

February 16, 2000

Mr. Garry L. Randolph
Vice President and Chief Nuclear Officer
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Fulton, MO 65251

SUBJECT: RELIEF REQUEST TO ALLOW USE OF THE 1998 EDITION OF ASME CODE SECTION XI, SUBSECTION IWE - CALLAWAY PLANT, UNIT 1 (TAC NO. MA4598)

Dear Mr. Randolph:

By letter dated November 26, 1999, the NRC approved the use of the 1998 Edition of Section XI, Subsection IWE, of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code for Callaway. The letter referenced the technical evaluation report (TER) that was prepared by the Idaho National Engineering and Environmental Laboratory. Due to an administrative error, the TER was not attached to the safety evaluation issued with the letter. Enclosed is a copy of the TER.

We apologize for any inconvenience this may have caused.

Sincerely,
Jack N. Donohew /RA/
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Project Directorate IV and Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-483

Enclosure: Technical Evaluation Report

cc w/encl: See next page

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Callaway Plant, Unit 1

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INEEL/EXT-99-00401

September 1999

**TECHNICAL EVALUATION REPORT ON
THE SECOND 10-YEAR INTERVAL
PROPOSED ALTERNATIVE TO IWE
CONTAINMENT INSPECTIONS:
UNION ELECTRIC CO.,
CALLAWAY PLANT, UNIT 1,
DOCKET NUMBER 50-483**

M. T. Anderson

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ATTACHMENT 2

**Technical Evaluation Report on the
Second 10-Year Interval Proposed Alternative
To IWE Containment Inspections
Union Electric Co.,
Callaway Plant, Unit 1,
Docket Number 50-483**

M. T. Anderson, C. T. Brown, S. G. Galbraith, A. M. Porter

Published September 1999

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**Prepared for the
Division of Engineering
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U.S. Nuclear Regulatory Commission
Washington, D.C. 20555
JCN No. J2603 (Task Order 007)**

ABSTRACT

This report presents the results of the evaluation of the licensee's proposed alternatives to the containment inspections required by the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Subsection IWE. The licensee's proposed alternatives to IWE containment inspection, submitted January 11, 1999, are evaluated in Section 2 of this report.

This work was funded under:

**U.S. Nuclear Regulatory Commission
JCN No. J2603, Task Order 007
Technical Assistance in Support
of the NRC Inservice Inspection Program**

SUMMARY

The licensee, AmerenUE, prepared a proposed alternative to the IWE containment inspections in accordance with 10 CFR 50.55a(g)(6)(ii)(B). The licensee proposed to use the 1998 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Subsection IWE, in lieu of the 1992 Edition with 1992 Addenda, as currently specified by the Regulation for containment inspections.

Information in the *Proposed Alternative to IWE Containment Inspections*, submitted January 11, 1999, was reviewed. As a result of this review, a request for additional information (RAI) was prepared describing the information and/or clarification required from the licensee in order to complete the review. The licensee provided the requested information in submittals dated July 9, 1999 and September 10, 1999.

Based on the review of the licensee's original submittal and AmerenUE's response to the NRC's RAI, it is concluded that, for Relief Request IWE, the intent of the Regulation will be satisfied at Callaway Plant, Unit 1. The licensee's proposed alternative—to use the 1998 Edition of Subsection IWE, as supplemented by specific, detailed requirements contained in the licensee's response to the NRC RAI—provides an acceptable level of quality and safety. Therefore, it is recommended that the proposed alternative(s) be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

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TECHNICAL EVALUATION REPORT ON THE SECOND 10-YEAR INTERVAL PROPOSED ALTERNATIVES TO IWE CONTAINMENT INSPECTIONS: UNION ELECTRIC CO., CALLAWAY PLANT, UNIT 1, DOCKET NUMBER 50-483

1. INTRODUCTION

In accordance with 10 CFR 50.55a(g)(6)(ii)(B) (Reference 1), licensees of all operating nuclear power plants shall implement inservice examinations specified for the first period of the first inspection interval in Subsection IWE, and inservice examinations that correspond to the number of years of operation specified in Subsection IWL of the American Society of Mechanical Engineers (ASME), Section XI, Subsections IWE and IWL, 1992 Edition with the 1992 Addenda (Reference 2), with the modifications specified in § 50.55a (b)(2)(ix) by September 9, 2001.

By letter dated January 11, 1999 (Reference 3), the licensee, AmerenUE, submitted Request for Relief IWE seeking relief from the ASME 1992 Edition requirements of IWE. This relief request was submitted for the second 10-year inservice inspection (ISI) interval for the Callaway Plant, Unit 1. The licensee proposed to use the 1998 Edition of the Code in lieu of the 1992 Edition/1992 Addenda required by the Regulations for containment inspections performed in accordance with Subsection IWE. The licensee provided a table comparing the 1998 Edition with the 1992 Edition, 1992 Addenda. The evaluation of the subject relief request included a review and comparison of requirements found in the 1992 Edition with the 1992 Addenda to those in the 1998 Edition and a brief analysis of the changes and/or implications. In general, the INEEL staff concurs with the licensee's analysis of the Code changes, except in the areas of the visual examination method description and procedure qualification, visual examination personnel qualification, and visual examination prior to paint or coating application. These areas required clarification from the licensee and an RAI (Reference 4) was issued to gather the appropriate information. By letter dated July 9, 1999 (Reference 5), the licensee submitted a response to the NRC RAI. The licensee revised the information in the original response in a letter dated September 10, 1999 (Reference 6). The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject requests for relief are in the following section. Tables showing variations between the different Code editions, and relevant comments, are included in Appendix A.

2. EVALUATION OF RELIEF REQUEST

The following evaluation consists of a review of the licensee's proposed alternatives to Code requirements; the licensee has determined that these alternatives will provide an acceptable level of quality and safety.

2.1 Request for Relief IWE, Proposed Alternative to Use ASME Section XI, 1998 Edition, Subsection IWE, for Examination of Class MC and Metal Liners of Class CC Components

Regulatory Requirement— 10 CFR 50.55a(g)(6)(ii)(B) requires that licensees implement the inservice examinations specified for the first period of the first inspection interval in Subsection IWE of the 1992 Edition with the 1992 Addenda of Section XI, Division 1, of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code).

Licensee's Proposed Alternative— In accordance with 10 CFR 50.55a(a)(3)(i), the licensee proposed to use the requirements of the 1998 Edition of ASME Section XI for the examination requirements for IWE components. The licensee stated:

"Perform the metallic liner inspections using the 1998 Edition of ASME Section XI, Subsection IWE".

Licensee's Basis for Proposed Alternative—

"The 1992 Edition with the 1992 Addendum of ASME Section XI, Subsection IWE governs the requirements for both Class MC and metallic liners of Class CC pressure retaining components of containment structures of light-water cooled plants. Callaway Plant's containment structure is a Class CC post tension, reinforced concrete structure with a metallic liner, which falls under the requirements of this section of the ASME Code. The 1992 Edition with the 1992 Addenda of Subsection IWE contains requirements which impose difficulties in the transition from the current ISI program and Appendix J program that includes containment ISI examinations. Development and implementation of a meaningful containment ISI program would be facilitated by adopting the examination requirements of the 1998 Edition of ASME Section XI, Subsection IWE. These alternative examinations provide for consistency with the existing programs in the qualification of nondestructive examination personnel as well as providing more practical requirements for the examination of containment pressure retaining components.

"The 1992 Edition of ASME Section XI, Subsection IWE has some significant changes from the requirements of the 1992 Addendum of this Code. These changes will provide for an effective inspection program at Callaway Plant while maintaining the structural integrity of the containment structure at a reasonable cost, keep radiation exposure ALARA and keep personnel safety risk to a minimum. Two of the more significant changes are summarized in detail below. All the changes are compared on a paragraph by paragraph basis in our relief request along with the justifications for using the 1998 edition in lieu of the 1992 Code.

