NUCLEAR REGULATORY COMMISSION

10 CFR Part 50

RIN 3150–AH76

[NRC–2007–0003]

Industry Codes and Standards; Amended Requirements

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is amending its regulations to incorporate by reference the 2004 Edition of Section III, Division 1, and Section XI, Division 1, of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPV Code), and the 2004 Edition of the ASME Code for Operation and Maintenance of Nuclear Power Plants (OM Code) to provide updated rules for constructing and inspecting components and testing pumps, valves, and dynamic restraints (snubbers) in light-water nuclear power plants. The NRC also is incorporating by reference ASME Code Cases N–722, ''Additional Examinations for PWR [pressurized water reactor (PWR)] Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials, Section XI, Division 1,'' and N–729–1, ''Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1,'' both with conditions. The amendment also removes certain obsolete requirements specified in the NRC's regulations. This action is in accordance with the NRC's policy to periodically update the regulations to incorporate by reference new editions and addenda of the ASME Codes and is intended to maintain the safety of nuclear reactors and make NRC activities more effective and efficient.

DATES: *Effective Date:* October 10, 2008. The incorporation by reference of certain publications listed in the regulation is approved by the Director of the Office of the Federal Register as of October 10, 2008.

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

Federal e-Rulemaking Portal: Go to *http://www.regulations.gov* and search for documents filed under Docket ID [NRC–2007–0003]. Address questions about NRC dockets to Carol Gallagher 301–415–5905; e-mail *Carol.Gallagher@nrc.gov.*

NRC's Public Document Room (PDR): The public may examine and have copied for a fee publicly available documents at the NRC's PDR, Public File Area O1F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland.

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FOR FURTHER INFORMATION CONTACT: L. Mark Padovan, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555–0001, telephone 301–415–1423, e-mail *Mark.Padovan@nrc.gov.*

SUPPLEMENTARY INFORMATION:

I. Background

The NRC is amending 10 CFR 50.55a to incorporate by reference the 2004 Edition of Section III, Division 1 and Section XI, Division 1 of the ASME BPV Code and the 2004 Edition of the ASME OM Code. Section 50.55a requires the use of Section III, Division 1 of the ASME BPV Code for the construction of nuclear power plant components; Section XI, Division 1 of the ASME BPV Code for the inservice inspection (ISI) of nuclear power plant components; and the ASME OM Code for the inservice testing (IST) of pumps and valves. The NRC published a proposed rulemaking on this subject in the **Federal Register** on April 5, 2007 (72 FR 16731). The 75-day public comment period for the proposed rule closed on June 19, 2007.

The introductory paragraph of § 50.55a establishes the applicability of the conditions therein to licenses and approvals issued under Part 52. Specifically, that rule states the following:

- ''Each combined license for a utilization facility is subject to the following conditions in addition to those specified in § 50.55, except that each combined license for a boiling or pressurized water-cooled nuclear power facility is subject to the conditions in paragraphs (f) and (g) of this section, but only after the Commission makes the finding under § 52.103(g) of this chapter.''
- ''Each manufacturing license, standard design approval, and standard design certification application under part 52 of this chapter is subject to the conditions in paragraphs (a), (b)(1), (b)(4), (c), (d), (e), (f)(3), and (g)(3) of this section.''

Accordingly, combined licenses, manufacturing licenses, standard design approvals, and standard design certifications are subject to these requirements.

The ASME BPV Code and OM Code are national, voluntary consensus standards, and are required by the National Technology Transfer and Advancement Act of 1995, Public Law 104–113, to be used by government agencies unless the use of such a standard is inconsistent with applicable law or is otherwise impractical. The NRC reviews new editions and addenda of the ASME BPV and OM Codes, and periodically updates § 50.55a to incorporate by reference newer editions and addenda. New editions of the subject codes are issued every 3 years; addenda to the editions are issued yearly except in years when a new edition is issued. The editions and addenda of the ASME BPV and OM Codes were last incorporated by reference into the regulations in a final rule dated October 1, 2004 (69 FR 58804). In that rule, § 50.55a was revised to incorporate by reference the 2001 Edition, and 2002 and 2003 Addenda, of Sections III and XI, Division 1, of the ASME BPV Code and the 2001 Edition, and 2002 and 2003 Addenda, of the ASME OM Code.

The NRC is now incorporating by reference Section III, Division 1, of the 2004 Edition of the ASME BPV Code; Section XI, Division 1, of the 2004 Edition of the ASME BPV Code subject to modifications and limitations; and the 2004 Edition of the ASME OM Code.

II. Analysis of Public Comments

The NRC received 23 letters and e-mails from the public that provided about 87 comments on the proposed rule. These comments were submitted by individuals, nuclear utilities, and nuclear industry organizations

consisting of the Nuclear Energy Institute (NEI), the Performance Demonstration Initiative, and the Strategic Teaming and Resource Sharing (STARS) organization. The NRC reviewed and considered the comments in its final rulemaking, as discussed in the following sections:

1. 10 CFR 50.55a(b)(1)

Public Comment:

In a letter dated June 12, 2007, G.C. Slagis Associates commented that the reversing dynamic load rules of the ASME BPV Code, Section III, should not be approved for new construction. The commenter stated that the draft rule language incorporated the 2004 Edition of the Section III piping rules (NB/NC/ND–3600) for evaluation of ''reversing dynamic loads,'' whereas the NRC had taken exception to these rules in the past. The commenter also stated that these piping rules should not be approved for new construction.

NRC Response:

The NRC has not approved the reversing dynamic load rules in the piping rules for the ASME BPV Code, Section III for new construction or existing nuclear plants. The NRC believes that the commenter's interpretation of the proposed rule was based on the wording contained in the summary of the proposed revisions to 10 CFR 50.55a (on the bottom of page 72 FR 16732 and top of page 72 FR 16733; April 5, 2007) that said ''The proposed rule would revise § 50.55a(b)(1) to incorporate by reference the 2004 Edition of Section III of the ASME Boiler and Pressure Vessel (BPV) Code. The NRC does not propose to adopt any limitations with respect to the 2004 Edition of Section III.'' The wording in the second sentence contained an editorial error. The sentence should have read ''The NRC does not propose to adopt any additional limitations with respect to the 2004 Edition of Section III.'' The proposed rule language on page 72 FR 16740 retained the previous restriction regarding the piping rules. The restriction applies to the 1994 Edition through the 2004 Edition. To clarify this, the NRC revised the subject sentences in Section III, Section-by Section Analysis, of this document as follows:

The final rule revises § 50.55a(b)(1) in the current regulation to incorporate by reference the 2004 Edition of Section III of the ASME BPV Code into 10 CFR 50.55a. The NRC is not adopting any additional limitations with respect to the 2004 Edition of Section III.

2. 10 CFR 50.55a(b)(1)(iii)—Seismic Design of Piping

Public Comment:

In a letter dated June 19, 2007, Westinghouse Electric Company requested that the NRC clarify the current limitation specified in § 50.55a(b)(1)(iii) regarding seismic design. The commenter stated that the limitations are related to the treatment of piping. However, as is stated in § 50.55a(b)(1)(iii), the rules in Article NB–3200 of Section III of the ASME BPV Code contain criteria applicable to the seismic design of components other than piping systems. The commenter recommended that the wording in § 50.55a(b)(1)(iii) be revised to clarify that the limitation only applies to the seismic design of piping.

NRC Response:

The NRC agrees with the commenter, and has revised § 50.55a(b)(1)(iii) in this final rule as follows:

Seismic design of piping. Applicants and licensees may use Articles NB–3200, NB–3600, NC–3600, and ND–3600 for seismic design of piping up to and including the 1993 Addenda, subject to the limitation specified in paragraph (b)(1)(ii) of this section. Applicants and licensees may not use these Articles for seismic design of piping in the 1994 addenda through the latest edition and addenda incorporated by reference in paragraph (b)(1) of this section.

3. 10 CFR 50.55a(b)(2)(xv)—Appendix VIII Specimen Set and Qualification Requirements

Public Comment:

Conflicts between §§ 50.55a(b)(2)(xv) and 50.55a(b)(2)(xxiv) were identified by the Performance Demonstration Initiative (letter dated May 11, 2007), Nuclear Management Company (letter dated June 19, 2007), and Mr. Michael Gothard (comment received on the NRC's public Web site on May 11, 2007). The proposed rule extends the application of § 50.55a(b)(2)(xv) from the 1995 Edition through the 2001 Edition to the 1995 Edition through the 2004 Edition. 10 CFR 50.55a(b)(2)(xxiv) prohibits the use of Appendix VIII of Section XI, 1995 Edition through the 2001 Edition, and the supplements of Appendix VIII and Article I–3000 of the 2002 Addenda through the latest edition and addenda incorporated by reference in § 50.55a(b). The proposed change in § 50.55a(b)(2)(vx) creates confusion, unnecessary burden, and conflicting requirements. The commentors proposed leaving § 50.55a(b)(2)(xv) unchanged.

NRC Response:

The NRC agrees with the commentors that the requirements in §§ 50.55a(b)(2)(xv) and 50.55a(b)(2)(xxiv) conflict. The intent of the proposed rule was to minimize the burden associated with reconciling an existing Appendix VIII of Section XI, 1995 Edition through the 2001 Edition, program with changes that occurred in the 2002 Addenda and later edition and addenda. In keeping with the NRC's intent, § 50.55a(b)(2)(xv) will reference up to, and including, the 2001 Edition of Appendix VIII as follows:

Appendix VIII specimen set and qualification requirements. The following provisions may be used to modify implementation of Appendix VIII of Section XI, 1995 Edition through the 2001 Edition. Licensees choosing to apply these provisions shall apply all of the following provisions under this paragraph except for those in § 50.55a(b)(2)(xv)(F) which are optional. Licensees who use later editions and addenda than the 2001 Edition of Section XI of the ASME Code shall use the 2001 Edition of Appendix VIII.

4. 10 CFR 50.55a(b)(2)(xx)—System Leakage Tests

Public Comment:

In a letter dated June 19, 2007, Progress Energy stated that the construction code requirement for a hydrostatic pressure test is not performed at a pressure that constitutes a challenge to the material. A hydrostatic test at this pressure does not contribute to safety any more than a pressure test at operating pressure, since both are conducted below the yield strength of the materials involved. Therefore, from a safety perspective, the hydrostatic test is not used to verify the structural integrity of the component or system being tested. It only proves leak tightness, which is also accomplished by a system leakage test. Hence, the end results of the hydrostatic test and the system leakage test are the same (leak tightness is verified). The additional nondestructive examination (NDE) being suggested by the NRC is of no value in verifying leak tightness, and thus is not related to the safety significance of not performing a hydrostatic test. The construction code NDE that is implemented by ASME Code, Section XI (IWA–4500, [''Examination and Testing'']), is all that is needed to verify any welding discontinuities that could affect the required joint efficiency for the required quality of the weld or brazed joint.

NRC Response:

Subarticle IWA–4540(a) of the 1995 Edition of the ASME BPV Code, Section XI, requires that after repair and replacement activities, a system hydrostatic pressure test be performed. The industry asserted that the hydrostatic pressure test creates a significant hardship. Subsequently, the ASME Committee developed Code Case N–416–3, ''Alternative Pressure Test Requirements for Welded Repairs or

Installation of Replacement Items by Welding Class 1, 2, and 3, Section XI, Division 1,'' to allow the use of system leakage testing and NDE to replace the hydrostatic test. Later, the technical provisions of Code Case N–416–3 were incorporated into the 2001 Edition of ASME Section XI, IWA–4540(a) and maintained through the 2002 Addenda. However, the NDE requirements of IWA–4540(a) were eliminated from the 2003 Addenda of the Code. Therefore, the NRC proposed a condition in § 50.55a(b)(2)(xx) requiring Section III NDE be performed following repair and replacement activities if a system leakage test was to be used in lieu of a hydrostatic test under the 2003 Addenda through the latest edition and addenda incorporated by reference in 10 CFR 50.55a(b)(2).

The piping systems in some vintage nuclear power plants were fabricated in accordance with American National Standards Institute (ANSI)/ASME B31.1, ''Power Piping,'' Code. ANSI/ASME B31.1 does not require a volumetric examination for those systems that would now be classified as ASME Class 2 and Class 3 piping systems during original construction. The current ASME BPV Code, Section XI (IWA–4500), allows licensees to use the NDE requirement of the original construction code as part of repair/replacement activities. Licensees of these vintage plants would not need to perform volumetric examinations after repair/replacement activities for piping classified as ASME Class 2 or Class 3 piping for which ANSI B31.1 does not require NDE. A system pressure test or hydrostatic pressure test does not verify the structural integrity of the repaired piping components. However, it is generally recognized in the industry that the volumetric examinations do provide significant information relative to the structural integrity of the repaired piping components. For those Class 2 and 3 piping systems that may not receive a volumetric examination for the life of the systems, the NRC is concerned that performance of a system leakage test without associated volumetric examinations would not adequately ensure high quality welds for the repaired or replaced component. Therefore, performance of a Section III volumetric examination in connection with a system leakage test in repair/replacement activities is necessary.

Public Comment:

In letter dated June 13, 2007, ASME stated that § 50.55a(b)(2)(xx) does not explicitly state that the NDE shall be performed after the system leakage test. As written, a licensee could comply with this requirement by performing the required NDE before the system leakage test. It is common practice to perform this NDE prior to the system leakage test.

NRC Response:

The NRC agrees with the commenter that an ASME BPV Code, Section III, 1992 Edition, volumetric examination performed as part of the repair/replacement activities prior to the system leakage test can be accepted to fulfill the NDE requirement of § 50.55a(b)(2)(xx)(B). The NRC's position has been, and continues to be, that the NDE performed as part of the repair/replacement activities satisfies the NDE provision of subarticle IWA–4540(a) of the 2002 Addenda of the ASME Code, Section XI.

Public Comment:

In letter dated June 19, 2007, Duke Energy stated that § 50.55a(b)(2)(xx) does not restrict a licensee from using the provisions of IWA–5213(a) in the 2003 Addenda of Section XI. Therefore, licensees may currently use the provisions of IWA–4540(a) in the 2003 Addenda without having to perform NDE in accordance with the requirements of IWA–4540(a)(2) of the 2002 Addenda after a system leakage test. Because the proposed change imposes additional requirements on licensees, the change should be evaluated to determine whether the change is a backfit.

