largest undetected flaw size, and worst degradation in fracture toughness. Therefore, unless a PFM approach is used which accounts for a large size flaw with its low probability, it is prudent that the fundamental flaw size assumption remains the same in these two deterministic FM analyses. The PWROG provided such a PFM approach in its response.

The PWROG performed a risk-informed assessment of Appendix E using the Fracture Analysis of Vessels - Oak Ridge (FAVOR) Code; the same tool used in the PFM analyses

supporting the final PTS rule. Based on a selected PWR and BWR RPV having the highest RT_{NDT} of the limiting RPV material and a typical beltline fluence model, the PWROG generated a pressure versus (T - RT_{NDT}) curve for each of the two RPVs by setting the CDF to 1E-6. The analytical results showed that the PWROG's PFM results bounds the corresponding Appendix E curve for both the unanticipated isothermal pressure events and the pressurized cool-down events. Since (1) the PFM methodology is consistent with the PTS rule's underlying methodology, in which large flaws are considered statistically, and (2) the resulting pressure versus (T - RT_{NDT}) curve bounds the corresponding curve based on the current Appendix E approach, the NRC concludes that the current Appendix E methodology, without the NRC's proposed condition, provides an appropriate conservative methodology for evaluating RPV integrity following an unanticipated transient that exceeds the operational limits in PWR plant operating procedures.

For these reasons, the NRC agrees with the comment based on the PFM analyses that the current ASME Code, Section XI, Appendix E analysis is appropriate. The proposed conditions placed on the use of ASME Code, Section XI, Appendix E in the proposed rule are, therefore, not included in the final rule.

Comment: Section E-1200 is useful and conservative as is, and prohibiting the use of Section E-1200 will ultimately result in added utility burden or loss of generation because of the additional time required to perform analysis under Section E-1300. It is estimated that a Section E-1200 evaluation can be completed in hours while a Section E-1300 evaluation may require days or weeks. Furthermore, use of a 1/4T flaw size can produce unacceptable analytical results, even though crack initiation has not occurred, thereby complicating the resolution process following a fairly minor thermal transient or overpressure event. [11-24, 14-24, 17-11, 19-1, 21-7]

NRC Response: The NRC agrees with this comment based on the PFM Analysis provided by the PWROG. The final rule does not include the condition of paragraph (b)(2)(xxv) from the proposed rule.

Comment: The NRC should reconsider the change specifying "...that Section E-1200 is not acceptable." The intent of Section E-1200 is to provide licensees a conservative and yet simple screening method that can be used to immediately judge whether a reactor vessel can be returned to service or whether a more in-depth analysis is needed prior to returning the reactor vessel to service following an unanticipated event. The evaluation procedures in Appendix E, Paragraphs E-1200 and E-1300, provide adequate safety margins for evaluating reactor pressure vessel integrity following an unanticipated event that results in pressures and temperatures outside the limits established for normal operation. Additionally, Appendix E is consistent with risk-informed acceptance criteria for normal operating and unanticipated events. Consequently, modifying Appendix E as proposed is unnecessary and disallowing use of Section E-1200 will result in an undue hardship without any compensating increase in safety. [20-7]

NRC Response: The NRC agrees with this comment based on the PFM Analysis provided by the PWROG. The final rule does not include the condition of paragraph (b)(2)(xxv) from the proposed rule.

10 CFR 50.55a(b)(2)(xxvi) (proposed rule paragraph (b)(2)(xxii))

Comment: If the NRC intends to require that Risk-Informed ISI (RI-ISI) Programs comply with RG 1.178, RG 1.200, and NRC Standard Review Plan 3.9.8, then in lieu of the proposed condition in paragraph (b)(2)(xxvi), the proposed condition should specify that use of Nonmandatory Appendix R is acceptable, provided licensees comply with these applicable RGs and the Standard Review Plan 3.9.8. [4-18; 11-25; 14-25; 19-1]

NRC Response: The NRC disagrees with the comment and believes that RI-ISI programs developed in accordance with Nonmandatory Appendix R should continue to be submitted as alternatives in accordance with 10 CFR 50.55a(a)(3). The NRC has not generically approved RI-ISI application because the code-approved guidance to date has not addressed inspection strategy for existing augmented and other inspection programs such as intergranular stress corrosion cracking (IGSCC), flow assisted corrosion (FAC), microbiological corrosion (MIC), and pitting or provided system-level guidelines for change in risk evaluation to ensure that the risk from individual system failures will be kept small and dominant risk contributors will not be created. Furthermore, allowing the use of Nonmandatory Appendix R without requiring submittal of an alternative would allow plants being licensed and constructed in accordance with 10 CFR Part 52 to implement Nonmandatory Appendix R. The NRC believes at this time that the use of Nonmandatory Appendix R at plants licensed under 10 CFR Part 52 plants is something that requires additional review of plant specific applications. For these reasons the NRC disagrees with the comment. No change was made to the final rule as a result of the comment.

10 CFR 50.55a(b)(3)(v) Subsection ISTD. Article IWF– 5000, ‘‘Inservice Inspection Requirements for Snubbers”

Comment: 10 CFR 50.55a(b)(3)(v) should be revised as follows for clarification:

(v) Subsection ISTD. Article IWF– 5000, “Inservice Inspection Requirements for Snubbers,” of the ASME B&PV Code, Section XI, must be used when performing inservice inspection examinations and tests of snubbers at nuclear plants, except as modified in (A) and (B) below.

[11-27; 14-27a; 17-12; 19-1]

NRC Response: The NRC agrees that paragraph (b)(3)(v) should be clarified, and revised it to

include references to paragraphs (b)(3)(v)(A) and (b)(3)(v)(B).. The recommended change provides clarity between the selection of paragraph (b)(3)(v)(A) or (b)(3)(v)(B). The final rule is revised to add the suggested references.

10 CFR 50.55a(b)(3)(v)(A)

Comment: It is unclear whether the intent of paragraph (b)(3)(v) is that, after licensees have updated their programs to comply with the 2006 Addenda and later editions and addenda of the ASME B&PV Code and the equivalent endorsed edition and addenda of the ASME OM Code, Subsection ISTD, preservice and inservice examinations need not be performed using a VT-3 visual examination method as described in IWA-2213. [14-27b; 17-13]

NRC Response: The NRC agrees with this comment to the extent that, as described in paragraph (b)(3)(v)(A), VT-3 visual examination must be used while using ASME OM Subsection ISTD in lieu of the requirements for snubbers in the editions and addenda up to the 2005 Addenda of the ASME Section XI, IWF-5200(a) and (b), and IWF-5300(a) and (b). Paragraph (b)(3)(v)(B) states that licensees using the 2006 Addenda and later editions of the ASME OM Code Subsection ISTD are not required to use VT-3 visual examination, because in the ASME OM Code snubber (pin-to-pin) visual examination VT-3 requirements have been replaced with the Owner's defined visual examination. However, removing VT-3 requirements for snubbers does not remove VT-3 requirements of support structure(s) and attachments as defined in IWF of ASME Section XI.

The proposed rulemaking would not change the intent of the current paragraph (b)(3)(v). The proposed rulemaking would split paragraph (b)(3)(v) into (b)(3)(v)(A) and (b)(3)(v)(B), because snubber inservice examination and testing requirements have been deleted in the 2006 addenda and later Editions of ASME Section XI. Up to, and including, the 2005 Addenda, both ASME Section XI and ASME OM Code contained snubber examination and testing

requirements. Now, in the 2006 Addenda, the ASME OM Code is the only Code which contains the inservice examination and testing requirements of snubbers. The paragraph (b)(3)(v)(A) option is for licensees using ASME Section XI up to the 2005 Addenda, which is similar to the current paragraph (b)(3)(v). The paragraph (b)(3)(v)(B) option is for the licensees using the 2006 Addenda or the later edition of ASME Section XI, where the licensee will not find any snubber requirements in ASME Section XI; therefore, the ASME OM Code must be used.

The intent of current paragraph (b)(3)(v) is based on the ASME Section XI, IWF-5000 and ASME OM, Subsection ISTD requirements. The ASME Section XI up to the 2005 Addenda does not clearly distinguish the boundary between the support structure, attachments and the snubber. The inservice examination of the support structure and attachments is performed using VT-3 as required by Subsection IWF of Section XI, and IWF-5000 requires that snubber examination must be performed using VT-3 visual examination as described in IWA-2213. Subsection ISTD of the ASME OM Code does not address inspection of the support structure and attachments. Therefore, to be consistent with the Section XI requirements, VT-3 visual examination is required when using Subsection ISTD of the OM Code in lieu of the IWF-5000 requirements of ASME Section XI, up to the 2005 Addenda. The proposed VT-3 requirement is consistent with the current requirement to ensure that an appropriate visual examination method was used for integral and non-integral snubber supports and attachments such as lugs, bolting, and clamps when using ISTD of the ASME OM Code in lieu of the ASME Section XI, 2005 Addenda.

In the 2006 Addenda and later edition of ASME Section XI, the inservice examination and testing requirements of snubbers have been deleted, and a Figure IWF-1300-1(f) has been added to clarify the boundary of a snubber (pin-to-pin) and its support structure and attachments. Figure IWF-1300-1(f) defines that a snubber (pin-to-pin) examination is excluded

from Section XI, and the support structure and attachments, etc. are still under the scope of ASME Section XI. ASME Section XI, IWF-1220 in the 2006 Addenda and later edition states that inservice examination and testing of snubbers are outside the Scope of IWF, and can be found in the ASME OM Code. Subsection IWF requires that the inservice examination of support structure and attachments are to be performed using VT-3 visual examination, whereas the ASME OM Code requires that snubber (pin-to-pin) visual examination is to be performed using the Owner's qualified procedures and methods. However, if licensees prefer, the VT-3 visual examination method still can be used for snubber (pin-to-pin) inservice examination, while using ASME OM Code requirements. No change was made to the final rule as a result of this comment.

10 CFR 50.55a(b)(3)(v)(B)

Comment: The examination boundary for a snubber examination as defined in ISTD is the snubber unit out to the pins that hold it in place. Commenters request that the NRC clarify in the final rule whether the pin-to-pin ISTD examination of the snubber unit should be a VT-3, even though a VT-3 examination is a Section XI requirement. [14-27c; 17-13]

NRC Response: The NRC clarifies that the licensees are required to meet the snubber (pin-to-pin) visual examination requirements as specified in the Subsection ISTD of the ASME OM Code when using the 2006 Addenda and later editions and addenda of Section XI of the ASME B&PV Code, as defined in paragraph (b)(3)(v)(B). Subsection ISTD of the ASME OM Code, 2006 Addenda and later editions requires that snubber (pin-to-pin) visual examination is to be performed using the Owner's qualified procedures and methods, whereas licensees must use VT-3 for integral and non-integral structure and attachments as required by ASME Section XI. However, licensees may use VT-3 visual examination method for snubber (pin-to-pin) inservice examination, while using ASME OM Code, 2006 Addenda and later editions.

When using the 2005 Addenda or earlier editions and addenda of the ASME OM Code, Subsection ISTD in lieu of the ASME Section XI, IWF-5000 as defined in paragraph (b)(3)(v)(A), licensees must use VT-3 visual examination for snubbers (pin-to-pin) and integral and non-integral structure and attachments as required by ASME Section XI.

Inservice Testing

10 CFR 50.55a(f)(5)(iv)

Comment: The words "and is not included in the revised inservice test program as permitted by paragraph (f)(4) of this section" seem to imply that a licensee need not seek relief if the inservice test program is revised to identify the impractical test requirement. If this is the intent of these words, licensees may not need to submit relief requests for IST Program impracticality if the IST Program is updated. If this is not the intent of these words, then the phrase "and is not included in the revised inservice test program as permitted by paragraph (f)(4) of this section" should be removed from paragraph (f)(5)(iv). [4-22]

NRC Response: The NRC does not agree with the comment. The proposed amendment states that where a pump or valve test requirement by the code or addenda is determined to be impractical by the licensee and is not included in the revised inservice test program, the basis for this determination must be submitted for NRC review and approval not later than 12 months after the expiration of the initial 120-month interval of operation. Therefore, a licensee has to submit relief requests for inservice testing (IST) Program impracticality if the IST Program is updated. No change was made to the final rule as a result of this comment.

Inservice Inspection

10 CFR 50.55a(g)(2), (g)(3)(i), (g)(3)(ii), (g)(4)(i) and (g)(4)(ii)

Comment: The introductory text and other applicable sections should state that licensees use the provisions for examination and testing of snubbers in Subsection ISTD of the ASME OM Code or the requirements in plant Technical Specifications (TS). [1-1; 17-6]

NRC Response: The NRC does not agree with the commenter to include the optional provision of TS requirements for inservice examination and testing of snubbers along with Subsection ISTD of the ASME OM Code.

Paragraph (g) establishes the ISI requirements that licensees must use when performing ISI of components (including supports). Additionally, paragraph (g)(4)(iv) states that ISI of components (including supports) may meet the requirements set forth in subsequent editions to the "Code of Record" and addenda that are incorporated by reference in 10 CFR 50.55a(b), subject to limitations and modifications listed in 10 CFR 50.55a(b) and subject to NRC approval.

The requirements at 10 CFR 50.55a do not define any documents beyond "Code of Record" to control the snubber inservice examination and testing program. Licensees have the option to control the ASME Code-required ISI and testing of snubbers through their TS or other licensee-controlled documents (e.g. technical requirements manual, etc.). For facilities using their TS to govern ISI and testing of snubbers, paragraph (g)(5)(ii) requires that if a revised ISI program for a facility conflicts with the TS, the licensee shall apply to the NRC for amendment of the TS to conform the TS to the revised program. Therefore, the regulation does not state the type of documents to be used by the licensees to meet the snubber inservice examination and testing requirements as specified in the ASME Code, but TS must meet the "Code of Record" requirements. For a particular facility, the snubber inservice examination and testing may be controlled by its TS, including the applicable snubber inservice examination and testing requirements as specified in the ASME Code. No change was made to the final rule as a result

of this comment.

10 CFR 50.55a(g)(5)(iii) and (g)(5)(iv)

Comment: The proposed rule adds extra burden on licensees to submit relief requests within 12 months of examinations where code requirements were determined to be impractical and the proposed rule language would put paragraph (g)(5)(iii) in conflict with paragraph (g)(5)(iv). [2-3; 4-25; 11-31a-g; 14-31; 17-7; 17-10; 18-1; 20-14; 21-1; 22-1]

NRC Response: The NRC agrees with the comments that paragraph (g)(5)(iii) would place an extra burden on the licensee by requiring that requests for relief made in accordance with paragraph (g)(5)(iii) must be submitted to the NRC no later than 12 months after the examination has been attempted. This requirement could increase the number of submittals licensees need to submit for code requirements determined to be impractical. Rather than submitting one request for relief at the end of the interval for all requirements determined to be impractical throughout the 10-year interval as currently allowed, licensees would be required to prepare a submittal within 12 months of every examination that determined a requirement was impractical. This could result in the licensee preparing numerous submittals for relief requests where under the current rules only one submittal is required at the end of the interval. This requirement is revised in this final rule to align with paragraph (g)(5)(iv) to require submittal of these requests no later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought.

Comment: Paragraph (g)(5) in general, and this proposed change to paragraph (g)(5)(iii) in particular, could also have a direct impact on examinations associated with welds and weld repairs performed during the course of a repair/replacement activity. Based on the proposed change to paragraph (g)(5)(iii), it could be argued that a relief request does not have to be submitted until after performance of a weld repair and alternative NDE or NDE with limited

coverage. If the intent is to exclude NDE associated with welds and weld repairs (i.e., repair/replacement activities), then the proposed change to paragraph (g)(5)(iii) should be revised to make this clarification. [17-8; 17-14; 18-2]

NRC Response**:** If a licensee proposes to use a different inspection technique (e.g., UT vs. RT), an alternative must be submitted under the provisions of 10 CFR 50.55a(a)(3), regardless of what amount of coverage they would achieve with either technique. If the licensee has knowledge of the fact that the inspection using the different inspection technique will be limited, it is the NRC's expectation that such information will be included as an integral part of the requested alternative. The alternative that would be approved would be based on the technique and the amount of coverage the licensee expects to achieve. If the requested alternative is approved and the licensee achieves less coverage using the alternative inspection technique than that stipulated in the original alternative request, the licensee would need to submit a request for relief based on 10 CFR 50.55a(g)(5). No change was made to the final rule as a result of this comment.

Comment: The requirement to submit the relief request after the examination has been attempted may in fact be a clarification of the NRC's intent, but the requirement to submit the relief request within 12 months of the attempt is certainly not a clarification, it is a new requirement. [2-3]

NRC Response: The NRC agrees that submitting the relief request within 12 months of the attempted examination would be a new requirement, which was not the NRC's intent. This paragraph is revised in this final rule to align with paragraph (g)(5)(iv).

Comment: The words "and is not included in the revised inservice inspection program as permitted by paragraph (g)(4) of this section" seem to imply that a licensee need not seek relief if the inservice inspection program is revised to identify the impractical requirement. If this

is the intent of these words, licensees may not need to submit relief requests for ISI Program impracticality if the ISI Program is updated. If this is not the intent of these words, then the phrase "and is not included in the revised inservice inspection program as permitted by paragraph (g)(4) of this section" should be removed from 10 CFR 50.55a(g)(5)(iv). [4-26]

NRC Response: The NRC agrees the phrase, "and is not included in the revised inservice inspection program as permitted by paragraph (g)(4) of this section," could cause confusion, because paragraph (g)(4) does not address the basis for the determination of an examination requirement's impracticality. The submittal of the basis for determination of the impracticality of an examination requirement is required by (g)(5)(iii) and the timing of this submittal is discussed in (g)(5)(iv). Therefore, paragraph (g)(5)(iv) of the final rule is revised to remove the wording "and is not included in the revised inservice inspection program as permitted by paragraph (g)(4) of this section."

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

Comment: The final rule should incorporate by reference Code Case N-770-1, approved by ASME on Dec. 25, 2009, in lieu of Code Case N-770. In Code Case N-770-1, "cladding" was changed to "onlay" to eliminate confusion and misapplication in either installation requirements or examination/evaluation requirements, or both. The confusion and misapplication could result from someone applying the existing Code rules for "cladding," which is not the intent when "cladding mitigation" in N-770 is used. [4-4; 4-27a; 11-3; 11a-34a; 14-3; 14-34a; 19-1]

NRC Response: The NRC agrees that incorporating by reference Code Case N-770-1 into the final rule could eliminate a number of the proposed conditions. Many of the conditions the NRC proposed to impose on the use of Code Case N-770 have been incorporated into Code Case N-770-1, as discussed in specific comments related to Code Case N-770. Therefore, the final rule incorporates by reference Code Case N-770-1, and does not include

most of the conditions on the use of Code Case N-770 that were included in the proposed rule. The NRC agrees that the term “cladding,” as used by Section XI, does not apply to mitigation in the context of Code Case N-770. “Onlay” is the terminology used in the code case. The incorporation of Code Case N-770-1 in the final rule addresses the commenters’ recommendation that the final rule use the terminology “onlay” instead of “cladding.”

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

Comment: The NRC has typically approved the application of pressure boundary weld mitigation techniques on a case-by-case basis. All mitigation techniques discussed in Code Case N-770, with the exception of Mechanical Stress Improvement Process (MSIP), are the subject of separate code cases which will be subject to approval by the NRC. MSIP meets the requirements of Appendix I of Code Case N-770 and has been separately approved by the NRC. If approved mitigation techniques are employed, a separate review of the reclassification of the welds as proposed by the condition in paragraph (g)(6)(ii)(F)(2) should not be required. [5-2; 8-1; 11a-34b; 14-34b; 16-1; 17-16; 18-4; 19-1; 20-16; 21-8]

NRC Response: The NRC disagrees that a separate NRC review of the reclassification of welds should not be required for mitigation techniques approved in ASME code cases. It is the NRC’s position that a separate review of the reclassification of welds will be required unless NRC-approved mitigation techniques are employed. This condition provides clarity for the licensee and inspectors for the classification of each weld. Under the condition, unless there is NRC approval of a mitigation technique, whether generic or plant specific, such welds will be classified as category items A-1, A-2 or B of Table 1 of ASME Code Case N-770-1. All mitigation techniques discussed in Code Case N-770, with the exception of MSIP, are covered by separate code cases in various stages of development. These code cases are subject to approval by the NRC. As ASME completes these mitigation code cases, the NRC will review

and approve them, if appropriate, possibly with conditions. The NRC uses RG 1.147, which is incorporated by reference in 10 CFR 50.55a, to endorse approved code cases for generic use. Based on the wording of paragraph (g)(6)(ii)(F)(*2*), as the NRC endorses mitigation code cases in the RG, the rule permits licensees to categorize mitigated welds in the corresponding Inspection Items in Code Case N-770-1, without a separate NRC review of the classification or reclassification. No change to paragraph (g)(6)(ii)(F)(*2*) was made in the final rule as a result of this comment.

Comment: The proposed condition in paragraph *(g)(6)(ii)(F)(2) is not consistent with the other proposed conditions in* paragraphs *(g)(6)(ii)(F)(6) and (g)(6)(ii)(F)(7) or Code Case N-770. Paragraph (g)(6)(ii)(F)(6) requires that a weld that has been mitigated by inlay or corrosion resistant cladding, and then is found to be cracked, be reclassified and inspected using the frequencies of Inspection Item A-I, A-2, or B. This indicates that an uncracked weld that has been mitigated by inlay or corrosion resistant cladding would not be categorized as Inspection Items A-1, A-2 or B following an acceptable pre-service examination. Additionally, paragraph (g)(6)(ii)(F)(7) requires that a weld mitigated by inlay or corrosion resistant cladding be examined each interval if at hot-leg temperatures and as part of a 25-percent sample plan on a 20-year frequency if at cold-leg temperatures, which is not consistent with Inspection Item A-1, A-2, or B. [5-2; 8-1; 11a-34b; 14-34b; 16-1; 17-16; 18-4; 19-1; 20-16; 21-8]*

NRC Response: The NRC agrees with the first point about the inconsistency between paragraphs (g)(6)(ii)(F)(*2*) and (g)(6)(ii)(F)(*6*), but disagrees with the second point about an inconsistency between paragraphs (g)(6)(ii)(F)(*2*) and (g)(6)(ii)(F)(*7*). Proposed paragraph (g)(6)(ii)(F)(*6*) referred to welds mitigated by inlay or cladding rather than referring to welds in Inspection Items G, H, J, and K. The wording in proposed paragraph (g)(6)(ii)(F)(*6*) overlooked the step required by paragraph (g)(6)(ii)(F)(*2*) to obtain NRC authorization for an alternative

classification of welds as Inspection Items G, H, J, or K. However, paragraph (g)(6)(ii)(F)(*6*) of the proposed rule is not included in the final rule because Code Case N-770-1 addresses the NRC's concern that was contained in this condition, and Code Case N-770-1 is incorporated by reference in the final rule.

The NRC disagrees with the commenters' second point. Paragraph (g)(6)(ii)(F)(*7*) in the proposed rule correctly referred to, and would apply to, welds in Inspection Items G, H, J and K. Before welds can be categorized as Inspection Items G, H, J, or K, the categorization would first have to be authorized by the NRC under the condition in paragraph (g)(6)(ii)(F)(*2*). Therefore, paragraph (g)(6)(ii)(F)(*7*) in the proposed rule would be consistent with paragraph (g)(6)(ii)(F)(*2*). No change to paragraph (g)(6)(ii)(F)(*7*) of the proposed rule was made in the final rule as a result of this comment.

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

Comment: The proposed condition in paragraph (g)(6)(F)(3) should not be applied. The final rule approval timing for some plants may be such that there would not be time to plan and prepare for the required baseline inspection under the proposed condition in paragraph (g)(6)(ii)(F)(3) and prepare repair contingencies, (e.g., approval of the rule in June and the next refueling outage for a plant is in September). By providing a window of the next two refueling outages, the required planning and preparation can be accommodated.

Additionally, for baseline examinations already completed to the requirements of the industry guidance, any condition applied should recognize these examinations as acceptable for compliance to N-770 and the NRC Conditions. [5-3; 8-2; 11a-34c; 14-34c; 16-2; 17-17; 18-5; 19-1; 20-17; 21-9]

NRC Response: The NRC agrees that more time may be needed after the rule becomes effective for licensees to complete the baseline examinations, but does not agree that

the condition should not be included in the final rule. The NRC believes that there are welds within the scope of Code Case N-770 that have not been examined under the industry program MRP-139, "Primary System Piping Butt Weld Inspection and Evaluation Guideline." There may also be welds that received less than complete ASME Code, Section XI, examination coverage under the MRP-139 program. Paragraph (g)(6)(ii)(F)(*3*) is necessary to ensure that adequate baseline examinations have been performed on all welds within the scope of Code Case N-770, since these welds are susceptible to PWSCC. The need for ensuring the integrity of these welds, beginning with baseline examinations, has been recognized by the NRC and industry groups for a number of years. The NRC included paragraph (g)(6)(ii)(F)(*3*) in the proposed rule because it believes that the code case requirement allowing two refueling outages after adoption of the code case to complete the baseline examinations is inconsistent with the safety significance of performing the initial inspections of these welds.

The NRC recognizes that the timing in paragraph (g)(6)(ii)(F)(*3*) as proposed would, in some cases, constrain planning and preparation efforts for the required baseline examination. Therefore, for butt welds that were not in the scope of MRP-139 and did not receive a baseline examination, the timing in paragraph (g)(6)(ii)(F)(*3*) in the final rule is extended to require that these baseline examinations be completed at the next refueling outage that occurs more than 6 months from the effective date of the final rule. This change in the condition would give licensees at least 6 months to plan and prepare for the baseline examination. If a baseline examination cannot be performed by the licensee to meet the requirements of paragraph (g)(6)(ii)(F), then the licensee is required to obtain NRC authorization of alternative examination requirements in accordance with paragraphs (a)(3)(i) or (a)(3)(ii).

In response to the comment regarding using examinations performed prior to issuance of the final rule as baseline examinations for Code Case N-770, the NRC revised paragraph

(g)(6)(ii)(F)(*3*) in the final rule to address this option. Previous examinations of these welds can be credited for baseline examinations if they were performed using Section XI, Appendix VIII requirements and met the Code-required examination volume for axial and circumferential flaws of essentially 100 percent. For butt welds that received a MRP-139 examination that did not fully meet Section XI, Appendix VIII requirements, or achieve essentially 100-percent coverage, licensees can re-perform the baseline examination to meet these requirements or obtain NRC authorization of alternative examination requirements in accordance with paragraph (a)(3)(i) or (a)(3)(ii) by the end of next refueling outage that occurs after 6 months from the effective date of the final rule. This provision acknowledges previous examinations that could satisfy the Code Case N-770-1 baseline requirement, with NRC authorization of alternative examination requirements within a reasonable time frame.

A licensee may also choose to use previous inspections of dissimilar-metal butt welds performed under the plant's ASME Code, Section XI, Inservice Inspection program to count as meeting the paragraph (g)(6)(ii)(F)(*3*) baseline requirement. This is acceptable, provided the previous inspection falls within the re-inspection period for welds in ASME Code Case N-770-1, Table 1, Inspection Items A–1, A–2, and B. Additionally, the NRC-approved alternative examination coverage for these welds during the current 10-year inservice inspection interval remain applicable. In all of these cases, the previously-approved alternative will continue to apply for the duration authorized by the NRC as the final rule does not revoke previous NRC-approved alternatives or relief requests.

In the final rule, paragraph (g)(6)(ii)(F)(*3*) is revised to require baseline examinations for welds in Table 1, Inspection Items A–1, A–2, and B, to be performed at the next refueling outage that occurs later than 6 months after the effective date of the final rule. The rule allows previous examinations of these welds to be credited for baseline examinations if they were

performed 1) within the re-inspection period for the weld item in Table 1, and 2) using Section XI, Appendix VIII requirements and met the Code-required examination volume of essentially 100 percent. The rule allows other previous examinations that do not meet these requirements to be used to meet the baseline examination requirement, provided NRC authorization of alternative inspection requirements in accordance with 10 CFR 50.55a(a)(3)(i) or (a)(3)(ii) is granted prior to the end of the next refueling outage that occurs later than 6 months after the effective date of the final rule.