The first significant change in the 1998 Code from the 1992 Code is the addition of Section IWE-2100.

IWE-2100 GENERAL

"The requirements of IWA-2000 apply, except the requirements of IWA-2300, IWA-2500, and IWA-2600 are not mandatory for Table IWE-2500 visual examinations. (1998 Code)

"The significance of this addition to the 1998 Code will be discussed below.

"All of Section IWE-2300 is new to the 1998 Code, which spells out the requirements for visual examinations. The most significant change is Section IWE-2310

"IWE-2310 VISUAL EXAMINATIONS (1998 CODE)

(a) The Owner shall define requirements for visual examination of containment surfaces.

"Section IWE-2310(a) gives plants some options from the strict requirements of the 1992 Code which requires the use of ASME Section XI, Subsection IWA-2210 for visual inspections of the entire pressure boundary. IWA-2210 requires the visual inspection be made from a maximum direct examination distance of four (4) feet with minimum illumination requirements. However, final rule 10 CFR 50.55a(b)(2)(x)(B) allows for the examination to be made by remote methods such as a camera or optical aids provided it can be demonstrated that the remote methods can give equal or better results as the direct examination method. In an operating plant, the only time this inspection can be made is during a plant shutdown such as a refueling outage. In order to meet the 4 foot maximum examination distance, some sort of inspection device would have to be suspended from polar crane support beams or other structural points or a considerable amount of scaffold would have to be erected to inspect the liner plate. This activity would add a significant amount of time and expense to any refueling outage. The polar crane would have to be taken out of service for safety reasons while the inspections are being performed. Consequently it will take a considerable amount of time to complete the inspection by this method as well as increasing radiation exposure and increasing personnel safety risk. If the remote inspection method is employed it would require the use of some sort of optical aids such as video cameras, special binoculars or telescope in order to get resolution anywhere near what one could see from 4 feet. These systems are mostly untried with the results less than desirable. While this method would eliminate or greatly reduce the personnel safety issue, it would still demand a considerable amount of resources and require a significant amount of time to complete due to very small field of view of the optical aids. Furthermore, section IWE-2310(b) states:

(b) General visual examinations shall be performed in accordance with IWE-2500 and Table IWE-2500-1, Examination Category E-A, to assess the general condition of containment surfaces.

"Under this section of the Code, General Visual examinations of 100% of the accessible pressure boundary components are required each period. This is also required by Final Rule, 10CFR50.55a(b)(2)(x)(E) so it is not actually a change. Callaway Plant is a PWR with a dry containment and as such, the metallic liner is not subjected to areas of standing water, repeated wetting and drying or other environmental factors that would accelerate corrosion. Therefore, because Callaway Plant's liner plate is in a very low corrosive environment, an inspection program can be developed using a general visual examination that will detect any significant deterioration without exposing personnel to dangerous high fall hazards or impacting the outage schedule. By using existing vantage points such as platforms, maintenance truss, and the polar crane coupled with employing special lights and standard optical aids, Callaway Plant will be able to inspect 100% of the accessible surfaces of the liner plate each period. Callaway Plant will define visual examination resolution requirements to be employed with the general visual examination that are meaningful and

practical which will allow Inspectors to detect minor deterioration before it becomes significant. If the general visual inspection reveals 'suspect' areas of the pressure boundary, IWE-2320(c) states:

- (c) *Detailed visual examination shall be performed in accordance with IWE-2500 and Table IWE-2500-1, Examination Category E-C:*
 - (2) *to determine the magnitude and extent of deterioration and distress of suspect containment surfaces initially detected by general visual examinations.*

"Under these conditions, AmerenUE would employ a detailed visual examination such as a VT-1 or VT-3 depending on the conditions to assure structural integrity of the pressure boundary. Callaway Plant's current inspection process, which is required under the Appendix J program, uses a general visual inspection method and has been effective in identifying minor problems in our pressure boundary. When minor problems were detected, they were closely inspected by an Engineer knowledgeable in the design of the Reactor Building and corrected under Callaway Plant's current work programs. To date only minor coatings problems have been detected. The development of written visual inspection methods which are specifically fitted to Callaway Plant conditions and ASME Section XI, Subsection IWE, will enhance and improve an inspection program that is already working for Callaway Plant.

"The change in bolting inspection is the second significant change in the 1998 Code from the 1992 Code. Section IWE-3515 of ASME Section XI, 1992 Code required pressure retaining bolting, that has not been disassembled anytime during the period, have a bolt torque or bolt tension test performed per Table IWE-2500-1 by the end of the interval. Performance of a maintenance activity to disassemble electrical covers to access bolted connections that are generally not disassembled, verifying torque or bolt tension on each bolt, would be a major impact on resources. The 1998 Code does not require the pressure retaining bolted connections to have a bolt torque or bolt tension test performed each interval. The 1998 Code does require however, that 100% of all bolted connections have a general visual inspection each period unless the connection is disassembled for some other reason. In that case, the connection would have a VT-1 inspection and a bolt torque or bolt tension test performed as required by both codes. Bolted joints are currently subject to Appendix J leak testing to verify leak tightness and structural integrity. The integrity of the Callaway Plant's bolted connections is demonstrated by existing programs which include Local Leak Rate Tests, Appendix J Integrated Leak Rate Tests, and general visual inspections which have been performed as part of the Appendix J ILRT's. Incorporating the general visual inspection requirements of the 1998 Edition of ASME Section XI, Subsection IWE Code into Callaway's programs for monitoring bolted connection performance will assure the structural integrity and leak tightness of the connections.

"CONCLUSION:

"AmerenUE is seeking relief to implement the 1998 Edition of ASME Section XI, Subsection IWE in lieu of the 1992 Edition and 1992 Addendum of this Code. The 1998 Edition of the ASME Section XI Code was developed in accordance with the ASME Code Committee process with input from utilities, manufacturers, engineering organizations, Authorized Nuclear Inspection Agencies, EPRI and the NRC. The updating of requirements by this process is intended to ensure the continued safe operation of nuclear power plants and specifically in this case the continued leak-tight and structural integrity of the metallic liner of our Class CC containment component. The use of the 1998 Edition of ASME Section XI, Subsection IWE at Callaway plant will provide an effective inspection program which will maintain the structural integrity of the containment structure at a reasonable cost while keeping radiation exposure ALARA and keeping personnel safety risk to a minimum."

In the July 9, 1999, response to the NRC RAI, the licensee provided that following information, as paraphrased below.

General and Detailed Visual Examination - At Callaway, the licensee will perform a general visual examination on 100% of the pressure boundary each inspection period using qualified NDE QC inspectors certified to CP-189. The inspection will be made from existing floors, platforms, and vantage points to cover the entire pressure boundary. Liner plate welds and dissimilar metal welds will not be inspected as a separate item, but will be covered under the general visual inspection. Pressure-retaining bolting, that is not disassembled during the period, will be inspected under the general visual examination. Bolted connections that are disassembled anytime during the period are subject to VT-1 visual examination in accordance with the 1998 Code. At Callaway Plant acceptance criteria will include excessive corrosion, blistered, flaking, or peeling paint; and general deformation, bulges or other signs of distress. If these acceptance criteria are not met, a detailed visual examination using either a VT-3 or VT-1, as defined by the 1998 Code, will be performed.

Reference to a VT-3 inspection in lieu of a VT-1 inspection was an error. Callaway Plant plans to perform a VT-1 inspection on the bolts, studs, nuts, bushings, washers, and threads in base material and flange ligaments of bolted connections that are disassembled for some other reason than IWE.

Personnel Qualifications - Visual examinations, including general, VT-3 and VT-1 examinations, will be performed by NDE QC inspectors certified to ANSI/ASNT CP-189.