NRC Response:

The NRC agrees with the commenter that the proposed requirement would result in a backfit for some licensees because this final rule would now require them to perform the required NDE in conjunction with the system leakage test in lieu of the hydrostatic test. In the October 1, 2004 (69 FR 58804), rulemaking of the 2003 Addenda of the ASME Code, the NRC neglected to incorporate the above NDE requirement in 10 CFR 50.55a(b)(2). However, the oversight needs to be corrected to ensure that during repair or replacement activities, the volumetric examination, in conjunction with a system leakage test, is performed to ensure structural integrity of the repaired or replaced piping system. The NRC discusses its backfit analysis for those licensees who may be affected by this rule in Section XI, Backfit Analysis, of this document.

5. 10 CFR 50.55a(b)(2)(xxi)(A)—Table IWB–2500–1 Examination Requirements

Public Comment:

In letter dated June 13, 2007, ASME; in letter dated June 19, 2007, Nuclear Energy Institute; and in letter dated June 19, 2007, Duke Energy disagree with modifying the limitation to require visual examination of Class 1 pressurizer and steam generator nozzle inner radius areas (ASME Code Case N–619) based on the previous reactor vessel nozzle inner radius limitation (ASME Code Case N–648–1). The commenters believe that the original limitation (to continue examination of the inner nozzle radius region) is unnecessary because of the following:

a. Inner nozzle radius regions in Class 1 systems have been examined for over 25 years without detecting cracking.

b. Structural integrity evaluations demonstrated a large tolerance for flaws.

c. Risk informed evaluations demonstrated that these nozzles have a large tolerance for flaws.

d. Risk informed evaluations demonstrated a low probability of failure under plant operating conditions.

e. There is a negligible change in risk if inspections are eliminated.

f. The term enhanced VT–1 is not defined in Code, and studies show that VT–1 character heights provide the same or better resolution than the 1 mil wire.

NRC Response:

The NRC disagrees with the commentors. The limitation on the visual examination in 10 CFR 50.55a(b)(2)(xxi)(A) did not differentiate between vessel components. The limitation is an alternative for volumetric examinations. The proposed change in the rule is to provide a visual examination criterion for determining fatigue crack flaw depth.

With respect to Item 5.a above, the commentor's information on 25 years of inservice ultrasonic examinations with no evidence of inner radius cracking on nozzles covered by the ASME Code cases is from an ASME document issued in 2001. At that time, ultrasonic examinations of pressurized-water reactors were normally performed from the inside surface, and were normally performed from the outside surface for boiling-water reactors. The NRC took issue with the effectiveness of ultrasonic examinations of the inner nozzle radius performed prior to performance-based qualification requirements. Performance-based examinations of all reactor pressure vessel (RPV) inner nozzle radii became mandatory on November 22, 2002. On July 26, 2006, the Electric Power Research Institute—Boiling Water Reactor Vessel & Internal Project (BWRVIP) provided a summary of results from inner nozzle radius performance-based examinations to support reducing RPV inner nozzle radii examination frequency by 75 percent.

By letter dated December 19, 2007, the NRC issued a safety evaluation

accepting BWRVIP–108 which reduced the inspection frequency of reactor nozzle-to-vessel shell welds and nozzle inner radius for BWRs (NRC ADAMS Accession Number ML073600374).

Operating conditions, such as fluctuating temperature, and fabricating conditions, such as work hardening can cause cracking of the inner nozzle radius. The ASME Code Cases (N–619 and N–648–1) are silent on conditions that are associated with cracking. These conditions may appear, or be affected, at various times during the operating cycle and may not be specific to vessel design. To detect degradation that appears during operations, NDE of inner nozzle radii are warranted.

Items 5b, 5c, and 5d pertained to risk-informed computations. Of the risk-informed piping programs reviewed to date, none of the programs contained risk data for Class 1 inner nozzle radius regions. The NRC did not find documentation of a review on the ASME 2001 article. Recently, the BWRVIP submitted to the NRC information on structural integrity and probability of failure and risk calculations concerning the inspection of inner nozzle radius regions to the NRC for review, which is ongoing.

With respect to Item 5f, the commentors referenced proprietary documents that were not made available to the NRC. Therefore, the NRC was unable to verify the data used to validate the adequacy of VT–1 and of character recognition for examinations of the inner radii regions. While characters are useful for distinguishing shapes, NUREG/CR 6860, ''An Assessment of Visual Testing,'' identified the crack open width dimension as a key variable for visually detecting cracks. In 10 CFR 50.55a(b)(2)(xxi)(A), the 1-mil width wire or crack is a measurable criterion for a postulated crack open width dimension. Therefore, the 1-mil width wire or crack requirement provides a minimum criteria for performance-based demonstrations of examination effectiveness.

The commentors stated that the term ''enhanced VT–1'' was not recognized by the ASME BPV Code. The term ''enhanced VT–1'' is being used by knowledgeable personnel for conversational expediency. The term ''enhanced VT–1'' is not used in the regulation. However, the use of the term ''enhanced magnification'' is used in the rule and may have been misleading. Therefore, the term ''enhanced'' will be removed from the regulation.

6. 10 CFR 50.55a(b)(2)(xxviii)—Evaluation Procedure and Acceptance Criteria for PWR Reactor Vessel Head Penetration Nozzles

Public Comment:

In a letter dated June 13, 2007, the ASME stated that this modification is being proposed because of a typographical error that the NRC says exists in ASME Section XI, Non-mandatory Appendix O, paragraph O–3220(b), equation S_R, = [l—0.82R]$^{-22}$, where the exponent -22 should be -2.2. ASME has identified this error and is publishing an ERRATA in July 2007 to correct this error retroactively to include the 2004 Edition of Section XI. As such, the proposed amendment to 10 CFR 50.55a(b)(2)(xxviii) is unnecessary.

NRC Response:

The NRC finds that ASME has published an ERRATA in July 2007 to correct the error in the S_R equation of paragraph O–3220(b) retroactively to include the 2004 Edition of ASME BPV Code, Section XI. The condition imposed in § 50.55a(b)(2)(xxviii) will not be necessary. Therefore, the NRC is not including § 50.55a(b)(2)(xxviii) in this final rule.

7. 10 CFR 50.55a(b)(3)(v)—Subsection ISTD

Public Comments:

By electronic mail dated June 11, 2007, George L. Fechter of Southern Nuclear Operating Company stated that Article IWF–5000, ''Inservice Inspection Requirements for Snubbers,'' was deleted from the 2006 Addenda of the ASME BPV Code, Section XI. With adequate verification of training provided to personnel performing visual exams, removal, testing, and reinstallation of snubbers per applicable Subsection ISTD, ''Inservice Testing of Dynamic Restraints (Snubbers) in Light-Water Reactor Power Plants,'' of the ASME OM Code and site licensing and maintenance criteria, it should be justifiable to allow performance of this type of visual examination versus a VT–3 visual examination. The knowledge obtained from such snubber-specific training and experience commonly exceeds the VT–3 visual examination criteria for snubbers. While IWA–2317 of the 2003 Addenda through 2004 Edition of the ASME BPV Code, Section XI, provides alternative VT–3 examination qualification requirements, the administrative burden incurred for the VT–3 certification may not be commensurate with any convenience provided by qualifying additional VT–3 personnel in this manner and, for reasons stated previously, does not provide higher quality examinations. The commenter requested that the permissive for allowing personnel trained specifically on snubber requirements per the applicable ISTD and site licensing and maintenance criteria be allowed to perform visual examinations for snubbers as an alternative to performing a VT–3 examination per the method described in IWA–2213 of the ASME BPV Code, Section XI.

NRC Response:

The commenter requested that the visual examination method required by § 50.55a(b)(3)(v) when performing examination and testing of snubbers be revised. The NRC declines to adopt the commenter's suggestion because the proposed rule did not suggest an amendment to the visual examination method in § 50.55a(b)(3)(v), and the NRC currently does not have a basis for supporting such a revision. There were no other public comments received on § 50.55a(b)(3)(v). Therefore, the NRC declines to adopt the commenter's suggestion. No change was made to § 50.55a(b)(3)(v) in the final rule as a result of the comment.

8. 10 CFR 50.55a(g)(6)(ii)(B)—Containment ISI Programs

Public Comments:

In a letter dated June 19, 2007, Duke Energy stated that when compliance with the requirements of the ASME BPV Code, Section XI, Subsections IWE and IWL was initially imposed by 10 CFR 50.55a, the requirements of § 50.55a(g)(6)(ii)(B) did not require licensees to submit ISI programs that were developed to comply with the Code during the expedited examination period (September 9, 1996, through September 9, 2001). However, when the initial expedited examination requirements were removed from § 50.55a after September 9, 2001, § 50.55a(g)(6)(ii)(B) was not deleted, leaving some licensees to believe that the NRC wanted to retain this provision. As a result, many licensees continue to believe that the NRC does not want updated containment ISI plans to be submitted. The NRC should take action to clarify whether it is the intent of 10 CFR 50.55a(g)(6)(ii)(B) that licensees be required to submit ISI plans for Class MC and Class CC components for all ISI plans developed after the expedited examination period.

NRC Response:

The NRC notes that the comment was not related to the proposed rule but to seek clarification on § 50.55a(g)(6)(ii)(B) in the current regulation. It is the NRC's position to retain the current § 50.55a(g)(6)(ii)(B) provision in the final rule. § 50.55a(g)(6)(ii)(B) states that

licensees do not have to submit to the NRC for approval of their containment in-service inspection (CISI) programs for Class MC and Class CC pressure retaining components that were developed to meet the requirements of the ASME BPV Code, Section XI, Subsections IWE and IWL, with specified modifications and limitations, under § 50.55a(g)(5)(i) and/or § 50.55a(g)(4). The provision requires that program elements and the required documentation of the developed plan must be maintained on site for audit. The provision applies to the CISI programs developed for each operating license for the initial 120-month inspection interval, including the CISI program revisions made by licensees of operating reactors during the September 1996 to September 2001 timeframe (i.e., expedited examination period) when the rule for ASME BPV Code, Section XI, compliance was initially imposed. Further, the provision applies to subsequent revisions to the CISI programs for successive 120-month inspection intervals under § 50.55a(g)(4)(ii). Therefore, as stated in § 50.55a(g)(6)(ii)(B), licensees do not have to submit to the NRC for approval of their CISI program that meets the ASME Code, Subsections IWE and IWL with specified modifications and limitations after the expedited examination period.

However, the NRC would like to clarify a situation which does not affect 50.55a(g)(6)(ii)(B) directly but which involves the use of Subsections IWE and IWL. If a licensee wishes to use Subsections IWE and IWL of later editions and addenda (i.e., later than the code of record for the ISI interval in question) of the ASME Code that are incorporated by reference in 10 CFR 50.55a(b) to be applied to the specific 10-year inservice inspection interval at its nuclear plant, the licensee needs to submit a request for the NRC's approval to use the later editions and addenda of the ASME Code. As stated in § 50.55a(g)(4)(iv), licensees are required to obtain NRC approval before using subsequent editions and addenda (or portions thereof) of the ASME BPV Code, Section XI, issued after their Code of Record for any 120-month inspection interval, if they choose to implement their ISI programs under § 50.55a(g)(4)(iv). The regulatory issue of using later editions and addenda of the Code has been previously clarified in NRC Regulatory Issue Summary 2004–12, ''Clarification on Use of Later Editions and Addenda to the ASME OM Code and Section XI.'' The intent of the commenter is to seek a clarification rather than a suggestion. Therefore, no change was made to § 50.55a(g)(6)(ii)(B) in the final rule as a result of this comment.

9. 10 CFR 50.55a(g)(6)(ii)(D)—Reactor Vessel Head Inspections

9a. Condition 10 CFR 50.55a(g)(6)(ii)(D)(*1*), Regarding the Implementation of Code Case N–729–1, as Amended, in Lieu of the First Revised NRC Order EA–03–009

Some commenters requested additional information on the implementation of these requirements, and asked the NRC about the process of changing the current NRC requirements for RPV closure head inspection requirements from the First Revised NRC Order EA–03–009, issued on February 20, 2004, (Order) to the requirements provided in the proposed rule language for 10 CFR 50.55a(g)(6)(ii)(D). (Comment Numbers 14, 19 and 20)

NRC Response:

To allow an orderly implementation of 10 CFR 50.55a(g)(6)(ii)(D), the NRC finds an implementation date of no later than December 31, 2008, for the requirements provided in this section is warranted. The requirements of NRC Order EA–03–009 will remain in effect until the provisions of 10 CFR 50.55a(g)(6)(ii)(D) are implemented. Once a licensee implements this requirement, the First Revised NRC Order EA–03–009 no longer applies to that licensee and under 10 CFR 50.55a(g)(6)(D)(1) shall be deemed to be withdrawn. All relaxations from the requirements of the Order will then no longer apply. If a licensee cannot meet the proposed requirements of 10 CFR 50.55a(g)(6)(ii)(D), then an alternative may be requested in accordance with 10 CFR 50.55a(a)(3)(i) or 10 CFR 50.55a(a)(3)(ii) or impracticality must be shown under 10 CFR 50.55a(g)(6)(i). To incorporate this implementation date, section 50.55a(g)(6)(ii)(D)(1) is revised to incorporate this implementation date.

9b. Condition 10 CFR 50.55a(g)(6)(ii)(D)(*2*), Regarding the Frequency of Reactor Vessel Head Inspection for ''Resistant'' Materials

Public Comment:

Some commenters disagreed with the proposed NRC position regarding the frequency of inspection of Item No. B4.40 of ASME Code Case N–729–1. The commenters made several remarks regarding previous and ongoing laboratory work with primary water stress corrosion cracking (PWSCC) ''resistant'' materials. Further, they noted operational experience with these materials had provided a sufficient basis to allow the inspection interval as stated in ASME Code Case N–729–1 without the NRC-proposed condition, as provided in proposed 10 CFR 50.55a(g)(6)(ii)(D)(*2*). One commenter, number 13, recommended extending the interval of inspection from every seven (7) years to every eight (8) years. (Comment Numbers 7, 9, 11, 13, 15, 16, 17, 19, 21, 22 and 23)

NRC Response:

During the writing of the proposed rule, the NRC disagreed with the NDE re-inspection frequency for ''resistant'' materials, in Item B4.40 of Table 1 of ASME Code Case N–729–1, of every ten (10) calendar years beyond the first 10 years. Therefore, the NRC proposed the condition 10 CFR 50.55a(g)(6)(ii)(D)(*2*) to limit the inspection frequency for ''resistant'' materials to every four refueling outages not to exceed seven (7) calendar years beyond the first 10 years. The proposed condition was based on two main factors: the availability of limited crack initiation and growth data on the Alloy 152/52 weld metal, and the accelerated susceptibility increases of replaced U.S. RPV heads versus the current operational experience data from international experience which demonstrates the resistance of Alloy 690/152/52 materials against PWSCC.