10 CFR 50.55a(g)(6)(ii)(F)(*5*)

Comment: In Code Case N-770-1, approved by the ASME on December 25, 2009, Paragraph –3132.3(b) has been modified, so the adoption of Code Case N-770-1 would make the proposed condition in paragraph (g)(6)(ii)(F)(5) no longer necessary. [5-5; 8-4; 11-34e; 14-34e; 16-4; 19-1; 20-19; 21-11]

NRC Response: The NRC agrees with this comment for several reasons. Code Case N-770, Paragraph –3132.3(b) states that a ‘‘flaw is not considered to have grown if the size difference (from a previous examination) is within the measurement accuracy of the NDE technique employed.” Use of this terminology may have resulted in a departure from the past practice when applying the ASME Code, Section XI. Paragraph (g)(6)(ii)(F)(*5*) of the proposed rule stated that a flaw is not considered to have grown if a previously-evaluated flaw has remained essentially unchanged. This wording is consistent with the requirements and practice of NDE under Section XI. Paragraph -3132.3(b) of Code Case N-770-1 uses the same wording as contained in paragraph (g)(6)(ii)(F)(*5*) of the proposed rule. The revised requirement of Code Case N-770-1 fully addresses the NRC’s concern contained in paragraph (g)(6)(ii)(F)(*5*) of the proposed rule. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the condition of paragraph (g)(6)(ii)(F)(*5*) from the proposed rule.

10 CFR 50.55a(g)(6)(ii)(F)(*6*)

Comment: Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified Note 16(c), so the adoption of Code Case N-770-1 would make the proposed condition in 10 CFR 50.55a(g)(6)(ii)(F)(6) no longer necessary. [5-6; 8-5; 11a-34f; 14-34f; 16-5; 19-1; 20-20; 21-12]

NRC Response: The NRC agrees with this comment for several reasons. Code Case N-770 would permit welds mitigated by inlay or cladding (i.e., onlay) in Inspection Items G, H, J, and K, to remain in those Inspection Items if cracking were to occur that penetrates through the thickness of the inlay or onlay. The purpose of an inlay or onlay is to provide a corrosion-resistant barrier between reactor coolant and the underlying Alloy 82/182 weld material that is susceptible to PWSCC. If cracking penetrates through the thickness of an inlay or onlay, the inspection frequencies of Inspection Items G, H, J, and K would no longer be appropriate even after satisfying the successive examination requirements of paragraph –2420. Paragraph (g)(6)(ii)(F)(*6*) would require welds in Inspection Items G, H, J, or K, with cracking that penetrates beyond the thickness of the inlay or cladding, be reclassified as Inspection Item A–1, A–2, or B, as appropriate, until corrected by repair/replacement activity in accordance with IWA–4000 or by corrective measures beyond the scope of Code Case N–770. A new sentence added to Note (16)(c) of Code Case N-770-1 states that “if cracking penetrates beyond the thickness of the inlay or onlay, the weld shall be reclassified as Inspection Item A-1, A-2, or B, as appropriate, until corrected by repair/replacement activity in accordance with IWA-4000 or by corrective measures beyond the scope of this Case (e.g., stress improvement).” The revision of Note (16)(c) in Code Case N-770-1 fully addresses the NRC concerns contained in paragraph

(g)(6)(ii)(F)(*6*) of the proposed rule. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the condition of paragraph (g)(6)(ii)(F)(*6*) from the proposed rule.

10 CFR 50.55a(g)(6)(ii)(F)(7)

Comment: The proposed condition is appropriate because the Appendix VIII supplement has not yet been developed to demonstrate the detection of flaws in the thin inlay or cladding when the examination is performed from the outside surface. Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified the "Extent and Frequency of Examination" column for Inspection Items G, H, J, and K in Table 1, so adoption of Code Case N-770-1 would allow the NRC to modify the proposed condition in paragraph (g)(6)(ii)(F)(7). [5-7; 8-6; 11a-34g; 14-34g; 16-6; 19-1; 20-21; 21-13]

NRC Response: The NRC agrees with this comment. In Code Case N-770, the Table 1 column titled “Extent and Frequency of Examination” for Inspection Items G, H, J, and K (welds mitigated by inlay or cladding) only requires a surface examination for welds in Inspection Items G, H, J, and K if a volumetric examination is performed from the weld inside-diameter surface. The NRC proposed adding paragraph (g)(6)(ii)(F)(*7*) on welds in Inspection Items G, H, J, and K, which would have required that the ISI surface examination requirements of Table 1 apply whether the inservice volumetric examinations are performed from the weld outside diameter or the weld inside diameter. A volumetric examination performed from the weld outside-diameter surface would not be capable of detecting flaws in an inlay or onlay. In Code Case N-770-1, the Table 1 column titled “Extent and Frequency of Examination” for Inspection Items G, H, J, and K contains revised requirements to perform a surface examination from the weld inside surface and a volumetric examination performed from either the inside or outside surface. The revised requirement of Code Case N-770-1 for surface examination of welds in Inspection Items G, H, J,

and K is the same requirement that was contained in paragraph (g)(6)(ii)(F)(*7*) of the proposed rule. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the surface examination requirement of paragraph (g)(6)(ii)(F)(*7*) from the proposed rule.

10 CFR 50.55a(g)(6)(ii)(F)(*8*)

Comment: Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified Notes 11(b)(1) and (2), so adoption of Code Case N-770-1 would make the proposed condition in paragraph (g)(6)(ii)(F)(8) no longer necessary. [5-9; 8-8; 11a-34h; 16-8; 19-1; 20-23; 21-15]

NRC Response: The NRC agrees with this comment for several reasons. Inspection Items D, G, and H pertain to mitigation of uncracked butt welds by stress improvement, weld inlay, and weld onlay, respectively. Code Case N-770 does not explicitly preclude deferral of the first examination of Items D, G, and H following mitigation to the end of the interval. Therefore, the NRC proposed paragraph (g)(6)(ii)(F)(*8*) to ensure that the initial examinations of welds in Inspection Items D, G, and H take place on an appropriate schedule to verify the effectiveness of the mitigation process. Note (11), which pertains to deferral of the first examinations after mitigation, was revised in Code Case N-770-1. The revised requirements of Code Case N-770-1, Note (11), indicate that the first examinations following mitigation are to be performed within 10 years following mitigation for Item D butt welds, but can be performed anytime within the 10 years. The revised requirements of Code Case N-770-1, Note (11), indicate that the first examinations following mitigation are to be performed as specified in Table 1 for Items G and H butt welds. The revised requirements of Code Case N-770-1 preclude deferral of the first examinations of Item D butt welds beyond the 10 years allowed by Table 1, and preclude deferral of the first examinations for Item G and H butt welds to the end of an interval, if that is later than the specified time in Table 1. The revision of Note (11) in Code

Case N-770-1 addresses the NRC's concerns in paragraph (g)(6)(ii)(F)(*8*) of the proposed rule. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the condition of paragraph (g)(6)(ii)(F)(*8*) from the proposed rule.

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

Comment: Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified paragraph I-1.1, so adoption of Code Case N-770-1 would make the proposed condition in paragraph (g)(6)(ii)(F)(9) no longer necessary. [5-10; 8-9; 11-34i; 14-34i; 16-9; 19-1; 20-24; 21-16]

NRC Response: The NRC agrees with this comment for several reasons. Code Case N-770, Appendix I, Measurement or Quantification Criteria I-1.1, requires an analysis that assumes the pre-stress-improvement, residual-stress condition resulting from a construction weld repair from the inside diameter to a depth of 50-percent of the weld thickness. Code Case N-770 does not specify the circumferential extent of the weld repair that must be assumed. Paragraph (g)(6)(ii)(F)(*9*) of the proposed rule would require that in applying Measurement or Quantification Criterion I-1.1, the weld repair be assumed to extend 360° around the weld. Code Case N-770-1 specifies in Measurement or Quantification Criterion I-1.1 that the weld repair be assumed to extend 360° around the weld. The addition of the circumferential extent of the assumed weld repair in Appendix I of Code Case N-770-1 fully addresses the NRC's concern contained in paragraph (g)(6)(ii)(F)(*9*) of the proposed rule. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the condition of paragraph (g)(6)(ii)(F)(*9*) from the proposed rule.

10 CFR 50.55a(g)(6)(ii)(F)(*10*)

Comment: Code Case N-770-1, approved by the ASME on Dec. 25, 2009, modified paragraph I-2.1, so adoption of Code Case N-770-1 in lieu of N-770 in the final rule would allow

the NRC to remove this condition. [5-11; 8-10; 11-34j; 14-34j; 16-10; 19-1; 20-25; 21-17]

NRC Response: The NRC agrees with this comment for several reasons. Code Case N-770, Appendix I, Measurement or Quantification Criterion I–2.1, requires that an analysis or demonstration test account for load combinations that could cause plastic ratcheting. This wording is inappropriate since this criterion pertains to the permanence of a mitigation process by stress improvement, and ''shakedown'' rather than ''ratcheting'' is the phenomenon that could lead to lack of permanence of the mitigation. Paragraph (g)(6)(ii)(F)(*10*) of the proposed rule would require that the last sentence of Measurement or Quantification Criterion I-2.1 be replaced with a sentence that uses the correct terminology. Code Case N-770-1 of Appendix I, Measurement or Quantification Criterion I–2.1, requires that an analysis or demonstration test account for load combinations that could relieve stress due to shakedown. The revised requirement of Code Case N-770-1 fully addresses the NRC's concern contained in paragraph (g)(6)(ii)(F)(*10*) of the proposed rule. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the condition of paragraph (g)(6)(ii)(F)(*10*) from the proposed rule.

10 CFR 50.55a(g)(6)(ii)(F)(*11*)

Comment: The NRC proposes to add a condition to require that in applying Measurement or Quantification Criterion I–7.1 of Appendix I, an analysis be performed using IWB–3600 evaluation methods and acceptance criteria to verify that the mitigation process will not cause any existing flaws to grow. However, measurement or Quantification Criterion I–7.1 permits the growth of existing flaws in welds mitigated by stress improvement recognizing that flaw growth can also be caused by fatigue crack growth, which cannot be precluded. Criterion I-7.1, however, also includes the requirement that the mitigation process will not cause any existing flaws to become unacceptable.

Code Case N-770-1 modified paragraph 1-7.1, so adoption of Code Case N-770-1 would allow the NRC to remove proposed condition 10 CFR 50.55a(g)(6)(ii)(F)(11). [5-12; 8-11; 11a-34k; 14-34k; 16-11; 19-1; 20-26; 21-18]

NRC Response: The NRC agrees with this comment for several reasons. Code Case N-770, Appendix I, Performance Criteria I-7, requires that the stress intensity factor at the depth of the flaw (the flaw tip) be determined using combined residual and operating stresses, and shall be zero. Under paragraph I-7, no flaw growth could occur if the stress intensity factor is zero at the flaw tip using the combined residual and operating stresses. The following section of the code case, Measurement or Quantification Criteria I-7.1, requires that an analysis be performed to verify that the mitigation process will not cause any existing flaws to become unacceptable. The NRC proposed adding paragraph (g)(6)(ii)(F)(*11*), because it appeared that, contrary to the requirements of I-7, the analysis required by the Mitigation or Quantification Criteria may have allowed flaw growth, even growth by primary-water stress corrosion cracking.

The revised requirements of Code Case N-770-1, Appendix I, Performance Criteria I-7, state that the stress intensity factor at the depth of the flaw shall be determined using combined residual and steady-state operating stresses, and shall not be greater than zero. By adding the words “steady-state” in I-7 of Code Case N-770-1, and maintaining the stress intensity factor at the flaw tip to zero or less, primary-water stress corrosion cracking would not be expected to occur. The next section of the Code Case N-770-1, Measurement or Quantification Criteria I-7.1, requires that an analysis be performed, using IWB-3600 evaluation methods and acceptance criteria, to verify that the mitigation process will not result in any existing flaws becoming unacceptable. The revised wording in I-7 and I-7.1 would only allow flaw growth under non-steady-state operating stresses (fatigue) and would ensure that standard ASME Code analysis methods are used to limit any fatigue growth to acceptable levels. Code Case N-

770-1, Appendix I, uses different wording than proposed in paragraph (g)(6)(ii)(F)(*11*). However, the revised requirements in Code Case N-770-1 fully address the NRC's concern that the criteria of Code Case N-770, Appendix I, were contradictory and may have permitted flaw growth by PWSCC. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the condition of paragraph (g)(6)(ii)(F)(*11*) from the proposed rule.

10 CFR 50.55a(g)(6)(ii)(F)(*13*)

Comment: Code Case N-770-1 modified the wording of the Extent and Frequency of Examination for Inspection Items C and F, so adoption of Code Case N-770-1 would allow removal of the proposed condition in 10 CFR 50.55a(g)(6)(ii)(F)(13). [5-14; 8-13; 11-34m; 14-34m; 16-13; 19-1; 20-28; 21-19]

NRC Response: The NRC agrees with this comment. Inspection Items C and F pertain to butt welds mitigated by full structural weld overlays. Note (10) of Code Case N-770 requires that welds in Inspection Items C and F that are not included in the 25-percent sample be examined prior to the end of the mitigation evaluation period if the plant is to be operated beyond that time. Proposed paragraph (g)(6)(ii)(F)(*13*) was written because Code Case N-770 does not contain a similar requirement to inspect prior to the end of the mitigation evaluation period for welds that are included in the 25-percent sample. Code Case N-770-1, Table 1, requires that for welds in the Inspection Items C and F 25-percent inspection sample that have a design life of less than 10 years, at least one inservice inspection shall be performed prior to exceeding the life of the overlay. The revised requirements in Code Case N-770-1 fully address the NRC concern that Inspection Item C and F welds in the 25-percent inspection sample may not have been inspected prior to the end of the life of the overlay. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the condition of paragraph (g)(6)(ii)(F)(*13*) from the proposed rule.

10 CFR 50.55a(g)(6)(ii)(F)(*14*)

Comment: The change in the dimension to be used in determining the thickness "t" in the acceptance criteria should be adopted, but the NRC-proposed condition should not be adopted, for the following reason.

The proposed condition in paragraph (g)(6)(ii)(F)(14) would cause a conflict in the definition of the required examination volume A-B-C-D, with Figures 2(a) and 5(a) showing the correct definition of the required volume and Figures 2(b) and 5(b) combined with the NRC's proposed condition defining a larger and unintended examination volume (by extending the examination volume of an overlay in both axial directions).

Code Case N-770-1 removed the ½-inch (13 mm) dimension shown in Figures 2(b) and 5(b) of Code Case N–770 and replaced them with dimensions "X" and "Y". The notes beneath each figure define dimensions "X" and "Y".

Concurrent with the change in the ½-inch dimension, Code Case N-770-1 also removed the examination volume A-B-C-D from Figures 2(b) and 5(b). This change was made to clarify that Figures 2(b) and 5(b) were not defining any examination volume, but were only defining the thicknesses to use in applying IWB-3514 acceptance standards. The thickness "t2" in Figures 2(b) and 5(b) was also revised/corrected in Code Case N-770-1 to reflect the total thickness of the original pipe plus the overlay at the location of the flaw.

The adoption of Code Case N-770-1 in lieu of N-770 in the final rule would allow the NRC to remove the proposed condition in paragraph (g)(6)(ii)(F)(14). If Code Case N-770-1 is not adopted in the final rule, the proposed NRC condition needs to be revised to either require the use of Figures 2(b) and 5(b) in Code Case N-770-1, or provide specific figures to use with the condition that are identical to Figures 2(b) and 5(b) in Case N-770-1. [11a-34n]

NRC Response: The NRC agrees with this comment for several reasons. Code Case

N-770, Figures 2(b) and 5(b), contain information on component thicknesses to be used in application of the acceptance standards of ASME Code, Section XI, IWB-3514, to evaluate flaws detected during preservice and inservice inspection of weld overlays. The ½-inch (13 mm) dimensions shown in Figures 2(b) and 5(b) could have resulted in a non-conservative application of the acceptance standards. The appropriate dimensions are a function of the nominal thickness of the nozzle and pipe being overlaid rather than a single, specified value (½-inch) on either side of the weld for all pipes and nozzles. The revision in Code Case N-770-1 of the ½-inch dimension in Figures 2(b) and 5(b) to be used in determining the thickness "t" in the acceptance standards is consistent with paragraph (g)(6)(ii)(F)(*14*) of the proposed rule. Concurrent with the change in the ½ inch dimension, Code Case N-770-1 also removed the examination volume A-B-C-D from Figures 2(b) and 5(b). This change was made to clarify that Figures 2(b) and 5(b) were not defining an examination volume, but were defining the thicknesses to use in applying IWB-3514 acceptance standards, that is, the locations in the weld overlay where each of the two thicknesses, "t1" and "t2", would apply to flaws. The thickness "t2" in Figures 2(b) and 5(b) was also corrected in Code Case N-770-1 to reflect the total thickness of the original pipe plus the overlay at the location of the flaw. The changes to Figures 2(b) and 5(b) that are reflected in Code Case N-770-1 address the NRC's concern regarding non-conservative application of acceptance standards during preservice inspection. The NRC agrees that the other changes made to Figures 2(b) and 5(b) in Code Case N-770-1 correct errors in these figures in Code Case N-770. Because the final rule incorporates by reference Code Case N-770-1, the final rule does not include the condition of paragraph (g)(6)(ii)(F)(*14*) from the proposed rule.

10 CFR 50.55a(g)(6)(ii)(F)(*15*)

Comment: The condition as proposed will not accomplish what was intended. As

proposed, for a flaw in the original nozzle/weld material we would have to use "t" equal to the inlay/onlay thickness to determine the acceptable size per IWB-3514. Nothing would be acceptable under that condition. For flaws that are not contained within the inlay/onlay/cladding, the value of "t" used should be the full structural wall thickness. If the NRC feels that there still needs to be a condition specified in this area, it needs to be re-structured to specify appropriate "t" values for flaws that are contained within the inlay/onlay, and t values for flaws that are contained in the original structural material. [11a-34o; 14-34o; 17-20; 18-9; 19-1]

NRC Response: The NRC agrees that the condition in paragraph (g)(6)(ii)(F)(*15*) of the proposed rule would be more effective if it were revised as recommended. The condition in paragraph (g)(6)(ii)(F)(*15*) of the proposed rule dealt with the value of "t" to use for flaws found in an inlay or onlay. Although a value of "t" equal to the full structural wall thickness is inferred by the code case, the condition did not address the value of "t" to be used for flaws that are not contained within the inlay or onlay material. In the final rule this condition has been revised to clarify that for Inspection Items G, H, J, and K, when applying the acceptance standards of ASME B&PV Code, Section XI, IWB–3514, for planar flaws that are not contained within the inlay or onlay material, the thickness "t" in IWB-3514 is the combined thickness of the inlay or onlay and the dissimilar metal weld.

III. Discussion of NRC Approval of New Edition and Addenda to the Codes, ASME Code Cases N-722-1 and N-770-1, and Other Changes to 10 CFR 50.55a

The NRC is amending its regulations to incorporate by reference the 2005 Addenda through 2008 Addenda of Section III, Division 1, and Section XI, Division 1 of the ASME B&PV Code; and the 2005 Addenda and 2006 Addenda of the ASME OM Code into 10 CFR 50.55a. The NRC also is incorporating by reference Code Case N-770-1, and revision 1 to Code Case

N-722, which was incorporated by reference into the NRC's regulations on September 10, 2008 (73 FR 52729).

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 subjects of this rule. First, 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 in support 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. Finally, the NRC position on each Code is reviewed and approved by NRC management as part of the rule amending 10 CFR 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 ASME Codes, provides reasonable assurances 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 reviewed changes to the Codes in the editions and addenda of the Codes identified in this rulemaking. The NRC concluded, in accordance with the process for review of changes to the Codes, that each of the editions and addenda of the Codes, and the 1994 Edition of NQA-1, are technically adequate, consistent with current NRC regulations, and approved for use with the specified conditions.

The following paragraphs contain the NRC's evaluation of the changes to the Code editions and addenda (including new Code provisions) and Code Cases N-722-1 and N-770-1,

where the NRC added new, revised existing, or removed conditions in 10 CFR 50.55a.

Quality Standards, ASME Codes and Institute of Electrical and Electronics Engineers (IEEE) Standards, and Alternatives

10 CFR 50.55a(a)

The NRC is amending § 50.55a(a) to add a new paragraph heading entitled "Quality standards, ASME Codes and IEEE standards, and alternatives." This will be consistent with paragraph headings throughout 10 CFR 50.55a.

Applicant / Licensee-Proposed Alternatives to the Requirements of 10 CFR 50.55a

10 CFR 50.55a(a)(3)

The NRC is amending § 50.55a(a)(3) to clarify that an alternative must be submitted to, and authorized by, the NRC prior to implementing the alternative. Licensees have misinterpreted § 50.55a(a)(3) and erroneously concluded that it is permissible to obtain NRC authorization of an alternative after its implementation. The final rule requires that alternatives to the requirements of §§ 50.55a(c), (d), (e), (f), (g), and (h) must be submitted to, and authorized by, the NRC prior to implementing the alternatives.

Standards Approved for Incorporation by Reference

10 CFR 50.55a(b)

The NRC is amending § 50.55a(b) to add a new paragraph heading entitled "Standards approved for incorporation by reference." This will be consistent with paragraph headings throughout 10 CFR 50.55a.

The question has arisen many times in the past of whether Subsection NE, "Class MC Components;" Subsection NF, "Supports;" Subsection NG, "Core Support Structures;" and Appendices of the ASME B&PV Code, Section III, are NRC requirements. The NRC is clarifying in this section how the regulations in 10 CFR 50.55a apply to these Section III subsections and

appendices. This discussion sets forth the NRC's views regarding the applicable NRC requirements, clarifies which portions of Section III are approved for use by applicants and licensees, identifies which portions of Section III are NRC requirements, and identifies which portions of Section III are not covered by the regulations in 10 CFR 50.55a. The requirements of Subsection NH, "Class 1 Components in Elevated Temperature Service," of Section III are already addressed in § 50.55a(b)(1)(vi), and the bases for these requirements have been discussed in the final rule (69 FR 58804) issued on October 1, 2004, that amended 10 CFR 50.55a to incorporate by reference the 2001 Edition up to and including the 2003 Addenda of the ASME Code, Section III.

First, it should be noted that in 10 CFR 50.55a, the NRC mandates the use of Section III, Division 1, rules for ASME Code Class 1, 2, and 3 components in 10 CFR 50.55a(c), (d) and (e), respectively. Specifically, 10 CFR 50.55a(c), (d) and (e) state that for applicants constructing a nuclear power plant, those components which are part of the reactor coolant pressure boundary must meet the requirements for Class 1 components in Section III (e.g., Subsection NB, "Class 1 Components"); components classified as Quality Group B must meet the requirements for Class 2 components (e.g., Subsection NC, "Class 2 Components"); and components classified as Quality Group C must meet the requirements for Class 3 components (e.g., Subsection ND, "Class 3 Components"). The NRC considers the rules of Subsection NCA and Section III mandatory appendices to be mandated as well, but only as they apply to Class 1, 2, and 3 components because the language in 10 CFR 50.55a(c), (d) and (e) also covers general requirements in Subsection NCA and mandatory appendices in Section III that are applicable to Class 1, 2, and 3 components.

In addition, the introductory text of 10 CFR 50.55a(b) states, in part, that the ASME Code, Section III, is 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. However, the regulatory language does not identify specific subsections in Section III that are incorporated by reference, and one can only assume that all of Section III (including all subsections, appendices and Division 2 and 3 rules) are incorporated by reference. Although it is clear that Subsections NB, NC and ND are regulatory requirements because they are mandated by 10 CFR 50.55a(c), (d) and (e) as discussed in this document, the lack of specific rule language in 10 CFR 50.55a mandating the use of Subsections NE, NF, NG, and the Section III mandatory (roman numeral) appendices has created confusion about the regulatory requirements applicable to Subsections NE, NF, and NG, and the Section III mandatory appendices. Subsection NE provides rules for constructing metal containment components (Class MC). Subsection NF provides rules for constructing supports for Class 1, 2, 3, and MC components. Subsection NG provides rules for constructing reactor core support structures. The Section III mandatory appendices are used in conjunction with the aforementioned subsections. In this sense, "constructing" is an all-inclusive term that comprises the design, fabrication, installation, examination, testing, inspection and selection of materials for nuclear power plant components.

The NRC is, therefore, clarifying that when Subsections NE, NF, NG, and the Section III mandatory appendices are incorporated by reference, but not mandated, these subsections are not NRC requirements. Rather, the NRC considers Subsections NE, NF, NG and the Section III mandatory appendices to be approved by the NRC for use by applicants and licensees of nuclear power plants by virtue of the NRC's overall approval of Section III, Division 1 rules without condition. In this manner, approval of the rules in Subsections NE, NF, NG, and the Section III mandatory appendices is similar to regulatory guidance provided in NRC RGs in that it provides an acceptable method for meeting NRC requirements and, in this particular case, in 10 CFR Part 50, Appendix A, General Design Criterion (GDC) 1, "Quality standards and

records." Applicants and licensees may propose means other than those specified by the provisions in Subsections NE, NF, NG, and the Section III mandatory appendices for meeting the applicable regulation. It should be noted that the NRC reviews an applicant's proposed means of meeting the requirements of GDC 1 as part of its review of an application for each manufacturing license, standard design approval, standard design certification and combined license under 10 CFR Part 52 and for each construction permit and operating license under 10 CFR Part 50 using the guidelines of NRC NUREG-0800, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants – LWR Edition," and applicable regulatory guides. During its review of new reactor designs under 10 CFR Part 52, the NRC is reviewing the criteria and extent of compliance of standard plant designs and combined licenses with the rules of the specific edition and addenda to Subsections NE, NF, NG, and the associated Section III mandatory appendices for applicability to these new reactor designs. The process being used by the NRC in the review of Subsections NE, NF, NG, and the Section III mandatory appendices for new reactors as described in this document is essentially the same process used by the NRC for the licensing of all nuclear power plants since the SRP was first issued in 1975. Therefore, this clarification does not establish new positions or requirements in the regulatory application of Subsections NE, NF, NG, and the Section III mandatory appendices to the construction of nuclear power plants.

Because the NRC staff participates on the ASME Code committees in the development of any revisions to Subsections NE, NF, NG, and the Section III mandatory appendices, the NRC is cognizant of the acceptability of the Code rules applicable to Subsections NE, NF, NG and the Section III mandatory appendices. NRC's use of consensus technical standards meets the requirements of Public Law 104-113, National Technology Transfer and Advancement Act of 1995. Additional discussion on NRC's compliance with the NTTAA is set forth in Section VII,

"Voluntary Consensus Standards," of this document.

Consistent with this discussion, the NRC did not substantially change the language in the introductory text to 10 CFR 50.55a(b). The NRC is modifying the regulatory language in the introductory text of 10 CFR 50.55a(b) to clarify that non-mandatory appendices are excluded from Section III rules that are incorporated by reference because the NRC does not review the acceptability of non-mandatory Section III appendices. Similarly, the NRC is clarifying in the introductory text of 10 CFR 50.55a(b) that only Division 1 rules of Section III and Section XI are incorporated by reference (i.e., Divisions 2 and 3 rules are not incorporated by reference). The NRC also is incorporating by reference ASME 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," and 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 W86182 Weld Filler Material with or without Application of Listed Mitigation Activities."

ASME B&PV Code, Section III

Introductory Text to 10 CFR 50.55a(b)(1)

The NRC is amending the introductory text of § 50.55a(b)(1) to clarify that references to Section III refer to Section III of the ASME Boiler and Pressure Vessel Code.