Illumination and Resolution Requirements for Visual Examinations - Callaway Plant has established acceptance criteria for the general visual examination. The procedures to assure that the acceptance criteria can be seen and or detected by the inspector in containment are currently under development but will involve the use of a "general visual reference standard" representative of defects or deterioration that may be experienced. The reference standard will be placed in representative locations during the inspection and it will be verified that lighting and magnification (when used) are adequate for the inspector to identify the defects. Well-defined standards for VT-1 and VT-3, which are currently defined by the 1998 Code, will be used.

Examination of Coatings Prior to Removal - The entire liner plate is painted and will receive a general visual examination each inspection period. If the liner plate meets the general visual examination acceptance criteria, no further examinations would be required and the coating would not be removed. If an area is not acceptable, the area will be subjected to a detailed visual examination. A failed general visual examination will have already determined that a potential problem exists. The acceptance criteria for the detailed inspection for the liner plate (discussed below) required that the failed coating and loose rust be removed in order to determine if the liner plate meets the acceptance criteria of the detailed inspection. Based on the above, additional examinations prior to removal are not necessary.

In the September 10, 1999, revised response to the NRC RAI, the licensee provided that following information regarding the examination of metallic liners (as stated):

"Acceptance criteria for liner plate pressure boundary thickness at Callaway Plant will be limited to 10% nominal thinning. Any defects or deterioration greater than 10% in depth will be documented by qualified NDE QC inspectors and evaluated by Engineering on a case by case basis. Any section of the liner plate pressure boundary that is found to be unacceptable by Engineering evaluation will either be repaired or replaced under Callaway Plant's ASME Section XI, IWE repair/replacement program."

Evaluation— 10 CFR50.55a(g)(6)(ii)(B) requires that licensees implement the inservice examinations specified for the first period of the first inspection interval in Subsection IWE of the 1992 Edition with the 1992 Addenda by September 9, 2001. The licensee is proposing to implement the 1998 Edition of Section XI, Subsection IWE in lieu of the 1992 Edition and Addenda. The licensee prepared and submitted a table comparing both Code Editions. The INEEL staff has reviewed the licensee's submittal and Subsection IWE of the 1998 Code and compared it with the 1992 Addenda. Appendix A of this report contains a comparison table, including the licensee's statements regarding the significance of Code changes and their basis for use as an alternative examination. The table also includes INEEL comments on each change. Significant differences were noted in areas such as personnel qualification, visual examination methods, containment weld inspection, paint and coating inspection, bolting inspection, seals and gasket inspection, and the requirements for successive examinations. Each of these issues will be discussed below and are summarized in Appendix B.

Article IWE-2100 has been added to the 1998 Edition to include requirements for visual examination and personnel qualification, while taking exception to certain requirements in Subsection IWA. Specifically, in accordance with IWE-2100, to IWA-2210, *Visual Examination*; IWA-2300, *Qualification of Nondestructive Personnel*; IWA-2500, *Extent of Examination*; and IWA-2600, *Weld Reference System* are not mandatory for Table IWE-2500 visual examinations. It is understandable to exclude the IWA-2500 and IWA-2600 requirements from the containment inspection program. However, excluding the visual examination requirements of IWA-2210 and the personnel qualification requirements of IWA-2300 may reduce the effectiveness of the Code. These issues are discussed below.

Visual Examination Methods

IWE-2300 of the 1998 Edition has invoked *Owner-defined* visual examinations and supporting visual personnel qualification requirements for metallic containments. The INEEL staff notes that Section XI is intentionally organized to refer to the General Requirements of Article IWA to define the type of examination to be performed (i.e., VT-1, VT-2, or VT-3) and the requirements to certify examination personnel for all visual examinations required by subsequent Subsections. Deferring these responsibilities to the individual Owners creates a potential for substantial inconsistencies with respect to ISI of containment structures. To ensure consistent application throughout the industry, it is necessary for each licensee to supplement the 1998 Code and provide specific details pertaining to visual examinations included in their Containment Inspection Program(s). Licensees Containment Inspection Programs are currently not required to be submitted for review by the regulatory authorities. For these reasons, the INEEL staff believes the 1998 Edition does not provide an acceptable level of quality and safety. To find the proposed alternative acceptable, the licensee must provide specific information supporting the implementation of visual examination methods.

At Callaway, a general visual examination will be performed on 100% of the pressure boundary each inspection period using visual examiners certified in accordance with ANSI/ASNT CP-189. Acceptance criteria will include excessive corrosion; blistered, flaking, or peeling paint; and general deformation, bulges, or other signs of distress. The licensee is currently developing procedures to assure that the acceptance criteria for the general visual examination are effective and will include the use of a "general visual reference standard" to represent defects or deterioration that may be experienced. The reference standard will be placed in representative locations during the inspection and it will be verified that lighting and magnification (when used) are adequate for the inspector to identify the defects. If these acceptance criteria are not met, a detailed visual examination using either a VT-3 or VT-1, as defined by the 1998 Code, will be performed. Existing standards for VT-1 and VT-3, which are currently defined by the 1998 Code, will be used. The licensee has defined the visual examination process that will be used, including acceptance criteria for general and detailed visual examinations and certification

requirements for inspectors. Therefore, it is concluded that the licensee's proposed alternative provides an acceptable level of quality and safety.

Personnel Qualification

The 1992 Addenda has incorporated ANSI/ASNT CP-189 for the qualification of examination personnel. Subsection IWE, of the 1998 Edition, takes exception to the certification requirements of other Subsections of the Code and invokes plant-specific personnel certification requirements for visual examination. Subsection IWE (1998 Edition) deleted the VT-1 and VT-3 visual examination requirements and replaced them with General and Detailed visual examinations; subsequently NDE personnel may not be required to perform these examinations. The 1998 Edition relies on the *Responsible Individual* to direct the containment visual examinations. The INEEL staff believes that this approach has a substantial potential for inconsistency with respect to containment ISI. For this reason, the 1998 Edition does not provide an acceptable level of quality and safety and cannot be found acceptable without supplementary information from the licensee describing how the Containment Inspection Program meets the intent of the 1992 Edition for qualification of examination personnel. The licensee has provided information to supplement the visual examinations requirements of the 1998 Code, and committed to use visual examiners certified to ANSI/ASNT CP-189. Therefore, it is concluded that the licensee's proposed alternative provides an acceptable level of quality and safety.

Successive Examinations

IWE-2420(c) (1992 Edition) requires areas containing flaws, areas of degradation, or repairs that were found acceptable by engineering evaluation, be reexamined during the next three inspection periods before they are removed from the augmented examination requirements. This is consistent with Subsection IWB-2420 requirements. The 1998 Edition, IWE-2420, has removed repairs from the list of conditions requiring acceptance by evaluation, which is consistent with Class 1, 2, and 3 components. In addition, the later edition has reduced the observation time required before a suspect area can be removed from the augmented examination requirements. IWE-2420(c) (1998 Edition) requires reexamination, during the next inspection period, of areas containing flaws or areas of degradation that have been accepted for continued service by engineering evaluation. If the suspect area is unchanged during the next period examination, the area no longer requires augmented examination. This approach is consistent with the requirements for Class 2 components. However, even though an area is removed from augmented examination, it may be re-designated for augmented examination at any time during the interval if the Owner determines that conditions that cause degradation still exist. Therefore, it is concluded that this Code change provides an acceptable level of quality and safety.

Additional Examinations

The 1998 Code does not rely on sampling and already examines 100% of containment surfaces. Therefore, elimination of this requirement is appropriate and acceptable.

Paint and Coatings

The IWE-2500(b) requirement to examine paint or coatings prior to removal has been eliminated from the 1998 Edition. Relief from this requirement has been found acceptable when adequate provisions exist in either the licensee's Containment Inspection, Repair/Replacement, Nuclear Coatings, or ISI Programs to examine the base metal for surface anomalies that could affect containment integrity prior to re-application of the coating. In addition, the base metal should be visually examined by qualified inspection personnel.