The available data on Alloy 152/52 weld metal resistance to PWSCC is an NRC concern. However, considering the comments on this issue and ongoing PWSCC research programs at Pacific Northwest National Laboratories and Argonne National Laboratory sponsored by the NRC Office of Nuclear Regulatory Research, NRC now finds that the current data is sufficient to support the re-inspection frequency of Item B4.40 of Table 1 of ASME Code Case N–729–1. NRC research on these materials is scheduled to continue through CY 2010. Accordingly, there should be enough time to address any items of concern regarding the resistance of these materials to PWSCC, if and when they develop, prior to becoming a significant safety issue.

The NRC acknowledges that current operating experience shows the resistance of Alloy 152/52 weld material to PWSCC to be superior to that of Alloy 82/182. However, RPV head temperatures at numerous international plants with replaced RPV upper heads are significantly less than U.S. upper-head temperatures. As PWSCC susceptibility in nickel based alloys like Alloy 600 has been shown to have a significant temperature dependence, NRC analysis of international head replacement data has shown that RPV heads in the U.S. will, with time, have

a greater susceptibility to PWSCC than a majority of the international plants in terms of accumulated, effective degradation years. Therefore, NRC has found that long-term operating experience is limited for components that contain Alloy 690/52/152 materials with indications and repairs of the scope and nature found in recently replaced U.S. RPV heads. Nevertheless, the NRC finds the operational experience is sufficient to support Code Case N–729–1 inspection frequencies while research on these materials continues.

The NRC agrees with the commenters and finds that there is sufficient Alloy 690/152/52 laboratory data and operational experience to allow the inspection frequency of Item B4.40 of Table 1 of ASME Code Case N–729–1 for RPV upper heads containing Alloy 690/152/52 components. Therefore, the proposed condition in 10 CFR 50.55a(g)(6)(ii)(D)(*2*) of the proposed rule will not be adopted.

9c. Condition 10 CFR 50.55a(g)(6)(ii)(D)(*3*), Regarding RPV Head Inspection Requirements and Frequencies

Public Comment:

Some commenters disagreed with the proposed NRC condition regarding the implementation of Note 6 of Table 1 of ASME Code Case N–729–1, which is stated in the 10 CFR 50.55a proposed rule language as 10 CFR 50.55a(g)(6)(ii)(D)(*3*). Several comments were concerned with the surface and volumetric examination coverage requirements and the surface examination requirement of the J-groove weld. The commenters requested to allow a UT ''leak-path'' examination in lieu of surface examination of the J-groove weld, and that a note be added to document that Appendix I of the Code Case may be used when approved as required in 10 CFR 50.55a(g)(6)(ii)(D)(6). In addition comments noted that the impact of Note 9 is not addressed in the elimination of the original Code Case N–729–1, Note 6. (Comment Numbers 7, 9, 11, 12, 13, 16, 17, 18, 19, 20, 22 and 23)

NRC Response:

In development of the proposed rule, the NRC did not find sufficient basis to allow an inspection regime of 3.0 re-inspection years (RIY) as described in Code Case N–729–1. Further, the NRC noted that due to the lack of a non-visual leak path assessment requirement in Code Case N–729–1, surface examination of all J-groove welds, commensurate with the volumetric examination of the penetration nozzle, should be required. Therefore the NRC proposed the condition in 10 CFR 50.55a(g)(6)(ii)(D)(*3*). The NRC found the inspection coverage as defined by Code Case N–729–1 using the ASME Code definition of ''essentially 100 percent'' inspection acceptable and therefore retained that language in the condition. No increase in inspection coverage is intended in the condition.

The NRC disagrees that the supporting probabilistic basis is adequate to support the 3.0 RIY option. A probabilistic fracture mechanics analysis was used as a basis for the 3.0 RIY inspection frequency option. NRC finds the supporting probabilistic model is based on an assumption of essentially no cracking in RPV head penetrations or welds with less than 4 effective years of degradation (EDY). The NRC considers this assumption to be non-conservative as used in the supporting probabilistic model. One U.S. plant at approximately 2 EDY identified cracking attributable to PWSCC. Many of the other near-cold-leg temperature RPV heads (cold-head plants) with susceptible material will not accumulate a total of 4 EDY through the next 15 to 30 years of operation. Development of flaws in these heads would cause adjustment of the probabilistic model output for all temperature ranges of RPV heads. Cracking attributed to PWSCC has been identified internationally in head penetration nozzles and associated welds at operating temperatures similar to U.S. cold-head plants. In the U.S., flaws in other components have been attributed to PWSCC in similar cold-leg temperature environments. The NRC finds that relatively few more instances of flaws attributed to PWSCC in the cold-head sub-population could significantly change the probabilistic model upon which the 3.0 RIY inspection frequency is justified. Therefore, NRC concludes that the supporting probabilistic model does not provide an adequate basis for extending the non-visual NDE inspection frequency to 3.0 RIY.

The conditional requirement for surface examinations of all J-groove welds is based on the need for a defense-in-depth method to ensure reactor coolant pressure boundary integrity through the J-groove weld. In Code Case N–729–1, the mechanism to identify a through-weld flaw in a J-groove weld is through the bare-metal visual exam using visual leak detection at the top of the RPV head. This method alone is not consistent with previous NRC inspection requirements under the Order which require a non-visual leak path assessment in conjunction with a bare-metal visual examination of the RPV head. The NRC finds that not performing a leak path assessment would limit the ability of an inspection plan to provide sufficient defense-in-depth to identify leakage through the J-groove weld. In the past, the NRC has accepted ultrasonic (UT) leak path assessments as an adequate inspection to provide this assurance. However, the UT leak path assessment was not included in Code Case N–729–1 because it had not been qualified through the ASME Code process. Surface examination of the J-groove weld was included in Code Case N–729–1, but only as an option to increase inspection frequency. Under the proposed condition, performance of a surface examination of the J-groove weld would have been the only option in terms of a leak path assessment.

The commenters stated that there are current plans to demonstrate the effectiveness of the ultrasonic leak path assessment technique for use within Code Case N–729–1. As the ultrasonic leak path assessment was a previously acceptable alternative to surface examination of the J-groove weld, due to physical constraints and radiological dose concerns in performing a surface exam in this area, the condition stated in 10 CFR 50.55a(g)(6)(ii)(D)(3) has been modified in this final rule.

As noted previously the Condition stated in 10 CFR 50.55a(g)(6)(ii)(D)(2) was removed. To address stakeholder comments about confusion between Notes 6 and 9 of Code Case N–729–1, condition in 10 CFR 50.55a(g)(6)(ii)(D)(*2*) of the proposed rule will simply state in the final rule that: ''Note 9 of ASME Code Case N–729–1 shall not be implemented.'' Note 9 of ASME Code Case N–729–1 provides the path for use of the 3.0 RIY inspection frequency interval. As previously stated, and as directed in the change to Note 6, the 3.0 RIY inspection frequency will not be included in the final rule.

9d. Condition 10 CFR 50.55a(g)(6)(ii)(D)(*4*), Regarding Qualification Requirements for Volumetric Inspection of RPV Head Penetration Nozzles

Public Comment:

Some commenters disagreed with the NRC-proposed condition regarding qualification requirements for volumetric examination as stated in Paragraph–2500 of ASME Code Case N–729–1. This proposed condition is stated in 10 CFR 50.55a(g)(6)(ii)(D)(*4*) of the proposed rule. (Comment Numbers 2, 7, 9, 11, 12, 13, 17, 19 and 22).

NRC Response:

The NRC notes that the condition stated in 10 CFR 50.55a(g)(6)(ii)(D)(*4*)

requires that reliable and effective ultrasonic examinations be performed to ensure adequate protection for public health and safety. Because of the emphasis placed on inspections of the penetrations, it is appropriate to incorporate requirements for a robust blind demonstration of the ability of personnel, procedures and equipment to reliably detect and characterize indications, consistent with the approach articulated in Appendix VIII of Section XI of the ASME BPV Code. As RPV head inspection frequencies transition to every 8 or 10 years due to replacement heads being installed, clearly defined performance demonstration requirements are necessary to ensure effective NDE. Due to the lack of current ASME BPV Code ultrasonic performance demonstration qualification requirements in Section XI, Appendix VIII, for RPV head penetrations, the NRC is adopting the conditions stated in 10 CFR 50.55a(g)(6)(ii)(D)(*4*) in the final rule.

With respect to the performance demonstration requirements of the ASME BPV Code, Section XI, Appendix VIII, have increased the effectiveness and reliability of ultrasonic examinations, most notably in the area of inspection of dissimilar metal welds. The development of a qualification program to meet the intermediate rigor requirements of ASME BPV Code, Section V, Article 14 would require an additional process beyond this rulemaking activity. As noted in paragraph 10 CFR 50.55a(g)(6)(ii)(C), implementation of performance demonstration requirements of Appendix VIII of Section XI of the ASME BPV Code is currently required by 10 CFR 50.55a for Supplements 1 through 8, 10 and 11. At this time, there is no ASME BPV Code supplement to address performance demonstration requirements for the qualification of ultrasonic inspection of Alloy 600 base material. The conditions identified in the paragraphs 10 CFR 50.55a(g)(6)(ii)(D)(4)(i) through 10 CFR 50.55a(g)(6)(ii)(D)(4)(iv) of the final rule are consistent with the performance demonstration requirements of Appendix VIII.

10 CFR 50.55a(g)(6)(ii)(D)(4), as stated in the proposed rule, is modified in the final rule to incorporate an implementation date of September 1, 2009, in order to address the comment which noted that additional time would be required to fully implement a formalized qualification program. The implementation date in the final rule addresses the time necessary for mockup production and qualification of sufficient numbers of NDE personnel. NRC determined that the implementation date of September 1, 2009, is adequate to address the current frequency of inspections and allow for enough qualified personnel resources to be available. During the interval between the effective date of the final rule and the implementation date, the NRC finds that the qualification requirements of Code Case N–729–1 will provide reasonable assurance of public health and safety.

With respect to the expansion of specimen qualification set applicability for a range of pipe diameters and thicknesses, 10 CFR 50.55a(g)(6)(ii)(D)(4)(i) was modified. The commenters noted that current demonstrations are performed on typical-sized control rod drive mechanism penetration nozzles. These demonstrations are used for a variety of similar-sized penetration nozzles (incore instrumentation, control rod drive and control element drive) and for smaller-size and thickness vent-line nozzles. The proposed draft condition specimen set applicability range was taken from Section XI, Appendix VIII, Supplement 10 requirements for dissimilar metal welds. A change to increase the range of applicability was made to 10 CFR 50.55a(g)(6)(ii)(D)(4)(i) to address stakeholder comments concerning the number of currently available mockup assemblies and the continued use of them for a slightly larger range of nozzles. The commenter noted that a small adjustment would allow the current mockups to be applicable for similar sized penetration nozzles which would fall just outside of the range stated in the proposed draft rule language. The NRC has reviewed the requested increased range of applicability and finds that the nozzles in question have enough through-wall thickness to provide similar response. As the weakness of ultrasonic examination is near field resolution, an expanded range for pipe diameters and thicknesses is allowed. The NRC finds that the range now stated in 10 CFR 50.55a(g)(6)(ii)(D)(4)(i) of the final rule is adequate to ensure representative specimen sets will be used in the qualification processes for both personnel and procedures over the entire range of penetration nozzles in the reactor vessel head, and address stakeholder concerns.

With respect to issues that recommended an adjustment for mockup specimens to include a range of blind demonstration mockups previously manufactured, 10 CFR 50.55a(g)(6)(ii)(D)(*4*)(ii) was modified for incorporation into the final rule. Specimen set flaw location requirements must meet several criteria to ensure the wide range of possible flaws identified through operational experience are captured for qualification of procedures, equipment, and personnel. The NRC has found that the commenters' flaw location range recommendations as stated in public comment viii of this section satisfactorily meet the intent of 10 CFR 50.55a(g)(6)(ii)(D)(4)(*ii*), which were established to ensure the entire range of flaws identified through operational experience are represented in the mockups. The NRC accepts the comments and, therefore, has modified the requirements of the condition stated in 10 CFR 50.55a(g)(6)(ii)(D)(4)(ii) for incorporation into the final rule.

With respect to asking for additional clarity when an essential variable may be changed outside of its demonstration range, 10 CFR 50.55a(g)(6)(ii)(D)(4)(iii) has been revised for incorporation into the final rule. The identification and definition of essential variables is necessary to ensure proper applicability of qualification standards to each particular inspection. 10 CFR 50.55a(g)(6)(ii)(D)(*4*)(*iii*) has been revised to include specific requirements if changes to essential variables occur. These requirements are the same as those required in Section XI, Appendix VIII general requirements of Subarticle VIII–2100 which are required for use under 10 CFR 50.55a(g)(6)(ii)(C) for implementation of performance demonstration requirements of Appendix VIII of Section XI of the ASME BPV Code.

With respect to the objection to the proposed generic qualification requirements for depth and length sizing qualification, noting that the requirements were currently unachievable for a generic procedure and were not necessary from a safety standpoint, 10 CFR 50.55a(g)(6)(ii)(D)(4)(*iv*) has been revised for incorporation into the final rule. Performance demonstration requirements provide depth sizing and length sizing root mean square (RMS) error tolerances to meet the acceptance standards of Table VIII–S10–1. The NRC reviewed the RMS error tolerances that the commenters recommended, and found the proposed RMS error tolerances of 1/8-inch (3 mm) in depth and 3/8-inch (10 mm) in length were adequate to ensure the validity of qualification. Therefore, for qualification of procedures, equipment, and personnel, the acceptance standard RMS error tolerance requirements were updated in 10 CFR 50.55a(g)(6)(ii)(D)(4)(iv) as incorporated into the final rule.

After review and assessment of the comments, the NRC is revising the proposed condition.