10 CFR 50.55a(b)(1)(ii) Weld-Leg Dimensions

The NRC is amending § 50.55a(b)(1)(ii) in order to apply the conditions currently in § 50.55a(b)(1)(ii) to the latest Edition and Addenda incorporated by reference in this rulemaking. The current regulations in § 50.55a(b)(1)(ii) outline the conditions on the use of stress indices used for welds in piping design under Subarticles NB-3600, NC-3600, and ND-3600 of the ASME B&PV Code. The current regulations are based on the NRC's concern

about the undersized weld-leg dimension of less than $1.09t_n$, which results in a weld which is weaker than the pipe to which it is adjoined. The reasons for the current condition in 10 CFR 50.55a(b)(1)(ii) are articulated in a previous NRC rulemaking (64 FR 51370; September 22, 1999).

In the proposed rule, the NRC proposed a revision to the condition identified in § 50.55a(b)(1)(ii) to address the NRC concerns with the undersized welds (C_x=0.75 t_n), which are not acceptable because the current ASME Code design rules would result in a circumferential, fillet-welded or socket-welded joint where the weld size is smaller than the adjoining pipe wall thickness, which makes the weld weaker than the pipe. The proposed rule also included an editorial addition of a condition on the use of paragraph NB-3683.4(c)(2). The proposed rule indicated that the use of paragraph NB-3683.4(c)(1) is currently not allowed and would continue to be prohibited in the proposed rulemaking. The addition of the condition on the use of paragraph NB-3683.4(c)(2) is purely editorial in nature since, by imposing a condition on the use of NB-3683.4(c)(1), the regulations would inherently impose a condition on the use of NB-3683.4(c)(2) given their use within Section III of the ASME B&PV Code. Therefore, this condition in the proposed rule was not new from a technical standpoint. Also, an editorial correction was proposed regarding Footnote 11, which should be Footnote 13 for the 2004 Edition through the 2008 Addenda in Figure NC-3673.2(b)-1 and Figure ND-3673.2(b)-1.

For licensees and applicants using the 1989 Addenda through the latest edition and addenda of Section III of the ASME B&PV Code incorporated by reference in § 50.55a(b)(1), the final rule prohibits applicants and licensees from applying the following ASME Code provisions: subparagraphs NB-3683.4(c)(1) and NB-3683.4(c)(2) and Footnote 11 from the 1989 Addenda through the 2003 Addenda, or Footnote 13 from the 2004 Edition through the 2008 Addenda, to Figures NC-3673.2(b)-1 and ND-3673.2(b)-1. The final rule requires applicants and licensees to

adhere to these prohibitions when considering welds with leg size less than $1.09t_n$.

The NRC received a number of public comments regarding the proposed modification to § 50.55a(b)(1)(ii), all of which disagreed with the proposed rule language. The disagreements were based on the assertion that the proposed rule language was not referencing the correct ASME B&PV Code provisions on weld sizes. However, the NRC disagreed with these public comments due to the fact that the language in the proposed rule was merely a modification to a current condition in the existing regulations and none of the public comments received on the proposed modification to § 50.55a(b)(1)(ii) present any new arguments or information that would cause the NRC to revisit its determination described in the previous rulemaking. As previously stated, the reasons for the current condition in 10 CFR 50.55a(b)(1)(ii) are articulated in a previous NRC rulemaking (64 FR 51370; September 22, 1999). Therefore, no change was made to paragraph § 50.55a(b)(1)(ii) of the final rule as a result of these comments. The complete bases for making no modifications to the proposed rule are found in the public comment response document.

10 CFR 50.55a(b)(1)(iii) Seismic Design of Piping

The NRC is amending § 50.55a(b)(1)(iii) to explicitly prohibit the use of Subarticles NB-3200, NB–3600, NC–3600 and ND–3600 from the 1994 Addenda through the 2005 Addenda of Section III of the ASME B&PV Code for the seismic design of piping. However, the amendment to § 50.55a(b)(1)(iii) does permit the use of Subarticle NB-3200 from the 2004 Edition through the 2008 Addenda of the ASME Code for the seismic design of piping, subject to the new condition identified as § 50.55a(b)(1)(iii)(A). The amendment to § 50.55a(b)(1)(iii) also permits the use of Subarticles NB–3600, NC–3600 and ND–3600 from the 2006 Addenda through the 2008 Addenda of Section III of the ASME B&PV Code for the seismic design of piping, subject to a new condition identified as § 50.55a(b)(1)(iii)(B).

The current requirements regarding piping seismic rules in Section III of the ASME B&PV Code were first introduced in the 1994 Addenda to the ASME B&PV Code. These rules were subsequently modified in the 2001 Edition and 2002 Addenda to the ASME B&PV Code. The current regulations in § 50.55a(b)(1)(iii) only allow the use of Subarticles NB-3200, NB-3600, NC-3600, and ND-3600 from the 1993 Addenda and earlier editions and addenda of the ASME B&PV Code, Section III for the seismic design of piping.

As noted, the amendment to § 50.55a(b)(1)(iii) includes the addition of a new condition identified as § 50.55a(b)(1)(iii)(A). The condition in § 50.55a(b)(1)(iii)(A) resolves an issue identified by the NRC regarding the inclusion of reversing dynamic loads when calculating the primary bending stresses for Level B service limits. Also, the amendment to § 50.55a(b)(1)(iii) includes the addition of a new condition identified as § 50.55a(b)(1)(iii)(B). The condition in § 50.55a(b)(1)(iii)(B) relates to the use of the D_o/t ratio and material requirements of NB-3656(b) when applying the 2006 Addenda through the 2008 Addenda of Section III of the ASME B&PV Code to the seismic design of piping.

In the proposed rule, the NRC proposed an amendment to § 50.55a(b)(1)(iii) which would have allowed the use of the latest edition and addenda of Section III of the ASME B&PV Code, incorporated by reference in this rulemaking, subject to three new conditions identified as § 50.55a(b)(1)(iii)(A), (b)(1)(iii)(B), and (b)(1)(iii)(C). These additional requirements would have provided three conditions on the use the latest edition and addenda of Section III of the ASME B&PV Code incorporated by reference in the current rulemaking, as they apply to the seismic design of piping. As a result of public comments received, the final rule retains only two of the original three conditions with respect to the use of the editions and addenda of Section III of the ASME B&PV Code incorporated by reference in § 50.55a(b)(1) for the seismic design of piping.

In the proposed rule, the NRC proposed an additional paragraph identified as

§ 50.55a(b)(1)(iii)(A) which addressed the NRC's position regarding the B_2' indices in paragraph NB-3656 of Section III of the ASME B&PV Code. This condition would have stipulated that the value of B_2' should be no less than $0.75B_2$ (from Table NB-3681(A)-1) when applying the 2006 Addenda through the 2008 Addenda of Section III of the ASME B&PV Code for the seismic design of piping. The NRC proposed this condition to address the possibility that ferritic steels may exhibit lower margins and a decrease in toughness at higher temperatures due to dynamic strain aging.

A number of public comments were received regarding the proposed condition on the B_2' indices, all of which cited ASME Position Paper STP-NU-008, issued on November 6, 2009, as the bases for eliminating the proposed condition. This position paper presents information demonstrating that dynamic strain aging at typical seismic strain rates is insignificant and that adequate margin exists between the ASME Section III code criteria and the ultimate moment under dynamic cyclic loading ("adequate margin" refers to the margin recommended in Appendix III of NUREG/CR-5361). The NRC agreed with the comments, and considers the previous concerns regarding the possible reduction in margin due to dynamic strain aging effectively resolved based on the information found in the aforementioned ASME position paper. Therefore, as a result of public comments received, the final rule does not include this condition. Additionally, as a result of the deletion of this condition from the final rule, the paragraphs which were identified as § 50.55a(b)(1)(iii)(B) and § 50.55a(b)(1)(iii)(C) in the proposed rule are identified as § 50.55a(b)(1)(iii)(A) and § 50.55a(b)(1)(iii)(B) in the final rule. A more comprehensive discussion regarding the bases for this change can be found in the public comment response document.

In the proposed rule, the NRC proposed an additional paragraph identified as § 50.55a(b)(1)(iii)(B) which addressed the NRC's position regarding Note (1) of Figure

NB-3222-1 of Section III of the ASME B&PV Code. The NRC proposed this condition based on the premise that while the inclusion of reversing dynamic loads in the calculation of primary bending stresses for Level B service limits may not be warranted when the Operating Basis Earthquake is not included in the design basis for the facility, at other times these loads must be considered. Such is the case when a licensee's Operating Basis Earthquake level is more than one-third the value of the Safe Shutdown Earthquake. However, the current wording of Note (1) in Figure NB-3222-1 of Section III of the ASME B&PV Code does not account for this situation.

Multiple public comments were received regarding this proposed condition and most generally concurred with the proposed language. However, all of the public comments received indicated that additional specificity should be provided in the condition by adding the words, "by NB-3223(b)" immediately after the word, "required" in the proposed wording for § 50.55a(b)(1)(iii)(B). The NRC agreed with the public commenters based on the fact that the suggestion within the comment results in a more direct application of the proposed condition in that there is no ambiguity as to how the condition applies with respect to the seismic design of piping. The final rule includes additional information regarding the applicability of this condition by noting the specific subparagraph (NB-3223(b)) for which this condition applies when the 2006 Addenda through the 2008 Addenda of Section III of the ASME B&PV Code are used for the seismic design of piping as a result of public comments received regarding this condition. Additionally, as a result of public comments, the final rule regarding this condition is identified as § 50.55a(b)(1)(iii)(A). The complete bases for this change can be found in the public comment response document.

In the proposed rule, the NRC proposed an additional paragraph identified as § 50.55a(b)(1)(iii)(C) which addressed the NRC's position regarding the limitation on the D_o/t ratio of ASME Class 1, 2 and 3 piping when applying Subarticles NB-3600, NC-3600 and

ND-3600 in the 2006 Addenda through the 2008 Addenda of Section III of the ASME B&PV Code. This proposed addition would have placed a condition on the D_o/t ratio by requiring this value to be no greater than 40 when applying Subarticles NB-3600, NC-3600, or ND-3600 in the 2006 Addenda through the 2008 Addenda of Section III of the ASME B&PV Code for the seismic design of piping.

The public comment responses received regarding this proposed condition all indicated that the condition which the NRC was proposing already existed within the code, except for one anomaly. Specifically, the comments noted that the limitation on the D_o/t ratio is already contained in NB-3656(b), NC/ND-3653.1(b), NC/ND-3655(b), and, by reference to the Level D requirements, NB-3655.2(b) and NC/ND-3654.2(b). However, the comments also noted that the D_o/t ratio limitation is not inherent or explicit for Level B service limits in Class 1 piping. As such, all of the comments suggested that the focus of the proposed condition be narrowed to capture the condition where it is not already included within the ASME Code provisions. The NRC agreed with these comments.

The final rule includes a provision for the seismic design of Class 1 piping which requires the material and D_o/t requirements of NB-3656(b) to be met for all Service Limits when the Service Limits include reversing dynamic loads, and the alternative rules for reversing dynamic loads are used as a result of the public comments received on this condition. Additionally, as a result of public comments, the final rule regarding the condition on the D_o/t requirements is identified as § 50.55a(b)(1)(iii)(B). The complete bases for this change can be found in the public comment response document.

10 CFR 50.55a(b)(1)(iv) Quality Assurance

The NRC is amending § 50.55a(b)(1)(iv) to be consistent with a revised quality assurance provision in the 2006 Addenda of the ASME B&PV Code, Section III, Subsection

NCA. The final rule allows the use of 1994 Edition of NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications," when using the 2006 Addenda of Section III of the ASME B&PV Code and later editions and addenda. The reference to ASME NQA-1 in Article 4000 of the ASME B&PV Code, Section III was updated to a later edition of NQA-1 in the 2006 Addenda. NCA-4110(b) was revised to require that the N-Type Certificate Holders comply with the Basic Requirements and Supplements of the ASME NQA-1-1994 Edition. Previous editions/addenda of the ASME B&PV Code, Section III referenced earlier editions and addenda of ASME NQA-1. There are no significant differences between of NQA-1-1994 Edition and the editions and addenda of NQA-1 currently referenced in the regulation. The NRC has reviewed and found the changes to Subsection NCA that reference the 1994 Edition of NQA-1 to be acceptable.

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

The NRC is amending § 50.55a(b)(1) to add a new paragraph (b)(1)(vii) to modify the requirements in Subsection NB of the ASME B&PV Code, Section III, for certifying the capacity of incompressible-fluid, pressure-relief valves when the testing facility has less than the full range of pressure capability necessary for achieving valve set-pressure conditions during the testing. The NRC has identified no issues with performing tests at less than the highest value of the set-pressure range for incompressible-fluid, pressure-relief valves and finds these new requirements for Class 2 and 3 components acceptable as described in paragraphs NC-7742 and ND-7742. However, the NRC has identified words that were inadvertently left out of the Code during the final printing of paragraph NB-7742 for Class 1 components. The parallel structure of the counterpart paragraphs (NC-7742 and ND-7742) reveal that the words "for the design and the maximum set pressure" are missing from paragraph NB-7742(a)(2). Without

these words, paragraph NB-7742(a)(2) is confusing, illogical, and could lead to a non-conservative interpretation of the required test pressure for the new Class 1 incompressible-fluid, pressure-relief valve designs. For these reasons, the final rule includes a condition in paragraph (b)(1)(vii) allowing use of paragraph NB-7742 when the corrected language intended by the Code is used.

ASME B&PV Code, Section XI

The regulations in § 50.55a(b)(2) incorporate by reference ASME B&PV Code, Section XI, 1970 Edition through the 1976 Winter Addenda; and the 1977 Edition (Division 1) through the 2004 Addenda (Division 1), subject to the conditions identified in § 50.55a(b)(2)(i) through (b)(2)(xxvii). The NRC is amending the introductory text to § 50.55a(b)(2) to incorporate by reference the 2005 Addenda (Division 1) through the 2008 Addenda (Division 1) of the ASME B&PV Code, Section XI, clarify the wording, and remove or revise some of the conditions as explained in this document.

The question has arisen in the past of whether Appendices of the ASME B&PV Code, Section XI, are NRC requirements. The NRC is clarifying in this section how the regulations in 10 CFR 50.55a apply to the Section XI subsections and appendices. This discussion sets forth the NRC's views regarding the applicable NRC requirements, clarifies which portions of Section XI are approved for use by applicants and licensees, identifies which portions of Section XI are NRC requirements, and identifies which portions of Section XI are not covered by the regulations in 10 CFR 50.55a.

First, it should be noted that in 10 CFR 50.55a, the NRC mandates in 10 CFR 50.55a(g)(4) that throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) which are classified Class 1, 2, 3, MC and CC meet the requirements of Section XI (with some exceptions). Specifically, within Section XI,

Subsection IWB provides the requirements for Class 1 components, Subsection IWC provides the requirements for Class 2 components, Subsection IWD provides the requirements for Class 3 components, Subsection IWE provides the requirements for Class MC components, and Subsection IWL provides the requirements for Class CC components. The NRC considers the rules of Subsection IWA and Section XI Mandatory Appendices to be mandated as well, because the language in IWA and the Mandatory Appendices covers general requirements that could apply to the inservice inspection of Class 1, 2, 3, MC and CC components.

The NRC is clarifying that the Section XI non-mandatory appendices which are incorporated by reference into 10 CFR 50.55a are approved for use, but are not mandated. The non-mandatory appendices may be used by applicants and licensees of nuclear power plants (subject to the conditions in 10 CFR 50.55a(b)(2)).

Introductory Text of 10 CFR 50.55a(b)(2)

The NRC is amending the introductory text of § 50.55a(b)(2) to clarify that references to Section XI refer to Section XI of the ASME Boiler and Pressure Vessel Code.

10 CFR 50.55a(b)(2)(i) Limitations on Specific Editions and Addenda

The NRC is amending § 50.55a(b)(2) to remove § 50.55a(b)(2)(i) from the regulations and is designating that paragraph as “Reserved.” This paragraph specified which addenda may be used when applying the 1974 and 1977 Editions of Section XI of the ASME B&PV Code. Section 50.55a(g)(4)(ii) requires that licensees’ successive 120-month inspection intervals comply with the requirements of the latest edition and addenda of the code incorporated by reference in § 50.55a(b)(2). Subsequently, licensees are no longer using these older editions (1974 and 1977 Editions) and addenda of the ASME B&PV Code, and therefore the NRC removed this paragraph.

10 CFR 50.55a(b)(2)(iii) Steam Generator Tubing

The NRC is amending § 50.55a(b)(2) to remove § 50.55a(b)(2)(iii) from the regulations and is designating that paragraph as “Reserved.” The current regulations in § 50.55a(b)(2)(iii) state that if the technical specifications of a nuclear power plant include surveillance requirements for steam generators different than those in Section XI, Article IWB-2000, the ISI program of steam generator tubing is governed by the requirements in the technical specifications. The 1989 Edition through the 2008 Addenda of Section XI IWB-2413, ”Inspection Program for Steam Generator Tubing,” state that “the examinations shall be governed by the plant Technical Specification.” Because the condition in § 50.55a(b)(2)(iii) is redundant to the 1989 Edition through the 2008 Addenda of Section XI, the NRC is removing this condition.

10 CFR 50.55a(b)(2)(iv) Pressure-Retaining Welds in ASME Code Class 2 Piping

The NRC is amending § 50.55a(b)(2) to remove § 50.55a(b)(2)(iv) from the regulations and is designating that paragraph as “Reserved.” This paragraph states how to select appropriate Code Class 2 pipe welds in residual heat removal systems, emergency core cooling systems, and containment heat removal systems when applying editions and addenda up to the 1983 Edition through the Summer 1983 Addenda of Section XI of the ASME B&PV Code. Section 50.55a(g)(4)(ii) requires that licensee’s successive 120-month inspection intervals comply with the requirements of the latest edition and addenda of the code incorporated by reference in § 50.55a(b)(2). Subsequently, licensees are no longer using these older editions and addenda of the code (editions and addenda up to the 1983 Edition through the Summer 1983 Addenda of Section XI) and, therefore, the NRC is removing § 50.55a(b)(2)(iv).

10 CFR 50.55a(b)(2)(v) Evaluation Procedure and Acceptance Criteria for Austenitic Piping

The NRC is amending § 50.55a(b)(2) to remove § 50.55a(b)(2)(v) from the regulations and is designating that paragraph as “Reserved.” This paragraph deals with evaluation

procedures and acceptance criteria for austenitic piping when applying the Winter 1983 Addenda and the Winter 1984 Addenda of Section XI. Section 50.55a(g)(4)(ii) requires that licensees' successive 120-month inspection intervals comply with the requirements of the latest edition and addenda of the code incorporated by reference in § 50.55a(b)(2). Subsequently, licensees are no longer using these older editions and addenda of the code (editions and addenda up to the 1983 Edition through the Summer 1983 Addenda of Section XI), and therefore, the NRC is removing § 50.55a(b)(2)(v).

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

The NRC is amending § 50.55a(b)(2)(vi) to stipulate the editions and addenda of Subsection IWE and Subsection IWL of Section XI of the ASME B&PV Code which are approved for use when licensees are implementing the initial 120-month inspection interval for containment inservice inspection requirements found in Section XI of the Code. The final rule also requires that the use of these applicable editions and addenda is subject to the conditions found in § 50.55a(b)(2)(viii) and (b)(2)(ix) for Subsection IWL and Subsection IWE, respectively. Additionally, the NRC is amending § 50.55a(b)(2)(vi) to change the words "modified and supplemented" to "conditioned" for clarification.

10 CFR 50.55a(b)(2)(viii) Examination of Concrete Containments

This paragraph stipulates the conditions that apply to the inservice examination of concrete containments using Subsection IWL of various editions and addenda of the ASME B&PV Code, Section XI, incorporated by reference in § 50.55a(b)(2). The regulations, in part, require that licensees applying Subsection IWL, 2001 Edition through the 2004 Edition shall apply the conditions in § 50.55a(b)(2)(viii)(E) through (b)(2)(viii)(G). The NRC is amending § 50.55a(b)(2)(viii) to remove the conditions in § 50.55a(b)(2)(viii)(F) and (b)(2)(viii)(G) in the

final rule when applying Subsection IWL of the 2007 Edition with 2008 Addenda of the ASME B&PV Code, Section XI because the intent of these conditions has been incorporated into the 2007 Edition with the 2008 Addenda of the ASME B&PV Code, as explained in this document. Accordingly, the final rule requires that licensees applying Subsection IWL, 2007 Edition with the 2008 Addenda shall apply only the condition in § 50.55a(b)(2)(viii)(E). Further, in the final rule, the conditions in § 50.55a(b)(2)(viii)(E) through (b)(2)(viii)(G) remain applicable to licensees applying Subsection IWL, 2004 Edition through the 2006 Addenda.

The condition in § 50.55a(b)(2)(viii)(F) relates to qualification of personnel that examine containment concrete surfaces and tendon hardware, wires, or strands. This condition states that personnel that examine containment concrete surfaces and tendon hardware, wires, or strands must meet the qualification provisions in IWA-2300, and that the "owner-defined" personnel qualification provisions in IWL-2310(d) are not approved for use. IWA-2300 stipulates qualification provisions for personnel performing nondestructive examination, including VT-1, VT-2, and VT-3 visual examinations. Paragraph IWA-2312(c) requires training, qualification, and certification of visual examination personnel to comply with the requirements of Appendix VI of the Code, which makes reference to ANSI/ASNT CP-189, and allows for limited certification (for personnel who are restricted to performing examinations of limited or specific scope, i.e., limited operations or limited techniques) per IWA-2350.

In Subsection IWL of the 2007 Edition, the ASME revised paragraph IWL-2100 to state, in part, that except as noted in IWL-2320, the requirements of IWA-2300 do not apply. Also, the 2007 Edition deleted subparagraphs IWL-2310(d) and IWL-2310(e), which allowed certain requirements (i.e., requirements for personnel qualification and requirements for visual examination of concrete and tendon anchorage hardware, wires, or strands) to be owner-defined. Further, the 2007 Edition with 2008 Addenda added a new paragraph IWL-2320

"Personnel Qualifications" and re-designated the former IWL-2320 "Responsible Engineer" as IWL-2330 "Responsible Engineer."

The new paragraph IWL-2320 stipulates specific plant experience, training, written and practical examination and frequency of administration to demonstrate training proficiency, and vision test requirements for qualification of personnel approved by the Responsible Engineer for performing general or detailed visual examinations of structural concrete, reinforcing steel and post-tensioning system components (i.e., wires, strands, anchorage hardware, corrosion protection medium and free water) of Class CC containments. The provision requires documentation of qualification requirements in the Employer's written practice. The Responsible Engineer is responsible for approval, instruction and training of personnel performing general and detailed visual examinations. The new provision also provided the requisite detailed requirements for the instruction material to be used to qualify personnel performing IWL inspections. Specifically, the addition included requirements for preservice and inservice inspections for concrete (references American Concrete Institute 201.1R), reinforcing steel, and post-tensioning items such as wires, strands, anchorage hardware, corrosion protection medium, and free water. Thus, the qualification requirements adequately include the areas and extent of required plant experience, instructional topics for class room training in IWL requirements and plant-specific IWL visual examination procedures, and require the vision test requirements of IWA-2321. The new paragraph IWL-2320, "Personnel Qualifications," details specific guidance for personnel qualification for containment concrete and reinforcing steel and post-tensioning system visual inspections that provide an acceptable level of quality and safety similar to the requirements in IWA-2300 and therefore, addressed the intent of the conditions in § 50.55a(b)(2)(viii)(F) of the current regulations. Therefore, the condition in § 50.55a(b)(2)(viii)(F) is not required to be applied for licensees using Subsection IWL, 2007

Edition with the 2008 Addenda. It is noted that the NRC's acceptance of the new code provision IWL-2320, "Personnel Qualifications," is based on paragraph IWL-2320 of the 2007 Edition as supplemented by the addition by errata in the 2008 addenda.

The condition in § 50.55a(b)(2)(viii)(G) of the final rule requires that corrosion protection material be restored following concrete containment post-tensioning system repair and replacement activities in accordance with the quality assurance program requirements specified in IWA-1400." In the 2007 Edition of Subsection IWL, the following revisions were made related to corrosion protection medium for post-tensioning systems:

1. The revised paragraph IWL-4110 added footnote 1 which states that the corrosion protection medium is exempt from the requirements of IWL-4000. However, the corrosion protection medium must be restored in accordance with IWL-2526 following concrete containment post-tensioning system repair/replacement activities.
2. The revised Line Item L2.40 "Corrosion Protection Medium" of Table IWL-2500-1 added reference to paragraph IWL-2526 in the columns for Test or Examination Requirement, Test or Examination Method, and Extent of Examination.
3. In the revised paragraph IWL-2526, subparagraph (b) requires that following the completion of tests and examinations required by Examination Category L-B, Items L2.10, L.2.20, and L2.30, the corrosion protection medium must be replaced to ensure sufficient coverage of anchorage hardware, wires, and strands. The total amount replaced in each tendon sheath must be recorded and differences between amount removed and amount replaced must be documented.
4. In the revised paragraph IWL-2526, subparagraph (d) requires that the Responsible Engineer specify the method for corrosion protection medium.

With the understanding that the Responsible Engineer (who per IWL-2320 is a

Registered Professional Engineer) will ensure that the corrosion protection medium is restored in accordance with the applicable Quality Assurance Program, the revised paragraphs IWL-4110(b)(3) [with footnote 1] and IWL-2526, and revised line item L2.40 in Table IWL-2500-1 of Subsection IWL, 2007 Edition through the 2008 Addenda adequately incorporated the intent of the condition in § 50.55a(b)(2)(viii)(G) of the current regulations and is acceptable to the NRC. Therefore, the condition in § 50.55a(b)(2)(viii)(G) is not required to be applied for licensees using Subsection IWL, 2007 Edition through the 2008 Addenda.

10 CFR 50.55a(b)(2)(ix) Examination of Metal Containments and the Liners of Concrete Containments

This paragraph stipulates the conditions that apply to the inservice examination of metal containments and liners of concrete containments using Subsection IWE of various editions and addenda of the ASME B&PV Code, Section XI, incorporated by reference in § 50.55a(b)(2). As a result of public comments, the NRC is amending § 50.55a(b)(2)(ix)(A) to divide the existing condition in § 50.55a(b)(2)(ix)(A) into paragraphs (b)(2)(ix)(A)(*1*) and (b)(2)(ix)(A)(*2*). The NRC is removing the conditions in § 50.55a(b)(2)(ix)(A)(*1*), (b)(2)(ix)(F), (b)(2)(ix)(G), (b)(2)(ix)(H) and (b)(2)(ix)(I) when applying the 2004 Edition with 2006 Addenda through the 2007 Edition with 2008 Addenda of the ASME Code, Section XI because these conditions have now been incorporated into the Code. The NRC is also removing the condition in § 50.55a(b)(2)(ix)(I) when applying the 2004 Edition, up to and including, the 2005 Addenda. Furthermore, the NRC is also amending § 50.55a(b)(2)(ix) to add a new condition as § 50.55a(b)(2)(ix)(J) on the use of Article IWE-5000 of Subsection IWE when applying the 2007 Edition, up to and including the 2008 Addenda of the ASME Code, Section XI. These changes are further explained in this document.

The current regulations, in part, require that licensees applying Subsection IWE, 1998

Edition through the 2004 Edition apply the conditions in § 50.55a(b)(2)(ix)(A), (b)(2)(ix)(B), and (b)(2)(ix)(F) through (b)(2)(ix)(I). In the final rule, the conditions in § 50.55a(b)(2)(ix)(F) through (b)(2)(ix)(I) remain applicable to licensees applying Subsection IWL, 1998 Edition through the 2001 Edition with the 2003 Addenda. As a minor correction to the current regulations, the final rule requires that licensees applying Subsection IWE of the 2004 Edition through the 2005 Addenda of the ASME B&PV Code, satisfy the requirements of § 50.55a(b)(2)(ix)(A), (b)(2)(ix)(B), and (b)(2)(ix)(F) through (b)(2)(ix)(H). This correction is being made since paragraph IWE-3511.3 of the 2004 Edition of the ASME B&PV Code incorporated the condition in § 50.55a(b)(2)(ix)(I), which requires that the ultrasonic examination acceptance standard specified in IWE-3511.3 for Class MC pressure-retaining components must also be applied to metallic liners of Class CC pressure-retaining components. Further, the final rule requires that licensees applying Subsection IWE, 2004 Edition with the 2006 Addenda through the latest edition and addenda incorporated by reference in § 50.55a(b)(2) satisfy the requirements of § 50.55a(b)(2)(ix)(A) and (b)(2)(ix)(B). This is because the intent of the conditions in § 50.55a(b)(2)(ix)(F) through (b)(2)(ix)(H) were incorporated into Subsection IWE, 2004 Edition with the 2006 addenda, and the condition § 50.55a(b)(2)(ix)(I) was incorporated into Subsection IWE, 2004 Edition, as explained in this document.