At Callaway Plant, nonpressure-retaining paint and coatings are covered in Callaway Plant's Safety Related Coatings program. In addition, the entire liner plate receives a general visual examination each inspection period. If the liner plate meets the general visual examination acceptance criteria, no further examinations would be required and the coating would not be removed. Unacceptable areas will be subjected to a detailed visual examination. The licensee has developed comprehensive acceptance criteria for the detailed inspection of the liner plate that will ensure that any significant patterns of degradation that could affect the functionality of the liner plate will be detected. Therefore, the INEEL staff concludes that the licensee has included adequate provisions to ensure the integrity of the paint, coatings, and liner plate, and that the licensee's proposed alternative provides an acceptable level of quality and safety.

Weld Examinations

Subsection IWE, 1998 Edition, has been revised and no longer contains any specific weld examination requirements. This approach is supported by 10 CFR 50.55a(b)(2)(x)(C), which makes the examinations specified in Examination Category E-B, *Pressure Retaining Welds*, and Examination Category E-F, *Pressure Retaining Dissimilar Metal Welds*, optional. Therefore, weld examinations will be addressed during the General Visual Examination required by Examination Category E-A. Based on the optional nature of the Regulatory requirements for examination of containment welds, the elimination of any direct references to containment weld examinations in the Code should be considered to provide an acceptable level of quality and safety.

Bolting, Seals, Gaskets, and Moisture Barriers

Examination Category E-D, *Seals, Gaskets, and Moisture Barriers*, and Examination Category E-G, *Pressure Retaining Bolting*, have been eliminated from the 1998 Code. The examination of pressure-retaining bolting and moisture barriers are now included in Examination Category E-A, footnote (1)(d) and Item E1.30, respectively. The examination of bolting, seals and gaskets to determine their ability to maintain containment leak tight integrity as a separate inspection has been found to be unnecessary. The Appendix J, Type A test has been considered sufficient for determining the leak-tight integrity of the penetration. Therefore, an acceptable level of quality and safety is maintained.

Ultrasonic Examination

In Paragraph IWE-3511.3 of the 1998 Code, examination of Class CC metallic liners has been excluded from the acceptance criteria, which require disposition of areas where material loss exceeds 10% of the nominal wall thickness. Therefore, the 1998 Code is not acceptable for Class CC metallic liners without augmentation by the licensee. At the Callaway Plant, the licensee has committed to document and perform engineering evaluation, on a case by case basis, of any defect or deterioration that exceeds a depth of 10% the nominal wall thickness. This is equivalent to the requirements of the 1992 Addenda. Therefore, the INEEL staff concludes that the proposed acceptance criteria for wall thinning will ensure that the integrity of the liner plate is maintained and will provide an acceptable level of quality and safety.

Conclusion—The licensee has proposed to use the 1998 Edition of Section XI, Subsection IWE, in lieu of the 1992 Edition with the 1992 Addenda as required by 10 CFR 50.55a(g)(6)(ii)(B). Review and evaluation of Subsection IWE of the 1998 Code has exposed several areas that do not provide an equivalent level of quality and safety. Consequently, the 1998 Edition cannot be considered an acceptable alternative to the existing Regulatory requirements. However, in a letter dated July 9, 1999, the licensee provided specific information and committed to supplement the requirements of the 1998

Code. Based on the above evaluation, it is concluded that the use Subsection IWE of the 1998 Code, as supplemented by the licensee, provides an acceptable level of quality and safety. Therefore, it is recommended that the licensee's proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

3. CONCLUSION

Based on the review of the proposed alternatives to IWE Containment Inspections and the licensee's response to the NRC's request for additional information, it is concluded that for Relief Request IWE the intent of the Regulations in imposing the 1992 Edition with the 1992 Addenda will be satisfied at Callaway Plant, Unit 1. The licensee's proposed alternatives—to use the 1998 Edition of Subsection IWE, as supplemented by specific details contained in the Callaway Plant Containment Inspection Program—will provide an acceptable level of quality and safety and should be authorized pursuant to 10 CFR 50.55a(a)(3)(i).

5. REFERENCES

1. Code of Federal Regulations, Title 10, Part 50.
2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 1:
 - 1992 Edition with 1992 Addenda
 - 1998 Edition
3. Letter, dated January 11, 1999, A. C. Passwater (AmerenUE) to NRC Document Control Desk containing proposed alternative to the requirements of Subsection IWE of the ASME Code.
4. Letter, dated June 24, 1999, NRC to G. L. Randolph (AmerenUE) containing NRC request for additional information (RAI).
5. Letter, dated July 9, 1999, A. C. Passwater (AmerenUE) to NRC Document Control Desk, containing response to NRC request for additional information.
6. Letter, dated September 10, 1999, A. C. Passwater (AmerenUE) to NRC Document Control Desk, revising to the original response to NRC request for additional information.

Appendix A

Callaway IWE Comparison Table

APPENDIX A -- CALLAWAY IWE COMPARISON TABLE

Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-1100	no change	n/a	
IWE-1200	no change	n/a	
IWE-1210	no change	n/a	
IWE-1220	Changed "containment" to "containment system"	non significant	Acceptable
IWE-1230	no change	n/a	
IWE-1231	<p>Removed item 3)-"single welded butt joints from the weld side"- as a specific item required to remain accessible for the life of the plant.</p> <p>Changed wording from "80% of the surface area" to "80% of the pressure retaining boundary" and stated exclusions from that 80%.</p> <p>Reworded paragraph b).</p>	<p>These single welded butt joints were removed as a separately listed examination item and is now included within the item for the pressure retaining boundary as discussed in the changes to Table IWE-2500-1 below.</p> <p>The exclusions from 80% incorporate an existing Table IWE-2500-1 note and clarify that areas made inaccessible during construction are also excluded.</p> <p>Change to b) is for clarity and is nonsignificant</p>	<p>Examination of welds is optional in 10 CFR 50.55a - Acceptable</p> <p>Acceptable</p> <p>Acceptable</p>

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-1232	<p>ASME XI generic change from repair and/or replacement to repair/replacement activities.</p> <p>Deleted paragraph (a)(3) addressing inaccessible welded joints</p>	<p>Non significant</p> <p>Welded joints were removed as a separately listed examination item and are now included within the item for the pressure retaining boundary as discussed in the changes to Table IWE-2500-1 below.</p>	<p>Acceptable</p> <p>Examination of welds is optional in 10 CFR 50.55a – Acceptable</p>
IWE-1240	<p>Added stiffeners and, by reference to IWE-2420, flaws accepted by evaluation as areas requiring augmented examination.</p>	<p>While these items were not included in the 1992 Code directly, they were implied. The 1998 Code simply clarifies the requirements of additional areas subject to augmented examination, further assuring containment integrity.</p>	<p>Appears to be a conservative change – Acceptable</p>
IWE-2000	<p>no change</p>	<p>n/a</p>	
IWE-2100	<p>Added new Subarticle 2100 - "General" - to provide reference to IWA-2000 with exceptions from IWA-2210, -2300, -2500 and-2600.</p>	<p>This is the first significant change in the 1998 Code from the 1992 Code. This section was added to the 1998 Code, which allows a plant to define their own requirements for visual examination of containment surfaces. The benefits of using the 1998 Code as it pertains to this section will be discussed under Sec. 2310.</p>	<ul style="list-style-type: none"> ▶IWE examinations will not require the visual examinations identified in IWA-2210. ▶Per the 1998 Code, personnel will not have to be certified to CP-189 (IWA-2300)- Licensee has committed to certify inspection personnel in accordance with CP-189. ▶IWA-2500 excludes repair welds from the requirements of examination. ▶IWA-2600 requires that a weld reference system be established for surface or volumetric examinations. However, IWE-2500(c)(4) requires reproducible grid markings for augmented ultrasonic thickness measurement. Details in appropriate sections below.