9e. Condition 10 CFR 50.55a(g)(6)(ii)(D)(5), Regarding Re-inspection Requirements Once a Plant has Identified PWSCC Flaws in Their RPV Head Penetration Nozzles or Associated Welds

Public Comment:

Some commenters disagreed with the NRC proposed condition 10 CFR 50.55a(g)(6)(ii)(D)(5). This condition requires a volumetric and/or surface re-inspection each outage once a plant identifies PWSCC in its vessel head penetration nozzles or welds. These commenters stated that flaw evaluation using the crack growth rates for PWSCC should provide an acceptable re-inspection interval for any flaws that were accepted by evaluation, and an exemption should be added to exclude the condition of ''craze cracking'' from mandating inspections at every outage. (Comment Numbers 7, 9, 11, 13, 17, and 19)

NRC Response:

The NRC disagrees with the commenters that flaw evaluation using the crack growth rates for PWSCC would provide an acceptable re-inspection interval. The proposed condition stated in 10 CFR 50.55a(g)(6)(ii)(D)(*5*) is based upon operating experience, and that several elements of PWSCC susceptibility (e.g., cold work, specific material properties, etc.) are not fully included in the susceptibility and probabilistic models of Code Case N–729–1. At least nine plants have identified flaws attributable to PWSCC in the refueling outage immediately following an inspection which identified the degradation mechanism. One plant identified at least four new flaws greater than 50 percent through-wall in one operational cycle of crack growth. The NRC finds that operational experience has shown that not all factors affecting the susceptibility of Alloy 600 materials are included within a standard flaw analysis model using the ASME BPV Code flaw analysis using the Alloy 600 crack growth rate identified in Subarticle IWB–3660 of Section XI of the ASME BPV Code.

The ASME BPV Code crack growth rate curve for Alloy 600 is a mean of the upper 50 percent of all acceptable Alloy 600 laboratory developed crack growth rate data points. It is not a bounding crack growth curve. Testing on field samples of Alloy 600 from the replaced RPV head of one plant by Argonne National Laboratories identified a crack growth rate which is at the upper bound (95th percentile) of the data used to develop the ASME curve. Additional factors may affect the initiation and growth of PWSCC in RPV upper head penetrations which were not fully analyzed in the laboratory tested material. These factors include the welding process, heats of material, and cold work applied in the field or during manufacturing conditions.

If a plant is found to have a flaw attributable to PWSCC, the flaw may have developed due to any one or a combination of the previously mentioned susceptibility factors. Therefore, the plant may not be fully bounded by the Code Case N–729–1 PWSCC model. The model provides appropriate inspection frequencies to ascertain when a plant develops PWSCC in its RPV upper head penetrations. However, to be conservative, the plant should perform volumetric and/or surface examinations for each outage to provide reasonable assurance of the integrity of the reactor coolant pressure boundary and prevent leakage once conditions for PWSCC have been verified through inspection results. As such, the NRC's proposed condition is that once a plant has identified a flaw attributable to PWSCC in a RPV head penetration or J-groove weld, that plant should perform visual and volumetric and/or surface examinations for each outage. This is consistent with NRC Order EA–03–009. Therefore, the proposed provisions in 10 CFR 50.55a(g)(6)(ii)(D)(5) are adopted without change in the final rule.

Indications of craze cracking have not previously been characterized as indications of PWSCC, and the NRC continues to find that indications of craze cracking are not PWSCC. Therefore, if a licensee determines that the indications in a vessel head penetration nozzle are a result of craze cracking alone, it would not be within the scope of proposed condition stated in 10 CFR 50.55a(g)(6)(ii)(D)(*5*).

9f. Condition 10 CFR 50.55a(g)(6)(ii)(D)(6), Regarding the Allowance of Licensee Deviation from the Requirements of ASME Code Case N–729–1 Without NRC Review and Approval Public Comments

Commenters disagreed with the NRC-proposed condition for use of Appendix I of ASME Code Case N–729–1, which is stated in 10 CFR 50.55a(g)(6)(ii)(D)(6). The comments concerned the following items:

- It is not the place of the ASME BPV Code to require utilities to get NRC approval on acceptable alternatives.
- NRC review of industry implementation of Appendix I of Code Case N–729–1 relief from the requirements of ASME Code Case N–729–1 is unnecessary.
- An exemption should be made for the need for NRC approval for use of Appendix I of Code Case N–729–1 by plants with new heads that use ''resistant'' material, until PWSCC is identified in those heads.

(Comment Numbers 7, 12, 13, 17 and 19)

NRC Response:

Appendix I of Code Case N–729–1 gives an analysis procedure that allows licensees to demonstrate the adequacy of an NDE zone of coverage less than that required by Code Case N–729–1. Implementation of this analysis procedure does not require NRC review and approval. In essence, Appendix I would allow licensees to self-approve relief from the requirements of Code Case N–729–1, essentially usurping NRC's authority under 10 CFR 50.55a to evaluate alternatives. NRC experience in processing relaxation requests to Order requirements has shown that there was significant variation in technical basis approaches between licensees in proposing alternatives to the Order. For example, probabilistic analyses were used in licensee relaxation requests from Order requirements that the NRC found to have insufficient basis and therefore did not approve as a basis for relaxation. However, under Appendix I of Code Case N–729–1, these relaxation requests could be found acceptable without NRC review. While the NRC agrees that the methods provided in Appendix I may be used as a basis to request relief from the ASME Code Case requirements, NRC review and approval shall be required for deviations from Code Case N–729–1 examination coverage requirements.

The NRC disagrees with the comment that excludes from this proposed condition new reactor vessel heads that use resistant material, until PWSCC is identified in these heads. The NRC notes that the flaw evaluation tools and susceptibility of new PWSCC resistant materials have not been established or approved by the NRC. As such, implementation of Appendix I of Code Case N–729–1 would be open to significant variation of interpretation. Therefore, the provisions in 10 CFR 50.55a(g)(6)(ii)(D)(*6*) are adopted without change in the final rule.

9g. General Public Comments on 10 CFR 50.55a(g)(6)(ii)(D)

Two commenters (comment numbers 8 and 11) stated that Public Law, PL 104–113, mandates that national consensus standards be used by Federal agencies where applicable. This

includes the use of ASME codes and standards. Because the consensus process used to develop the Code Case specifically considered the NRC comments (i.e., additional conditions being added with this rule change) and found them to be without technical merit, one commenter considered it inappropriate for NRC to impose additional conditions on the use of Code Case N–729–1. Therefore, the commenter requested that the additional conditions be removed from the rule language. Alternatively, if the additional conditions would not be removed from the rule language, the technical justifications for the need for these additional conditions should be included in the supplemental information for the final rule.

NRC Response:

NRC review of ASME Code Case N–729–1 concludes that its basis implies that leakage is acceptable as long as ejection and structural integrity due to wastage isn't likely to occur. All of the RPV head penetration and associated weld examinations required by the NRC to date, have been based on assuring an extremely low probability of leakage from these components as well as assuring their structural integrity. NRC's position for reactor pressure vessel upper head inspections is that if an active degradation mechanism is present, any long term inspection plan should be based on assuring an extremely low probability of abnormal leakage rather than allowing leakage and demonstrating the acceptability of its consequences. Consistent with this position, the NRC sets the conditions regarding the use of ASME Code Case N–729–1 in order to incorporate its use, by reference, into the Code of Federal Regulations. The technical justifications for the need for these conditions are included in the public comment section of this rulemaking activity.

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

Public Comment:

In a letter dated June 19, 2007, Progress Energy stated that the ASME has not amended Section XI of the BPV Code to include Code Case N–722. Therefore, requiring licensees to comply with a Code Case that has not been incorporated into the ASME Code sets a precedence of mandatory implementation of a Code Case which has not been subject to ASME public review and comment during its development.

NRC Response:

The NRC recognizes that the ASME has not amended Section XI of the ASME BPV Code to include Code Case N–722 and that during development code cases may be subjected to different ASME public review and comment than Section XI. The NRC is incorporating Code Case N–722 in the rule to expedite the implementation of Code Case N–722. The NRC is requiring expedited implementation of Code Case N–722 because the NRC concluded from a safety perspective that these inspections are necessary to ensure the integrity of the Alloy 600/82/182 components. The NRC has previously incorporated code cases in 10 CFR 50.55a prior to the ASME taking action to include the code cases in the ASME Code. The NRC declines to adopt commenter's suggestion. No change was made to the final rule as a result of this comment.

Public Comment:

In a letter dated June 22, 2007, Southern Nuclear Operating Company stated that the NRC does not reference the industry efforts, especially those made through the Electric Power Research Institute's Materials and Reliability Program (MRP) to address the issue of bare-metal visual examination of Alloy 600 welds. Every PWR in the United States has agreed to the implementation of MRP–139, which requires an augmented program to perform bare-metal visual examinations on the large diameter Alloy-600 welds on a frequency that is almost identical to the schedule mandated in ASME Code Case N–722. Typically, utilities are given the option to assess each code case and determine if that code case should be adopted for use. By mandating the use of Code Case N–722, the NRC is, in effect, writing their own code and deviating from using guidance from an international consensus standard body (ASME Code Committees, of which the NRC is a participant and voting member). The NRC and the industry have been working on this issue, and industry programs are in place to cover these examinations. Additional time should be provided to allow the MRP and ASME to develop the necessary enhancements.

NRC Response:

The MRP–139 report referenced by the commenter is an industry guidance document which includes guidance on bare-metal visual examinations of Alloy 82/182 butt welds. Because MRP–139 is written as inspection guidance, MRP–139 is not suitable to be incorporated by reference in 10 CFR 50.55a. In addition, the MRP has not issued inspection guidelines for partial-penetration welded components with Alloy 600/82/182 materials. The NRC finds Code Case N–722 with conditions is suitable to be incorporated by reference in the final rule. Given the safety significance of these inspections, the NRC concluded that the reactor coolant pressure boundary visual inspections of 10 CFR 50.55a(g)(6)(ii)(E) are necessary to ensure that the appropriate safety-significant visual inspections are performed.

The NRC recognizes that the ASME is an international, consensus standard body, and that the ASME Code provides necessary requirements for the design and inspection of nuclear power plant components. Therefore, the NRC has incorporated by reference in 10 CFR 50.55a certain editions and addenda of Section III and XI of the ASME BPV Code. However, in certain cases, such as when an active degradation mechanism is affecting the integrity of pressure boundary components, the NRC needs to take regulatory actions to ensure safety and protect the public health and safety. As mandated by the Atomic Energy Act of 1954, as amended, and the Energy Reorganization Act of 1974, the NRC has the statutory authority and responsibility to enact regulations through the rulemaking process as necessary to ensure safety.

The NRC declines to adopt commenter's suggestion. No change was made to the final rule as a result of this comment.

Public Comment:

In a letter dated June 20, 2007, Arizona Public Service Company stated that 10 CFR 50.55a(g)(6)(ii)(E)(1) exempts Alloy 600/82/182 materials that have been mitigated by weld overlay or stress improvement from the inspection requirements of Code Case N–722. The commenter recommended that nozzles and penetrations that have been mitigated by half-nozzle replacement or Alloy 690/52/152 weld pads should also be exempted from the requirements of Code Case N–722.

NRC Response:

Code Case N–722, as implemented by 10 CFR 50.55a(g)(6)(ii)(E), applies to examination of *pressure retaining* partial or full penetration welds in Class 1 components fabricated with Alloy 600/82/182 material in PWRs. The requirements of Code Case N–722, as implemented by 10 CFR 50.55a(g)(6)(ii)(E), applies to nozzles and penetrations that have Alloy 600/82/182 materials that form the pressure boundary. This requirement is clear from the title and wording of Code Case N–722. Note the clarification in the preceding sentences applies even though Alloy 600/82/182 materials may not be entirely removed from the component, provided that *pressure retaining* penetrations and welds no

longer contain Alloy 600, Alloy 82, or Alloy 182 materials. In addition, 10 CFR 50.55a(g)(6)(ii)(E)(1) is revised in the final rule.

Public Comment:

In a letter dated June 20, 2007, Jack Spanner of Electric Power Research Institute stated that with respect to 10 CFR 50.55a(g)(6)(ii)(E)(2), it should be sufficient to demonstrate the ability to characterize location, orientation and length of cracks with calibration blocks or mockups containing a notch in the axial and circumferential orientation.

NRC Response:

The requirements of paragraph (g)(6)(ii)(E)(2) state only that additional actions must be taken to characterize the location, orientation, and length of cracks. The comment does not provide sufficient information for the NRC to respond regarding the adequacy of calibration blocks or mockups to meet these requirements. Therefore, the NRC declines to adopt the commenter's suggestion. No change was made to the final rule as a result of this comment.

Public Comment:

In a letter dated June 20, 2007, Arizona Public Service Company recommended that the term ''Non-visual NDE'' used in paragraph (g)(6)(ii)(E)(3) be changed to ''surface'' or ''volumetric'' examination.

NRC Response:

The ASME Code, Section XI, paragraph IWA–2200 states that ''three types of examinations used during inservice inspection are defined as visual, surface, and volumetric.'' It is clear from this Code definition that non-visual examination refers to either surface or volumetric examination. The NRC declines to adopt the commenter's suggestion. No change was made to the final rule as a result of this comment.

Public Comment:

In a letter dated June 20, 2007, Arizona Public Service Company stated that paragraph (g)(6)(ii)(E)(4) imposes the rule of Appendix VIII of the ASME Code, Section XI, to components where qualification may not have been performed (possibly due to size and thickness). Therefore, the commenter recommended that because the component causing the implementation of this paragraph is leaking, the NDE method and techniques utilized to characterize the leak in paragraph (g)(6)(ii)(E)(2) should be sufficient qualification.

NRC Response:

The commentor believes that paragraph (g)(6)(ii)(E)(4) is unnecessary and suggests that the NDE method and techniques utilized to characterize the leak in (g)(6)(ii)(E)(2) be sufficient [NDE] qualification. The NRC disagrees with the commentor's suggestion. Paragraph (g)(6)(ii)(E)(2) requires that when leakage is detected in a component, additional action (e.g., non-visual examination) must be performed to characterize the location, orientation, and length of cracks that cause the leakage. Paragraph (g)(6)(ii)(E)(2) does not provide specific qualification for NDE. The intent of Paragraph (g)(6)(ii)(E)(2) is to provide a general requirement for non-visual examinations to be performed should leakage be detected. The NDE method and techniques utilized to characterize the leak in paragraph (g)(6)(ii)(E)(2) are visual examinations which cannot characterize flaw sizes.