The condition in § 50.55a(b)(2)(ix)(F) of the final rule requires that VT-1 and VT-3 examinations be conducted in accordance with IWA-2200. Personnel conducting examinations in accordance with the VT-1 or VT-3 examination method must be qualified in accordance with IWA-2300, and the "owner-defined" personnel qualification provisions in IWE-2330(a) for personnel that conduct VT-1 and VT-3 examinations are not approved for use. This condition defines the code provision (IWA-2200) and personnel qualification (IWA-2300) requirements for personnel performing visual examinations by the VT-1 or VT-3 method, as specified in the

conditions in § 50.55a(b)(2)(ix)(G) and (b)(2)(ix)(H) of the rule. The condition does not allow use of the “owner-defined” personnel qualification provisions in IWA-2330(a) for personnel that conduct VT-1 and VT-3 examinations. The revised code provision in IWE-2330(a) of the 2006 Addenda requires that personnel performing VT-1 and VT-3 visual examinations shall meet the qualification requirements of IWA-2300. The revised code provision in IWL-2100 of the 2006 Addenda states that IWA-2000 applies with the exception that IWA-2210 and IWA-2300 do not apply to general visual examination only (except as required by 2330(b) for vision test requirements). Therefore, the code provisions in IWA-2200 and IWA-2300 will apply to VT-1 and VT-3 examinations. Thus, the revised code provisions in IWE-2330(a) and IWE-2100 of the 2006 through 2008 Addenda fully incorporates the condition in § 50.55a(b)(2)(ix)(F). Therefore, the condition in § 50.55a(b)(2)(ix)(F) is not required to be applied for licensees using Subsection IWE, 2004 Edition with the 2006 Addenda and the 2007 Edition through the 2008 Addenda.

The condition in § 50.55a(b)(2)(ix)(G) of the final rule requires that the VT-3 examination method be used to conduct the examinations in Items E1.12 and E1.20 of Table IWE 2500-1, and the VT-1 examination method be used to conduct the examination in Item E4.11 of Table IWE-2500-1. An examination of the pressure-retaining bolted connections in Item E1.11 of Table IWE-2500-1 using the VT-3 examination method must be conducted once each interval. The "owner-defined" visual examination provisions in IWE-2310(a) are not approved for use for VT-1 and VT-3 examinations. This condition, applicable in the current regulations to the 1998 Edition through the 2004 Edition, requires that the VT-3 and VT-1 examination methods be used in lieu of the “General Visual” and “Detailed Visual” methods, respectively, as specified in Table IWE-2500-1 for the Item Numbers listed in the condition, and that the owner-defined visual examination provisions in IWE-2310(a) cannot be used for VT-1 and VT-3 examinations. In the 2006 Addenda through the 2008 Addenda, Table IWE-2500-1 was revised to change the

examination method for Item Numbers E1.12 and E1.20 to the VT-3 method and for Item E4.11 to the VT-1 method. Also, a new Examination Category E-G was added for pressure-retaining bolting with Item No. E8.10 which requires 100 percent of each bolted connection to be examined, using the VT-1 method and the acceptance standard in the newly added paragraph IWE-3530, once during each Inspection Interval with the connection assembled and bolting in-place, provided the connection is not disassembled during the interval, or in the disassembled configuration if the connection is disassembled for any reason during the interval. This VT-1 examination, which is more stringent than the VT-3 method specified in the condition, is in addition to the general visual examination of 100 percent of the pressure-retaining bolted connections during each inspection period required to be performed under Item No. E1.11 of Table IWE-2500-1. Further, the revised IWE-2310 does not have any owner-defined provisions for performing visual examinations including VT-1 and VT-3 examinations. Thus, the provisions in the revised Table IWE-2500-1 and the revised paragraph IWE-2310 addressed the intent of the condition in § 50.55a(b)(2)(ix)(G). Therefore, the condition in § 50.55a(b)(2)(ix)(G) is not required to be applied for licensees using Subsection IWE, 2004 Edition with the 2006 Addenda and the 2007 Edition through the 2008 Addenda.

The condition in § 50.55a(b)(2)(ix)(H) of the final rule requires that containment bolted connections that are disassembled during the scheduled performance of the examinations in Item E1.11 of Table IWE-2500-1 be examined using the VT-3 examination method. Flaws or degradation identified during the performance of a VT-3 examination must be examined in accordance with the VT-1 examination method, and the criteria in the material specification or IWB 3517.1 must be used to evaluate containment bolting flaws or degradation. As an alternative to performing VT-3 examinations of containment bolted connections that are disassembled during the scheduled performance of Item E1.11, VT-3 examinations of

containment bolted connections may be conducted whenever containment bolted connections are disassembled for any reason. The condition in § 50.55a(b)(2)(ix)(H) is similar to the condition for bolted connections in § 50.55a(b)(2)(ix)(G), but applies only to the examination of pressure-retaining bolted connections that are disassembled. The condition requires flaws or degradation identified during the VT-3 examination to be examined using the VT-1 method. The NRC notes that the VT-1 (and not VT-3) examination method is the method specified in the new Item E8.10 for pressure-retaining bolted connections in the revised Table IWE-2500-1 in the 2006 Addenda through 2008 Addenda of the ASME B&PV Code. Further, the acceptance standard for the VT-1 examination of pressure-retaining bolting in the new paragraph IWE-3530 requires that the relevant conditions, as defined in IWA-9000, and listed in IWB-3517.1, shall be corrected or evaluated to meet the requirements of IWE-3122, prior to continued service. Therefore, the new provision for pressure-retaining bolting in Table IWE 2500-1, as discussed in this document, and the new acceptance standard specified in IWE-3530, as discussed in this document, fully addressed the intent of the condition in § 50.55a(b)(2)(ix)(H). Therefore, the condition in § 50.55a(b)(2)(ix)(H) is not required to be applied for licensees using Subsection IWE, 2004 Edition with the 2006 Addenda and the 2007 Edition through the 2008 Addenda.

The condition in § 50.55a(b)(2)(ix)(I) of the rule requires that the ultrasonic examination acceptance standard specified in IWE-3511.3 for Class MC pressure-retaining components also be applied to metallic liners of Class CC pressure-retaining components. This condition requires that the acceptance standard in IWE-3511.3 also apply to the metallic shell and penetration liners of Class CC pressure-retaining components in the re-designated paragraph IWE-3522, “Ultrasonic Examination,” in the 2004 Edition through the 2007 Edition and 2008 Addenda. Therefore, the condition in § 50.55a(b)(2)(ix)(I) is not required to be applied for licensees using Subsection IWE, 2004 Edition through the 2007 Edition and the 2008 Addenda.

The revised paragraph IWE-2310 (IWE-2313 to be specific) and new subparagraphs IWE-2420(c) and IWE-2500(d), in the 2006 Addenda through the 2008 Addenda, address the condition in § 50.55a(b)(2)(ix)(A) of the final rule with regard to requiring evaluation of acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence or result in degradation to such inaccessible areas. However, the information specified in the condition to be provided in the ISI Summary Report is not explicitly addressed in the ASME B&PV Code. Therefore, based on a public comment, for expediency to remove part of the condition for certain addenda, the NRC is dividing the existing condition in 50.55a(b)(2)(ix)(A) into paragraphs (b)(2)(ix)(A)(*1*) and (b)(2)(ix)(A)(*2*). The condition in § 50.55a(b)(2)(ix)(A)(*1*) of the final rule, addressing the requirement for evaluation of inaccessible areas, is not required to be applied for licensees using Subsection IWE, 2006 Addenda through the 2008 Addenda. However, the condition in § 50.55a(b)(2)(ix)(A)(*2*), addressing the information relative to evaluation of inaccessible areas to be provided in the ISI Summary Report, is required to be applied for licensees using the 2006 Addenda through the 2008 Addenda.

10 CFR 50.55a(b)(2)(ix)(J)

The NRC is amending § 50.55a(b)(2)(ix) to add a new § 50.55a(b)(2)(ix)(J) to place a condition on the use of Article IWE-5000, “System Pressure Tests,” of Subsection IWE when applying the 2007 Edition up to and including the 2008 Addenda of the ASME Code, Section XI, for Class MC pressure-retaining components. The revised Article IWE-5000 does not make a distinction between “major” and “minor” modification (or repair/replacement) with regard to the type of pneumatic leakage tests specified following repair/replacement activities. The NRC notes that IWL-5210 provides a reasonable quantitative definition of a repair/replacement activity, in terms of meeting the design basis Construction Code requirements prior to and

during the repair/replacement activity, that is considered major for Class CC containments and requiring a containment pressure test to be conducted at the design basis accident pressure (Pa) that would demonstrate structural integrity of the repaired containment. There is no such definition provided in IWE-5000 for Class MC containments. IWE-5000 (2007 Edition with 2008 Addenda) requires a pneumatic leakage test to be performed following welding or brazing associated with repair or replacement activities, prior to returning the component to service. It also allows the test boundary for the pneumatic leak test to be limited to the brazed joints and welds affected by the repair/replacement activity, which is acceptable from the point of ensuring leak-tightness of the locally repaired area. However, it allows a licensee the option of only performing a local bubble test even for a "major" containment modification or repair/replacement, which is not sufficient to provide a verification of global structural integrity. Following "major" containment repair/replacement activities, it makes the performance of the appropriate pneumatic leakage test (which is a Type A test) in accordance with 10 CFR Part 50, Appendix J, optional, which is inconsistent with the NRC position and the provisions in 10 CFR Part 50, Appendix J, paragraph IV.A, and hence the NRC is adding a new condition in this rule. It is, and has been, the NRC's position that a 10 CFR Part 50, Appendix J, Type A test must be performed following a "major" containment modification or repair/replacement, prior to returning the containment to operation. This is because a "major" containment modification such as the replacement of a large penetration or the creation of large construction opening(s) for replacement of equipment such as steam generators, reactor vessel head, pressurizers, etc., or other similar repair/replacement activity results in the breach of the containment pressure boundary that invalidates the periodic verification of structural and leak tight integrity provided by the previous Type A test as required by the Containment Leakage Rate Testing Program in 10 CFR Part 50, Appendix J. Further, the breach of pressure boundary of the magnitude

resulting from a “major” containment modification has a global effect on containment structural integrity and not a localized effect. Therefore, performing a Type A test prior to returning to operation, is necessary to provide a reasonable assurance and verification of both containment structural integrity and leakage integrity following restoration of a breach in the containment pressure boundary due to a “major” repair/replacement activity. Thus, the new condition in § 50.55a(b)(2)(ix)(J) of the final rule requires the performance of Type A test following a “major” containment modification of a Class MC containment structure.

The new condition provides a general, qualitative definition of what constitutes a “major” modification or repair/replacement activity for containments consistent with what the NRC has historically considered as major modifications. The new condition also requires that, when applying IWE-5000, if a Type A, B or C test is performed in accordance with 10 CFR Part 50, Appendix J, the test pressure and acceptance standard for the test shall also be in accordance with 10 CFR Part 50, Appendix J. This is because the test pressure range in IWE-5223.1 seems to apply even for Type B and Type C tests; and the acceptance standard for leakage in IWE-5223.5 is based only on Section V, Article 10, for any pneumatic leakage test performed when applying IWE-5000 of the 2007 Edition up to and including the 2008 Addenda of Section XI of the ASME Code. The requirement in the new condition for performing a Type A test prior to returning to operation following a major containment modification, is necessary to provide a reasonable assurance and verification of both containment structural and leakage integrity following restoration of a breach in the containment pressure boundary due to the “major” repair/replacement activity of a Class MC containment structure.

10 CFR 50.55a(b)(2)(xv) Appendix VIII Specimen Set and Qualification Requirements

The NRC is amending § 50.55a(b)(2)(xv) so the conditions in that paragraph would not apply to the 2007 Edition through the 2008 Addenda of Section XI of the ASME B&PV Code.

Section 50.55a(b)(2)(xv) has conditions that may be used to modify Appendix VIII of Section XI, 1995 Edition through the 2001 Edition. The ASME Boiler and Pressure Vessel Code Committees took action to address these conditions in the 2007 Edition of the Code and revised Appendix VIII to address the NRC's concerns with specimen sets and qualification requirements. Therefore, the final rule does not require these conditions when using the 2007 Edition through the 2008 Addenda of the ASME B&PV Code.

10 CFR 50.55a(b)(2)(xv)(A)(*2*)

The NRC is amending § 50.55a(b)(2)(xv)(A)(*2*) to modify the condition to allow for an add-on qualification for austenitic welds with no austenitic base metal side to an existing Supplement 10 qualification.

10 CFR 50.55a(b)(2)(xvi) Appendix VIII Single-Side Ferritic Vessel and Piping and Stainless Steel Piping Examinations

The NRC is amending § 50.55a(b)(2)(xvi) to modify the condition to only apply to those licensees using the 2006 Addenda and earlier editions and addenda of ASME Section XI.

10 CFR 50.55a(b)(2)(xviii) Certification of NDE Personnel

The NRC is amending § 50.55a(b)(2)(xviii)(B) so the current condition in that paragraph would not apply to the 2007 Edition through the 2008 Addenda of Section XI of the ASME B&PV Code. Section 50.55a(b)(2)(xviii)(B) limits the activities that can be performed by NDE personnel certified in accordance with IWA-2316 of the 1998 Edition through the 2004 Addenda of the ASME B&PV Code. These personnel are limited to observing for leakage during system leakage and hydrostatic tests conducted in accordance with IWA-5211(a) and (b). The ASME Boiler and Pressure Vessel Code Committees took action to address this, and modified IWA-2316 in the 2005 Addenda and the 2007 Edition to limit the activities performed by personnel qualified in accordance with IWA-2316. Therefore, the condition is not required when using the

2007 Edition through the 2008 Addenda. Accordingly, the NRC is amending § 50.55a(b)(2)(xviii)(B) for this condition not to apply when using the 2007 Edition through the 2008 Addenda of the ASME B&PV Code.

The NRC is amending § 50.55a(b)(2)(xviii)(C) so the condition in that paragraph would not apply to the 2005 Addenda through the 2008 Addenda of Section XI of the ASME B&PV Code. This paragraph places conditions on the qualification of VT-3 examination personnel certified under paragraph IWA-2317 of the 1998 Edition through the 2004 Addenda. The regulation requires the administering of an initial qualification examination to demonstrate proficiency of this training, and administering subsequent examinations on a 3-year interval. The ASME Boiler and Pressure Vessel Code Committees took action to address this condition and modified IWA-2317 in the 2005 Addenda of the ASME B&PV Code to require a written examination for initial qualification and at least every 3 years thereafter for VT-3 qualification. Therefore, the final rule does not require this condition when using the 2005 Addenda through the 2008 Addenda. The NRC is revising the wording of the condition for clarity in the final rule based on public comment.

10 CFR 50.55a(b)(2)(xix) Substitution of Alternative Methods

The NRC is amending § 50.55a(b)(2)(xix) so the conditions for the substitution of alternative examination methods in that paragraph would not apply when using the 2005 Addenda through the 2008 Addenda. The conditions in § 50.55a(b)(2)(xix) do not allow the use of Section XI, IWA-2240 of the 1998 Edition through the 2004 Edition of the ASME B&PV Code. These conditions also do not allow the use of IWA-4520(c) of the 1997 Addenda through the 2004 Edition of Section XI of the ASME B&PV Code. In 2005, the ASME Boiler and Pressure Vessel Code Committees took action to address these conditions and modified IWA-2240 and deleted IWA-4520(c) in the 2005 Addenda such that alternative examination methods or newly

developed techniques are not allowed to be substituted for the methods specified in the construction code. Therefore, these conditions are not required when using the 2005 Addenda through the 2008 Addenda.

The final rule also imposes the condition that paragraphs IWA-4520(b)(2) and IWA-4521 of the 2007 Edition of Section XI, Division 1, of the ASME B&PV Code, with the 2008 Addenda are not approved for use. In the 2008 Addenda of Section XI of the ASME B&PV Code, the ASME added new provisions in IWA 4520(b)(2) and IWA-4521 that allow the substitution of ultrasonic examination (UT) for radiographic examination (RT) specified in the Construction Code. Substitution of UT for RT as addressed in paragraph IWA-4520(b)(2) of the ASME B&PV Code, Section XI, for the repair/replacement welds in 2008 Addenda is of a concern to the NRC because, depending on flaw type (i.e., volumetric or planar) and orientation, UT and RT are not equally effective for flaw detection and characterization. The NRC had originally identified concerns relative to the calibration blocks to be used, and developed two conditions that appear in RG 1.84, “Design, Fabrication, and Materials Code Case Acceptability, ASME Section III, Proposed Revision 34,” October 2006.

RT is effective in detecting volumetric-type flaws (e.g., slag, porosity, root concavity, and misalignment), planar type flaws with large openings (e.g., lack of fusion and large cracks in high stressed areas), and those flaws that are oriented in a plane parallel to the X-ray beam. RT is effective in all materials common to the nuclear industry for detecting the type of flaws generated during construction due to workmanship issues and, therefore, ensures an acceptable level of weld quality and safety at the time of construction. In contrast, UT is most effective in detecting and sizing planar-type flaws associated with inservice degradation due to, for example, fatigue or stress corrosion cracking. Significant advances have recently been made regarding the use of UT to detect flaws in cast

stainless steel. However, the ASME Code provisions addressing the inspection of cast stainless steels are still under development and are, therefore, not yet published for use. Finally, UT requires more surface scanning area than RT to perform examinations.

To ensure that a UT technique would be capable of detecting typical construction flaws, the NRC requires a licensee to demonstrate, through performance-based ASME B&PV Code, Section XI, Appendix VIII-like requirements, its capability of identifying the construction flaws which are easily detected by RT. Performance-based qualifications require demonstrations on mockups having flaws with realistic UT responses and with a statistically sufficient number of representative flaws and non-flawed volumes to establish procedure effectiveness and personnel skill. The statistical approach to qualification has been shown to improve the reliability of inspections, to improve the probability of flaw detection, and to reduce the number of false calls. The addition of only two or three construction flaws to a demonstration is not sufficient to capture the variety of flaws common to construction or to statistically evaluate procedure effectiveness and personnel skills.

The NRC is concerned that using the second leg of the ultrasound metal path (V-path) to achieve two direction scanning from only one side of the weld may not be adequate in detecting construction flaws. Single-side examinations have not been demonstrated for construction flaws for any material. Single-side examinations of welds have been successfully qualified for planar flaws in ferritic carbon and low alloy steels but have not been reliably demonstrated for austenitic stainless steel and nickel alloys.

Based on this information, the NRC concludes that the substitution of UT for RT may not be adequate for detecting some construction flaws, specifically in a single-V full penetration groove welds. Therefore, substitution of UT for RT is not generically acceptable. This position is consistent with the NRC's previous position with respect to the review of ASME Code Case

N-659-1, which is published in RG 1.193, Revision 2, "ASME Code Cases not Approved for Use." Accordingly, the final rule imposes the condition that paragraphs IWA-4520(b)(2), and IWA-4521 of the 2007 Edition of Section XI, Division 1, with 2008 Addenda are not approved for use.

10 CFR 50.55a(b)(2)(xxi) Table IWB-2500-1 Examination Requirements

The NRC is amending § 50.55a(b)(2)(xxi) to remove and designate as "Reserved" paragraph (b)(2)(xxi)(B) of this section because this condition was not consistent with the NRC's unconditional approval of Code Case N-652-1 in RG 1.147, Revision 15.

10 CFR 50.55a(b)(2)(xxiv) Incorporation of the Performance Demonstration Initiative and Addition of Ultrasonic Examination Criteria

The NRC is amending § 50.55a(b)(2)(xxiv) not to apply the condition when using the 2007 Edition through the 2008 Addenda. Section 50.55a(b)(2)(xxiv) prohibits the use of Appendix VIII, the supplements of Appendix VIII and Article I-3000 of ASME B&PV Code, 2002 Addenda through the 2004 Edition. In 2007, the ASME Boiler and Pressure Vessel Code Committees took action to address this condition and modified Appendix VIII and its Supplements in the 2007 Edition. Therefore, the condition is not required when using the 2007 Edition through the 2008 Addenda, and the final rule eliminates this condition when using the 2007 Edition through the 2008 Addenda.

10 CFR 50.55a(b)(2)(xxv) Evaluation of Unanticipated Operating Events

The NRC had proposed a new § 50.55a(b)(2)(xxv) to condition the use of ASME B&PV Code, Section XI, Nonmandatory Appendix E, "Evaluation of Unanticipated Operating Events." Based on the Probabilistic Fracture Mechanics Analysis (PFMA) provided by commenters, which used the Fracture Analysis of Vessels - Oak Ridge (FAVOR) Code, the same tool used in the PFM analyses supporting the final PTS rule (75 FR 13), the NRC concludes this condition is

no longer necessary. The PFMA showed that, based on a selected PWR and BWR RPV having the highest RT_{NDT} of the limiting RPV material and a typical beltline fluence model, the PFMA generated a pressure versus (T - RT_{NDT}) curve for each of the two RPVs by setting the CDF to 1E-6. The analytical results showed that the PFMA results bounds the corresponding Appendix E curve for both the unanticipated isothermal pressure events and the pressurized cool-down events. Since 1) the PFMA methodology is consistent with the PTS rule's underlying methodology, in which large flaws are considered statistically, and 2) the resulting pressure versus (T - RT_{NDT}) curve bounds the corresponding curve based on the current Appendix E approach, the NRC concludes that the current Appendix E methodology, without the NRC's proposed condition, provides an appropriate conservative methodology for evaluating RPV integrity following an unanticipated transient that exceeds the operational limits in PWR plant operating procedures. Therefore, the proposed condition placed on the use of ASME Code, Section XI, Appendix E in the proposed rule is not included in the final rule.

10 CFR 50.55a(b)(2)(xxvii) Removal of Insulation

The NRC is amending § 50.55a(b)(2)(xxvii) to refer to IWA-5242 of the 2003 Addenda through the 2006 Addenda or IWA-5241 of the 2007 Edition through the 2008 Addenda of Section XI of the ASME B&PV Code for performing VT-2 visual examination of insulated components in systems borated for the purpose of controlling reactivity. The regulations at § 50.55a(b)(2)(xxvii) place specific requirements on when insulation must be removed to visually examine insulated components in accordance with IWA-5242. In the 2007 Edition of the ASME B&PV Code, Section XI, paragraph IWA-5242 was deleted and these requirements were included in paragraph IWA-5241.

10 CFR 50.55a(b)(2)(xxviii) Analysis of Flaws

The NRC is amending § 50.55a(b)(2) to add a new paragraph (b)(2)(xxviii) placing

conditions on the use of Section XI, Nonmandatory Appendix A, “Analysis of Flaws.” The final rule places a condition on the use of Appendix A related to the fatigue crack growth rate calculation for subsurface flaws defined in paragraph A-4300(b)(1) when the ratio of the minimum cyclic stress to the maximum cyclic stress (R) is less than zero. The fatigue crack growth rate, da/dN, is defined as follows when using Equation (1) in paragraph A-4300(a) and Equation (2) in paragraph A-4300(b)(1):

da/dN = 1.99×10^{-10} S $(\Delta K_I)^{3.07}$,where S is a scaling parameter and ΔK_I is the range of applied stress intensity factor

S and ΔK_I are defined in A-4300 (b)(1) of the ASME B&PV Code, Section XI, Appendix A as follows:

For $-2 \le R \le 0$ and $K_{max} - K_{min} \le 1.12\ \sigma_f \sqrt{(\pi a)}$, S = 1 and $\Delta K_I = K_{max}$

For $R < -2$ and $K_{max} - K_{min} \le 1.12\ \sigma_f \sqrt{(\pi a)}$, S = 1 and $\Delta K_I = (1-R)\ K_{max}/3$

For $R < 0$ and $K_{max} - K_{min} > 1.12\ \sigma_f \sqrt{(\pi a)}$, S = 1 and $\Delta K_I = K_{max} - K_{min}$

The above guidelines permit reduction of ΔK_I from the value of $(K_{max} - K_{min})$ when $K_{max} - K_{min} \le 1.12\ \sigma_f \sqrt{(\pi a)}$. This is adequate if the material property σ_f is from test-based data of the component material and if the geometry of the cracked component can be modeled as an edge crack in a half plane, so that the formula $K = 1.12\ \sigma \sqrt{(\pi a)}$ applies. In most ASME B&PV Code, Section XI, Appendix A applications, test-based σ_f is not available, and the generic value from the ASME B&PV Code tabulations is used. Further, the geometry of a subsurface flaw in a plate differs significantly from the model of an edge crack in a half plane. Consequently, for the case where full ΔK_I should be used, the calculation in accordance with ASME B&PV Code, Section XI, Appendix A may show that $K_{max} - K_{min} \le 1.12\ \sigma_f \sqrt{(\pi a)}$ and prompt a wrongful reduction of ΔK_I.

To address the use of the generic σ_f value instead of the test-based value for the cracked component and the significant difference between the cracked component geometry and the cracked test-specimen geometry on which the criterion of 1.12 $\sigma_f \sqrt{(\pi a)}$ is derived, the NRC revised the criterion of 1.12 $\sigma_f \sqrt{(\pi a)}$ to 0.8 times 1.12 $\sigma_f \sqrt{(\pi a)}$. By doing so, reduction of ΔK_I will not take place during the range of K_{max} - K_{min} from 0.8 x1.12 $\sigma_f \sqrt{(\pi a)}$ to 1.12 $\sigma_f \sqrt{(\pi a)}$, erasing the non-conservatism from the two sources mentioned above. Selection of a multiplying factor of 0.8 is based on the following:

- The 10 percent error that could be introduced for the subsurface flaw configurations having membrane stress correction factors less than 1.12 as indicated in Appendix A, Figure A-3310-1; and
- Another 10-percent error that accounts for the uncertainty in the σ_f value.

Applying the revised criterion of 0.8 times 1.12 $\sigma_f \sqrt{(\pi a)}$, results in the following condition on the use of the fatigue crack growth rate calculation for subsurface flaws defined in paragraph A-4300(b)(1) of Section XI, Nonmandatory Appendix A when R is less than zero:

$da/dN = 1.99 \times 10^{-10} S (\Delta K_I)^{3.07}$

For $R < 0$, ΔK_I depends on the crack depth, a, and the flow stress, σ_f. The flow stress is defined by $\sigma_f = ½(\sigma_{ys} + \sigma_{ult})$, where σ_{ys} is the yield strength and σ_{ult} is the ultimate tensile strength in units ksi (MPa) and a is in units in. (mm).

For $-2 \leq R \leq 0$ and $K_{max} - K_{min} \leq 0.8 \times 1.12 \sigma_f \sqrt{(\pi a)}$, $S = 1$ and $\Delta K_I = K_{max.}$

For $R < -2$ and $K_{max} - K_{min} \leq 0.8 \times 1.12 \sigma_f \sqrt{(\pi a)}$, $S = 1$ and $\Delta K_I = (1-R) K_{max} /3$.