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2200	<p>Deleted paragraph c) which provided allowances for the use of shop or field examinations in lieu of on site preservice examinations.</p> <p>Deleted paragraph g) which required the condition of new coating to be documented in the preservice examination record.</p> <p>ASME XI generic change from repair and or replacement to repair/replacement activities.</p>	<p>This paragraph in the 1992 Code dealt with preservice construction inspections. Callaway Plant has been in operation since 1984; therefore, this paragraph of the Code is not applicable to our plant.</p> <p>The coatings that would be applied to the liner plate at Callaway plant fall under our safety related coatings program as required by Regulation Guide 1.54. Callaway procedures are in place that control the type of coating, painter qualification, surface preparation, coating application, atmospheric conditions as well as QC inspection points for safety related coatings. The level of inspection under this program is much higher than that required by the 1992 addition of the ASME Section XI Code. Therefore, using the 1998 Code without this section will not reduce the reliability of the containment pressure boundary.</p> <p>Non significant</p>	<p>Appears to be a conservative change – Acceptable</p> <p>Covered under Callaway coating program (confirmed in 6/17/99 conference call). Acceptable as supplemented by the Callaway coating program with established testing and acceptance criteria.</p> <p>Acceptable</p>

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2300	Added new Subarticle -2300 -"Visual Examination, Personnel Qualification and Responsible Individual"	The paragraphs within this Subarticle are considered significant and contain requirements that either did not previously exist or that were contained in other areas. Placing these requirements within Article IWE-2000 further ensures proper "Examination and Inspection" of areas important to containment integrity and provides consistency with Subsections IWB, IWC and IWD. The specific paragraphs added are discussed below.	See below.

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2310	Added new paragraph -2310 - "Visual Examinations"- which a) states that the owner shall define requirements for visual examination of containment surfaces;	a) Section 2310 gives plants some options from the strict requirements of the 1992 Code which require the use of IWA-2210 for visual inspections. IWA-2210 requires the visual inspection be made from a maximum distance of four (4) feet with minimum illumination requirements. The Code also allows for the examination to be made by remote methods such as a camera provided it can be demonstrated that the remote methods can give the same results as the direct examination method. In an operating plant, the only time this inspection can be made is during a plant shutdown such as a refueling outage. In order to meet the 4 foot maximum examination distance, a considerable amount of very high scaffolding would have to be erected to access the liner plate for inspection, or some sort of inspection device, such as a man lift, would have to be suspended from polar crane support beams or other structural points to inspection liner plate. Consequently, the scaffold builders and inspectors will be placed at significant personal risk and increased radiation exposure for no apparent increase in Nuclear Safety over that which will be provided by the 1998 Code. Furthermore, this activity would add a significant amount of time and expense to any refueling outage.	Consistency with existing ISI visual examination requirements could provide for an efficient internal program. The licensee provided acceptance criteria for visual examination in their 7/9/99 submittal. - Acceptable

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2310 (con't)	b) and c) defines general and detailed visual examinations; and	<p>The 1998 Edition of ASME Section XI, Subsection IWE-2310(a) allows the Owner to define the requirements for visual inspection of containment surfaces. Allowing the owner to define visual examination requirements provides for more efficient containment ISI program implementation by allowing examinations that may be more consistent with existing ISI, containment coating, maintenance rule and Appendix J programs. Callaway Plant is a PWR with a dry containment and as such, the metallic liner is not subjected to areas of standing water, repeated wetting and drying or other environmental factors that would accelerate corrosion. Therefore, an inspector, using special lights and optical aids from existing vantage points will be able to assure the integrity of the liner plate using the 1998 Code.</p> <p>b) and c) The VT general examination, which would be defined as required by paragraph a), is performed to indicate the general condition of the containment. Should any suspect areas be indicated during the general examination, a more detailed examination would be performed, as required by paragraph c) to determine the magnitude and extent of any deterioration or distress. This method of inspection is practical from both an ALARA aspect as well as cost. A dry PWR containment, such as Callaway Plant, has large vast areas of the liner plate for which a general inspection is adequate to identify</p>	<p>The licensee provided acceptance criteria for visual examination in their 7/9/99 submittal. Licensee has also defined general and detailed visual examinations - Acceptable</p>

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2310 (con't)	d) and e) provide the requirements for the conditions of areas affected by repair/replacement activities, painted or coated areas, non coated areas, pressure retaining materials and moisture barriers.	d) and e) Previously these examination requirements did not exist within the Article IWE-2000 but rather only in the acceptance criteria of Article IWE-3000. Adding these specific attributes here ensure proper containment examinations.	Acceptable
IWE-2320	<p>Added new paragraph 2320 - "Responsible Individual"- which a) states the qualification requirements of the responsible individual and</p> <p>b) defines the responsibilities of the responsible individual for the development of plans and procedures; instruction, training and approval of visual examination personnel; performance or direction of visual examinations; evaluation of results and documenting results.</p>	<p>a) The details for the responsible individual qualification requirements were previously contained in the acceptance standards of IWE-3510.1.</p> <p>b) The added detailed responsibilities for the responsible individual ensure proper performance of those related activities. Having an individual possessing the qualifications of a) and performing the responsibilities of b) increases plant quality and safety by assuring the reliable detection of conditions adverse to containment integrity.</p>	<p>Acceptable</p> <p>The duties identified must be performed regardless of who is assigned to do them. However, the 1998 philosophy gives the responsible individual complete control over the Program. Section XI consistency maintains that licensee containment programs meet the requirements of Subsection IWA.</p>

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2330	<p>Added new paragraph 2330 - <i>Personnel Qualification</i> - which a) states that the owner is responsible for defining the qualification requirements for personnel performing visual examinations and</p> <p>b) provides minimum qualification requirements that were previously contained in the acceptance criteria of IWE-3510.1.</p>	<p>a) Adding requirements for the owner to define personnel qualification requirements provides for more efficient containment ISI program implementation by permitting personnel performing containment examinations to be qualified to written practices that are more consistent to those used for other NDE personnel.</p> <p>b) Providing these details in the qualification requirements paragraph focuses the containment visual qualification on areas important to containment integrity.</p>	<p>Personnel should be qualified in accordance with Subsection IWA. 1998 Code is unacceptable. The licensee committed to certify visual inspectors in accordance with CP-189 in their 7/9/99 submittal. - Acceptable</p> <p>1998 Code is unacceptable without licensee augmentation. 10 CFR 50.55a(b)(x)(B) requires the qualification of remote visual examinations. Licensee provided criteria for qualifying visual procedures - Acceptable</p>
IWE-2400	INSPECTION SCHEDULE	n/a	
IWE-2410	no change	n/a	
IWE-2411	Deleted a subparagraph (b) discussing decreasing and extending inspection periods.	The deleted subparagraph eliminates duplication with IWA-2400.	Acceptable
IWE-2412	The 1998 Code added a subparagraph detailing requirements for the scheduling of added welds or components.	The added requirements for the scheduling of added welds or components ensures that a representative sampling of examinations is maintained. This is more restrictive than that 1992 Code.	Acceptable

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2420	(c) Removed <i>"repaired"</i> areas as areas requiring reexaminations and changed the duration for reexamination of areas that remain essentially unchanged from <i>"three consecutive inspection periods"</i> to <i>"the next successive inspection period"</i> .	First of all, subparagraph (c) refers to areas that indicated flaws or degradation and were evaluated and found to be acceptable as is per subparagraph (b) of this same section. Any area that is repaired would not fall under this subparagraph because once the repairs are completed in accordance with approved plant procedures and inspected in accordance with the Code, the affected area of the containment structure is considered to be returned to <i>"as designed condition"</i> . Areas that require reexamination per IWE-2420(b) are areas located in non augmented areas. Since these areas are falling under IWE-2420(c) they have already been evaluated as acceptable as is and if the augmented inspection on the next period (3 years) indicated no change, it would revert back to a general visual at the next inspection period. Since the entire pressure boundary is required to be inspected each period, areas affected by this section of the Code will continue to be inspected every period for the life of the plant. This will provide a high level of assurance that the pressure boundary will remain sound.	Changing duration of reexamination of areas that remain essentially unchanged from <i>"three consecutive inspection periods"</i> to <i>"the next successive inspection period"</i> is consistent with the requirements for Class 2 components -- Acceptable.
IWE-2430	Deleted the paragraph - Additional Examinations" -which discussed adding examination items of the same category if flaws or areas of degradation are identified during an examination.	The changes to Table IWE-2500-1 eliminate several examination categories. The categories that remain all require 100% examination. Therefore no items are available for additional examinations.	The 1998 Code does not rely on sampling as 100% of the containment surface is already examined. Therefore, elimination of this requirement is appropriate -- Acceptable.