Paragraph (g)(6)(ii)(E)(4) requires that the ultrasonic examination be performed using the appropriate supplement of Section XI, Appendix VIII of the ASME Code. The intent of paragraph (g)(6)(ii)(E)(4) is to provide specific NDE qualification requirements for ultrasonic examination for Alloy 600/82/182 butt welds so that the requirements of paragraphs (g)(6)(ii)(E)(2) or (g)(6)(ii)(E)(3) can be satisfied.

This position is consistent with other provisions of 10 CFR 50.55a in that ultrasonic examination of butt welds must be qualified in accordance with the appropriate supplement of Section XI, Appendix VIII of the ASME Code. Therefore, the NRC declines to adopt the commenter's suggestion. No change was made to the final rule as a result of this comment.

Public Comment:

After the public comment period closed, the NRC received an additional comment from Florida Power and Light Company via a phone call on July 8, 2008, regarding the schedule for implementing the initial inspections under Code Case N–722 as required by 10 CFR 50.55a(g)(6)(ii)(E), *Reactor coolant pressure boundary visual inspections.* The commenter pointed out that Code Case N–722 specifies frequency of examination for each part to be examined but does not specify when the initial inspections shall be performed. The commenter recommended that the schedule for the initial inspections be specified in the rule.

NRC Response:

The NRC agrees with the commenter that the schedule for the initial inspections is not specified in Code Case N–722 nor is it specified in a NRC-proposed condition applicable to this Code Case. Code Case N–722 contains three different inspection intervals: inspections to be conducted every other refueling outage, each refueling outage, and once per interval. The NRC has specified the following initial inspection requirements in a new footnote to the new paragraph.

For inspections to be conducted every refueling outage and inspections conducted every other refueling outage, the initial inspection shall be performed at the next refueling outage after January 1, 2009. For inspections to be conducted once per interval, the inspections shall begin in the interval in effect on January 1, 2009, and shall be prorated over the remaining periods and refueling outages in this interval. For inspections to be conducted once per interval, if the current interval ends prior to January 1, 2009, the initial inspection shall be performed at the first refueling outage after January 1, 2009. These initial inspection schedules are believed to be reasonable since, in general, the inspections are straightforward to perform and licensees have been aware for over two years of the NRC intent to incorporate Code Case N–722 in the regulations during which to plan the inspections.

III. Section-by-Section Analysis

ASME BPV Code, Section III

10 CFR 50.55a(b)(1)

The final rule revises § 50.55a(b)(1) in the current regulation to incorporate by reference the 2004 Edition of Section III, Division 1, of the ASME BPV Code into 10 CFR 50.55a. This paragraph requires new applicants for a nuclear power plant who submit an application for a construction permit under 10 CFR part 50 after the effective date of this rule use the 2004 Edition of Section III, Division 1 of the ASME BPV Code for the design and construction of the reactor coolant pressure boundary and Quality Group B and C components. This paragraph also requires that existing modifications and limitations for weld leg dimensions, independence of inspection and subsection NH in §§ 50.55a(b)(1)(ii), 50.55a(b)(1)(v), and 50.55a(b)(1)(vi), respectively, apply to the 2004 Edition of Section III, Division 1 of the ASME BPV Code. The NRC is not adopting any additional limitations with respect to the 2004 Edition of Section III.

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

As discussed in Section II of this document, applicants or licensees may use Articles NB–3200, NB–3600, NC–3600, and ND–3600 for seismic design of piping up to and including the 1993 Addenda, subject to the limitation specified in paragraph (b)(1)(ii) of this section. Applicants or licensees may not use these Articles for seismic design of

piping in the 1994 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(1) of this section. The final rule revises 50.55a(b)(1)(iii) in the current 10 CFR 50.55a to clarify the current limitation regarding seismic design. Current § 50.55a(b)(1)(iii) states that applicants or licensees may use Articles NB–3200, NB–3600, NC–3600, and ND–3600 for seismic design. However, the rules in Article NB–3200 of Section III of the ASME BPV Code contain criteria applicable to the seismic design of components other than piping systems. The NRC revises § 50.55a(b)(1)(iii) to clarify that the limitation only applies to the seismic design of piping.

ASME BPV Code, Section XI

The final rule revises § 50.55a(b)(2) to incorporate by reference the 2004 Edition of the ASME BPV Code, Section XI, Division 1, subject to the modifications and limitations discussed in the following paragraphs:

10 CFR 50.55a(b)(2)(xi)—Class 1 Piping

Paragraph 50.55a(b)(2)(xi) states that ''licensees may not apply IWB–1220, ''Components Exempt from Examination,'' of Section XI, 1989 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(2) of this section, and shall apply IWB–1220, 1989 Edition.'' Subarticle IWB–1220 of the 1989 Edition of the ASME BPV Code, Section XI, exempts certain components (such as small bore piping) from the volumetric and surface examinations. However, welds or portions of welds that are inaccessible due to being encased in concrete, buried underground, located inside a penetration, or encapsulated by guard pipe were included in components for exemption from examination and incorporated in the edition and addenda of the ASME BPV Code, Section XI, after the 1989 Edition. The NRC previously did not agree with the incorporation of these types of welds for exemption from examination because the NRC believed that these welds should be examined to monitor their structural integrity. Therefore, the NRC prohibited the use of 1989 addenda through the latest editions and addenda of the ASME BPV Code, Section XI, regarding the application of IWB–1220 in 10 CFR 50.55a(b)(2)(xi) (64 FR 51394; September 22, 1999).

The revision to the regulation removes 10 CFR 50.55a(b)(2)(xi), thereby permitting the use of ASME BPV Code, Section XI, IWB–1220 of any edition or addenda of ASME BPV Code, Section XI, incorporated by reference in 10 CFR 50.55a. The condition placed upon Section XI, IWB–1220 in 10 CFR 50.55a(b)(2)(xi) is no longer necessary because of the following:

1. Licensees can select an alternate weld for inspection that does not have limitations.

2. Licensees have committed to perform augmented inspections of break exclusion zone (BEZ) welds which are located in inaccessible areas such as containment penetrations or encapsulated by guard pipe to the extent practical under the BEZ criteria.

3. Boiling water reactor (BWR) licensees have followed the provisions of Generic Letter 88–01, ''NRC Position on IGSCC [intergranular stress corrosion cracking] in BWR Austenitic Stainless Steel Piping,'' and the associated NRC report, NUREG–0313, ''Technical Report on Material Selection and Process Guidelines for BWR Coolant Pressure Boundary Piping,'' and the provisions of the BEZ criteria (Reference: Branch Technical Position MEB 3–1 attached to Standard Review Plan 3.6.2) apply to the examination of the welds such as those that are located inside containment penetrations or encapsulated by guard pipe.

4. Licensees of plants whose construction permits were issued after January 1, 1971, are required to have ASME Class 1 and Class 2 components designed and provided with access to enable the performance of ISIs, and the removal of the limitation on the use of IWB–1220(d) would not permit welds to be located in reactor coolant pressure boundary components (including Class 1 components permitted to be designed to Class 2 rules) that are encased in concrete, buried underground, located inside a penetration, or encapsulated by guard pipe.

10 CFR 50.55a(b)(2)(xiii)—Mechanical Clamping Devices

Paragraph 50.55a(b)(2)(xiii) is removed from the regulation. This paragraph permitted licensees to use the provisions of Code Case N–523–1, ''Mechanical Clamping Devices for Class 2 and 3 Piping.'' Instead, Code Case N–523–2 provides updated requirements to those of Code Case N–523–1, has been accepted in Regulatory Guide (RG) 1.147, Revision 15, ''Inservice Inspection Code Case Acceptability, ASME BPV Code, Section XI, Division 1,'' and Revision 15 is incorporated by reference into 10 CFR 50.55a(g)(4)(i) and 10 CFR 50.55a(g)(4)(ii). Therefore, 10 CFR 50.55a(b)(2)(xiii) no longer serves any useful purpose and is removed.

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

Paragraph 50.55a(b)(2)(xv) in the current 10 CFR 50.55a regulation specifies provisions that may be used to modify implementation of Appendix VIII of Section XI, 1995 Edition through the 2001 Edition of the ASME BPV Code with regard to ultrasonic examinations of piping systems. The change specifies that licensees who have been approved by the NRC to use later editions and addenda than the 2001 Edition of the ASME BPV Code shall use the 2001 Edition of Appendix VIII. Licensees cannot use Appendix VIII to the editions and addenda of the ASME Code Section XI that are later than the Appendix VIII to 2001 Edition.

10 CFR 50.55a(b)(2)(xx)—System Leakage Tests

10 CFR 50.55a(b)(2)(xx) in the current 50.55a regulation requires certain hold time when performing system leakage tests in accordance with IWA–5213(a) of the 1997 through 2002 addenda of the ASME Code Section XI. Since the publication of the current 10 CFR 50.55a, the NRC has noticed an NDE issue that involves the system leakage tests when performed in accordance with IWA–4540(a). 10 CFR 50.55a(b)(2)(xx) is revised to address the NDE issue. The requirements in current 10 CFR 50.55a(b)(2)(xx) are not changed. The revised 10 CFR 50.55a(b)(2)(xx) provides new requirements. The revision requires, as part of repair and replacement activities (by welding or brazing under the 2003 Addenda through the latest edition and addenda incorporated by reference in 10 CFR 50.55a(b)(2)), that NDE be performed in accordance with subarticle IWA–4540(a)(2) of the 2002 Addenda of the ASME BPV Code, Section XI, after a system leakage test is performed per subarticle IWA–4540(a)(2) of the 2003 Addenda through later editions and addenda of the ASME BPV Code, Section XI. This provision requires that after repair or replacement activities (1) the NDE method and acceptance criteria of the 1992 Edition, or later, of Section III be performed and met prior to returning the system to service, and that (2) a system leakage test be performed in accordance with IWA–5000 prior to, or as part of, returning the system to service.

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

Paragraph 10 CFR 50.55a(b)(2)(xxi)(A) in the current 50.55a regulation allows the use of the visual examination with

enhanced magnification in lieu of an ultrasonic examination. Because of the latest development in visual examination requirements in the ASME Code, Paragraph 10 CFR 50.55a(b)(2)(xxi)(A) is revised to be consistent with the condition for Code Case N–648–1, ''Alternative Requirements for Inner Radius Examination of Class I Reactor Vessel Nozzles, Section XI, Division 1.'' in RG 1.147, Revision 15, which requires the assumption of a limiting flaw aspect ratio when using the allowable flaw length criteria in Table IWB–3512–1 during an enhanced visual examination. The revision states ''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) in 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.'' The limitation on the flaw aspect ratio is needed because visual examination cannot determine the depth of cracks. A visual examination requirement may be applied only when a limiting flaw aspect ratio of 0.5 is assumed. A flaw aspect ratio of less than 0.5 would not be conservative. As shown in Table IWB–3512–1, there are no flaw aspect ratios higher than 0.5. Therefore, assuming a flaw aspect ratio of 0.5 is appropriate.

10 CFR 50.55a(g)(6)(ii)(A)—Augmented Examination of Reactor Vessel

Paragraph 50.55a(g)(6)(ii)(A) is removed from the regulation. This paragraph required a one-time, augmented ISI program for those systems and components the Commission determined that added assurance of structural reliability was necessary. Paragraph 50.55a(g)(6)(ii)(A) was incorporated in the regulations in 1992 to require all current licensees to conduct a one-time, expedited examination of reactor vessel shell welds. Examination requirements were specified in item B1.10, ''Shell Welds,'' of Examination Category B–A, ''Pressure Retaining Welds in Reactor Vessel,'' in Table IWB–2500–1, ''Examination Categories'' of the 1989 Edition of the ASME BPV Code, Section XI, Division 1. Because all the licensees have completed the subject augmented examination of the reactor vessel shell welds, the requirements in 10 CFR 50.55a(g)(6)(ii)(A) and associated subparagraphs are no longer needed. Future licensees need not conduct this augmented examination, because new Code provisions should adequately address the degradation to which the augmented examination was directed.

10 CFR 50.55a(g)(6)(ii)(D)—Reactor Vessel Head Inspections

On September 30, 2002, the Davis-Besse Lessons Learned Task Force (LLTF) issued a report containing 51 recommendations for actions that the NRC should take to address areas that the LLTF considered contributors to the Davis-Besse event. On November 26, 2002, the senior NRC management review team endorsed all but two of the task force's recommendations. One endorsed high-priority recommendation was the following:

> The NRC should encourage American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) requirement changes for bare metal inspections of nickel based alloy nozzles for which the code does not require the removal of insulation for inspections. The NRC should also encourage ASME Code requirement changes for the conduct of non-visual non-destructive examination (NDE) inspections of VHP [vessel head penetration] nozzles. Alternatively, the NRC should revise Title 10 Code of Federal Regulations (10 CFR) Part 50.55a to address these areas.

Section XI of the ASME Code, which is incorporated by reference into NRC regulations by 10 CFR 50.55a, ''Codes and standards,'' currently specifies that inspections of the reactor pressure vessel (RPV) head need only include a visual check for leakage on the insulated surface or surrounding area. Experience has shown that these inspections may not detect small amounts of leakage from an RPV head penetration with cracks extending through the nozzle or the J-groove weld. Such leakage can create an environment that leads to circumferential cracks in RPV head penetration nozzles and/or corrosion of the RPV head.

The NRC issued Order EA–03–009, ''Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors,'' dated February 11, 2003, which modified licensees' licenses to require specific inspections of the reactor pressure vessel head and associated penetration nozzles at pressurized water reactors. In September 2003, industry representatives through the Materials Reliability Program provided industry input to support industry alternative inspection programs through various public meetings and MRP–95, ''Materials Reliability Program: Generic Evaluation of Examination Coverage Requirements for the Reactor Pressure VHP Nozzles, (ML032740424).'' In response to internal review and stakeholder input, the NRC issued First Revised Order EA–03–009, February 20, 2004 (Order), which refined the inspection requirements of NRC Order EA–03–009 by taking into account lessons learned from inspections performed from February 2003 to January 2004.

On July 7, 2004, after an assessment which concluded that ASME Code requirement revisions would not be complete in 2004, the NRC issued a Commission Paper (SECY–04–0115) requesting Commission approval of a rulemaking plan to incorporate into 10 CFR 50.55a the RPV head and associated head penetration inspection requirements contained in the Order.

The Commission, in a Staff Requirements Memorandum, dated August 6, 2004, approved an alternative option to evaluate the RPV inspection requirements of an upcoming ASME Code Case or revision of the ASME Code for incorporation into 10 CFR 50.55a.