For $R < 0$ and $K_{max} - K_{min} > 0.8 \times 1.12 \sigma_f \sqrt{(\pi a)}$, $S = 1$ and $\Delta K_I = K_{max} - K_{min.}$

The NRC is amending § 50.55a(b)(2) to add a new condition in § 50.55a(b)(2)(xxix) to condition the use of ASME B&PV Code, Section XI, Non-Mandatory Appendix R, "Risk-Informed Inspection Requirements of Piping." The final rule requires licensees to submit an alternative in accordance with § 50.55a(a)(3) and obtain NRC authorization of the proposed alternative prior to implementing RI-ISI programs under Appendix R. The 2004 Edition of the ASME B&PV Code, Section XI, currently incorporated by reference in the regulations, did not contain provisions for RI-ISI. The 2005 Addenda introduced Non-Mandatory Appendix R into Section XI to provide requirements for the RI-ISI of ASME B&PV Code Class 1, 2 and 3 piping. The addition of Appendix R to Section XI was essentially the incorporation of ASME Code Cases N-577 and N-578 into the ASME B&PV Code. The NRC determined that ASME Code Cases N-577 and N-578 were unacceptable for use and are currently listed in RG 1.193,"ASME Code Cases Not Approved for Use," Revision 2. Licensees have been implementing RI-ISI requirements for piping as an alternative to the ASME B&PV Code, Section XI requirements of Tables IWB-2500-1, IWC-2500-1 and IWD-2500-1 submitted in accordance with § 50.55a(a)(3). Adding a condition as § 50.55a(b)(2)(xxvi) that would require licensees to submit an alternative in accordance with § 50.55a(a)(3) and obtain NRC authorization of the proposed alternative prior to implementing Appendix R, RI-ISI programs would ensure that future RI-ISI programs continue to comply with RG 1.178, "An Approach for Plant-Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping," RG1.200, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities," and NRC Standard Review Plan 3.9.8, "Risk-Informed Inservice Inspection of Piping."

ASME OM Code

The NRC is amending the introductory text in § 50.55a(b)(3) to incorporate by reference the 2005 and 2006 Addenda of the ASME OM Code into 10 CFR 50.55a. The amendment to

§ 50.55a(b)(3) also clarifies that Subsections ISTA, ISTB, ISTC, and ISTD, Mandatory Appendices I and II, and Nonmandatory Appendices A through H and J of the ASME OM Code are incorporated by reference.

The conditions in § 50.55a(b)(3)(i), (b)(3)(ii), and (b)(3)(iv) continue to apply to the 2005 and 2006 Addenda because the earlier ASME B&PV Code provisions that these regulations are based on were not revised in the 2005 and 2006 Addenda of the ASME B&PV Code to address the underlying issues which led the NRC to impose the conditions on the ASME B&PV Code.

The NRC is amending the current requirements in § 50.55a(b)(3)(v) to be consistent with the revised snubber ISI provisions in the 2006 Addenda of the ASME B&PV Code, Section XI. To accomplish this § 50.55a(b)(3)(v) was divided into § 50.55a(b)(3)(v)(A) and § 50.55a(b)(3)(v)(B). Where § 50.55a(b)(3)(v)(A) allows licensees using editions and addenda up to the 2005 Addenda of ASME Section XI to optionally use Subsection ISTD, ASME OM Code in place of the requirements for snubbers in Section XI. Section 50.55a(b)(3)(v)(B) requires licensees using the 2006 Addenda and later editions and addenda of Section XI to follow the requirements of Subsection ISTD of the ASME OM Code for snubbers. Provisions for the ISI of snubbers have been in Subsection ISTD since the ASME OM Code was first issued in 1990.

10 CFR 50.55a(b)(3)(v) Subsection ISTD

Section 50.55a(b)(3)(v) allows licensees using editions and addenda up to the 2004 Edition of the ASME B&PV Code, Section XI to comply with, at their option, Subsection ISTD, ASME OM Code instead of the requirements for snubbers in Section XI. If the licensee chooses to comply with subsection ISTD, § 50.55a(b)(3)(v) requires the snubber preservice and inservice examinations to be performed using the VT-3 visual examination method. The NRC previously imposed this requirement to ensure that an appropriate visual examination method was used for the inspection of integral and non-integral snubber attachments, such as lugs, bolting, and

clamps when using Subsection ISTD of the ASME OM Code. Section 50.55a(b)(3)(v)(A) allows licensees using editions and addenda up to the 2005 Addenda of ASME B&PV Code, Section XI, to optionally use Subsection ISTD, ASME OM Code in place of the requirements for snubbers in Section XI and continues to invoke the VT-3 requirement. This option does not apply when using the 2006 Addenda and later editions and addenda of Section XI of the ASME B&PV Code. Figure IWF-1300-1 was revised in the 2006 Addenda of Section XI to clarify that integral and non-integral snubber attachments are in the scope of Section XI. Therefore, the visual examination method specified in the 2006 Addenda and later editions and addenda of Section XI applies to the examination of integral and non-integral snubber attachments. The NRC is thus amending § 50.55a(b)(3)(v)(B) in the final rule to require licensees using the 2006 Addenda and later editions and addenda of Section XI to follow the requirements of Subsection ISTD of the ASME OM Code for snubbers.

10 CFR 50.55a(b)(3)(vi) Exercise Interval for Manual Valves

The NRC is amending the current requirement for exercising manual valves in § 50.55a(b)(3)(vi). The final rule limits the current requirement to the 1999 through 2005 Addenda of the ASME OM Code. The current requirement is not applicable to the 2006 Addenda of the ASME OM Code because the exercise interval in Subarticle ISTC-3540 for manually operated valves was revised in this Addenda to make it the same as the current requirement in § 50.55a(b)(3)(vi).

Reactor Coolant Pressure Boundary, Quality Group B Components, and Quality Group C Components

The NRC is amending § 50.55a(c)(3), (d)(2), and (e)(2) to replace "but—" with "subject to the following conditions" at the end of the introductory text to each paragraph for clarity.

Inservice Testing Requirements

10 CFR 50.55a(f)(5)(iv) Requests for Relief

The NRC is amending § 50.55a(f)(5)(iv) to clarify that licensees are required to submit requests for relief based on impracticality within 12 months after the expiration of the IST interval for which relief is being sought. Section 50.55a(f)(5)(iv) describes the licensee's responsibility to demonstrate to the satisfaction of the NRC those items determined to be impractical and discusses the timeframe for this determination. The final rule clarifies § 50.55a(f)(5)(iv) to more clearly articulate the requirements for licensee action when compliance with certain code requirements is determined to be impractical. Licensees have interpreted the current language in § 50.55a(f)(5)(iv) in a number of ways, especially regarding NRC approval of their submittal within the specified timeframe. Since the licensee has little or no control over the timeliness of NRC action on their submittal, this interpretation is problematic.

Inservice Inspection Requirements

Snubber Examination and Testing

Paragraphs (g)(2), (g)(3)(i), (g)(3)(ii), the introductory text of paragraph (g)(4), and paragraphs (g)(4)(i) and (g)(4)(ii) of 10 CFR 50.55a reference Section XI of the ASME B&PV Code for component support ISI (including snubber examination and testing provisions). Section 50.55a(b)(3)(v) allows licensees the option of complying with the provisions in Subsection ISTD of the ASME OM Code for snubber examination and testing in lieu of the ISI provisions for snubber examination and testing in Article IWF-5000 of Section XI of the ASME B&PV Code. However, Article IWF-5000 was deleted in the 2006 Addenda of Section XI. Therefore, the NRC is amending § 50.55a(b)(3)(v) to require that licensees who use the 2006 Addenda and later editions and addenda of Section XI must use the snubber examination and testing provisions in Subsection ISTD of the ASME OM Code.

The NRC is amending § 50.55a(g)(2), (g)(3)(i), (g)(3)(ii), (g)(4)(i) and (g)(4)(ii) to require that licensees use the provisions for preservice and inservice examination and testing of snubbers in Subsection ISTD of the ASME OM Code when using the 2006 Addenda and later edition of Section XI. Licensees may also use optional code cases in RG 1.192 as approved by the NRC. The NRC is clarifying that preservice examination may meet preservice examination requirements in Section III as an alternative to preservice examination of Section XI. The NRC is also amending the introductory text of § 50.55a(g)(4) to require that licensees using the ASME OM Code shall follow the provisions in Subsection ISTD of the ASME OM Code for examination and testing of snubbers instead of Article IWF-5000 of Section XI. Provisions for examinations and tests of snubbers have been in Article IWF-5000 since Subsection IWF was first issued in the Winter 1978 Addenda of Section XI, but Article IWF-5000 was deleted in the 2006 Addenda of Section XI. Because Article IWF-5000 was deleted, Subarticle IWF-1220 in the 2006 Addenda of Section XI states that the examination and testing requirements for snubbers are now outside the scope of Section XI, and that the examination and test requirements for snubbers can be found in Subsection ISTD of the ASME OM Code.

The NRC is also correcting an error to reinstate rule language adopted in an August 2007 rulemaking (72 FR 49352; August 28, 2007), which was deleted in a final rule (72 FR 71750; December 19, 2007) whose publication closely followed the August 2007 rule. The statement of considerations for the December 2007 rule did not acknowledge or explain the reason for its removal of rule language which was adopted four months earlier. The NRC believes that the December 2007 removal of the rule language adopted in August 2007 was inadvertent, and the result of the NRC's failure to revise the "December 2007 rule language to reflect the newly-adopted August 2007 rule language, before the December 2007 rule was transmitted to the *Federal Register* for publication.

This correction was not included in the May 4, 2010 proposed rule (75 FR 24324) which preceded this final rule. The NRC finds, in accordance with the Administrative Procedure Act, 5 U.S.C. 553(b)(3)(B), that good cause exists for adopting this correction without notice in the *Federal Register* and an opportunity for public comment.

The NRC is also amending § 50.55a(g)(4)(ii) to provide at least 18 months for a specified set of licensees to update and begin implementation of the 2007 Edition and 2008 Addenda versions of Appendix VIII in their next inservice inspection interval. This set of licensees are those whose next inservice inspection interval must begin to be implemented during the period between 12 through 18 months after the effective date of the final rule, and therefore would otherwise be required to implement the 2007 Edition and 2008 Addenda versions of Appendix VIII (providing them less than 18 months to comply with the provisions of the 2007 Edition and 2008 Addenda versions of Appendix VIII). For these licensees, the final rule permits a delay of 6 months in the implementation of Appendix VIII *only* (*i.e*., these licensees will still be required to update and implement the inservice inspection program during the next inspection interval without delay). Other licensees, whose next inservice inspection interval commences more than 18 months after the final date of the rule, will have sufficient time to develop their programs for the next inservice inspection interval and are not affected by this provision of the final rule.

10 CFR 50.55a(g)(4)(iii) Surface Examinations of High-Pressure Safety Injection Systems

Section 50.55a(g)(4)(iii) currently gives licensees the option of not performing surface examinations of high-pressure safety injection systems as specified in Section XI, Table IWB-2500-1, “Examination Category B-J,” Item Numbers B9.20, B9.21 and B9.22. Editions and addenda of Section XI after the 1995 Edition have been modified, and some of the Item Numbers have either changed or been deleted. The surface examination requirement was

removed from Table IWB-2500-1 in the 2003 Addenda. Therefore, the final rule requires this condition to apply to those licensees using Code editions and addenda prior to the 2003 Addenda.

10 CFR 50.55a(g)(5)(iii) and (g)(5)(iv) Inservice Inspection Requests for Relief

Section 50.55a(g)(5)(iii) currently requires the licensee to notify the NRC if conformance with certain code requirements are found to be impractical and submit the information to support this determination to the NRC. Section 50.55a(g)(5)(iv) currently requires that when examination requirements of the code are determined to be impractical by the licensee, that the basis for this determination must be demonstrated to the satisfaction of the NRC not later than 12 months after the expiration of the 120-month interval during which the examination is determined to be impractical.

The final rule adds a sentence to § 50.55a(g)(5)(iii) to clarify that a request for relief must be submitted only after the necessary examination has been attempted during a given ISI interval and the ASME B&PV Code requirement determined to be impractical. In the past, licensees have submitted requests under § 50.55a(g)(5)(iii) prior to performing the ASME B&PV Code examination in a given interval based on limited examination coverage from previous ISI 10-year intervals. The NRC believes that this is an inappropriate basis for a determination of impracticality as new examination techniques are often developed from one interval to the next, which could result in a reasonable expectation of improved results. As a result, the NRC believes that a licensee usually cannot make the determination that an examination is indeed impractical without first attempting the examination in the current ISI interval. In addition, if the NRC were to grant relief prior to the component having been examined and the results of the examination are less than stated in the request for relief, the licensee would be required to resubmit the request for relief to address the actual examination. This places an unnecessary

burden on the licensee and the NRC to review the same issue twice. Accordingly, the final rule requires that the determination of impracticality should be based on actual attempts to perform a requirement, and that the relief request be submitted only after the licensee has unsuccessfully attempted to perform the inspection in the relevant inspection interval.

The final rule removes the requirement that the basis for the licensee's determination that an examination is impractical be demonstrated to the satisfaction of the NRC not later than 12 months after the expiration of the 120-month interval during which the examination is determined to be impractical. The current regulatory language is problematic, inasmuch as the current regulations do not explicitly require the licensee to submit a request for relief. This interpretation of the current regulations was reflected in a comment which stated that the current regulations may be interpreted to mean that determinations of impracticality need not be submitted to the NRC for approval (i.e., the licensee merely needed to be able to justify the impracticality determination to the NRC's satisfaction if asked by the NRC). In addition, the NRC recognizes that the licensee has little or no control over the timeliness of NRC action on a licensee's request for relief. Therefore, the final rule removes the current regulatory language, and replaces it with language clearly stating that all licensee determinations of impracticality must be submitted to the NRC for approval.

The proposed rule would have required that a relief request under § 50.55a(g)(5)(iii) be submitted no later than 12 months after the examination has been attempted in a given ISI interval and the licensee has determined that the ASME Code requirement is impractical. Several commenters stated that this proposed change, which differs from the current requirement to submit a single relief request at the end of the ISI interval, would place additional burden on licensees by increasing the number of submittals licensees need to submit for code relief when requirements are determined to be impractical. Rather than submitting one request

for relief at the end of the interval for all examination requirements determined to be impractical throughout the 10-year interval as currently allowed, licensees would be required to prepare a submittal within 12 months of every examination that determined a requirement was impractical. The NRC has determined that the administrative burden on the licensee of preparing multiple relief requests throughout the inspection interval, and the concomitant burden on the NRC to act on those relief requests, does not appear to be justified. Therefore, the final rule requires relief requests under paragraph (g)(5)(iv) to be submitted no later than 12 months after the expiration of the 120-month interval for which relief is sought.

10 CFR 50.55a(g)(6)(ii)(E) Reactor Coolant Pressure Boundary Visual Inspections

The NRC is amending § 50.55a(g)(6)(ii)(E)*(1)* through (g)(6)(ii)(E)*(3)* to reference Revision 1 of Code Case N-722, and is revising footnote 1 to clarify requirements in that paragraph that pertain to reactor coolant pressure boundary visual inspections. In the last update to 10 CFR 50.55a, the NRC added new § 50.55a(g)(6)(ii)(E), requiring all PWR licensees to augment their ISI program by implementing ASME Code Case N-722, subject to the conditions specified in § 50.55a(g)(6)(ii)(E)*(2)* through (g)(6)(ii)(E)*(4).* ASME 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," was published in Supplement 8 of the 2007 Edition of the ASME Boiler and Pressure Vessel Code Nuclear Code Case book. Code Case N-722 has been updated to Revision 1 (N-722-1) and contains one additional note indicating that visual examination of Alloy 600/82/182 materials in flange seal leak-off lines is not required. This change eliminates the need for licensees to submit relief requests under § 50.55a(3)(i) or 50.55a(a)(3)(ii) for flange seal leak-off lines which are not normally exposed to a corrosive environment and are inaccessible for visual examination. The NRC believes that the likelihood of the flange seals being degraded is relatively low. Therefore, the visual inspection

of these flange leak-off lines is not needed.

The current wording in the second sentence of footnote 1 to § 50.55a(g)(6)(ii)(E) has generated some confusion, and has the unintended consequence of some licensees believing that they need to submit additional relief requests related to the percentage of inspections to be completed during the current interval. The second sentence in the current footnote was intended to provide guidance to licensees for the distribution of weld inspections required by Code Case N-722 throughout the remainder of a plant's current 10-year ISI period after January 1, 2009. The intent was to require licensees to distribute the population of weld inspections that are required only once in a 10-year interval to be distributed over a licensee's current interval and into the next interval in a manner such as that described in IWA-2400 of the 1994 Addenda and later editions and addenda of Section XI. Because the current wording was not specific, licensees using editions and addenda of Section XI prior to the 1994 Addenda have interpreted the regulation as requiring all the weld inspections required by Code Case N-722 to be distributed over, and inspected during, the remaining periods and outages in the current interval only, which could be less than 10 years. The final rule revises footnote 1 to § 50.55a(g)(6)(ii)(E) to clarify this issue by directing licensees to use the rules of IWB-2400 of the 1994 Addenda or later editions and addenda of Section XI for scheduling weld inspections for Code Case N-722-1 welds added in the middle of an interval.

10 CFR 50.55a(g)(6)(ii)(F) Examination Requirements for Class 1 Piping and Nozzle Dissimilar-Metal Butt Welds

The NRC proposed adding a new § 50.55a(g)(6)(ii)(F) to require licensees to implement ASME Code Case N-770, "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 the Application of Listed Mitigation Activities,

Section XI, Division 1," with 15 conditions. Code Case N-770 contains baseline and ISI requirements for unmitigated butt welds fabricated with Alloy 82/182 material and preservice and ISI requirements for mitigated butt welds fabricated with Alloy 82/182 material. On December 25, 2009, ASME approved Code Case N-770-1. The ASME prepared Code Case N-770-1 to address comments on Code Case N-770 that NRC had provided to the ASME code committee. The NRC addressed these comments in the proposed rule as conditions on implementation of Code Case N-770.

The NRC reviewed the changes made in Code Case N-770-1 to determine if it was appropriate for referencing in the new § 50.55a(g)(6)(ii)(F) in lieu of Code Case N-770. The NRC concluded that it was appropriate for referencing based on the following considerations. Incorporation by reference of Code Case N-770-1 in lieu of Code Case N-770 allows the NRC to remove eight and partially remove one of the 15 conditions in the proposed rule. The NRC concluded that removing these conditions significantly improves the rule. The basis for removing or modifying each of these proposed conditions is contained in the Analysis of Public Comments document (ADAMS Accession No. ML110280240).

ASME Code Case N-770-1 has, in addition to changes to address proposed NRC conditions, additional changes that made no significant modification to the requirements from N-770. The NRC considers that the editorial changes improve the usability of the rule. Only one technical addition was made in Code Case N-770-1 that was not covered by the proposed rule. The technical addition provides an alternative examination volume for welds mitigated by optimized weld overlays. The NRC concluded that, with the exception of the one technical addition, Code Case N-770-1 was appropriate for referencing. Therefore, the NRC is amending its regulations to incorporate Code Case N-770-1 by reference instead of Code Case N-770. The NRC is adding a new condition to the rule to preclude the use of the technical addition

made to Code Case N-770-1. The NRC has prepared a document, "Review of Changes Between American Society of Mechanical Engineers Boiler and Pressure Vessel Code Cases N-770 and N-770-1 to Support 10 CFR 50.55a Final Rule" (ADAMS Accession No. ML111250292), setting forth the NRC's bases for approval of all of the changes made in Code Case N-770-1.

In addition to the new condition discussed, the NRC is adding a condition and is modifying two conditions from the proposed rule as a result of public comments it received. Because a number of the proposed conditions were not included, many of the remaining conditions in the final rule have been renumbered.

Substitution of the Term "Condition" in 10 CFR 50.55a

The NRC is amending 10 CFR 50.55a to substitute the word "condition(s)" for the words "limitation(s)," "modification(s)," and "provision(s)" throughout 10 CFR 50.55a for consistency. The NRC does not believe it necessary to distinguish among different types of "caveats" that it imposes on the use of the ASME Codes. Therefore, the NRC will now use the term "condition" for clarity and consistency.

IV. Paragraph-by-Paragraph Discussion

Quality Standards, ASME Codes and IEEE Standards, and Alternatives

10 CFR 50.55a(a)

The NRC is amending 10 CFR 50.55a to add the title "Quality standards, ASME Codes and IEEE standards, and alternatives" to paragraph (a).

Applicant / Licensee Proposed Alternatives to the Requirements of 10 CFR 50.55a

10 CFR 50.55a(a)(3)

The NRC is amending 10 CFR 50.55a(a)(3) to clarify that a proposed alternative must be submitted to, and authorized by, the NRC prior to an applicant or licensee implementing the

alternative.

Standards Approved for Incorporation by Reference

10 CFR 50.55a(b) Standards Approved for Incorporation by Reference

The NRC is amending 10 CFR 50.55a(b) to add the title "Standards approved for incorporation by reference" to paragraph (b).

The final rule also clarifies that non-mandatory appendices are excluded from the ASME B&PV Code, Section III requirements that are incorporated by reference into 10 CFR 50.55a, and clarifies that only Division 1 requirements of Section III and Section XI are incorporated by reference (not Division 2 and Division 3 requirements). The NRC is also incorporating by reference ASME Code Case N-722-1 and N-770-1 into 10 CFR 50.55a.

ASME B&PV Code, Section III

10 CFR 50.55a(b)(1)

The NRC is amending paragraph (b)(1) to incorporate by reference the 2005 Addenda (Division 1) through 2008 Addenda (Division 1) of Section III of the ASME B&PV Code into 10 CFR 50.55a, subject to the conditions outlined in modified paragraphs (b)(1)(i) through 50.55a(b)(1)(vi) and paragraph (b)(vii). The paragraph modification also includes an editorial change to the references to Section III ASME B&PV Code for clarification purposes. As a result, applicants and licensees may use the 1974 Edition (Division 1) through the 2008 Addenda (Division 1) of Section III of the ASME B&PV Code subject to the conditions contained within modified paragraphs (b)(1)(i) through (b)(1)(vi) and new paragraph (b)(1)(vii).

10 CFR 50.55a(b)(1)(ii) Weld-Leg Dimensions

The NRC is applying the existing condition in paragraph (b)(1)(ii) regarding stress indices used for weld stresses in piping design to the comparable provisions in the ASME Code editions and addenda incorporated by reference in this final rule. The paragraph modification

also includes the addition of a condition on the use of paragraph NB–3683.4(c)(2) for applicants and licensees applying the 1989 Addenda through the latest edition and addenda of Section III of the ASME B&PV Code incorporated by reference in this final rule. As a result, this final rule prohibits applicants and licensees from using Footnote 13 from the 2004 Edition through the 2008 Addenda of Section III of the ASME B&PV Code to Figures NC-3673.2(b)-1 and ND-3673.2(b)-1 for welds with leg size less than 1.09 times the nominal pipe wall thickness (t_n). Also as a result, the use of paragraph NB–3683.4(c)(2), is not allowed for applicants and licensees applying the 1989 Addenda through the latest edition and addenda of Section III of the ASME B&PV Code incorporated by reference in this final rule.

10 CFR 50.55a(b)(1)(iii) Seismic Design of Piping

The NRC is amending paragraph (b)(1)(iii) to impose conditions on the seismic design of piping when licensees use the latest editions and addenda of the ASME B&PV Code, Section III, incorporated by reference in modified paragraph (b). The paragraph is also amended to include an editorial change to replace “limitations and modifications” with “conditions” and “limitation” with “condition.” The final rule allows the use of Subarticles NB-3200, NB-3600, NC-3600, and ND-3600 for the seismic design of piping when applying editions and addenda, up to and including the 1993 Addenda of the ASME B&PV Code, Section III, subject to the condition in modified paragraph (b)(1)(ii). The amended paragraph does not allow the use of Subarticles NB-3200, NB-3600, NC-3600, and ND-3600 for the seismic design of piping when applying the 1994 Addenda through the 2005 Addenda of Section III of the ASME B&PV Code except that Subarticle NB-3200 in the 2004 Edition through the 2008 Addenda of Section III of the ASME B&PV Code may be used by applicants and licensees subject to the condition in new paragraph (b)(1)(iii)(A) (see the following discussion on this new paragraph). The final rule allows the use of Subarticles NB-3200, NB-3600, NC-3600, and ND-3600 for the seismic design

of piping when applying the 2006 Addenda through the 2008 Addenda of Section III of the ASME B&PV Code, subject to the two new conditions in new paragraphs (b)(1)(iii)(A) and (b)(1)(iii)(B).

10 CFR 50.55a(b)(1)(iii)(A)

The NRC is amending 10 CFR 50.55a(b)(1)(iii) to add a new paragraph (b)(1)(iii)(A) which requires licensees and applicants using Note (1) of Figure NB-3222-1 in Section III of the 2004 Edition up to and including the 2008 Addenda of the ASME B&PV Code to include reversing dynamic loads in calculating primary bending stresses, if consideration of these loads is warranted by subparagraph NB-3223(b).

10 CFR 50.55a(b)(1)(iii)(B)

The NRC is amending 10 CFR 50.55a(b)(1)(iii) to add a new paragraph(b)(1)(iii)(B) which imposes a condition on the use of Subarticle NB-3600 of the ASME B&PV Code, Section III when applying the 2006 Addenda through the 2008 Addenda of Section III of the ASME B&PV Code by requiring the material and D_o/t requirements found in NB-3656(b) to be adhered to for all Service Limits if the Service Limits include reversing dynamic loads which are not required to be combined with non-reversing dynamic loads, and the alternative rules for reversing dynamic loads are used. As such, per NB-3656(b), the final rule requires that licensee's adhere to a D_o/t ratio limitation requiring this ratio to be less than 40 for all Service Limits when evaluating the seismic design of Class 1 piping. Paragraph (b)(1)(iii) specifies both whether the condition applies and the circumstances in which it applies.

10 CFR 50.55a(b)(1)(iv) Quality Assurance

The NRC is amending paragraph (b)(1)(iv) to allow the use of the 1994 Edition of NQA-1 when applying the 2006 Addenda and later editions of the ASME B&PV Code, Section III, up to

the 2008 Addenda. Previously paragraph (b)(1)(iv) permitted the use of NQA-1 up to the 1992 Edition.

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

In the 2006 Addenda, new requirements were added to the ASME Code, Section III, that have a parallel structure in paragraphs NB-7742, NC-7742, and ND-7742 for Class 1, 2, and 3 incompressible-fluid, pressure relief valves, respectively. These new paragraphs address new valve designs having a range of possible sizes and set-pressure conditions. The method described in these paragraphs for performing the tests and evaluation data involves performing tests at less than the highest value of the set-pressure range and establishing an incompressible fluid flow coefficient of discharge that then allows extrapolation of capacities to higher pressures. These new paragraphs address circumstances in which a certified test facility lacks the fluid-pressure capability at the necessary flow rate for testing a new, incompressible-fluid, pressure-relief valve design. Due to a printing error in the ASME Code for paragraph NB-7742(a)(2), some words were omitted. The NRC is amending paragraph (b)(1)(vii) to add a condition to allow use of NB-7742(a)(2) when the language intended to be included in the Code is used.

ASME B&PV Code, Section XI

10 CFR 50.55a(b)(2)

The NRC is amending the introductory text to paragraph (b)(2) to incorporate by reference only Subsections IWA, IWB, IWC, IWD, IWE, IWF, IWL, Mandatory and Non-Mandatory Appendices, of the 2005 Addenda through 2008 Addenda of Section XI of the ASME B&PV Code, with conditions, into 10 CFR 50.55a. It is also amended to make clear that references to Section XI are to Section XI of the ASME B&PV Code.

10 CFR 50.55a(b)(2)(i)

The NRC is deleting the requirements of paragraph (b)(2)(i), which address limitations on specific editions and addenda, and is designating the paragraph as “Reserved.” Licensees are no longer using these older editions (1974 and 1977 Editions) and addenda of the ASME B&PV Code.

10 CFR 50.55a(b)(2)(iii)

The NRC is deleting the requirements of paragraph (b)(2)(iii), which address steam generator tubing, and is designating this paragraph as “Reserved.”

10 CFR 50.55a(b)(2)(iv)

The NRC is deleting the requirements of paragraph (b)(2)(iv), which address pressure retaining welds in ASME Code Class 2 piping, and is designating this paragraph as “Reserved.”

10 CFR 50.55a(b)(2)(v)

The NRC is deleting the requirements of paragraph (b)(2)(v), which address the evaluation procedures and acceptance criteria for austenitic piping when applying the Winter 1983 Addenda and the Winter 1984 Addenda of Section XI, and is designating this paragraph as “Reserved.”