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2500	<p>Reworded the existing subparagraphs consistent with the previous paragraph changes and with Table IWE-2500-1 changes.</p> <p>Deleted the requirement to examine paint or coatings prior to removal.</p> <p>Replaced the requirement for one foot square grids in thickness measurements with a reference to Table IWE-2500-2.</p> <p>Added a reference to IWE-5000 for pressure tests.</p>	<p>The reworded subparagraphs add clarity and provide consistency within IWE.</p> <p>Coatings are non-pressure retaining components. Their primary function is to provide a barrier to protect the substrate from corrosion. Should some of the indicators that problems exist on the liner appear in the coatings such as cracking, peeling or discoloration, the coating must be removed in order to determine the actual condition of the pressure boundary. Not having to perform ASME examinations of non pressure retaining coatings prior to removal provides for more efficient containment ISI program implementation without adversely affecting the integrity of the pressure retaining base metal being exposed.</p> <p>The new Table IWE-2500-2 provides more detailed requirements for thickness measurement gridding and is discussed below.</p> <p>The added reference to IWE-5000 provides direction for the performance of pressure test.</p>	<p>Acceptable</p> <p>1998 Code is unacceptable. Elimination of the paint or coatings exam prior to removal has been found acceptable provided adequate provisions exist in the licensee's program to examine the base metal prior to re application of the coating. Licensee has met this condition - Acceptable</p> <p>The ultrasonic gridline approach is a sampling methodology similar to that of other portions of the Code and other erosion/corrosion monitoring programs utilized throughout the industry -- Acceptable.</p> <p>Acceptable</p>

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-2600	Deleted a sentence discussing compatibility of paint and coating systems and a requirement to examine the new paint.	Non pressure retaining paint and coatings are covered in Callaway Plant's Safety Related Coatings program. The removal of this sentence eliminates duplication of programs thereby providing for a more efficient containment ISI program for the same reason stated in paragraph 2200(g).	Elimination of this sentence considered acceptable when covered by existing nuclear coatings program. Acceptable change for Callaway Plant.
IWE-3000	ACCEPTANCE STANDARDS		
IWE-3100	Removed the word nondestructive from the heading	Non significant	Consistent with IWB and IWC wording - Acceptable
IWE-3110	PRESERVICE EXAMINATIONS	n/a	
IWE-3111	Replaced the reference to Table IWE-3410-1 with a reference to Subarticle IWE-3500. Removed reference to paragraph IWE-3115.	Table IWE-3410-1 and paragraph IWE-3115 have been deleted and are discussed below. IWE-3500 adequately captures all of the information previously contained in the deleted table and paragraph.	Under the 1998 Edition, Table IWE-3410-1 probably isn't necessary because there are only two examination categories and the acceptance criteria are specified in Table IWE-2500-1 - Acceptable
IWE-3112	Replaced the reference to Table IWE-3410-1 with a reference to Subarticle IWE-3500. ASME XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Same as above.
IWE-3114	Replaced the reference to Table IWE-3410-1 with a reference to Subarticle IWE-3500. ASME XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Same as above.
IWE-3115	Deleted subparagraph which addressed repair programs and evaluations being subject to review by authorities.	Non significant - there were no submittal or retention requirements changed by the deletion of the subparagraph. These evaluations are covered in Subsection IWA.	The Regulations do not require the licensees to submit their containment inspection programs -- Acceptable

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-3120	Removed the word nondestructive from the heading.	Non significant	Consistent with IWB and IWC --Acceptable
IWE-3121	Removed the word nondestructive and deleted references to IWE-3124 and IWE-3125 for the acceptance of flaws for continued service.	The removal of nondestructive is non significant. The referenced subparagraphs did not actually apply to the acceptance of flaws for continued service.	Acceptable
IWE-3122	Replaced the references to Table IWE-2500-1 and to IWE-3000 with a reference to Subarticle IWE-3500. ASME XI generic change from repair and or replacement to repair/replacement activities. Reworded several sentences. Deleted sentence which addressed evaluations being subject to review by authorities.	Non significant - the changes are for clarity and to reconcile paragraph numbering. There were no submittal or retention requirements changed by the deletion of the sentence addressing evaluation reviews.	Consistent with IWB and IWC -- Acceptable
IWE-3124	Replaced the reference to Table IWE-3410-1 with a reference to Subarticle IWE-3500. ASME XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Acceptable
IWE-3125	Deleted subparagraph which addressed repair programs and reexamination results being subject to review by authorities.	Non significant - there were no submittal or retention requirements changed by the deletion of the subparagraph.	Acceptable
IWE-3130	no change	n/a	

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-3200	Added a statement to the end of the paragraph that states supplemental surface or volumetric examinations are required when specified by engineering evaluation.	The added statement clarifies requirements and eliminates potential duplication or contradiction of requirements in stating that the engineering evaluation requirements of IWE-3122 determine what and when supplemental examinations are required.	Acceptable
IWE-3410	Replaced the reference to Table IWE-3410-1 with a reference to Subarticle IWE-3500.	Non significant	Acceptable

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IWE-3430	no change	n/a	
IWE-3500	ACCEPTANCE STANDARDS	n/a	

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-3510	<p>Reconciled acceptance standards with the IWE-2300 changes discussed above and the Table IWE-2500-1 changes discussed below by:</p> <p>Adding the requirement in IWE-3510.1 that <i>The owner shall define acceptance criteria for visual examination of containment surfaces;</i></p> <p>Removed the wording from IWE-3510.1 of the 1992 Code for responsible individual and for personnel qualifications;</p> <p>Combining 3510.2 and 3510.3 and removing specific VT-1 and VT-3 examination attribute wording; and</p>	<p>Previously, examination requirements were contained in the acceptance standards of IWE-3500. This has been corrected by the addition of IWE-2300 <i>VISUAL EXAMINATION, PERSONNEL QUALIFICATION, AND RESPONSIBLE INDIVIDUAL.</i></p> <p>This change directly corresponds to the addition of IWE-2310(a). The 1992 Code gave some general acceptance criteria that defined a "suspect" area, then stated such areas shall be accepted by engineering evaluation. The 1998 Code permits the Owner to spell out these acceptance criteria more in detail in their ISI Containment Inspection Program. Not all conditions can be defined in an inspection program, therefore, engineering evaluations will still be used. Therefore, this change is considered minor and non-significant.</p> <p>This wording is not contained in the new Section IWE-2320 and is simply a change in location within the Code.</p> <p>Section IWE-3510.2 and IWE-3510.3 split the acceptance criteria for coated and non-coated surfaces into two different sections. Section IWE-3510.1 of the 1998 Code requires the Owner to define acceptance criteria for visual examinations; therefore there is not need to differentiate between the two.</p>	<p>Owner defined visual examination requirements do not provide uniformity and consistency industry wide. 1998 Code is unacceptable without specifics provided by licensee. Callaway plant has provided those specifics – Acceptable</p> <p>Owner defined visual examination requirements do not provide uniformity and consistency industry wide. 1998 Code is unacceptable without specifics provided by licensee. Callaway plant has provided those specifics – Acceptable</p> <p>Acceptable</p> <p>Acceptable</p>