In March 2006, the ASME approved Code Case N–729–1, Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, which provides an alternative long-term inspection program for RPV upper heads. The NRC participated in ASME Code development and approval of N–729–1. The NRC has reviewed the final version of Code Case N–729–1, and with conditions, finds it provides reasonable assurance of public health and safety from failure of the reactor pressure vessel upper head and penetration nozzles. Therefore, the NRC is pursuing this rulemaking activity to incorporate by reference the inspection requirements of Code Case N–729–1, as conditioned, into 10 CFR 50.55a.

The experience of the Davis-Besse RPV head degradation and the discovery of leaks and nozzle cracking at other plants over the past seven years reinforce the need for effective regulatory required inspections of the RPV head and penetration nozzles. The absence of an effective inspection regime could, over time, result in unacceptable circumferential cracks in RPV head penetration nozzles or in the degradation of the RPV head by

corrosion from leaks in the reactor coolant pressure boundary. These degradation mechanisms increase the probability of a loss of reactor coolant pressure boundary event through ejection of a nozzle or other rupture of the RPV head. The result of this rulemaking would be the establishment of inspection requirements that result in an extremely low probability of abnormal leakage, of rapidly propagating failure and of gross rupture of the reactor pressure vessel head and penetration nozzles.

The Code Case N–729–1 inspection plan for RPV upper heads with Alloy 600/182/82 penetration nozzles requires periodic bare metal visual (BMV) examinations and periodic nonvisual examinations using ultrasonic testing (UT), eddy current testing (ET), or dye penetrant testing of the penetration nozzle base metal. BMV examinations are performed in order to identify primary coolant leakage based on the presence of boric acid deposit accumulations. Nonvisual examinations are performed in order to identify flaws which could lead to leakage or failure of the penetration nozzle.

These same inspections are required to be performed for RPV upper heads with Alloy 690/152/52 penetration nozzles, but the frequency of inspection is greatly reduced. This reduction is due to the enhanced resistance these materials have demonstrated against PWSCC.

Paragraph 50.55a(g)(6)(ii)(D) is added to the regulation to require licensees to comply with the reactor vessel head inspection requirements of ASME Code Case N–729–1, subject to conditions, by December 31, 2008. Compliance to Code Case N–729–1; with conditions regarding inspection frequency, examination coverage, qualification of ultrasonic examination, and re-inspection intervals; would be equivalent to complying with NRC Order EA–03–009, dated February 11, 2003, and First Revised Order EA–03–009, dated February 20, 2004. Thus, once a licensee implements Code Case N–729–1, with conditions, the First Revised NRC Order EA–03–009 no longer applies to that licensee and is deemed to be withdrawn. This allows licensees to transfer from the Order requirements to the requirements of 10 CFR 50.55a(g)(6)(ii)(D).

Footnote 10 to 10 CFR 50.55a(b)(2) is removed because Code Case N–729–1, as conditioned, replaces the requirements of the NRC Order EA–03–009 cited in that footnote.

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

A new paragraph 10 CFR 50.55a(g)(6)(ii)(E) is added to require all current and future licensees to apply ASME Section XI, Code Case N–722, with conditions. Code Case N–722 provides requirements for bare metal visual examination of full and partial penetration welds in Class 1 components that are fabricated with Alloy 600/82/182 material. Surfaces required to be examined by the bare metal visual method have to be unobstructed by debris, paint, insulation or other sources of interference. 10 CFR 50.55a(g)(6)(ii)(E) requires the use of N–722 plus four additional conditions. Condition (1) requires that PWR licensees implement N–722 except for those welds that have been mitigated by weld overlay or stress improvements. Condition (2) requires that if leakage occurs from a component, licensees take additional actions to characterize the orientation of the crack that caused the leakage. Condition (3) requires that if the crack that leads to leakage is circumferentially oriented and potentially the result of primary water stress-corrosion cracking, licensees perform non-visual sample inspections of the population of the components. Condition (4) requires that the ultrasonic examinations of the butt welds as required by Condition (2) and (3) follow the appropriate supplement of Appendix VIII of the ASME Code, Section XI.

The visual examinations specified in Code Case N–722 are additional requirements beyond the current NDE requirements of Table IWB–2500–1 in the ASME Code, Section XI. The application of ASME Code Case N–722 is necessary because current inspections are inadequate and the safety consequences can be significant should the components fail due to cracking. NRC's determination that existing inspections of the reactor coolant pressure boundary (RCPB) are inadequate is based upon the degradation of RPV head penetration nozzles at Davis-Besse and the discovery of leaks and cracking at other plants, such as Oconee and Arkansas Nuclear One Unit 1. The absence of an effective inspection regime could, over time, result in unacceptable circumferential cracking or the degradation of reactor coolant system (RCS) components by corrosion from leaks in the RCPB. These degradation mechanisms increase the probability of a loss-of-coolant accident. The inspections required by the 2004 Edition of the ASME BPV Code, Section XI, are inadequate because Examination Category B–P, ''All Pressure Retaining Components,'' of Table IWB–2500–1, only requires a visual examination of the reactor vessel with the insulation in place during a system leakage test each refueling outage. Visual inspections may not detect gradual leakage as confirmed by industry experience.

Both the NRC and the industry took short-term actions to address PWSCC in the RCPB because of limitations of the ASME BPV Code inspection programs to address PWSCC in the RCPB. In addition to issuing bulletins, the NRC issued Order EA–03–009 and First Revised Order EA–03–009 to quickly establish interim inspection requirements for RPV upper heads at PWRs. However, these measures addressed the issue only temporarily, and for specific locations. The industry also responded with compensatory measures (e.g., by specifying that a one-time, bare-metal visual inspection of all RCS nickel-based alloy components and weld locations be performed within two refueling outages). However, these were only short-term measures.

The ASME also took actions to address PWSCC. An ASME task group concluded that more rigorous inspections than those currently provided by the ASME BPV Code were needed in the areas most susceptible to PWSCC. The task group developed ASME Code Case N–722 to enhance the current ASME BPV Code requirements for detection of leakage and corrosion in the components considered to be susceptible to PWSCC. The Code Case specifies bare-metal visual examinations for all RCS pressure retaining components fabricated from Alloy 600/82/182 materials. This Code Case was approved by ASME in July 2005 and was published in Supplement 6 to the 2004 Code Cases. However, the Code Case is not mandatory for industry to follow. The Code Case improves upon existing ASME BPV Code inspection requirements, because it specifies *bare metal* visual examinations.

Beyond the bare metal visual inspection requirements and frequencies of inspections, ASME Code Case N–722 is relatively limited in scope. The NRC is requiring non-visual inspection for items where leakage is identified in Class 1 components. The additional non-visual NDE is required to determine whether circumferential cracking is present in the flawed material and if multiple circumferential flaws have initiated. Leakage detected by visual examination only identifies that a flaw exists, and is not able to characterize flaw orientations and

locations. The NRC is requiring NDE scope expansion once a circumferential flaw is identified in these components because once flaws are found, favorable conditions must be assumed to exist for additional flaws to develop in other similar components in similar environments. Circumferential cracking has occurred, and is a particularly serious safety concern because it could, if undetected by NDE, lead to a complete severing of the piping and a loss-of-coolant accident.

Therefore, the NRC is requiring the application of Code Case N–722 with additional conditions. The conditions require additional NDE when leakage is detected and expansion of the sample size if a circumferential PWSCC flaw is found. Operating experience has shown that bare metal visual inspections alone are not sufficient and that NDE is necessary in order to detect cracking. The requirements for the schedule for conducting the initial inspections are specified in a new footnote to the new paragraph.

ASME OM Code

The revision to § 50.55a(b)(3) incorporates by reference the 2004 Edition of the ASME OM Code subject to no new modifications or limitations.

Paragraph (b)(3)(iv)(D) is revised to be less specific with regard to paragraph references in subsection ISTC [Inservice testing, the Code for Operation and Maintenance of Nuclear Power Plants] to eliminate inconsistencies in paragraph numbering. This is considered to be an editorial change that does not affect the intent or implementation of the current modification regarding the discontinuance of Appendix II condition monitoring programs of check valves.

IV. Generic Aging Lessons Learned Report

In September 2005, the NRC issued, ''Generic Aging Lessons Learned (GALL) Report,'' NUREG–1801, Volumes 1 and 2, Revision 1, 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 are adequate without change or augmentation for license renewal. Section XI, Division 1, of the ASME BPV Code is one of the existing programs in the GALL report that is evaluated as an aging management program (AMP) for license renewal. Subsections IWB, IWC, IWD, IWE, IWF, and IWL of the 2001 Edition up to and including the 2003 Addenda of Section XI of the ASME BPV Code for ISI were evaluated in the GALL report and the conclusions in the GALL report are valid for this edition and addenda.

In the GALL report, Sections XI.M1, ''ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD,'' XI.S1, ''ASME Section XI, Subsection IWE,'' XI.S2, ''ASME Section XI, Subsection IWL,'' and XI.S3, ''ASME Section XI, Subsection IWF,'' describe the evaluation and technical bases for determining the adequacy of Subsections IWB, IWC, IWD, IWE, IWF, and IWL, respectively. In addition, many other AMPs in the GALL report rely in part, but to a lesser degree, on the requirements in the ASME BPV Code, Section XI.

The NRC has evaluated Subsections IWB, IWC, IWD, IWE, IWF, and IWL of Section XI of the ASME BPV Code, 2004 Edition as part of the § 50.55a amendment process to incorporate by reference the 2004 Edition of the ASME BPV Code to determine if the conclusions of the GALL report also apply to AMPs that rely upon the ASME BPV Code edition that is incorporated by reference into § 50.55a by this final rule. The NRC finds that the 2004 Edition of Sections III and XI of the ASME BPV Code, as modified and limited in this final rule, are acceptable and the conclusions of the GALL report remain valid. Accordingly, an applicant may use Subsections IWB, IWC, IWD, IWE, IWF, and IWL of Section XI of the 2004 Edition of the ASME BPV Code, as modified and limited in this final rule, as acceptable alternatives to the requirements of the 2001 Edition up to and including the 2003 Addenda of the ASME BPV Code, Section XI, referenced in the GALL AMPs in its plant-specific license renewal application. 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 of the ASME BPV Code as acceptable alternatives to the AMPs described in the GALL report.

However, a licensee must assess and follow applicable NRC requirements with regard to changes to its licensing basis.

The GALL report includes AMPs that are based on the requirements in the 2001 Edition through the 2003 Addenda of Section XI of the ASME BPV Code but in which the AMPs may recommend additional augmentation of the Code requirements in order to achieve aging management for license renewal. The technical or regulatory aspects of the AMPs, for which augmentation is recommended, also apply when implementing the 2004 Edition of Section XI of the ASME BPV Code. 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 aspect of its AMP.

The NRC currently provides license renewal guidance for augmented inspections of PWR upper reactor vessel heads and their penetration nozzles in GALL AMP XI.M11A, ''Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Heads of Pressurized Water Reactors (PWR Only).'' The current program elements and aging management recommendations in GALL AMP XI.M11A are based on the augmented inspection requirements in the First Revised Order EA–03–009, ''Issuance of First Revised Order (EA–03–009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors.'' For licensees that have been granted a renewed operating license and have committed to an AMP that is based on both conformance with GALL AMP XI.M11A and compliance with First Revised Order EA–03–009, the licensees may update the program elements of their AMP to reflect compliance with the new requirements in 10 CFR 50.55a(g)(6)(ii)(D) and (E) without having to identify an exception to GALL AMP XI.M11A. For new or current license renewal applicants, they may reference conformance with GALL AMP XI.M11A and compliance with the new augmented inspection requirements in paragraphs 10 CFR 50.55a(g)(6)(ii)(D) and (E) without the need for taking an exception to the program elements in GALL AMP XI.M11A.

V. Availability of Documents

Document	Public document room	Electronic reading room	ADAMS No.
ASME BPV Code*			N/A
ASME OM Code*			N/A
ASME Code Case N–722	X		ML070170676
ASME Code Case N–729–1	X		ML070170679

Document	Public document room	Electronic reading room	ADAMS No.
Regulatory Analysis	X	.....	ML081550317
EA–03–009	X	X	ML030380470
First Revised NRC Order EA–03–009	X	X	ML040220181
GALL Report, NUREG–1801	.....	X	ML012060392
	.....	.....	ML012060514
	.....	.....	ML012060521
	.....	.....	ML012060539
Staff Requirements Memorandum dated September 10, 1999	.....	.....	ML003751061
RG 1.147, Revision 15	X	X	ML072070419

*Available on the ASME Web site.

VI. Voluntary Consensus Standards

The National Technology Transfer and Advancement Act of 1995, Public Law 104–113, requires agencies to use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or is otherwise impractical. Public Law 104–113 requires Federal agencies to use industry consensus standards to the extent practical; it does not require Federal agencies to incorporate by reference a standard into the regulations in its entirety. The law does not prohibit an agency from generally 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.

The NRC is amending its regulations to incorporate by reference a more recent edition of Sections III and XI of the ASME BPV Code and ASME OM Code, for construction, ISI, and inservice testing of nuclear power plant components. ASME BPV and OM Codes are national consensus standards developed by participants with broad and varied interests, in which all interested parties (including the NRC and licensees of nuclear power plants) participate. In an SRM dated September 10, 1999, the Commission indicated its intent that a rulemaking identify all parts of an adopted voluntary consensus standard that are not adopted, and to justify not adopting such parts. The parts of the ASME BPV Code and OM Code that the NRC is not adopting; or is adopting with conditions, modifications, or limitations under which the Codes may be applied; are identified in Section III of this document and in the regulatory analysis. If the NRC did not conditionally accept ASME Code Editions and Addenda, it would disapprove these items entirely. The effect would be that licensees would need to submit a larger number of relief requests which would be an unnecessary additional burden for both the licensee and the NRC. This situation fits the definition of ''impractical'' under Public Law 104–113. For these reasons, the treatment of ASME Code Editions and Addenda, and conditions, modifications, or limitations placed on them in this final rule do not conflict with any policy on agency use of consensus standards specified in Office of Management and Budget Circular A–119.

VII. Finding of No Significant Environmental Impact: Environmental Assessment

This action is in accordance with NRC's policy to incorporate by reference in 10 CFR 50.55a new editions and addenda of the ASME BPV and OM Codes to provide updated rules for constructing and inspecting components and testing pumps, valves, and dynamic restraints (snubbers) in light-water nuclear power plants. ASME Codes are national voluntary consensus standards and are required by the National Technology Transfer and Advancement Act of 1995, Public Law 104–113, to be used by government agencies unless the use of such a standard is inconsistent with applicable law or otherwise impractical.