10 CFR 50.55a(b)(2)(vi)

This paragraph addresses the pertinent editions and addenda of the ASME B&PV Code for which licensees must utilize when implementing the initial inservice inspection requirements for containment structures. The NRC is amending paragraph (b)(2)(vi) to clarify that, in accordance with the paragraph, licensees may use either the 1992 Edition with the 1992 Addenda or the 1995 Edition with the 1996 Addenda of Subsection IWE and Subsection IWL of the ASME B&PV Code, Section XI, for the initial 120-month inspection interval, subject to the conditions in paragraphs (b)(2)(viii) and (b)(2)(ix), including the new condition identified in

paragraph (b)(2)(ix)(J). Following the initial 120-month inspection interval, successive 120-month inspection interval updates must be implemented in accordance with the provisions of paragraph (g)(4)(ii).

10 CFR 50.55a(b)(2)(viii)

This paragraph, which addresses the inservice examination of concrete containments in accordance with Subsection IWL of the ASME B&PV Code, Section XI, is amended so that the conditions in paragraphs (b)(2)(viii)(F) and (b)(2)(viii)(G) do not apply when using the 2007 Edition to the latest edition and addenda incorporated by reference into § 50.55a (currently the 2008 Addenda of the ASME B&PV Code).

10 CFR 50.55a(b)(2)(ix)

This paragraph addresses the examination of metal containments and the liners of concrete containments in accordance with Subsection IWE of the ASME B&PV Code, Section XI. The NRC is dividing the existing condition in paragraph (b)(2)(ix)(A) into paragraphs (b)(2)(ix)(A)(*1*) and (b)(2)(ix)(A)(*2*). The NRC is also amending the introductory text of this paragraph so that the conditions in paragraphs (b)(2)(ix)(F), (b)(2)(ix)(G), (b)(2)(ix)(H) and (b)(2)(ix)(I) do not apply when using the 2004 Edition with 2006 Addenda through the 2007 Edition with 2008 Addenda of Subsection IWE of the ASME B&PV Code, Section XI. Also, the NRC is amending the introductory text of this paragraph so that the condition in paragraph (b)(2)(ix)(I) does not apply when using the 2004 Edition, up to and including the 2005 Addenda of Subsection IWE of the ASME B&PV Code, Section XI.

10 CFR 50.55a(b)(2)(ix)(J)

The NRC is amending paragraph (b)(2)(ix) to add a new paragraph (b)(2)(ix)(J) to address pressure testing requirements following major modifications of Class MC containment structures when applying Article IWE-5000, of Subsection IWE of the 2007 Edition to the latest

edition and addenda incorporated by reference into § 50.55a (currently the 2008 Addenda of the ASME B&PV Code, Section XI).

10 CFR 50.55a(b)(2)(xv)

The NRC is amending the requirements in paragraph (b)(2)(xv), which address Appendix VIII specimen set and qualification requirements, by limiting the use of the provisions described in paragraphs (b)(2)(xv)(A) through (b)(2)(xv)(M) to licensees using the B&PV Code 2001 Edition and earlier editions and addenda. Additionally, paragraph (b)(2)(xv)(A)(2) is amended to allow a qualification for austenitic welds with no austenitic base metal side to be added on to an existing Supplement 10 qualification.

10 CFR 50.55a(b)(2)(xvi)

The NRC is amending the requirements in paragraph (b)(2)(xvi), which address Appendix VIII single-sided ferritic-vessel and piping and stainless steel piping examination, to limit the condition to those licensees using the editions and addenda of ASME Section XI prior to the 2007 Edition on Section VIII.

10 CFR 50.55a(b)(2)(xviii)(B)

The NRC is amending paragraph (b)(2)(xviii)(B), which addresses certification of NDE personnel that observe leakage during system leakage and hydrostatic testing, such that the condition would only apply to editions and addenda prior to the 2007 Edition of Section XI.

10 CFR 50.55a(b)(2)(xviii)(C)

The NRC is amending paragraph (b)(2)(xviii)(C), which addresses certification of NDE personnel, such that the current conditions on the qualification of VT-3 examination personnel requiring initial qualification examinations and subsequent examinations on a 3-year interval would only apply to the editions and addenda prior to the 2005 Addenda of Section XI.

10 CFR 50.55a(b)(2)(xix)

The NRC is amending paragraph (b)(2)(xix), which addresses substitution of alternative methods, so the current conditions for the substitution of alternative examination methods in that paragraph would not apply when using the 2005 Addenda through the 2008 Addenda. The paragraph is also amended to impose the condition that paragraphs IWA-4520(b)(2) and IWA-4521 of the 2007 Edition of Section XI, Division 1, with 2008 Addenda, are not approved for use.

10 CFR 50.55a(b)(2)(xxi)

The NRC is deleting the requirements of paragraph (b)(2)(xxi)(B), which addressed examination requirements for Examination Category B-G-2, Item B7.80 bolting, and designating it as "Reserved." This condition was inconsistent with the NRC's unconditional approval of Code Case N-652-1, "Alternative Requirements to Categories B-G-1, B-G-2, and C-D Bolting Examination Methods and Selection Criteria" in RG 1.147, Revision 15.

10 CFR 50.55a(b)(2)(xxiv)

The NRC is amending the requirements in paragraph (b)(2)(xxiv), which addresses incorporation of the performance demonstration initiative and addition of ultrasonic examination criteria, so that the current condition would not apply when using the 2007 Edition through the 2008 Addenda of Section XI of the ASME B&PV Code.

10 CFR 50.55a(b)(2)(xxvii)

The NRC is amending the requirements in paragraph (b)(2)(xxvii), which address removal of insulation, to add a condition to refer to paragraph IWA-5241 instead of IWA-5242 for the 2007 Edition and later addenda of Section XI of the ASME B&PV Code.

10 CFR 50.55a(b)(2)(xxviii)

The NRC is adding a new paragraph (b)(2)(xxviii), *Analysis of flaws*, which conditions the use of the fatigue crack growth rate calculation for subsurface flaws defined in paragraph A-4300(b)(1) of Section XI, Nonmandatory Appendix A when the ratio of the minimum cyclic

stress to the maximum cyclic stress (R) is less than zero.

10 CFR 50.55a(b)(2)(xxix)

The NRC is adding a new paragraph (b)(2)(xxix), which conditions the use of ASME B&PV Code, Section XI, Non-Mandatory Appendix R, to require licensees to submit an alternative in accordance with paragraph (a)(3) and obtain NRC authorization of the proposed alternative prior to implementing Appendix R, RI-ISI programs.

ASME OM Code

10 CFR 50.55a(b)(3)

The NRC is amending the introductory text of paragraph (b)(3) to require that the 2004 Edition with the 2005 and 2006 Addenda of the ASME OM Code be used during the initial 120-month IST interval under paragraph (f)(4)(i) and during mandatory 120-month IST program updates under paragraph (f)(4)(ii). The amendment also allows users to voluntarily update their IST programs to the 2004 Edition with the 2005 and 2006 Addenda of the ASME OM Code under paragraph (f)(4)(iv).

10 CFR 50.55a(b)(3)(v)

The NRC is amending paragraph (b)(3)(v) to require that the provisions in Subsection ISTD of the ASME OM Code be used for the inservice examination and testing of snubbers when using the 2006 Addenda and later editions and addenda of Section XI.

10 CFR 50.55a(b)(3)(vi)

The NRC is amending paragraph (b)(3)(vi) to require that the current condition for exercising manual valves continue to apply when using the 1999 through 2005 Addenda of the ASME OM Code. This condition does not apply to the 2006 Addenda and later editions and addenda of the ASME OM Code.

Reactor Coolant Pressure Boundary, Quality Group B Components and Quality Group C

Components

The NRC is amending paragraphs (c)(3), (d)(2), and (e)(2) to replace "but—" with "subject to the following conditions" at the end of the introductory text to the paragraphs for clarity.

Inservice Testing Requirements

10 CFR 50.55a(f)(5)(iv)

The NRC is amending paragraph (f)(5)(iv) to clarify that licensees are required to submit requests for relief based on impracticality within 12 months after the expiration of the IST interval for which relief is being sought.

Inservice Inspection Requirements

10 CFR 50.55a(g)(2), (g)(3)(i), (g)(3)(ii), and the Introductory Text of (g)(4)

The NRC is amending paragraphs (g)(2), (g)(3)(i), and (g)(3)(ii) to require that the provisions in the ASME OM Code, and the optional ASME code cases listed in RG 1.192, be used for the examination and testing of snubbers. The NRC is amending the introductory text of paragraph (g)(4) to require that licensees use the provisions in the ASME OM Code for the examination and testing of snubbers.

10 CFR 50.55a(g)(4)(i)

The NRC is amending paragraph (g)(4)(i) to require that the optional code cases listed in RG 1.192 be followed when using the ASME OM Code. The NRC is also correcting an earlier error which deleted rule language in this paragraph which is applicable to combined licenses under 10 CFR Part 52. The restored rule language makes clear that, for combined license holders under 10 CFR Part 52, the inservice examinations for the initial 120-month inspection interval must comply with the inservice examination requirements in the latest edition and addenda of the Code approved by the NRC in § 50.55a on the date 12 months before the date

scheduled for initial loading of fuel under a combined license under 10 CFR Part 52, except as allowed – as with operating licenses under 10 CFR Part 50 – under the remainder of paragraph (g)(4)(i).

10 CFR 50.55a(g)(4)(ii)

The NRC is amending paragraph (g)(4)(ii) to allow the optional code cases listed in RG 1.192 to be followed when using the ASME OM Code. Paragraph (g)(4)(ii) is also amended to provide up to a 6-month delay in the implementation of the 2007 Edition and 2008 Addenda provisions of Appendix VIII for those licensees whose next inspection interval must be implemented in the period between 12 through 18 months after the effective date of the final rule. Other licensees, whose next inservice inspection interval commences more than 18 months after the final date of the rule, are not affected by this provision of the final rule.

10 CFR 50.55a(g)(4)(iii)

The NRC is amending paragraph (g)(4)(iii) to provide the proper references to Section XI, Table IWB-2500-1, "Examination Category B-J," Item Numbers B9.20, B9.21 and B9.22, and to limit the condition's applicability to the editions and addenda prior to the 2003 Addenda of Section XI.

10 CFR 50.55a(g)(5)(iii)

The NRC is amending paragraph (g)(5)(iii) by adding a sentence to clarify that a request for relief must be submitted to the NRC only after an examination has been attempted during a given ISI interval and the ASME Code requirement determined to be impractical. These requests for relief describing the determinations that the code requirement is impractical must be submitted to the NRC no later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought.

10 CFR 55a(g)(5)(iv)

The NRC is amending paragraph (g)(5)(iv) to clarify that licensees are required to submit requests for relief based on impracticality no later than 12 months after the end of the ISI interval for which relief is being sought.

10 CFR 50.55a(g)(6)(ii)(E)(*1*) through (g)(6)(ii)(E)*(3)*

The NRC is amending paragraphs (g)(6)(ii)(E)(*1*) through (g)(6)(ii)(E)*(3)* by changing the requirement to implement Code Case N-722 to a requirement to implement Code Case N-722-1.

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

The final rule incorporates ASME Code Case N-770-1 by reference in paragraph (g)(6)(ii)(F)(*1*). The NRC is not including the following proposed conditions in this final rule, since they are addressed in Code Case N-770-1: paragraphs (g)(6)(ii)(F)(*5*), (*6*), (*8*), (*9*), (*10*), (*11*), (*13*), and (*14*). The NRC is not including part of the proposed condition in paragraph (g)(6)(ii)(F)(*7*), since the part is addressed in Code Case N-770-1. Because the NRC did not include these proposed conditions in the final rule, the numbering of the conditions in the final rule differs from that of the proposed rule.

Paragraph (g)(6)(ii)(F)(2) pertains to obtaining NRC approval prior to reclassification of welds under the Inspection Items of Code Case N-770. All mitigation techniques discussed in Code Case N-770, with the exception of Mechanical Stress Improvement Process, are covered by separate ASME Code Cases. These Code Cases are subject to approval by the NRC. As ASME completes these mitigation Code Cases, the NRC will review and approve them, if appropriate, possibly with conditions. The NRC uses RG 1.147, which is incorporated by reference in 10 CFR 50.55a, to endorse approved Code Cases for generic use. Based on the wording of paragraph (g)(6)(ii)(F)(2), as the NRC endorses mitigation Code Cases in the RG, the rule permits licensees to categorize mitigated welds in the corresponding Inspection Items in

Code Case N-770-1, without a separate NRC review of the classification or reclassification. This condition is unchanged from the proposed rule.

Paragraph (g)(6)(ii)(F)(*3*) pertains to the schedule for completing baseline examinations. The final rule extends the timing for completing baseline examinations. Previous examinations of these welds can be credited for baseline examinations if they were performed using Section XI, Appendix VIII requirements and met the Code required examination volume for axial and circumferential flaws of essentially 100 percent. For butt welds that received a MRP-139 examination that did not fully meet Section XI, Appendix VIII requirements or achieve essentially 100 percent coverage, licensees can re-perform the baseline examination to meet these requirements or obtain NRC authorization of alternative examination requirements in accordance with 10 CFR 50.55a(a)(3)(i) or (ii) by the end of next refueling outage that occurs after six months from the effective date of the final rule. A licensee may choose to use previous inspections of dissimilar metal butt welds performed under the plant's ASME Code, Section XI, Inservice Inspection program to meet the paragraph (g)(6)(ii)(F)(3) baseline requirement. This is acceptable provided the previous inspection falls within the re-inspection period for welds in ASME Code Case N-770-1, Table 1, Inspection Items A–1, A–2, and B. Additionally, the NRC-approved alternative examination coverage for these welds during the current 10-year inservice inspection interval remain applicable. In all of these cases the previously approved alternative will continue to apply for the duration authorized by the NRC. In the final rule the NRC modified the proposed condition to extend the timing for completing baseline examinations and to address credit for previous baseline examinations.

Paragraph (g)(6)(ii)(F)(*4*) pertains to the requirement for satisfying axial examination coverage of welds. The discussion for paragraph (g)(6)(ii)(F)(*4*) contains guidance on satisfying the axial examination coverage requirement during previous baseline examinations. This

condition is unchanged from the proposed rule.

Paragraph (g)(6)(ii)(F)(*5*) requires that all hot-leg temperature welds in the Code Case N-770-1 Inspection Items G, H, J and K for inlays and onlays be inspected each interval and specifies requirements for sample inspection of cold leg temperature welds in these Inspection Items. This condition prohibits sample inspection of hot leg temperature welds in Inspection Items G, H, J, and K. This condition was part of paragraph (g)(6)(ii)(F)(*7*) of the proposed rule. This part of the condition is unchanged from the proposed rule.

Paragraph (g)(6)(ii)(F)(*6*) pertains to submitting reports to the NRC for mitigated welds whose volumetric examination detects new flaws or growth of existing flaws in the required examination volume. This condition was included in paragraph (g)(6)(ii)(F)(*12*) of the proposed rule. This condition is unchanged from the proposed rule.

Paragraph (g)(6)(ii)(F)(*7*) requires that the thickness of the inlay or onlay be used as the thickness "t" when applying the acceptance standards in ASME Section XI, IWB-3514, for planar flaws contained within the inlay or onlay in Inspection Items G, H, J, and K. This condition was included in paragraph (g)(6)(ii)(F)(*15*) of the proposed rule. In the final rule paragraph (g)(6)(ii)(F)(*7*) is expanded to clarify that 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.

Paragraph (g)(6)(ii)(F)(*8*) prohibits sample inspection of welds mitigated by optimized weld overlays in Inspection Items D and E. This condition was included in paragraph (g)(6)(ii)(F)(16) of the proposed rule. This condition is unchanged from the proposed rule.

Paragraph (g)(6)(ii)(F)(*9*) is a new condition as a result of public comments. This condition removes the requirement of Code Case N-770-1 to spread the initial examinations of the Inspection Item D welds mitigated in the same inspection period throughout years 3 through

10 following application of stress improvement. For the extent and frequency of examination in Table 1, the condition requires that the initial examination for all Inspection Item D welds shall be performed no sooner than the third refueling outage and no later than 10 years following stress improvement application. The condition addresses deferral of the examinations to the end of the interval by repeating the previous requirement, that is, to perform the initial examination of Inspection Item D welds no sooner than the third refueling outage and no later than 10 years following stress improvement application.

Paragraph (g)(6)(ii)(F)(*10*) is a new condition as a result of incorporating Code Case N-770-1 in lieu of Code Case N-770. Note 2 of Figure 5(a) in Code Case N-770-1 permits the use of an alternative examination volume for an alternative examination volume for welds mitigated by optimized weld overlays. This alternative examination volume was not issued as part of the proposed rule and, therefore, this condition in the final rule prohibits the use of the alternative examination volume. While the NRC does not have a technical objection to Note 2 of Figure 5(a), licensees must obtain NRC authorization to use the alternative examination volume pursuant to 10 CFR 50.55a(a)(3)(i) or (ii).

10 CFR 50.55a(g)(6)(ii)(E)(*1*) through (g)(6)(ii)(E)*(3)*

The NRC is amending paragraphs (g)(6)(ii)(E)(*1*) through (g)(6)(ii)(E)*(3)* to update the requirement to implement Code Case N-722-1. The amendment also clarifies that for inspections conducted once per interval, the portion of welds to be inspected in the remaining portion of the interval is based on rules already established by the ASME B&PV Code.

Footnote 1 to 10 CFR 50.55a(g)(6)(ii)(E)

The NRC is amending footnote 1 to paragraph (g)(6)(ii)(E) to clarify that for inspections conducted once per interval, the portion of welds to be inspected in the remaining portion of the interval be based on rules already established by the ASME B&PV Code, Section XI, paragraph

IWB-2400.

Substitution of the Term “Condition” in 10 CFR 50.55a

The NRC is amending 10 CFR 50.55a to substitute the words "limitation(s)," "modification(s)," and "provision(s)" with the word “condition(s)” throughout the regulations for consistency.

V. Generic Aging Lessons Learned Report

In December 2010, the NRC issued “Generic Aging Lessons Learned (GALL) Report,” NUREG-1801, Revision 2, for applicants to use in preparing their license renewal applications. The GALL Report evaluates existing programs and documents the bases for determining when existing programs, without change or augmentation, are adequate for aging management in accordance with the license renewal rule, as given in 10 CFR 54.21(a)(3). In Revision 2 of the GALL Report, editions of the ASME B&PV Code, Section XI, Subsections IWB, IWC, IWD, IWE, IWF, and IWL from the 1995 Edition through the 2004 Edition were evaluated and were found to be acceptable editions and addenda for complying with the requirements of 10 CFR 54.21(a)(3), unless specifically noted in certain sections of the GALL Report. For example, GALL Report Section XI.S1, “ASME Section XI, Subsection IWE,” specifically addresses the 1992 Edition of ASME B&PV Code, Section XI, Subsection IWE.

In the GALL Report, Section XI.M1, “ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD;” Section XI.S1, “ASME Section XI, Subsection IWE;” Section XI.S2,“ASME Section XI, Subsection IWL;” and Section XI.S3, “ASME Section XI, Subsection IWF” describe the evaluation and technical bases for determining the adequacy of these ASME Code subsections. In addition, many other aging management programs (AMPs) in the GALL Report rely in part, but to a lesser degree, on the requirements in the ASME B&PV Code, Section XI.

The NRC has evaluated Subsections IWB, IWC, IWD, IWE, IWF, and IWL of Section XI

of the ASME B&PV Code, 2004 Edition with the 2005 and 2006 Addenda through the 2007 Edition with the 2008 Addenda as part of the § 50.55a amendment process to determine if the conclusions of the GALL Report also apply to AMPs that rely upon the ASME B&PV Code editions and addenda that are incorporated by reference into § 50.55a by this rule. The NRC finds that the 2004 Edition, inclusive of the 2005 and 2006 Addenda, and the 2007 Edition, inclusive of the 2008 Addenda of Section XI of the ASME B&PV Code, Subsections IWB, IWC, IWD, IWE, IWF, and IWL, as subject to the conditions of this rule, are acceptable to be adopted as AMPs for license renewal and the conclusions of the GALL Report remain valid, except where specifically noted and augmented 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 2004 Edition with the 2005 and 2006 Addenda through the 2007 Edition with the 2008 Addenda of the ASME B&PV Code, subject to conditions in this rule, as acceptable alternatives to the requirements of the 1995 Edition through the 2004 Edition of the ASME B&PV Code, Section XI, as referenced in Revision 2 of the GALL Report . 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 2004 Edition inclusive of the 2005 and the 2006 Addenda through the 2007 Edition with the 2008 Addenda of the ASME B&PV Code as acceptable alternatives to the AMPs described in the Revision 2 of the GALL report. However, a licensee must assess and follow applicable NRC requirements with regard to changes to its licensing basis.

The NRC, however, notes that the GALL Report includes Subsection IWE AMP that is evaluated based on the requirements in the 1992 Edition through 2004 Edition of Section XI of the ASME B&PV Code. Also, some of the terminology used and some details in this AMP is based on the 1992 Edition. Since this AMP in Revision 2 of the GALL report has a specific

ASME B&PV Code year in the description of the AMP or in one or more of the ten elements, the details in the AMP based on a specific ASME B&PV Code edition may not be accurate for other editions.

Revision 2 of the GALL Report includes AMPs that are based on the requirements in the 1995 Edition through the 2004 Edition of Section XI of the ASME B&PV Code but in which the AMPs may recommend additional augmentation of the Code requirements or the use of specific Code Edition or Addenda in order to achieve adequate aging management for license renewal. The technical or regulatory aspects of the AMPs, for which augmentation is recommended, also apply if using the 2004 Edition inclusive of the 2005 Addenda, or the 2007 Edition, inclusive of the 2008 Addenda, of Section XI of the ASME B&PV Code to meet the requirements of 10 CFR 54.21(a)(3). A license renewal applicant may either augment its AMPs in these areas, as described in the GALL report, or propose alternatives (exceptions) for the NRC to review as part of a plant-specific program element justification for its AMP.GALL Revision 1, in AMP XI.M11A, provides an acceptable approach for aging management - through inservice inspection - of PWR nickel-alloy upper vessel head penetration nozzles. This inservice inspection is the same as the inservice inspection mandated by Order EA-03-009, “Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors (PWRs),” as amended by the First Revision of the Order. GALL Revision 2, in GALL AMP XI.M11B, “Cracking of Nickel-Alloy Components and Loss of Material Due to Boric Acid-Induced Corrosion in Reactor Coolant Pressure Boundary Components (PWRs Only),” provides inspection guidance for all PWR nickel-alloy reactor coolant pressure boundary (RCPB) components (including nickel-alloy welds) and nickel alloy aging management review line items. Thus, AMP XI.M11B in GALL Revision 2 supersedes the provisions of GALL Revision 1 AMP XI.M11A. GALL Revision 2 AMP XI.M11B is based on, and is consistent with the provisions of

several ASME Code Cases addressing inspection of nickel alloy upper vessel head penetration nozzles which have been endorsed by the NRC (with conditions in 10 CFR 50.55a). Accordingly, new or current license renewal applicants who identify consistency with GALL AMP XI.M11B through compliance with 10 CFR 50.55a(g)(6)(ii)(D), (g)(6)(ii)(E), and (g)(6)(ii)(F) need not take an exception to the program elements in GALL AMP XI.M11B. Licensees that have been granted a renewed operating license will eventually update their ISI programs to comply with the Code Cases on inspection of nickel alloy upper vessel head penetration nozzles, in accordance with § 50.55a(g). Accordingly, these licensees will eventually become consistent with GALL AMP XI.M11B.

VI. Availability of Documents

The NRC is making the documents identified below available to interested persons through one or more of the following:

Public Document Room (PDR): The NRC PDR is located at 11555 Rockville Pike, Room O-1F21, Rockville, Maryland 20852.

Federal rulemaking Web site: Public comments and supporting material related to this final rule can be found at http://regulations.gov by searching on the Docket ID NRC-2008-0554.

The NRC's Library:

The NRC's Library is located at *http://www.nrc.gov/reading-rm.html.*

Document	PDR	Rulemaking Web Site	Library
Analysis of Public Comments	**X**	.....	ML110280240
ASME B&PV Code*	**X**	.....	.....
ASME Code Case N-770-1*	**X**	.....	.....

ASME Code Case N-722-1*	X	.....	.....
ASME OM Code*	X	.....	.....
GALL Report, NUREG-1801, Rev.1, September 2005, Volume 1, ...	X	.....	ML052770419
Volume 2	X	.....	ML052780376
NQA-1*, "Quality Assurance Requirements ..... for Nuclear Facilities," 1994 Edition	.....	.....	.....
NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants – LWR Edition	X	.....	reading-rm/doc-collections/nuregs/staff/sr0800/
PNNL-19086, "Replacement of Radiography with Ultrasonics for the Nondestructive Inspection of Welds – Evaluation of Technical Gaps – An Interim Report"	.....	.....	ML1010312543
Public Submissions (Comments) on Proposed Rule		X	ML103200546
Regulatory Analysis and Backfit Considerations ..... for Final Amendment 10 CFR 50.55a, "Codes and Standards"	X	X	ML110320011
Regulatory Guide 1.178, "An Approach for ..... Plant-Specific Risk-Informed Decisionmaking for Inservice Inspection of Piping"	X	.....	ML032510128
Regulatory Guide 1.193, Revision 2, "ASME ..... Code Cases not Approved for Use."	X	.....	ML072470294
Regulatory Guide 1.200, "An Approach for ..... Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities"	X	.....	ML090410014
"Review of Changes Between American Society of Mechanical Engineers Boiler and Pressure Vessel Code Cases N-770 and N-770-1 to Support 10 CFR 50.55a Final Rule"	X	.....	ML111250292
Standard Review Plan 3.9.8, "Risk-Informed ..... Inservice Inspection of Piping"	X	.....	ML032510135

*Available on the ASME Web site
**Available on the EPRI Web site

VII. Voluntary Consensus Standards

Section 12(d)(3) of the National Technology Transfer and Advancement Act of 1995, Pub. L. 104-113 (NTTAA), and implementing guidance in U.S. Office of Management and Budget (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 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 rulemaking, 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 10 CFR 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.

As discussed in Section III of this statement of considerations, in this final rule the NRC

is conditioning the use of certain provisions of the 2005 Addenda through 2008 Addenda of Section III, Division 1, and the 2005 Addenda through 2008 Addenda of Section XI, Division 1, of the ASME B&PV Code; and the 2005 Addenda and 2006 Addenda of the ASME OM Code, and Code Cases N-722-1 and N-770-1. In addition, the final rule does not adopt ("excludes") certain provisions of the ASME Codes and this statement of considerations, and in the regulatory and backfit analysis for this rulemaking. The NRC believes 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(a)(3), requests for relief under § 50.55a(f) and (g), or requests for exemptions under 10 CFR 50.12 and/or 10 CFR 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 rulemaking (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 rulemaking 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 US voluntary consensus standards bodies for use within the US, 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. NRC evaluation of the 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 US voluntary consensus standard does not appear to substantially further the apparent underlying objectives of the NTTAA.

In summary, this final rulemaking satisfies the requirements of the Section 12(d)(3) of the NTTAA and Office of Management and Budget (OMB) Circular A 119.

VIII. Finding of No Significant Environmental Impact: Environmental Assessment

This final rule action is in accordance with the NRC's policy to incorporate by reference in 10 CFR 50.55a new editions and addenda of the ASME B&PV 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. ASME Codes are national

voluntary consensus standards and are required by the National Technology Transfer and Advancement Act of 1995, Pub. L. 104–113, 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 government 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. Sec. 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 final 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 final 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 Code Case N-770-1 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 Code Case N-770-1 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. The final rulemaking does not involve non-radiological plant effluents and has no other environmental impact. Therefore, no significant non-radiological

impacts are associated with this action. The determination of this final environmental assessment is that there will be no significant off-site impact to the public from this action.

IX. Paperwork Reduction Act Statement

This final rule decreases the overall burden on licensees by reducing the number of relief requests licensees would have to submit to the NRC under 10 CFR 50.55a(f)(5) and 10 CFR 50.55a(g)(5), but adds burden for 69 Pressurized Water Reactors (PWRs) to revise procedures and programs related to ASME Code Case N-770-1. The public burden reduction for these information collections is estimated to average -4 hours per response. Because the burden for this information collection is insignificant, Office of Management and Budget (OMB) clearance is not required. Existing requirements were approved by the Office of Management and Budget, approval number 3150-0011.