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-3510 (con't)	By the incorporation of 3515 the acceptance standards for bolting were changed from referencing material specs and torque or tension limits to conditions affecting leak tight or structural integrity.	All pressure retaining components are subject to a general visual inspection under the 1998 Code. This includes bolted connections. However, if a bolted connection is not disassembled for other maintenance activities, it is also not subject to a torque or tension test. All bolted connections at Callaway Plant are subject to Appendix J inspection. To date, the LLRT inspections performed on the bolted connections have produced excellent results, indicating that Callaway Plant does not have a problem with the bolted connections. Furthermore, the entire pressure boundary, which includes bolted connections, is subject to an LLRT once every period. The successful completion of this test, coupled with a general visual examination will assure structural integrity and leak tightness of the system while keeping radiation exposure ALARA and minimizing the impact on outage schedule. However, bolted connections that are disassembled anytime during the period are still subject to VT-3 inspections, which is unchanged from the 1992 Code.	The examination of bolting, seals and gaskets to determine their ability to maintain containment leak tight integrity as a separate inspection is considered unnecessary. The Appendix J, Type A test is considered sufficient for determining the leak-tight integrity of the penetration - Acceptable

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-3511	<p>Renumbered paragraph IWE-3512 of the 1992 Code to IWE-3511 in the 1998 Code. Reconciled acceptance standards with the addition of Section IWE-2300 changes to Table IWE-2500-1.</p> <p>Added the requirement that <i>the owner shall define acceptance criteria for visual examination of containment surfaces;</i></p> <p>Combined 3512.2 and 3512.3 with changes into 3511.2 and removed specific VT-1 examination attribute wording; and</p>	<p>The subparagraph was renumbered based on the deletion of previous Section IWE-3511 of the 1992 Code. Previously, examination requirements were contained in the acceptance standards of IWE-3500. This has been moved to Section IWE-2300 of the 1998 Code.</p> <p>The 1992 Code gave some general acceptance criteria that defined a "suspect" area, then stated such areas shall be accepted by engineering evaluation. The 1998 Code permits the Owner to spell out these acceptance criteria in more detail in their ISI Containment Inspection Program. Not all conditions can be defined in an inspection program, therefore, engineering evaluations will still be used. Therefore, this change is considered minor and non-significant.</p> <p>These changes directly correspond to the addition of IWE-2310(e)(1) and (2) discussed above and eliminate potential duplication or contradiction of requirements.</p>	<p>Acceptable</p> <p>Owner defined acceptance criteria do not provide consistency through out the industry. Therefore, the 1998 Code is unacceptable without specifics provided by licensee. Callaway plant has provided those specifics – Acceptable</p> <p>Acceptable</p>

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-3511 (con't)	Reworded ultrasonic examination subparagraph stating that Class MC pressure retaining components that ultrasonic examinations detect material loss in local areas exceeding 10% of the nominal wall thickness shall be documented.	This change states that only Class MC pressure retaining components are subject to the 10% material loss criteria. Metallic liners of Class CC pressure retaining components are not subject to this same requirement. The structural element of a Class MC containment is the metal shell. However, on a metallic liner of a Class CC containment, the structural element is the reinforced, post-tensioned concrete shell, therefore, the liner plate is a non-structural element and serves only as an air seal. At Callaway Plant the maximum load the liner plate would ever see is stress from wet concrete during constructions of the plant because the liner was also used as a concrete form. The pressure from a design basis accident is only 48.1 psi., therefore, a 10% reduction of the liner plate is not significant to the structural integrity of containment. The liner plate is required to have a general visual inspection under the 1998 Code per Subsection IWE-2310. Any areas found that show any signs of deterioration would require further evaluation per the Owners acceptance criteria as defined in their ISI program and required per IWE-3500. This would assure that the liner plate integrity would be maintained throughout the life of the plant.	Callaway Plant has committed to document and perform engineering evaluation, on a case by case basis, of any defect or deterioration that exceeds a depth of 10% the nominal wall thickness. - Acceptable

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-3513	Deleted paragraph Section IWE-3513 of the 1992 Code from the 1998 Code, which required examination of seals, gaskets, and moisture barriers.	Seals and gaskets previously required examination once per interval for defects that may violate leak-tight integrity. Leak-tight integrity is verified during each 10 CFR 50, Appendix J leak test. There are seals in electrical penetrations that would require disassembly and determination of safety related electrical circuitry, which could result in potential significant Nuclear Safety Concerns. Furthermore, the 1992 Code, in Table 2500-1 for examination category E-G, note 5 states that bolt torque or tension test is required only for bolted connections that have not been disassembled and reassembled during the inspection interval. This implies that the Owner is not expected to take apart every bolted connection on the pressure boundary to perform inspections. Seals and gaskets that are in bolted connections that are not otherwise disassembled and pass the Appendix J leak testing are considered satisfactory.	The separate examination of bolting, seals and gaskets to determine their ability to maintain containment leak tight integrity inspection is considered unnecessary. The Appendix J, Type A test is considered sufficient for determining the leak-tight integrity of the penetration - Acceptable

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-3511 & IWE-3514 of the 1992 Code	Deleted paragraphs Section IWE-3511 and Section IWE-3514 of the 1992 Code from the 1998 Code which dealt with examination of pressure retaining welds and pressure retaining dissimilar metal welds.	The Final Rule, 10 CFR 50.55a(b)(2)(x)(C), states that examinations in Category E-B and E-F are optional. The basis for this allowance is that there is no evidence of problems associated with welds of this type and that radiation exposure required to conduct these examinations cannot be justified. The items will be examined as part of the general visual examination and the leak tightness verified through 10 CFR 50, Appendix J testing. Therefore, there is no change in the Final Rule as a result of these deletions.	Based on the optional nature of the Regulatory requirements pertaining to containment welds, the elimination of any direct references to containment weld examinations in the Code is justified – Acceptable
IWE-4100	no change	n/a	
IWE-5200	SYSTEM TEST REQUIREMENTS		
IWE-5210	no change	n/a	
IWE-5220	ASME XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Acceptable
IWE-5221	ASME XI generic change from repair and or replacement to repair/replacement activities. Removed the quotation of 10 CFR 50 Appendix J paragraph IV.A.	Non significant - the requirement to meet the requirements of Appendix J paragraph referenced is not affected by removing the quoted App J paragraph.	Acceptable
IWE-5222	ASME XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Acceptable

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
IWE-5240	Replaced a reference to IWA-5240 with requirements to perform detailed visual examination of repair/replacement areas during pressure tests.	The addition of specific IWE examination requirements during pressure testing in lieu of referencing IWA general requirements focuses requirements on issues specific to containment integrity and therefore provides added assurance of the integrity of repaired/replaced areas.	Acceptable
IWE-5250	Changed Corrective Measures to Corrective Action in the heading. ASME XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Acceptable
IWE-7100	no change	n/a	
	TABLE CHANGES		
Table IWE-2411-1	no change	n/a	
Table IWE-2412-1	Replaced the separate entries for 1 st and successive intervals with one entry for All intervals.	Non significant - The previous requirements for the 1 st and successive intervals were identical. Therefore, combining the entries does not affect any requirements.	Acceptable