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. 4332(C); NEPA § 102(C)).

The Commission has determined under NEPA, as amended, and the Commission's regulations in subpart A of 10 CFR part 51, that this rule, is not a major Federal action significantly affecting the quality of the human environment and, therefore, an environmental impact statement is not required.

The rulemaking will 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; there is no increase in occupational exposure; and there is no significant increase in public radiation exposure. Some of the changes concerning ensuring the integrity of the RCPB would reduce the probability of accidents and radiological impacts on the public. The rulemaking does not involve non-radiological plant effluents and has no other environmental impact. Therefore, no significant non-radiological impacts are associated with the action.

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

VIII. Paperwork Reduction Act Statement

This rule increases the burden on licensees to report requirements and maintain records for examination requirements in ASME BPV Code Section XI IWB–2500(b). The public burden for this information collection is estimated to average 3 hours every ten years per request. Because the burden for this information collection is insignificant, OMB clearance is not required. Existing requirements were approved by the OMB, 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.

IX. Regulatory Analysis

The NRC has prepared a regulatory analysis on this final rule. The analysis is available for review in the NRC's PDR, located in One White Flint North, 11555 Rockville Pike, Rockville, Maryland. In addition, copies of the regulatory analysis may be obtained as indicated in Section V of this document.

X. Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980, 5 U.S.C. 605(b), the Commission certifies that this amendment will not, if promulgated, have a significant economic impact on a substantial number of small entities. This amendment affects the licensing and operation of nuclear power plants. The companies that own these plants do not fall within the scope of the definition of small entities set forth in the Regulatory Flexibility Act or the Small Business Size Standards set forth in regulations issued by the Small Business Administration at 13 CFR part 121.

XI. Backfit Analysis

The NRC's Backfit Rule in 10 CFR 50.109 states that the Commission shall require the backfitting of a facility only when it finds the action to be justified under specific standards stated in the rule. Section 50.109(a)(1) defines backfitting as the modification of or addition to systems, structures, components, or design of a facility; or the design approval or manufacturing license for a facility; or the procedures or organization required to design, construct or operate a facility; any of which may result from a new or amended provision in the Commission rules or the imposition of a regulatory staff position interpreting the Commission rules that is either new or different from a previously applicable NRC position after issuance of the construction permit or the operating license or the design approval.

Section 50.55a requires nuclear power plant licensees to construct ASME BPV Code Class 1, 2, and 3 components in accordance with the rules provided in Section III, Division 1, of the ASME BPV Code; inspect Class 1, 2, 3, Class MC, and Class CC components in accordance with the rules provided in Section XI, Division 1, of the ASME BPV Code; and test Class 1, 2, and 3 pumps, valves, and dynamic restraints (snubbers) in accordance with the rules provided in the ASME OM Code. This rule incorporates by reference the 2004 Edition of Section III, Division 1, of the ASME BPV Code; Section XI, Division 1, of the ASME BPV Code; and the ASME OM Code.

Incorporation by reference of more recent editions and addenda of Section III, Division 1, of the ASME BPV Code does not affect a plant that has received a construction permit or an operating license or a design that has been approved, because the edition and addenda to be used in constructing a plant are, by rule, determined on the basis of the date of the construction permit, and are not changed thereafter, except voluntarily by the licensee. Thus, incorporation by reference of a more recent edition and addenda of Section III, Division 1, does not constitute a ''backfitting'' as defined in § 50.109(a)(1).

Incorporation by reference of more recent editions and addenda of Section XI, Division 1, of the ASME BPV Code and the ASME OM Code affect the ISI and IST programs of operating reactors. However, the Backfit Rule does not apply to incorporation by reference of later editions and addenda of the ASME BPV Code (Section XI) and OM Code. The NRC's policy has been to incorporate later versions of the ASME Codes into its regulations. This practice is codified in § 50.55a which requires licensees to revise their ISI and IST programs every 120 months to the latest edition and addenda of Section XI of the ASME BPV Code and the ASME OM Code incorporated by reference in § 50.55a that is in effect 12 months prior to the start of a new 120-month ISI and IST interval.

Other circumstances where the NRC does not apply the Backfit Rule to the incorporation by reference of a later Code into the regulations are as follows:

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

(2) When an NRC exception relaxes an existing ASME BPV Code or OM code provision but does not prohibit a licensee from using the existing Code provision, the Backfit Rule does not apply because the NRC is not imposing new requirements and;

(3) Modifications and limitations imposed during previous routine updates of § 50.55a have established a precedent for determining which modifications or limitations are backfits or require a backfit analysis (e.g., final rule dated October 1, 2004 (69 FR 58804). The application of the backfit requirements to modifications and limitations in the current rule are consistent with the application of backfit requirements to modifications and limitations in previous rules.

There are some circumstances in which the incorporation by reference of a later ASME BPV Code or OM Code into 10 CFR 50.55a introduces a backfit. In these cases, the NRC performs a backfit analysis or documented evaluation in accordance with § 50.109. These include the following:

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

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

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

The backfitting discussion for the revisions to 10 CFR 50.55a is set forth as follows:

1. Remove 10 CFR 50.55a(b)(2)(xi) Concerning Components Exempt From Examination

This change removes an existing limitation on the use of 1989 Addenda and later editions and addenda of the ASME BPV Code, Section XI, regarding the use of subarticle IWB–1220 in the examinations of welds in the inaccessible locations. Licensees have either committed to perform augmented inspection or have followed the provisions of Generic Letter 88–01 and NUREG–0313 in examining the inaccessible welds. Therefore, this change is not considered as a backfit under 10 CFR 50.109.

2. Remove 10 CFR 50.55a(b)(2)(xiii) Concerning the Provisions of Code Case N–523–1, ''Mechanical Clamping Devices for Class 2 and 3 Piping''

10 CFR 50.55a(b)(2)(xiii) states that ''Licensees may use the provisions of

Code Case N–523–1, ''Mechanical Clamping Devices for Class 2 and 3 Piping.'' 10 CFR 50.55a(b)(2)(xiii) does not require, but provides an option for, licensees to use Code Case N–523–1. In 2000, ASME updated Code Case N–523–1 to N–523–2 without changes to technical requirements. Code Case N–523–2, ''Mechanical Clamping Devices for Class 2 and 3 Piping,'' has been accepted in RG 1.147, Revision 15, which is incorporated by reference into 10 CFR 50.55a(g)(4)(i) and 10 CFR 50.55a(g)(4)(ii). Code Case N–523–2 may be used by licensees without requesting authorization. According to RG 1.147, Revision 15, Code Case N–523–1 has been superseded by Code Case N–523–2. It is stated in RG 1.147, Revision 15, that ''After the ASME annuls a Code Case and the NRC amends 10 CFR 50.55a and this guide [RG 1.147], licensees may not implement that Code Case for the first time. However, a licensee who implemented the Code Case prior to annulment may continue to use that Code Case through the end of the present ISI interval. An annulled Code Case cannot be used in the subsequent ISI interval unless implemented as an approved alternative under 10 CFR 50.55a(a)(3) * * *'' The NRC has not annulled or prohibited the use of Code Case N–523–1 in RG 1.147, Revision 15. Licensees who have used Code Case N–523–1 may continue to use it. The NRC is not imposing new requirements by removing 10 CFR 50.55a(b)(2)(xiii). Therefore, the removal of 10 CFR 50.55a(b)(2)(xiii) is not a backfit.

3. Modify 10 CFR 50.55a(b)(2)(xv) To Implement Appendix VIII of Section XI, the 1995 Edition Through the 2004 Edition of the ASME BPV Code

This change updates the edition of the ASME BPV Code in 10 CFR 50.55a(b)(2)(xv). Therefore, is not considered as a backfit under 10 CFR 50.109.

4. Add 10 CFR 50.55a(b)(2)(xx) to Require NDE Provision in IWA–4540(a)(2) of the 2002 Addenda of Section XI When Performing System Leakage Tests

Subarticle IWA–4540(a)(2) of the 2002 Addenda of the ASME BPV Code, Section XI, requires an NDE be performed in combination with a system leakage test during repair/replacement activities. Subarticle IWA–4540(a)(2) of the 2003 Addenda through later editions and addenda of the ASME BPV Code, Section XI, does not specify an NDE after a system leakage test. The addition requires, as part of repair and replacement activities, that a NDE be performed per IWA–4540(a)(2) of the 2002 Addenda of the ASME BPV Code, Section XI, after a system leakage test is performed per subarticle IWA–4540(a)(2) of the 2003 Addenda through later editions and addenda of the ASME BPV Code, Section XI.

As stated previously, when the NRC takes exception to a later ASME BPV Code provision but merely retains the existing requirement, prohibits the use of the later Code provision, limits the use of the later Code provision, or supplements the provisions in a later Code, the Backfit Rule does not apply because the NRC is not imposing new requirements. The addition retains the system leakage test requirement in IWA–4540(a)(2) of the 2003 Addenda through the later editions and addenda of the ASME BPV Code, Section XI, but supplements it with the NDE of IWA–4540(a)(2) of the 2002 Addenda of the Code. However, the NRC has approved a few licensees to use IWA–4540(a) of the 2003 addenda of the ASME Code, Section XI without imposing the NDE requirement in conjunction with the system leakage tests. Therefore, some licensees may currently use the provisions of IWA–4540(a) in the 2003 Addenda without having to perform NDE. Because 10 CFR 50.55a(b)(2)(xx) imposes NDE requirements after these licensees are allowed not to perform the required NDE, the additional NDE requirements in 10 CFR 50.55a(b)(2)(xx) may be considered backftting under 10 CFR 50.109(a)(1) for these licensees. However, the NRC believes that the NDE requirements are necessary for compliance with Commission requirements and/or license provisions. Therefore, a backfit analysis need not be prepared under the ''compliance'' exception in 10 CFR 50.109(a)(4)(i). The following discussion constitutes the documented evaluation to support the invocation of the compliance exception.

A system leakage test does not verify fully the structural integrity of the repaired or replaced piping components. NDE examinations will most likely detect whether cracks exist and thereby ensure the structural integrity of the repaired or replaced components. The general design criteria (GDC) for nuclear power plants (Appendix A to 10 CFR part 50) provide the regulatory requirements for the NRC's assessment of the potential for, and consequences of, degradation of the reactor coolant pressure boundary (RCPB). The applicable GDCs include GDC 14 and GDC 31. GDC 14 specifies that the RCPB be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture. GDC 31 specifies that the probability of rapidly propagating fracture of the RCPB be minimized.

The nuclear plants that were licensed before GDC were incorporated in 10 CFR Part 50 also would not be in compliance with their licensing basis which requires maintenance of the structural and leakage integrity of the RCPB.

Cracking of primary system piping as a result of the repair or replacement is a non-compliance with GDC 14 because the RCPB must be fabricated and tested as to have an extremely low probability of abnormal leakage, of rapidly propagating failure and of gross rupture. Without an NDE, there would be no confirmation as to whether cracks exist in the component. The volumetric examination (NDE) will verify the structural integrity of the component as part of the repair or replacement activity. If a crack, especially a circumferential crack in a pipe, is not detected, it would increase the probability of rapidly propagating fracture of RCPB (i.e., a non-compliance with GDC 31). Therefore, cracking, if undetected, would be detrimental to the structural and leakage integrity of the RCPB. The NDE requirements in conjunction with system leakage testing of 50.55a(b)(2)(xx) will ensure the structural and leakage integrity of the RCPB, assuring an extremely low probability of abnormal leakage, and minimizing the probability of a rapidly propagating fracture of the RCPB.

The NRC concludes that those licensees who use subsection IWA–4540(a) of the 2003 addenda of the ASME Code, Section XI will not be in compliance with GDC and their licensing basis for the structural integrity of piping components throughout the term of their license (including any renewal periods) absent the imposition of NDE examination in conjunction with the system leakage testing. The NRC concludes, therefore, that 10 CFR 50.55a(b)(2)(xx) is a compliance backfit under 10 CFR 50.109(a)(4)(i).

5. Revise 10 CFR 50.55a(b)(2)(xxi) To Be Consistent With the NRC's Imposed Condition for Code Case N–648–1 in RG 1.147, Revision 15

This change aligns the conditions imposed on visual examinations in 10 CFR 50.55a(b)(2)(xxi) with the conditions imposed on Code Case N–648–1 in RG 1.147, Revision 15. The imposed conditions do not represent a new NRC position. Therefore, this change is not considered as a backfit under 10 CFR 50.109.

6. Remove 10 CFR 50.55a(g)(6)(ii)(A) and Associated Subparagraphs on the Augmented Examination of the Reactor Vessel

This change removes a one-time examination requirement which has been completed by all current licensees, and, therefore, is not considered as a backfit under 10 CFR 50.109. Future licensees will be subject to other Code provisions that preclude the need for this one-time examination.

7. Add Paragraph (D) to 10 CFR 50.55a(g)(6)(ii)—Reactor Vessel Head Inspections

The current regulatory requirements for RPV head inspection are set forth in the First Revised NRC Order EA–03–009, dated February 20, 2004. Order EA–03–009 was issued to ensure that boric acid corrosion of RPV heads and PWSCC of RPV head penetration nozzles and welds, which could result in failure of the RPV head or head penetrations, are promptly identified and corrected. The NRC determined that Order EA–03–009 constitutes backfitting as defined in 10 CFR 50.109(a)(1), but that the actions mandated by the Order were necessary for reasonable assurance of adequate protection to public health and safety. Therefore, a backfit analysis was not prepared for the Order in accordance with § 50.109(a)(4)(ii). Section III of the Order also stated, in part, ''It is appropriate and necessary to the protection of public health and safety to establish a clear regulatory framework, pending the incorporation of revised inspection requirements into 10 CFR 50.55a.''