Public Protection Notification

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

X. Regulatory Analysis and Backfitting

The NRC prepared a document, “Regulatory Analysis and Backfit Considerations for Final Amendment 10 CFR 50.55a, “Codes and Standards””. The document provides the regulatory analysis for this final rule. It also addresses backfitting for the final rule and provides the basis for the NRC’s determination that the final rule does not constitute “backfitting” as defined in 10 CFR 50.109(a)(4). The analysis is available for review as indicated in Section VI,

“Availability of Documents,” of this document.

XI. Regulatory Flexibility Certification

Under the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the NRC certifies that this final rule does not impose a significant economical impact on a substantial number of small entities. This final rule affects only the licensing and operation of commercial nuclear power plants. A licensee who is a subsidiary of a large entity does not qualify as a small entity. The companies that own these plants are not "small entities" as defined in the Regulatory Flexibility Act or the size standards established by the NRC (10 CFR 2.810), as the companies:

- Provide services that are not engaged in manufacturing, and have average gross receipts of more than $6.5 million over their last 3 completed fiscal years, and have more than 500 employees;
- Are not governments of a city, county, town, township or village;
- Are not school districts or special districts with populations of less than 50; and
- Are not small educational institutions.

XII. Congressional Review Act

In accordance with the Congressional Review Act of 1996, the NRC has determined that this action is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs of the Office of Management and Budget.

List of Subjects in 10 CFR Part 50

Antitrust, Classified information, Criminal penalties, Fire protection, Incorporation by reference, Intergovernmental relations, Nuclear power plants and reactors, Radiation protection, Reactor siting criteria, Reporting and recordkeeping requirements.

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: Secs. 102, 103, 104, 105, 161, 182, 183, 186, 189, 68 Stat. 936, 937, 938, 948, 953, 954, 955, 956, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2132, 2133, 2134, 2135, 2201, 2232, 2233, 2236, 2239, 2282); secs. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); sec. 1704, 112 Stat. 2750 (44 U.S.C. 3504 note); Energy Policy Act of 2005, Pub. L. 109-58, 119 Stat. 194 (2005).

Section 50.7 also issued under Pub. L. 95-601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 102-486, sec. 2902, 106 Stat. 3123 (42 U.S.C. 5841), Section 50.10 also issued under secs. 101, 185, 68 Stat. 955, as amended (42 U.S.C. 2131, 2235); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.13, 50.54(dd), and 50.103 also issued under sec. 108, 68 Stat. 939, as amended (42 U.S.C. 2138).

Sections 50.23, 50.35, 50.55, and 50.56 also issued under sec. 185, 68 Stat. 955 (42 U.S.C. 2235). Sections 50.33a, 50.55a and Appendix Q also issued under sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332). Sections 50.34 and 50.54 also issued under sec. 204, 88 Stat. 1245 (42 U.S.C. 5844). Sections 50.58, 50.91, and 50.92 also issued under Pub. L. 97-415, 96 Stat. 2073 (42 U.S.C. 2239). Section 50.78 also issued under sec. 122, 68 Stat. 939 (42 U.S.C. 2152). Sections 50.80-50.81 also issued under sec. 184, 68 Stat. 954, as amended (42 U.S.C. 2234). Appendix F also issued under sec. 187, 68 Stat. 955 (42 U.S.C. 2237).

2. In § 50.55a:

a. Revise paragraph (a), the introductory text of paragraphs (b) and (b)(1), paragraphs

(b)(1)(ii), (b)(1)(iii), and (b)(1)(iv); and add paragraph (b)(1)(vii);

b. Revise paragraph (b)(2);

c. Revise the introductory text of paragraph (b)(3), paragraphs (b)(3)(v), (b)(3)(vi), (c)(3), (d)(2), (e)(2), (f)(2), (f)(3)(v), (f)(4), (f)(5)(iv), (g)(2), (g)(3), (g)(4), (g)(5)(iii), (g)(5)(iv), (g)(6)(ii)(B), (g)(6)(ii)(E)(*1*), (g)(6)(ii)(E)(*2*), and (g)(6)(ii)(E)(*3*);

d. Add paragraph (g)(6)(ii)(F); and

e. Revise footnote 1 to this section that appears after paragraph (h)(3).

The revisions and additions read as follows:

§ 50.55a Codes and standards.

* * * * *

(a) *Quality standards, ASME Codes and IEEE standards, and alternatives.*

(1) Structures, systems, and components must be designed, fabricated, erected, constructed, tested, and inspected to quality standards commensurate with the importance of the safety function to be performed.

(2) Systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the requirements of the ASME Boiler and Pressure Vessel Code specified in paragraphs (b), (c), (d), (e), (f), and (g) of this section. Protection systems of nuclear power reactors of all types must meet the requirements specified in paragraph (h) of this section.

(3) Proposed alternatives to the requirements of paragraphs (c), (d), (e), (f), (g), and (h) of this section, or portions thereof, may be used when authorized by the Director, Office of Nuclear Reactor Regulation, or Director, Office of New Reactors, as appropriate. Any proposed alternatives must be submitted and authorized prior to implementation. The applicant or licensee shall demonstrate that:

(i) The proposed alternatives would provide an acceptable level of quality and safety;

or

(ii) Compliance with the specified requirements of this section would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

(b) *Standards approved for incorporation by reference*. Systems and components of boiling and pressurized water cooled nuclear power reactors must meet the requirements of the following standards referenced in paragraphs (b)(1), (b)(2), (b)(3), (b)(4), (b)(5), and (b)(6) of this section: the ASME Boiler and Pressure Vessel Code, Section III, Division 1 (excluding Non-mandatory Appendices), and Section XI, Division 1; the ASME Code for Operation and Maintenance of Nuclear Power Plants; NRC Regulatory Guide (RG) 1.84, Revision 35, “Design, Fabrication, and Materials Code Case Acceptability, ASME Section III” (July 2010), RG 1.147, Revision 16, “Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1” (July 2010), and RG 1.192, ‘‘Operation and Maintenance Code Case Acceptability, ASME OM Code’’ (March 2003); and the following ASME Code Cases, approved with conditions by the NRC: 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’’ (ASME Approval Date: January 26, 2009), in accordance with the requirements in paragraph (g)(6)(ii)(E) of this section; N–729–1, ‘‘Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1’’ (ASME Approval Date: March 28, 2006), in accordance with the requirements in paragraph (g)(6)(ii)(D) of this section; and 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 W86182 Weld Filler Material With or Without Application of Listed Mitigation Activities, Section XI, Division 1," (ASME Approval Date: December 25, 2009), in accordance with the requirements in paragraph (g)(6)(ii)(F) of this section. These standards 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. Copies of the ASME Boiler and Pressure Vessel Code, the ASME Code for Operation and Maintenance of Nuclear Power Plants, ASME Code Case N–722-1, ASME Code Case N-729–1, and ASME Code Case N-770-1 may be purchased from the American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016 or through the Web http://www.asme.org/Codes/. Single copies of NRC Regulatory Guides 1.84, Revision 35; 1.147, Revision 16; and 1.192 may be obtained free of charge by writing the Reproduction and Distribution Services Section, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001; or by fax to 301–415–2289; or by e-mail to DISTRIBUTION.RESOURCE@nrc.gov. Copies of the ASME Codes and NRC Regulatory Guides incorporated by reference in this section may be inspected at the NRC Technical Library, Two White Flint North, 11545 Rockville Pike, Rockville, MD 20852–2738 or call 301–415–5610, 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) As used in this section, references to Section III refer to Section III of the ASME Boiler and Pressure Vessel Code, and include the 1963 Edition through 1973 Winter Addenda, and the 1974 Edition (Division 1) through the 2008 Addenda (Division 1), subject to the following conditions:

* * * * *

(ii) *Weld leg dimensions*. When applying the 1989 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(1) of this section, applicants or licensees may not apply subparagraphs NB-3683.4(c)(1) and NB-3683.4(c)(2) or Footnote 11

from the 1989 Addenda through the 2003 Addenda, or Footnote 13 from the 2004 Edition through the 2008 Addenda to Figures NC-3673.2(b)-1 and ND-3673.2(b)-1 for welds with leg size less than 1.09 t_n.

(iii) *Seismic design of piping*. Applicants or licensees may use Subarticles NB–3200, NB–3600, NC–3600, and ND–3600 for seismic design of piping, up to and including the 1993 Addenda, subject to the condition specified in paragraph (b)(1)(ii) of this section. Applicants or licensees may not use these subarticles for seismic design of piping in the 1994 Addenda through the 2005 Addenda incorporated by reference in paragraph (b)(1) of this section except that Subarticle NB-3200 in the 2004 Edition through the 2008 Addenda may be used by applicants and licensees subject to the condition in paragraph (b)(1)(iii)(B) of this section. Applicants or licensees may use Subarticles NB-3600, NC-3600 and ND-3600 for the seismic design of piping in the 2006 Addenda through the 2008 Addenda subject to the conditions of this paragraph corresponding to these subarticles.

(A) When applying Note (1) of Figure NB-3222-1 for Level B service limits, the calculation of P_b stresses must include reversing dynamic loads (including inertia earthquake effects) if evaluation of these loads is required by NB-3223(b).

(B) For Class 1 piping, the material and D_o/t requirements of NB-3656(b) shall be met for all Service Limits when the Service Limits include reversing dynamic loads, and the alternative rules for reversing dynamic loads are used.

(iv) *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 Facilities," 1986 Edition through the 1994 Edition, are acceptable for use, provided that the edition and addenda of NQA-1 specified in NCA-4000 is used in conjunction with the administrative, quality, and technical provisions contained in the edition and addenda of Section

III being used.

* * * * *

(vii) *Capacity certification and demonstration of function of incompressible-fluid pressure-relief valves*. When applying the 2006 Addenda through the 2007 Edition up to and including the 2008 Addenda, applicants and licensees may use paragraph NB-7742, except that paragraph NB-7742(a)(2) may not be used, and 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 which can be accommodated at the demonstration facility selected for the test.

(2) As used in this section, references to Section XI refer to Section XI, Division 1, of the ASME Boiler and Pressure Vessel Code, and include the 1970 Edition through the 1976 Winter Addenda, and the 1977 Edition through the 2007 Edition with the 2008 Addenda, subject to the following conditions:

(i) [Reserved]

(ii) *Pressure-retaining welds in ASME Code Class 1 piping (applies to Table IWB–2500 and IWB–2500–1 and Category B-J).* If the facility's application for a construction permit was docketed prior to July 1, 1978, the extent of examination for Code Class 1 pipe welds may be determined by the requirements of Table IWB–2500 and Table IWB–2600 Category B-J of Section XI of the ASME B&PV Code in the 1974 Edition and addenda through the Summer 1975 Addenda or other requirements the NRC may adopt.

(iii) [Reserved]

(iv) [Reserved]

(v) [Reserved]

(vi) *Effective edition and addenda of Subsection IWE and Subsection IWL, Section XI.* Applicants or licensees 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 (b)(2)(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.

(vii) *Section XI References to OM Part 4, OM Part 6 and OM Part 10 (Table IWA–1600-1).* When using Table IWA–1600–1, "Referenced Standards and Specifications," in the Section XI, Division 1, 1987 Addenda, 1988 Addenda, or 1989 Edition, the specified "Revision Date or Indicator" for ASME/ANSI OM Part 4, ASME/ANSI Part 6, and ASME/ANSI Part 10 must be the OMa–1988 Addenda to the OM–1987 Edition. These requirements have been incorporated into the OM Code which is incorporated by reference in paragraph (b)(3) of this section.

(viii) *Examination of concrete containments*. Applicants or licensees applying Subsection IWL, 1992 Edition with the 1992 Addenda, shall apply paragraphs (b)(2)(viii)(A) through (b)(2)(viii)(E) of this section. Applicants or licensees applying Subsection IWL, 1995 Edition with the 1996 Addenda, shall 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 shall apply paragraphs (b)(2)(viii)(E) and (b)(2)(viii)(F) of this section. Applicants or licensees applying Subsection IWL, 2001 Edition through the 2004 Edition, up to and including the 2006 Addenda, shall apply paragraphs (b)(2)(viii)(E) through (b)(2)(viii)(G) of this section. Applicants or licensees applying Subsection IWL, 2007 Edition through the latest edition and

addenda incorporated by reference in paragraph (b)(2) of this section, shall apply paragraph (b)(2)(viii)(E) of this section.

(A) Grease caps that are accessible must be visually examined to detect grease leakage or grease cap deformations. Grease caps must be removed for this examination when there is evidence of grease cap deformation that indicates deterioration of anchorage hardware.

(B) When evaluation of consecutive surveillances of prestressing forces for the same tendon or tendons in a group indicates a trend of prestress loss such that the tendon force(s) would be less than the minimum design prestress requirements before the next inspection interval, an evaluation must be performed and reported in the Engineering Evaluation Report as prescribed in IWL–3300.

(C) When the elongation corresponding to a specific load (adjusted for effective wires or strands) during retensioning of tendons differs by more than 10 percent from that recorded during the last measurement, an evaluation must be performed to determine whether the difference is related to wire failures or slip of wires in anchorage. A difference of more than 10 percent must be identified in the ISI Summary Report required by IWA–6000.

(D) The applicant or licensee shall report the following conditions, if they occur, in the ISI Summary Report required by IWA–6000:

(*1*) The sampled sheathing filler grease contains chemically combined water exceeding 10 percent by weight or the presence of free water;

(*2*) The absolute difference between the amount removed and the amount replaced exceeds 10 percent of the tendon net duct volume;

(*3*) Grease leakage is detected during general visual examination of the containment surface.

(E) For Class CC applications, the applicant or 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. For each inaccessible area identified, the applicant or licensee shall provide the following in the ISI Summary Report required by IWA-6000:

(*1*) A description of the type and estimated extent of degradation, and the conditions that led to the degradation;

(*2*) An evaluation of each area, and the result of the evaluation, and;

(*3*) A description of necessary corrective actions.

(F) Personnel that examine containment concrete surfaces and tendon hardware, wires, or strands must meet the qualification provisions in IWA–2300. The "owner-defined" personnel qualification provisions in IWL–2310(d) are not approved for use.

(G) Corrosion protection material must be restored following concrete containment post-tensioning system repair and replacement activities in accordance with the quality assurance program requirements specified in IWA–1400.

(ix) *Examination of metal containments and the liners of concrete containments*. Applicants or licensees applying Subsection IWE, 1992 Edition with the 1992 Addenda, or the 1995 Edition with the 1996 Addenda, shall satisfy the requirements of paragraphs (b)(2)(ix)(A) through (b)(2)(ix)(E) of this section. Applicants or licensees applying Subsection IWE, 1998 Edition through the 2001 Edition with the 2003 Addenda, shall satisfy the requirements of paragraphs (b)(2)(ix)(A), (b)(2)(ix)(B), and (b)(2)(ix)(F) through (b)(2)(ix)(I) of this section. Applicants or licensees applying Subsection IWE, 2004 Edition, up to and including the 2005 Addenda, shall satisfy the requirements of paragraphs (b)(2)(ix)(A), (b)(2)(ix)(B), and (b)(2)(ix)(F) through (b)(2)(ix)(H) of this section. Applicants or licensees applying Subsection

IWE, 2004 Edition with the 2006 Addenda, shall 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 addenda incorporated by reference in paragraph (b)(2) of this section, shall satisfy the requirements of paragraphs (b)(2)(ix)(A)(*2*), (b)(2)(ix)(B) and (b)(2)(ix)(J) of this section.

(A) For Class MC applications, the following apply to inaccessible areas.

(*1*) The applicant or 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.

(*2*) For each inaccessible area identified for evaluation, the applicant or licensee shall provide the following in the ISI Summary Report as required by IWA–6000:

(*i*) A description of the type and estimated extent of degradation, and the conditions that led to the degradation;

(*ii*) An evaluation of each area, and the result of the evaluation, and;

(*iii*) A description of necessary corrective actions.

(B) When performing remotely the visual examinations required by Subsection IWE, the maximum direct examination distance specified in Table IWA–2210–1 may be extended and the minimum illumination requirements specified in Table IWA–2210–1 may be decreased provided that the conditions or indications for which the visual examination is performed can be detected at the chosen distance and illumination.

(C) The examinations specified in Examination Category E-B, Pressure Retaining Welds, and Examination Category E-F, Pressure Retaining Dissimilar Metal Welds, are optional.

(D) This paragraph (b)(2)(ix)(D) may be used as an alternative to the requirements of IWE-2430.

(*1*) 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 which exceeds acceptance standards, the applicant or licensee shall provide the following in the ISI Summary Report required by IWA–6000:

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

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

(*iii*) A description of necessary corrective actions.

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

(E) A general visual examination as required by Subsection IWE must be performed once each period.

(F) VT–1 and VT–3 examinations must be conducted in accordance with IWA–2200. Personnel conducting examinations in accordance with the VT–1 or VT–3 examination method shall be qualified in accordance with IWA–2300. The “owner-defined” personnel qualification provisions in IWE–2330(a) for personnel that conduct VT–1 and VT–3 examinations are not approved for use.

(G) The VT–3 examination method must be used to conduct the examinations in Items E1.12 and E1.20 of Table IWE–2500–1, and the VT–1 examination method must be used to conduct the examination in Item E4.11 of Table IWE–2500–1. An examination of the pressure-retaining bolted connections in Item E1.11 of Table IWE–2500–1 using the VT–3 examination method must be conducted once each interval. The “owner-defined” visual

examination provisions in IWE–2310(a) are not approved for use for VT–1 and VT–3 examinations.

(H) Containment bolted connections that are disassembled during the scheduled performance of the examinations in Item E1.11 of Table IWE–2500–1 must be examined using the VT–3 examination method. Flaws or degradation identified during the performance of a VT-3 examination must be examined in accordance with the VT–1 examination method. The criteria in the material specification or IWB–3517.1 must be used to evaluate containment bolting flaws or degradation. As an alternative to performing VT–3 examinations of containment bolted connections that are disassembled during the scheduled performance of Item E1.11, VT–3 examinations of containment bolted connections may be conducted whenever containment bolted connections are disassembled for any reason.

(I) The ultrasonic examination acceptance standard specified in IWE–3511.3 for Class MC pressure-retaining components must also be applied to metallic liners of Class CC pressure-retaining components.

(J) In general, a repair/replacement activity such as replacing a large containment penetration, cutting a large construction opening in the containment pressure boundary to replace steam generators, reactor vessel heads, pressurizers, or other major equipment; or other similar modification is considered a major containment modification. When applying IWE-5000 to Class MC pressure-retaining components, any major containment modification or repair/replacement, must be followed by a Type A test to provide assurance of both containment structural integrity and leaktight integrity prior to returning to service, in accordance with 10 CFR 50, Appendix J, Option A or Option B on which the applicant's or licensee's Containment Leak-Rate Testing Program is based. When applying IWE-5000, if a Type A, B, or

C Test is performed, the test pressure and acceptance standard for the test must be in accordance with 10 CFR 50, Appendix J.

(x) *Quality assurance.* When applying Section XI editions and addenda later than the 1989 Edition, the requirements of NQA–1, “Quality Assurance Requirements for Nuclear Facilities,” 1979 Addenda through the 1989 Edition, are acceptable as permitted by IWA–1400 of Section XI, if the licensee uses its 10 CFR Part 50, Appendix B, quality assurance program, in conjunction with Section XI requirements. Commitments contained in the licensee's quality assurance program description that are more stringent than those contained in NQA–1 must govern Section XI activities. Further, where NQA–1 and Section XI do not address the commitments contained in the licensee's Appendix B quality assurance program description, the commitments must be applied to Section XI activities.

(xi) [Reserved]

(xii) *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 (b)(2) of this section, are not approved for use on irradiated material.

(xiii) [Reserved]

(xiv) *Appendix VIII personnel qualification.* All personnel qualified for performing ultrasonic examinations in accordance with Appendix VIII shall receive 8 hours of annual hands-on training on specimens that contain cracks. Licensees applying the 1999 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section may use the annual practice requirements in VII–4240 of Appendix VII of Section XI in place of the 8 hours of annual hands-on training provided that the supplemental practice is performed on material or welds that contain cracks, or by analyzing prerecorded data from material or welds

that contain cracks. In either case, training must be completed no earlier than 6 months prior to performing ultrasonic examinations at a licensee's facility.

(xv) *Appendix VIII specimen set and qualification requirements*. Licensees using Appendix VIII in the 1995 Edition through the 2001 Edition of the ASME Boiler and Pressure Vessel Code may elect to comply with all of the provisions in paragraphs (b)(2)(xv)(A) through (b)(2)(xv)(M) of this section, except for paragraph (b)(2)(xv)(F) of this section, which may be used at the licensee's option. Licensees using editions and addenda after 2001 Edition through the 2006 Addenda shall use the 2001 Edition of Appendix VIII, and may elect to comply with all of the provisions in paragraphs (b)(2)(xv)(A) through (b)(2)(xv)(M) of this section, except for paragraph (b)(2)(xv)(F) of this section, which may be used at the licensee's option.

(A) When applying Supplements 2, 3, and 10 to Appendix VIII, the following examination coverage criteria requirements must be used:

(*1*) Piping must be examined in two axial directions, and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available. Dissimilar metal welds must be examined axially and circumferentially.

(*2*) Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld. Dissimilar metal weld qualifications must be demonstrated from the austenitic side of the weld, and the qualification may be expanded for austenitic welds with no austenitic sides using a separate add-on performance demonstration. Dissimilar metal welds may be examined from either side of the weld.

(B) The following conditions must be used in addition to the requirements of Supplement 4 to Appendix VIII:

(*1*) Paragraph 3.1, Detection acceptance criteria—Personnel are qualified for detection if the results of the performance demonstration satisfy the detection requirements of ASME Section XI, Appendix VIII, Table VIII-S4-1 and no flaw greater than 0.25 inch through wall dimension is missed.

(*2*) Paragraph 1.1(c), Detection test matrix—Flaws smaller than the 50 percent of allowable flaw size, as defined in IWB–3500, need not be included as detection flaws. For procedures applied from the inside surface, use the minimum thickness specified in the scope of the procedure to calculate a/t. For procedures applied from the outside surface, the actual thickness of the test specimen is to be used to calculate a/t.

(C) When applying Supplement 4 to Appendix VIII, the following conditions must be used:

(*1*) A depth sizing requirement of 0.15 inch RMS must be used in lieu of the requirements in Subparagraphs 3.2(a) and 3.2(c), and a length sizing requirement of 0.75 inch RMS must be used in lieu of the requirement in Subparagraph 3.2(b).

(*2*) In lieu of the location acceptance criteria requirements of Subparagraph 2.1(b), a flaw will be considered detected when reported within 1.0 inch or 10 percent of the metal path to the flaw, whichever is greater, of its true location in the X and Y directions.

(*3*) In lieu of the flaw type requirements of Subparagraph 1.1(e)(1), a minimum of 70 percent of the flaws in the detection and sizing tests shall be cracks. Notches, if used, must be limited by the following:

(*i*) Notches must be limited to the case where examinations are performed from the clad surface.

(*ii*) Notches must be semielliptical with a tip width of less than or equal to 0.010 inches.

(*iii*) Notches must be perpendicular to the surface within ±2 degrees.

(*4*) In lieu of the detection test matrix requirements in paragraphs 1.1(e)(2) and 1.1(e)(3), personnel demonstration test sets must contain a representative distribution of flaw orientations, sizes, and locations.

(D) The following conditions must be used in addition to the requirements of Supplement 6 to Appendix VIII:

(*1*) Paragraph 3.1, Detection Acceptance Criteria—Personnel are qualified for detection if:

(*i*) No surface connected flaw greater than 0.25 inch through wall has been missed.

(*ii*) No embedded flaw greater than 0.50 inch through wall has been missed.

(*2*) Paragraph 3.1, Detection Acceptance Criteria—For procedure qualification, all flaws within the scope of the procedure are detected.

(*3*) Paragraph 1.1(b) for detection and sizing test flaws and locations—Flaws smaller than the 50 percent of allowable flaw size, as defined in IWB–3500, need not be included as detection flaws. Flaws which are less than the allowable flaw size, as defined in IWB–3500, may be used as detection and sizing flaws.

(*4*) Notches are not permitted.

(E) When applying Supplement 6 to Appendix VIII, the following conditions must be used:

(*1*) A depth sizing requirement of 0.25 inch RMS must be used in lieu of the requirements of subparagraphs 3.2(a), 3.2(c)(2), and 3.2(c)(3).

(*2*) In lieu of the location acceptance criteria requirements in Subparagraph 2.1(b), a flaw will be considered detected when reported within 1.0 inch or 10 percent of the metal path to the flaw, whichever is greater, of its true location in the X and Y directions.

(*3*) In lieu of the length sizing criteria requirements of Subparagraph 3.2(b), a length sizing acceptance criteria of 0.75 inch RMS must be used.

(*4*) In lieu of the detection specimen requirements in Subparagraph 1.1(e)(1), a minimum of 55 percent of the flaws must be cracks. The remaining flaws may be cracks or fabrication type flaws, such as slag and lack of fusion. The use of notches is not allowed.

(*5*) In lieu of paragraphs 1.1(e)(2) and 1.1(e)(3) detection test matrix, personnel demonstration test sets must contain a representative distribution of flaw orientations, sizes, and locations.

(F) The following conditions may be used for personnel qualification for combined Supplement 4 to Appendix VIII and Supplement 6 to Appendix VIII qualification. Licensees choosing to apply this combined qualification shall apply all of the provisions of Supplements 4 and 6 including the following conditions:

(*1*) For detection and sizing, the total number of flaws must be at least 10. A minimum of 5 flaws shall be from Supplement 4, and a minimum of 50 percent of the flaws must be from Supplement 6. At least 50 percent of the flaws in any sizing must be cracks. Notches are not acceptable for Supplement 6.

(*2*) Examination personnel are qualified for detection and length sizing when the results of any combined performance demonstration satisfy the acceptance criteria of Supplement 4 to Appendix VIII.

(*3*) Examination personnel are qualified for depth sizing when Supplement 4 to Appendix VIII and Supplement 6 to Appendix VIII flaws are sized within the respective acceptance criteria of those supplements.

(G) When applying Supplement 4 to Appendix VIII, Supplement 6 to Appendix VIII, or combined Supplement 4 and Supplement 6 qualification, the following additional conditions must be used, and examination coverage must include:

(*1*) The clad to base metal interface, including a minimum of 15 percent T (measured from the clad to base metal interface), must be examined from four orthogonal directions using procedures and personnel qualified in accordance with Supplement 4 to Appendix VIII.

(*2*) If the clad-to-base-metal-interface procedure demonstrates detectability of flaws with a tilt angle relative to the weld centerline of at least 45 degrees, the remainder of the examination volume is considered fully examined if coverage is obtained in one parallel and one perpendicular direction. This must be accomplished using a procedure and personnel qualified for single-side examination in accordance with Supplement 6. Subsequent examinations of this volume may be performed using examination techniques qualified for a tilt angle of at least 10 degrees.

(*3*) The examination volume not addressed by paragraph (b)(2)(xv)(G)(*1*) of this section is considered fully examined if coverage is obtained in one parallel and one perpendicular direction, using a procedure and personnel qualified for single sided examination when the conditions in paragraph (b)(2)(xv)(G)(*2*) are met.

(H) When applying Supplement 5 to Appendix VIII, at least 50 percent of the flaws in the demonstration test set must be cracks and the maximum mis-orientation must be demonstrated with cracks. Flaws in nozzles with bore diameters equal to or less than 4 inches may be notches.

(I) When applying Supplement 5, Paragraph (a), to Appendix VIII, the number of false calls allowed must be D/10, with a maximum of 3, where D is the diameter of the nozzle.

(J) [Reserved]

(K) When performing nozzle-to-vessel weld examinations, the following conditions must be used when the requirements contained in Supplement 7 to Appendix VIII are applied for nozzle-to-vessel welds in conjunction with Supplement 4 to Appendix VIII, Supplement 6 to Appendix VIII, or combined Supplement 4 and Supplement 6 qualification.

(*1*) For examination of nozzle-to-vessel welds conducted from the bore, the following conditions are required to qualify the procedures, equipment, and personnel:

(*i*) For detection, a minimum of four flaws in one or more full-scale nozzle mock-ups must be added to the test set. The specimens must comply with Supplement 6, paragraph 1.1, to Appendix VIII, except for flaw locations specified in Table VIII S6–1. Flaws may be notches, fabrication flaws or cracks. Seventy-five (75) percent of the flaws must be cracks or fabrication flaws. Flaw locations and orientations must be selected from the choices shown in paragraph (b)(2)(xi)(K)(*4*) of this section, Table VIII-S7-1—Modified, with the exception that flaws in the outer eighty-five (85) percent of the weld need not be perpendicular to the weld. There may be no more than two flaws from each category, and at least one subsurface flaw must be included.

(*ii*) For length sizing, a minimum of four flaws as in paragraph (b)(2)(xv)(K)(*1*)(*i*) of this section must be included in the test set. The length sizing results must be added to the results of combined Supplement 4 to Appendix VIII and Supplement 6 to Appendix VIII. The combined results must meet the acceptance standards contained in paragraph (b)(2)(xv)(E)(*3*) of this section.

(*iii*) For depth sizing, a minimum of four flaws as in paragraph (b)(2)(xv)(K)(*1*)(*i*) of this section must be included in the test set. Their depths must be distributed over the ranges of

Supplement 4, Paragraph 1.1, to Appendix VIII, for the inner 15 percent of the wall thickness and Supplement 6, Paragraph 1.1, to Appendix VIII, for the remainder of the wall thickness. The depth sizing results must be combined with the sizing results from Supplement 4 to Appendix VIII for the inner 15 percent and to Supplement 6 to Appendix VIII for the remainder of the wall thickness. The combined results must meet the depth sizing acceptance criteria contained in paragraphs (b)(2)(xv)(C)(*1*), (b)(2)(xv)(E)(*1*), and (b)(2)(xv)(F)(*3*) of this section.

(*2*) For examination of reactor pressure vessel nozzle-to-vessel welds conducted from the inside of the vessel,

(*i*) The clad to base metal interface and the adjacent examination volume to a minimum depth of 15 percent T (measured from the clad to base metal interface) must be examined from four orthogonal directions using a procedure and personnel qualified in accordance with Supplement 4 to Appendix VIII as conditioned by paragraphs (b)(2)(xv)(B) and (b)(2)(xv)(C) of this section.

(*ii*) When the examination volume defined in paragraph (b)(2)(xi)(K)(*2*)(*i*) of this section cannot be effectively examined in all four directions, the examination must be augmented by examination from the nozzle bore using a procedure and personnel qualified in accordance with paragraph (b)(2)(xi)(K)(*1*) of this section.

(*iii*) The remainder of the examination volume not covered by paragraph (b)(2)(xv)(K)(*2*)(*ii*) of this section or a combination of paragraphs (b)(2)(xv)(K)(*2*)(i) and (b)(2)(xv)(K)(*2*)(*ii*) of this section, must be examined from the nozzle bore using a procedure and personnel qualified in accordance with paragraph (b)(2)(xv)(K)(*1*) of this section, or from the vessel shell using a procedure and personnel qualified for single sided examination in accordance with Supplement 6 to Appendix VIII, as conditioned by paragraphs (b)(2)(xv)(D) through (b)(2)(xv)(G) of this section.

(*3*) For examination of reactor pressure vessel nozzle-to-shell welds conducted from the outside of the vessel,

(*i*) The clad to base metal interface and the adjacent metal to a depth of 15 percent T, (measured from the clad to base metal interface) must be examined from one radial and two opposing circumferential directions using a procedure and personnel qualified in accordance with Supplement 4 to Appendix VIII, as conditioned by paragraphs (b)(2)(xv)(B) and (b)(2)(xv)(C) of this section, for examinations performed in the radial direction, and Supplement 5 to Appendix VIII, as conditioned by paragraph (b)(2)(xv)(J) of this section, for examinations performed in the circumferential direction.

(*ii*) The examination volume not addressed by paragraph (b)(2)(xv)(K)(*3*)(*i*) of this section must be examined in a minimum of one radial direction using a procedure and personnel qualified for single sided examination in accordance with Supplement 6 to Appendix VIII, as conditioned by paragraphs (b)(2)(xv)(D) through (b)(2)(xv)(G) of this section.

(*4*) Table VIII-S7-1, “Flaw Locations and Orientations,” Supplement 7 to Appendix VIII, is conditioned as follows:

Table VIII-S7-1—Modified

Flaw Locations and Orientations		
	Parallel to weld	**Perpendicular to weld**
Inner 15 percent	X	X
OD Surface	X	
Subsurface	X	

(L) As a condition to the requirements of Supplement 8, Subparagraph 1.1(c), to Appendix VIII, notches may be located within one diameter of each end of the bolt or stud.

(M) When implementing Supplement 12 to Appendix VIII, only the provisions related to the coordinated implementation of Supplement 3 to Supplement 2 performance demonstrations are to be applied.

(xvi) *Appendix VIII single side ferritic vessel and piping and stainless steel piping examination.* When applying editions and addenda prior to the 2007 Edition of Section XI, the following conditions apply.

(A) Examinations performed from one side of a ferritic vessel weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single side examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as conditioned by this paragraph and paragraphs (b)(2)(xv)(B) through (b)(2)(xv)(G) of this section, on specimens containing flaws with non-optimum sound energy reflecting characteristics or flaws similar to those in the vessel being examined.

(B) Examinations performed from one side of a ferritic or stainless steel pipe weld must be conducted with equipment, procedures, and personnel that have demonstrated proficiency with single side examinations. To demonstrate equivalency to two sided examinations, the demonstration must be performed to the requirements of Appendix VIII as conditioned by this paragraph and paragraph (b)(2)(xv)(A) of this section.

(xvii) *Reconciliation of quality requirements.* When purchasing replacement items, in addition to the reconciliation provisions of IWA–4200, 1995 Addenda through 1998 Edition, the replacement items must be purchased, to the extent necessary, in accordance with the licensee's quality assurance program description required by 10 CFR 50.34(b)(6)(ii).

(xviii) *Certification of NDE personnel.* (A) Level I and II nondestructive examination personnel shall be recertified on a 3-year interval in lieu of the 5-year interval specified in the

1997 Addenda and 1998 Edition of IWA–2314, and IWA–2314(a) and IWA–2314(b) of the 1999 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section.

(B) When applying editions and addenda prior to the 2007 Edition of Section XI, paragraph IWA-2316 may only be used to qualify personnel that observe leakage during system leakage and hydrostatic tests conducted in accordance with IWA 5211(a) and (b).

(C) When applying editions and addenda prior to the 2005 Addenda of Section XI, licensee's qualifying visual examination personnel for VT-3 visual examination under paragraph IWA-2317 of Section XI, must demonstrate the proficiency of the training by administering an initial qualification examination and administering subsequent examinations on a 3-year interval.

(xix) *Substitution of alternative methods*. The provisions for substituting alternative examination methods, a combination of methods, or newly developed techniques in the 1997 Addenda of IWA-2240 must be applied when using the 1998 Edition through the 2004 Edition of Section XI of the ASME B&PV Code. The provisions in IWA-4520(c), 1997 Addenda through the 2004 Edition, allowing the substitution of alternative methods, a combination of methods, or newly developed techniques for the methods specified in the Construction Code are not approved for use. The provisions in IWA-4520(b)(2) and IWA-4521 of the 2008 Addenda through the latest edition and addenda approved in paragraph (b)(2) of this section, allowing the substitution of ultrasonic examination for radiographic examination specified in the Construction Code are not approved for use.

(xx) *System leakage tests.*

(A) When performing system leakage tests in accordance with IWA–5213(a), 1997 through 2002 Addenda, the licensee shall maintain a 10-minute hold time after test pressure has been reached for Class 2 and Class 3 components that are not in use during normal

operating conditions. No hold time is required for the remaining Class 2 and Class 3 components provided that the system has been in operation for at least 4 hours for insulated components or 10 minutes for uninsulated components.

(B) The NDE provision in IWA–4540(a)(2) of the 2002 Addenda of Section XI must be applied when performing system leakage tests after repair and replacement activities performed by welding or brazing on a pressure retaining boundary using the 2003 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section.

(xxi) *Table IWB–2500–1 examination requirements.*

(A) 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 (b)(2) of this section. A visual examination with magnification that has a resolution sensitivity to detect a 1-mil width wire or crack, utilizing the allowable flaw length criteria in Table IWB-3512-1, 1997 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(2) 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.

(B) [Reserved]

(xxii) *Surface examination.* The use of the provision in IWA–2220, “Surface Examination,” of Section XI, 2001 Edition through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section, that allow use of an ultrasonic examination method is prohibited.

(xxiii) *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 latest edition and addenda incorporated by reference in paragraph (b)(2) of this section are prohibited.

(xxiv) *Incorporation of the performance demonstration initiative and addition of ultrasonic examination criteria*. The use of Appendix VIII and the supplements to Appendix VIII and Article I-3000 of Section XI of the ASME B&PV Code, 2002 Addenda through the 2006 Addenda is prohibited.

(xxv) *Mitigation of defects by modification.* The use of the provisions in IWA–4340, "Mitigation of Defects by Modification," Section XI, 2001 Edition through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section are prohibited.

(xxvi) *Pressure testing Class 1, 2, and 3 mechanical joints.* The repair and replacement activity provisions in IWA–4540(c) of the 1998 Edition of Section XI for pressure testing Class 1, 2, and 3 mechanical joints must be applied when using the 2001 Edition through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section.

(xxvii) *Removal of insulation*. When performing visual examination in accordance with IWA-5242 of Section XI of the ASME B&PV Code, 2003 Addenda through the 2006 Addenda, or IWA-5241 of the 2007 Edition through the latest edition and addenda incorporated in paragraph (b)(2) of this section, insulation must be removed from 17-4 PH or 410 stainless steel studs or bolts aged at a temperature below 1100°F or having a Rockwell Method C hardness value above 30, and from A-286 stainless steel studs or bolts preloaded to 100,000 pounds per square inch or higher.

(xxviii) *Analysis of flaws*. Licensees using ASME B&PV Code, Section XI, Appendix A shall use the following conditions when implementing Equation (2) in A-4300(b)(1):

For $R < 0$, ΔK_I depends on the crack depth (a), and the flow stress (σ_f). The flow

stress is defined by $\sigma_f = ½(\sigma_{ys} + \sigma_{ult})$, where σ_{ys} is the yield strength and σ_{ult} is the ultimate tensile strength in units ksi (MPa) and a is in units in. (mm). For $-2 \leq R \leq 0$ and $K_{max} - K_{min} \leq 0.8 \times 1.12 \sigma_f \sqrt{(\pi a)}$, S = 1 and $\Delta K_I = K_{max}$. For $R < -2$ and $K_{max} - K_{min} \leq 0.8 \times 1.12 \sigma_f \sqrt{(\pi a)}$, S = 1 and $\Delta K_I = (1-R) K_{max} /3$. For $R < 0$ and $K_{max} - K_{min} > 0.8 \times 1.12 \sigma_f \sqrt{(\pi a)}$, S = 1 and $\Delta K_I = K_{max} - K_{min}$.

(xxix) *Nonmandatory Appendix R.* Nonmandatory Appendix R, "Risk-Informed Inspection Requirements for Piping," of Section XI, 2005 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section, may not be implemented without prior NRC authorization of the proposed alternative in accordance with paragraph (a)(3)(i) of this section.

(3) As used in this section, references to the OM Code refer to the ASME *Code for Operation and Maintenance of Nuclear Power Plants*, Subsections ISTA, ISTB, ISTC, and ISTD, Mandatory Appendices I and II, and Nonmandatory Appendices A through H and J, and include the 1995 Edition through the 2006 Addenda subject to the following conditions:

* * * * *

(v) *Subsection ISTD.* Article IWF-5000, "Inservice Inspection Requirements for Snubbers," of the ASME B&PV Code, Section XI, must be used when performing inservice inspection examinations and tests of snubbers at nuclear power plants, except as conditioned in paragraphs (b)(3)(v)(A) and (b)(3)(v)(B) of this section.

(A) Licensees may use Subsection ISTD, "Preservice and Inservice Examination and Testing of Dynamic Restraints (Snubbers) in Light-Water Reactor Power Plants," ASME OM Code, 1995 Edition through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section, in place of the requirements for snubbers in the editions and addenda up to the 2005 Addenda of the ASME B&PV Code, Section XI, IWF-5200(a) and (b)

and IWF-5300(a) and (b), by making appropriate changes to their technical specifications or licensee-controlled documents. Preservice and inservice examinations must be performed using the VT-3 visual examination method described in IWA-2213.

(B) Licensees shall comply with the provisions for examining and testing snubbers in Subsection ISTD of the ASME OM Code and make appropriate changes to their technical specifications or licensee-controlled documents when using the 2006 Addenda and later editions and addenda of Section XI of the ASME B&PV Code.

(vi) *Exercise interval for manual valves.* Manual valves must be exercised on a 2-year interval rather that the 5-year interval specified in paragraph ISTC-3540 of the 1999 through the 2005 Addenda of the ASME OM Code, provided that adverse conditions do not require more frequent testing.

* * * * *

(c) * * *

(3) The Code edition, addenda, and optional ASME Code cases to be applied to components of the reactor coolant pressure boundary must be determined by the provisions of paragraph NCA-1140, Subsection NCA of Section III of the ASME Boiler and Pressure Vessel Code, subject to the following conditions:

(i) The edition and addenda applied to a component must be those which are incorporated by reference in paragraph (b)(1) of this section;

(ii) The ASME Code provisions applied to the pressure vessel may be dated no earlier than the Summer 1972 Addenda of the 1971 edition;

(iii) The ASME Code provisions applied to piping, pumps, and valves may be dated no earlier than the Winter 1972 Addenda of the 1971 edition; and

(iv) The optional Code cases applied to a component must be those listed in NRC Regulatory Guide 1.84 that is incorporated by reference in paragraph (b) of this section.

* * * * *

(d) * * *

(2) The Code edition, addenda, and optional ASME Code cases to be applied to the systems and components identified in paragraph (d)(1) of this section must be determined by the rules of paragraph NCA-1140, Subsection NCA of Section III of the ASME Boiler and Pressure Vessel Code, subject to the following conditions:

(i) The edition and addenda must be those which are incorporated by reference in paragraph (b)(1) of this section;

(ii) The ASME Code provisions applied to the systems and components may be dated no earlier than the 1980 Edition; and

(iii) The optional Code cases must be those listed in the NRC Regulatory Guide 1.84 that is incorporated by reference in paragraph (b) of this section.

(e) * * *

(2) The Code edition, addenda, and optional ASME Code cases to be applied to the systems and components identified in paragraph (e)(1) of this section must be determined by

the rules of paragraph NCA-1140, subsection NCA of Section III of the ASME Boiler and Pressure Vessel Code, subject to the following conditions:

(i) The edition and addenda must be those which are incorporated by reference in paragraph (b)(1) of this section;

(ii) The ASME Code provisions applied to the systems and components may be dated no earlier than the 1980 Edition; and

(iii) The optional Code cases must be those listed in NRC Regulatory Guide 1.84 that is incorporated by reference in paragraph (b) of this section.

(f) * * *

(2) 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 which are classified as ASME 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 Boiler and Pressure Vessel Code incorporated by reference in paragraph (b) of this section (or the optional ASME Code cases listed in NRC Regulatory Guide 1.147, Revision 16, or Regulatory Guide 1.192 that are incorporated by reference in paragraph (b) of this section) 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 which are incorporated by reference in paragraph (b) of this section (or the optional ASME Code Cases listed in NRC Regulatory Guide 1.147, Revision 16,

or Regulatory Guide 1.192 that are incorporated by reference in paragraph (b) of this section), subject to the applicable conditions listed therein.

(3) * * *

(v) All pumps and valves may meet the test requirements set forth in subsequent editions of codes and addenda or portions thereof which are incorporated by reference in paragraph (b) of this section, subject to the conditions listed in paragraph (b) of this section.

(4) Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, pumps and valves which are classified as ASME Code Class 1, Class 2, and Class 3 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 (f)(3) of this section and that are incorporated by reference in paragraph (b) of this section, to the extent practical within the limitations of design, geometry and materials of construction of the components.

(i) 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 Code incorporated by reference in paragraph (b) 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 fuel under a combined license under Part 52 of this chapter (or the optional ASME Code cases listed in NRC Regulatory Guide 1.192, that is incorporated by reference in paragraph (b) of this section), subject to the conditions listed in paragraph (b) of this section.

(ii) 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 Code incorporated by reference in paragraph (b) 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, Revision 16, or Regulatory Guide 1.192 that are incorporated by reference in paragraph (b) of this section), subject to the conditions listed in paragraph (b) of this section.

(iii) [Reserved]

(iv) Inservice tests of pumps and valves may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of this section, subject to the conditions listed in paragraph (b) of this section, and subject to NRC approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met.

(5) * * *

(iv) Where a pump or valve test requirement by the code or addenda is determined to be impractical by the licensee and is not included in the revised inservice test program as permitted by paragraph (f)(4) of this section, the basis for this determination must be submitted for NRC review and approval not later than 12 months after the expiration of the initial 120-month interval of operation from start of facility commercial operation and each subsequent 120-month interval of operation during which the test is determined to be impractical.

* * * * *

(g) * * *

(2) 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 (including supports) which are classified as ASME Code Class 1 and Class 2 must be designed and be provided with access to enable the performance of inservice examination of such components (including supports) and must meet the preservice examination requirements set forth in editions and addenda of Section III or Section XI of the ASME B&PV Code (or ASME OM Code for snubber examination and testing) incorporated by reference in paragraph (b) of this section (or the optional ASME code cases listed in NRC Regulatory Guide 1.147, Revision 16, that are incorporated by reference in paragraph (b) of this section) in effect six months before the date of issuance of the construction permit. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of this Code which are incorporated by reference in paragraph (b) of this section (or the optional ASME code cases listed in NRC Regulatory Guide 1.147, Revision 16, when using Section XI, or Regulatory Guide 1.192 when using the OM Code, that are incorporated by reference in paragraph (b) of this section), subject to the applicable conditions.

(3) 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:

(i) Components (including supports) which are classified as ASME Code Class 1 must be designed and provided with access to enable the performance of inservice examination of these components and must meet the preservice examination requirements set forth in the editions and addenda of Section III or Section XI of the ASME B&PV Code (or ASME OM Code for snubber examination and testing) incorporated by reference in paragraph (b) of this section (or the optional ASME code cases listed in NRC Regulatory Guide 1.147, Revision 16, when

using Section XI, or Regulatory Guide 1.192 when using the OM Code, that are incorporated by reference in paragraph (b) of this section) applied to the construction of the particular component.

(ii) Components which are classified as ASME Code Class 2 and Class 3 and supports for components which are classified as ASME Code Class 1, Class 2, and Class 3 must be designed and be provided with access to enable the performance of inservice examination of these components and must meet the preservice examination requirements set forth in the editions and addenda of Section III or Section XI of the ASME B&PV Code (or ASME OM Code for snubber examination and testing) incorporated by reference in paragraph (b) of this section (or the optional ASME code cases listed in NRC Regulatory Guide 1.147, Revision 16, when using Section XI; or Regulatory Guide 1.192 when using the OM Code, that are incorporated by reference in paragraph (b) of this section) applied to the construction of the particular component.

(iii)--(iv) [Reserved]

(v) All components (including supports) may meet the requirements set forth in subsequent editions of codes and addenda or portions thereof which are incorporated by reference in paragraph (b) of this section, subject to the conditions listed therein.

(4) Throughout the service life of a boiling or pressurized water-cooled nuclear power facility, components (including supports) which are classified as ASME Code Class 1, Class 2, and Class 3 must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of editions and addenda of the ASME B&PV Code (or ASME OM Code for snubber examination and testing) that become effective subsequent to editions specified in paragraphs (g)(2) and (g)(3) of this section and that are incorporated by reference in paragraph (b) of this section, to the extent practical within the

limitations of design, geometry and materials of construction of the components. Components which are classified as Class MC pressure retaining components and their integral attachments, and components which are classified as Class CC pressure retaining components and their integral attachments must meet the requirements, except design and access provisions and preservice examination requirements, set forth in Section XI of the ASME B&PV Code and addenda that are incorporated by reference in paragraph (b) of this section, subject to the condition listed in paragraph (b)(2)(vi) of this section and the conditions listed in paragraphs (b)(2)(viii) and (b)(2)(ix) of this section, to the extent practical within the limitation of design, geometry and materials of construction of the components.

(i) Inservice examinations 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 Code incorporated by reference in paragraph (b) 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, through Revision 16, when using Section XI; or Regulatory Guide 1.192 when using the OM Code, that are incorporated by reference in paragraph (b) of this section), subject to the conditions listed in paragraph (b) of this section.

(ii) 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 Code incorporated by reference in paragraph (b) 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, Revision 16, that are incorporated by reference in paragraph (b) 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 [**Insert date that is 30 days after the date of publication in the Federal Register**] may delay the update of their Appendix VIII program by up to 18 months after [**Insert date that is 30 days after the date of publication in the Federal Register**].

(iii) When applying editions and addenda prior to the 2003 Addenda of Section XI of the ASME B&PV Code licensees may, but are not required to, perform the surface examinations of high-pressure safety injection systems specified in Table IWB-2500-1, Examination Category B-J, Item Numbers B9.20, B9.21 and B9.22.

(iv) Inservice examination of components and system pressure tests may meet the requirements set forth in subsequent editions and addenda that are incorporated by reference in paragraph (b) of this section, subject to the conditions listed in paragraph (b) of this section, and subject to Commission approval. Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met.

(v) For a boiling or pressurized water-cooled nuclear power facility whose construction permit under this part or combined license under Part 52 of this chapter was issued after January 1, 1956:

(A) Metal containment pressure retaining components and their integral attachments must meet the inservice inspection, repair, and replacement requirements applicable to components which are classified as ASME Code Class MC;

(B) Metallic shell and penetration liners which are pressure retaining components and their integral attachments in concrete containments must meet the inservice inspection, repair, and replacement requirements applicable to components which are classified as ASME Code Class MC; and

(C) Concrete containment pressure retaining components and their integral attachments, and the post-tensioning systems of concrete containments must meet the inservice inspections, repair, and replacement requirements applicable to components which are classified as ASME Code Class CC.

(5) * * *

(iii) If the licensee has determined that conformance with a code requirement is impractical for its facility, the licensee shall notify the NRC and submit, as specified in § 50.4, information to support the determinations. Determinations of impracticality in accordance with this section must be based on the demonstrated limitations experienced when attempting to comply with the code requirements during the inservice inspection interval for which the request is being submitted. Requests for relief made in accordance with this section must be submitted to the NRC no later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought.

(iv) Where the licensee determines that an examination required by Code edition or addenda is impractical, the basis for this determination must be submitted for NRC review and approval not later than 12 months after the expiration of the initial or subsequent 120-month inspection interval for which relief is sought.

(6) * * *

(ii) * * *

(B) Licensees do not have to submit to the NRC for approval of their containment inservice inspection programs which were developed to satisfy the requirements of Subsection IWE and Subsection IWL with specified conditions. The program elements and the required documentation must be maintained on site for audit.

* * * * *

(E) * * *

(*1*) All licensees of pressurized water reactors shall augment their inservice inspection program by implementing ASME Code Case N-722-1 subject to the conditions specified in paragraphs (g)(6)(ii)(E)(*2*) through (g)(6)(ii)(E)(*4*) of this section. The inspection requirements of ASME Code Case N-722-1 do not apply to components with pressure retaining welds fabricated with Alloy 600/82/182 materials that have been mitigated by weld overlay or stress improvement.

(*2*) If a visual examination determines that leakage is occurring from a specific item listed in Table 1 of ASME Code Case N-722-1 that is not exempted by the ASME Code, Section XI, IWB–1220(b)(1), additional actions must be performed to characterize the location, orientation, and length of crack(s) in Alloy 600 nozzle wrought material and location, orientation, and length of crack(s) in Alloy 82/182 butt welds. Alternatively, licensees may replace the Alloy 600/82/182 materials in all the components under the item number of the leaking component.

(*3*) If the actions in paragraph (g)(6)(ii)(E)(*2*) of this section determine that a flaw is circumferentially oriented and potentially a result of primary water stress corrosion cracking, licensees shall perform non-visual NDE inspections of components that fall under that ASME Code Case N-722-1 item number. The number of components inspected must equal or exceed the number of components found to be leaking under that item number. If circumferential cracking is identified in the sample, non-visual NDE must be performed in the remaining components under that item number.

* * * * *

(F) *Examination requirements for class 1 piping and nozzle dissimilar-metal butt welds.*

(*1*) Licensees of existing, operating pressurized-water reactors as of [**Insert date that is 30 days after the date of publication in the Federal Register**] shall implement the requirements of ASME Code Case N-770-1, subject to the conditions specified in paragraphs (g)(6)(ii)(F)*(2)* through (g)(6)(ii)(F)*(10)* of this section, by the first refueling outage after [**Insert date that is 60 days after the date of publication in the Federal Register**].

(*2*) Full structural weld overlays authorized by the NRC staff may be categorized as Inspection Items C or F, as appropriate; welds that have been mitigated by the Mechanical Stress Improvement Process (MSIP^{TM}) 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 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 until an alternative code case Inspection Item is used based on conformance with an ASME mitigation code case endorsed in Regulatory Guide 1.147 with conditions, if applicable, and incorporated in this section.

(*3*) Baseline examinations for welds in Table 1, Inspection Items A–1, A–2, and B, shall be completed by the end of the next refueling outage after [**Insert date that is 6 months and 30 days after the date of publication in the Federal Register**]. Previous examinations of these welds can be credited for baseline examinations if they were performed within the re-inspection period for the weld item in Table 1 using Section XI, Appendix VIII requirements and met the Code required examination volume of essentially 100 percent. Other previous examinations that do not meet these requirements can be used to meet the baseline examination requirement, provided NRC approval of alternative inspection requirements in

accordance with paragraphs (a)(3)(i) or (a)(3)(ii) of this section is granted prior to the end of the next refueling outage after [**Insert date that is 6 months and 30 days after the date of publication in the Federal Register**].

(*4*) The axial examination coverage requirements of -2500(c) may not be considered to be satisfied unless essentially 100 percent coverage is achieved.

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

(*6*) 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 cause 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*) For Inspection Items G, H, J, and K, when applying the acceptance standards of ASME B&PV 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*) Welds mitigated by optimized weld overlays in Inspection Items D and E are not permitted to be placed into a population to be examined on a sample basis and must be examined once each inspection interval.

(*9*) Replace the first two sentences of Extent and Frequency of Examination for Inspection Item D in Table 1 of Code Case N-770-1 with, "Examine all welds no sooner than the

third refueling outage and no later than 10 years following stress improvement application." Replace the first two sentences of Note (11)(b)(2) in Code Case N-770-1 with, “The first examination following weld inlay, onlay, weld overlay, or stress improvement for Inspection Items D through K shall be performed as specified.”

(*10*) Note (2) to Figure 5(a) of Code Case N-770-1 pertaining to alternative examination volume for optimized weld overlays may not be applied unless NRC approval is authorized under paragraphs (a)(3)(i) or (a)(3)(ii) of this section.

* * * * *

[1] For inspections to be conducted once per interval, the inspections shall be performed in accordance with the schedule in Section XI, paragraph IWB-2400, except for plants with inservice inspection programs based on a Section XI edition or addenda prior to the 1994 Addenda. For plants with inservice inspection programs based on a Section XI edition or addenda prior to the 1994 Addenda, the inspection shall be performed in accordance with the schedule in Section XI, paragraph IWB-2400, of the 1994 Addenda.

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Dated at Rockville, Maryland, this 27th day of May 2011.

For the Nuclear Regulatory Commission

/RA/

Eric J. Leeds, Director
Office of Nuclear Reactor Regulation.