This rule revokes Order EA–03–009 as the current regulatory requirement for RPV head inspection, and replace it with ASME Code Case N–729–1, as modified in 10 CFR 50.55a per 10 CFR 50.55a(g)(6)(ii)(D)(1). All current licensees will be required to implement ASME Code Case N–729–1, with the limitations and conditions denoted by this rule. The Code Case provisions on RPV head and head penetration inspections are somewhat different from those established in Order EA–03–009, and will require a licensee to modify its procedures for inspection of its RPV head and head penetrations to meet the requirements on the Code Case. Accordingly, NRC imposition of the Code Case may be deemed to be a modification of the procedures to operate a facility resulting from the imposition of new regulation, and as such, this rulemaking provision may be considered backfitting under 10 CFR 50.109(a)(1). The NRC continues to find that RPV head inspections are necessary for adequate protection of public health and safety, and that the requirements of Code Case N–729–1, with the limitations and conditions denoted by this rule, represents an acceptable approach, developed by a voluntary consensus standards organization, for performing future RPV head and head penetration inspections. The NRC believes, in keeping with the intent of the National Technology Transfer and Advancement Act, that it is preferable to endorse a voluntary consensus standard such as Code Case N–729–1, with the limitations and conditions denoted by this rule, rather than continuing to rely upon the requirements embodied in Order EA–03–009. Therefore, the NRC concludes that NRC approval of Code Case N–729–1, with the limitations and conditions denoted by this rule, by incorporation by reference of that Code Case into § 50.55a, constitutes a redefinition of the requirements necessary to provide reasonable assurance of adequate protection of public health and safety. Therefore, a backfit analysis was not prepared for this portion of the final rule, in accordance with § 50.109(a)(4)(iii).

8. Add Paragraph (E) to 10 CFR 50.55a(g)(6)(ii)—Reactor Coolant Pressure Boundary Visual Inspections

The NRC is adding 10 CFR 50.55a(g)(6)(ii)(E) to require augmented inspections of Class 1 components fabricated with Alloy 600/82/182 materials. The augmented inspection will consist of the requirements in Code Case N–722 which specifies ISI for PWR ASME Code Class 1 components containing materials susceptible to PWSCC and NRC imposed conditions to the Code Case to require additional NDE when leakage is detected and expansion of the inspection sample size if a circumferential PWSCC flaw is detected. The intent of conditioning the Code Case is to identify leakage of and prevent unacceptable cracks and corrosion in Class 1 components, which are part of RCPB. The requirements may be considered backfitting under 10 CFR 50.109(a)(1). However, the NRC believes that the requirements are necessary for compliance with Commission requirements and/or license provisions. Therefore a backfit analysis need not be prepared under the ''compliance'' exception in 10 CFR 50.109(a)(4)(i). The following discussion constitutes the documented evaluation to support the invocation of the compliance exception.

Failure of the RCPB could result in unacceptable challenges to reactor safety systems that, combined with other failures, could lead to the release of radioactivity to the environment. Based on PWSCC experience in PWRs, the NRC concludes that there is a reasonable likelihood that PWR licensees would not be in compliance with appropriate regulatory requirements and current licensing basis with respect to structural integrity and leak-tightness throughout the term of the operating license, should PWSCC occur in their plants. The general design criteria (GDC) for nuclear power plants (Appendix A to 10 CFR part 50) provide the regulatory requirements for the NRC's assessment of the potential for, and consequences of, degradation of the RCPB. The applicable GDCs include GDC 14 and GDC 31. GDC 14 specifies that the RCPB be designed, fabricated, erected, and tested so as to have an extremely low probability of abnormal leakage, of rapidly propagating failure, and of gross rupture. GDC 31 specifies that the probability of rapidly propagating fracture of the RCPB be minimized.

The nuclear plants that were licensed before GDC were incorporated in 10 CFR Part 50 also would not be in compliance with their licensing basis which requires maintenance of the structural and leakage integrity of the RCPB.

Leakage of primary system coolant as a result of PWSCC in Alloy 600/82/182 material is a non-compliance with GDC 14 and 31 and licensing bases because there have been many cases of leakage as a result of PWSCC of Alloy 600/82/182 material in PWRs. Therefore, leakage as a result of PWSCC has not been shown to be of extremely low probability (i.e., a non-compliance with GDC 14). In addition, the operating experience has shown that the crack growth rate of PWSCC in Alloy 600/82/182 material can be rapid. If PWSCC is not detected and removed, a crack, especially a circumferential crack in a pipe, would increase the probability of rapidly propagating fracture of RCPB (i.e., a non-compliance with GDC 31). Therefore, PWSCC in Alloy 600/82/182 material, if undetected, would be detrimental to the structural and leakage integrity of the RCPB. Code Case N–722 with conditions provides inspection requirements to detect PWSCC so that licensees can repair or replace the affected components, thereby maintaining the structural and leakage integrity of the RCPB, assuring an extremely low probability of abnormal leakage, and minimizing the probability of a rapidly propagating fracture of the RCPB.

The NRC concludes that licensees will not be in compliance with GDC and their licensing basis for structural and leakage integrity of Class 1 components

that were made of Alloy 600/82/182 material throughout the term of their license (including any renewal periods) absent the imposition of Code Case N–722 with conditions. The NRC concludes, therefore, that 10 CFR 50.55a(g)(6)(ii)(E) is a compliance backfit under 10 CFR 50.109(a)(4)(i).

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 OMB.

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); sec. 651(e), Pub. L. 109–58, 119 Stat. 806–810 (42 U.S.C. 2014, 2021, 2021b, 2111).

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(d), 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. Section 50.55a is amended by:

■ A. Revising paragraph (b) introductory text, (b)(1) introductory text, (b)(1)(iii), (b)(2) introductory text , (b)(2)(xv) introductory text, (b)(2)(xx) and (b)(2)(xxi)(A), (b)(3) introductory text, and (b)(3)(iv)(D);

■ B. Removing and reserving paragraphs (b)(2)(xi) and (b)(2)(xiii), and (g)(6)(ii)(A); and

■ C. Adding paragraphs (g)(6)(ii)(D) and (g)(6)(ii)(E), to read as follows:

§ 50.55a Codes and standards.

* * * * *

(b) The following 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: Sections III and XI of the ASME Boiler and Pressure Vessel Code and the ASME Code for Operation and Maintenance of Nuclear Power Plants, which are referenced in paragraphs (b)(1), (b)(2), and (b)(3) of this section; NRC Regulatory Guide 1.84, Revision 34, ''Design, Fabrication, and Materials Code Case Acceptability, ASME Section III'' (October 2007); NRC Regulatory Guide 1.147, Revision 15, ''Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1'' (October 2007); and Regulatory Guide 1.192, ''Operation and Maintenance Code Case Acceptability, ASME OM Code'' (June 2003), which list ASME Code cases that the NRC has approved in accordance with the requirements in paragraphs (b)(4), (b)(5), and (b)(6) of this section; ASME Code Case N–729–1, ''Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial-Penetration Welds, Section XI, Division 1'' (Approval Date: March 28, 2006), which has been approved by the NRC with conditions in accordance with the requirements in paragraph (g)(6)(ii)(D) of this section; and ASME Code Case N–722, ''Additional Examinations for PWR Pressure Retaining Welds in Class 1 Components Fabricated with Alloy 600/82/182 Materials, Section XI, Division 1'' (Approval Date: July 5, 2005), which has been approved by the NRC with conditions in accordance with the requirements in paragraphs (g)(6)(ii)(E) of this section. Copies of the ASME Boiler and Pressure Vessel Code, the ASME Code for Operation and Maintenance of Nuclear Power Plants, ASME Code Case N–729–1, and ASME Code Case N–722 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 34; 1.147, Revision 15; 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@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/code_of_federal_regulations/ibr_locations.html.*

(1) As used in this section, references to Section III of the ASME Boiler and Pressure Vessel Code refer to Section III, and include the 1963 Edition through 1973 Winter Addenda, and the 1974 Edition (Division 1) through the 2004 Edition (Division 1), subject to the following limitations and modifications:

* * * * *

(iii) *Seismic design of piping.* Applicants and licensees may use Articles NB–3200, NB–3600, NC–3600, and ND–3600 for seismic design of piping, up to and including the 1993 Addenda, subject to the limitation specified in paragraph (b)(1)(ii) of this section. Applicants and licensees may not use these Articles for seismic design of piping in the 1994 Addenda through the latest edition and addenda incorporated by reference in paragraph (b)(1) of this section.

* * * * *

(2) As used in this section, references to Section XI of the ASME Boiler and Pressure Vessel Code refer to Section XI, and include the 1970 Edition through the 1976 Winter Addenda, and the 1977 Edition (Division 1) through the 2004 Edition (Division 1), subject to the following limitations and modifications:

* * * * *

(xi) [Reserved]

* * * * *

(xiii) [Reserved]

* * * * *

(xv) *Appendix VIII specimen set and qualification requirements.* The following provisions may be used to modify implementation of Appendix VIII of Section XI, 1995 Edition through

the 2001 Edition. Licensees choosing to apply these provisions shall apply all of the following provisions under this paragraph except for those in § 50.55a(b)(2)(xv)(F) which are optional. Licensees who use later editions and addenda than the 2001 Edition of the ASME Code shall use the 2001 Edition of Appendix VIII.

* * * * *

(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) * * *

(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.

* * * * *

(3) As used in this section, references to the OM Code refer to the ASME *Code for Operation and Maintenance of Nuclear Power Plants,* and include the 1995 Edition through the 2004 Edition subject to the following limitations and modifications:

* * * * *

(iv) * * *

(D) The applicable provisions of subsection ISTC must be implemented if the Appendix II condition monitoring program is discontinued.

* * * * *

(g) * * *

(6) * * *

(ii) * * *

(A) [Reserved]

* * * * *

(D) *Reactor vessel head inspections.*

(*1*) All licensees of pressurized water reactors shall augment their inservice inspection program with ASME Code Case N–729–1 subject to the conditions specified in paragraphs (g)(6)(ii)(D)(2) through (6) of this section. Licensees of existing operating reactors as of [insert final date of rule] shall implement their augmented inservice inspection program by December 31, 2008. Once a licensee implements this requirement, the First Revised NRC Order EA–03–009 no longer applies to that licensee and shall be deemed to be withdrawn.

(*2*) Note 9 of ASME Code Case N–729–1 shall not be implemented.

(*3*) Instead of the specified 'examination method' requirements for volumetric and surface examinations in Note 6 of Table 1 of Code Case N–729–1, the licensee shall perform volumetric and/or surface examination of essentially 100 percent of the required volume or equivalent surfaces of the nozzle tube, as identified by Figure 2 of ASME Code Case N–729–1. A demonstrated volumetric or surface leak path assessment through all J-groove welds shall be performed. If a surface examination is being substituted for a volumetric examination on a portion of a penetration nozzle that is below the toe of the J-groove weld [Point E on Figure 2 of ASME Code Case N–729–1], the surface examination shall be of the inside and outside wetted surface of the penetration nozzle not examined volumetrically.

(*4*) By September 1, 2009, ultrasonic examinations shall be performed using personnel, procedures and equipment that have been qualified by blind demonstration on representative mockups using a methodology that meets the conditions specified in (50.55a(g)(6)(ii)(D)(*3*)(*i*) through (50.55a(g)(6)(ii)(D)(*3*)(*iv*), instead of the qualification requirements of Paragraph –2500 of ASME Code Case N–729–1. References herein to Section XI, Appendix VIII shall be to the 2004 Edition with no Addenda of the ASME BPV Code.

(*i*) The specimen set shall have an applicable thickness qualification range of +25 percent to −40 percent for nominal depth through-wall thickness. The specimen set shall include geometric and material conditions that normally require discrimination from primary water stress corrosion cracking (PWSCC) flaws.

(*ii*) The specimen set shall have a minimum of ten (10) flaws which provide an acoustic response similar to PWSCC indications. All flaws shall be greater than 10 percent of the nominal pipe wall thickness. A minimum of 20 percent of the total flaws shall initiate from the inside surface and 20 percent from the outside surface. At least 20 percent of the flaws shall be in the depth ranges of 10–30 percent through wall thickness and at least 20 percent within a depth range of 31–50 percent through wall thickness. At least 20 percent and no more than 40 percent of the flaws shall be oriented axially.

(*iii*) Procedures shall identify the equipment and essential variables and settings used for the qualification, and are consistent with Subarticle VIII–2100 of Section XI, Appendix VIII. The procedure shall be requalified when an essential variable is changed outside the demonstration range as defined by Subarticle VIII–3130 of Section XI, Appendix VIII and as allowed by Articles VIII–4100, VIII–4200 and VIII–4300 of Section XI, Appendix VIII. Procedure qualification shall include the equivalent of at least three personnel performance demonstration test sets. Procedure qualification requires at least one successful personnel performance demonstration.

(*iv*) Personnel performance demonstration test acceptance criteria shall meet the personnel performance demonstration detection test acceptance criteria of Table VIII—S10–1 of Section XI, Appendix VIII, Supplement 10. Examination procedures, equipment, and personnel are qualified for depth sizing and length sizing when the RMS error, as defined by Subarticle VIII–3120 of Section XI, Appendix VIII, of the flaw depth measurements, as compared to the true flaw depths, do not exceed ⅛ inch (3 mm), and the root mean square (RMS) error of the flaw length measurements, as compared to the true flaw lengths, do not exceed ⅜ inch (10 mm), respectively.

(*5*) If flaws attributed to PWSCC have been identified, whether acceptable or not for continued service under Paragraphs –3130 or –3140 of ASME Code Case N–729–1, the re-inspection interval must be each refueling outage instead of the re-inspection intervals required by Table 1, Note (8) of ASME Code Case N–729–1.

(*6*) Appendix I of ASME Code Case N–729–1 shall not be implemented without prior NRC approval.

(E) *Reactor coolant pressure boundary visual inspections.*[1]

(*1*) All licensees of pressurized water reactors shall augment their inservice inspection program by implementing ASME Code Case N–722 subject to the conditions specified in paragraphs (g)(6)(ii)(E)*(2)* through *(4)* of this section. The inspection requirements of ASME Code Case N–722 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 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 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.

(4) If ultrasonic examinations of butt welds are used to meet the NDE requirements in paragraphs (g)(6)(ii)(E)*(2)* or (g)(6)(ii)(E)*(3)* of this section, they must be performed using the appropriate supplement of Section XI, Appendix VIII of the ASME Boiler and Pressure Vessel Code.

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For the U.S. Nuclear Regulatory Commission.

Dated at Rockville, Maryland, this 18th day of August 2008.

R.W. Borchardt,

Executive Director for Operations.

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[1] For inspections to be conducted every refueling outage and inspections conducted every other refueling outage, the initial inspection shall be performed at the next refueling outage after January 1, 2009. For inspections to be conducted once per interval, the inspections shall begin in the interval in effect on January 1, 2009, and shall be prorated over the remaining periods and refueling outages in this interval.