APPENDIX A -- CALLAWAY IWE COMPARISON TABLE

Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
<p>Table IWE-2500-1</p> <p>Examination Category E-A</p>	<p>Revised all EXAMINATION CATEGORIES E-A.</p> <p>Item E1.11: Revised frequency of examination from "prior to each type A test" to "100%" during each period".</p> <p>Item E1.12: Redesignated item from "accessible surface areas" to "wetted surfaces of submerged areas". Replaced examination method VT-3 with general visual.</p> <p>Item E1.20: Added BWR to item description. Replaced examination method VT-3 with general visual.</p>	<p>A general visual of 100% of the pressure retaining boundary is already required each period per 10CFR50.55a. This will include an inspection prior to a type A test. Therefore, is not a change from what is already required and specific reference to the Type A test is not required.</p> <p>Accessible surface area designation is now included in E1.11. Wetted surface areas were previously included in E1.12 footnote 4. These changes do not eliminate or reduce any required examination areas. Requiring a general VT in lieu of a VT-3 eliminates the more detailed examinations of areas with satisfactory general visual inspection results. The performance of the general visual will identify any areas of deterioration or distress. Any areas identified will then be subject to a VT detailed examination to determine the magnitude and extent of those conditions. The general visual inspection therefore allows for more efficient containment ISI program implementation without adversely affecting containment integrity.</p> <p>This item is not applicable to Callaway Plant's containment because Callaway Plant is a PWR.</p>	<p>Conservative change. Appendix J, Option A, requires periodic (one each period) Type A tests. Appendix J, Option B, is based on historical performance and requires periodic visual inspection for Type A tests – Acceptable</p> <p>Changing "accessible surface areas" to "wetted surfaces of submerged areas" essentially eliminates any detailed visual examination requirements for structures that are part of reinforcing structure (i.e., stiffening rings, manhole frames, and reinforcement around openings).</p> <p>The change to general visual removes the emphasis on containment welds.</p> <p>Relaxation of visual examination requirements. 1998 Code is unacceptable. However, this requirement not applicable for Callaway.</p>

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
Table IWE-2500-1 (continued)	<p>Item E1.30: Added item for moisture barriers with a general VT required each period.</p> <p>All items no.'s - Replaced reference to IWE-3510 for examination requirements with IWE-2310.</p> <p>Notes - Revised to specifically include welds and bolting as part of the pressure retaining boundary requiring examination.</p>	<p>This item is not applicable to Callaway Plant's containment because we have no moisture barriers.</p> <p>Non significant - Previously some examination requirements were contained in IWE-3500. They now exist in IWE-2300.</p> <p>Welds and bolting were previously included in Examination Categories E-B, E-F and E-G. Including these items in the examination category for the containment pressure retaining boundary provides for more efficient program implementation without adversely affecting component integrity.</p>	<p>Acceptable</p> <p>Acceptable</p> <p>Previous visual examination requirements included VT-1 and VT-3. 1998 Edition specifies general visual. This is a significant relaxation in Code requirements.</p> <p>1998 Code is unacceptable without specifics provided by licensee. Callaway plant has provided those specifics - Acceptable</p>
Table IWE-2500-1. CAT. E-B	Deleted examination category which addressed pressure retaining welds.	Pressure retaining welds are now included in Examination Category E-A as discussed under item IWE-2500.	10 CFR 50.55a makes containment weld inspections optional - Acceptable
Table IWE-2500-1 Examination Category E-C	<p>Revised EXAMINATION CATEGORIES E-C</p> <p>Item E4.11: Replaced examination method VT-1 with detailed visual.</p>	Referring to the visual examination by the VT detailed term does not adversely affect the integrity of the containment components examined as discussed under item IWE-2500.	Replaced VT-1 with detailed visual. 1998 Code is unacceptable without specifics provided by licensee. Callaway plant has provided those specifics (i.e., detailed visual will be VT-3 or VT-1) - Acceptable

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Paragraph	Changes between IWE 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Comments
	Item E4.12: Added grid line intersections to description of parts examined. Changed examination method from volumetric to ultrasonic thickness.	The added wording clarifies inspection requirements and ensures repeatability in the location of subsequent thickness measurement points.	The recommended ultrasonic gridline sample requirements provide a more practical approach to augmented container examinations – Acceptable
Examination Category E-C (con't)	<p>All item no.'s - Added examination requirement paragraph number references. Updated acceptance standard references.</p> <p>Notes - Changed note 2 from requiring augmented examination until an area remains unchanged for three consecutive inspection periods to the next inspection period.</p> <p>Deleted note 3 which discussed inspection deferrals.</p>	<p>Previously no references existed for examination requirements. These requirements have been added to IWE-2300 and -2500 as discussed above. Adding new references and updating paragraph numbers ensure proper requirements are applied to examinations.</p> <p>This note clarifies the requirements of IWE-2420(c) as discussed under that section.</p> <p>Under the 1998 Code, no deferrals are allowed. This is more restrictive than the 1992 Code.</p>	<p>Acceptable</p> <p>Change from three consecutive periods to one period consistent with the requirements for Class 2 components – Acceptable</p> <p>Acceptable</p>
Table IWE-2500-1 CAT. E-D	E-D Deleted examination category which addressed seals, gaskets and moisture barriers.	Moisture barriers have been included in Examination Category E-A as addressed in Table 2500-1 Cat. E-A. Seals and gaskets previously required examination once per an interval with effectively an acceptance criteria of leak tightness. Leak tight integrity is verified during each 10CFR50 App. J leak test. See Section 3115 for more detail.	Visual examination acceptance criteria no longer exist for moisture barriers.

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Table IWE-2500-1 CAT. E-F	E-F Deleted examination category which addressed dissimilar metal welds.	Dissimilar metal welds are not required to be VT-1 inspected per 10 CFR 50.55a(b)(2)(x)(C) of the Final Rule.	10 CFR 50.55a makes containment weld inspections optional - Acceptable
Table IWE-2500-1 CAT. E-G	E-G Deleted examination category which addressed pressure retaining bolting.	Pressure retaining bolting is now included in Examination Category E-A. See Section 3511 for more details.	1992 Code required VT-1 visual examination of bolting when a connection was disassembled. The 1998 Edition requires general visual, in place, with no requirement when the joint is disassembled. Callaway plant committed to perform VT-1 when bolting disassembled. - Acceptable
Table IWE-2500-1 CAT. E-P	E-P Deleted examination category which addressed 10CFR50 Appendix J testing for all pressure retaining components.	Appendix J testing is mandated by plant technical specifications. Removing this duplicate requirement from IWE does not adversely affect component integrity.	Acceptable
Table IWE-2500-2	Added new Table IWE-2500-2 - Ultrasonic Thickness Measurements For Augmented Examinations - which details gridding and thickness measurement requirements.	The new requirements provide for consistency and repeatability in obtaining thickness measurements and thus assure the reliable detection of conditions adverse to containment integrity.	Acceptable
Table IWE-3410-1	Deleted table.	Non significant - the contents of the previous table are adequately addressed in IWE-3500.	Acceptable

Appendix B

Callaway Plant's Supplements to 1998 Code

Appendix B
Callaway Plant's Supplemental Information to the 1998 Code Edition

Initial 1998 Code Proposed Alternative	Supplemented Proposed Alternative (7/9/99 and 9/10/99 responses)	Recommendations/Comments
IWE-2310 - "Visual Examinations"- a) the owner shall define requirements for visual examination of containment surfaces.	General visual examination performed on 100% of the pressure boundary each inspection period using "general visual reference standard" to represent relevant defects and visual examiners certified in accordance with ANSI/ASNT CP-189. Detailed visual consisting of VT-3 or VT-1 examination per 1998 Code.	Authorize per 10 CFR 50.55a(a)(3)(i).
IWE-2330 - "Personnel Qualification" - a) the owner shall define the qualification requirements for personnel performing visual examinations and b) provides minimum qualification requirements that were previously contained in the acceptance criteria of IWE-3510.1.	Visual inspection personnel will be certified in accordance with CP-189. General visual qualified using "general visual reference standard" with representative defects or deterioration placed in representative locations during the inspection to verify lighting and magnification (when used) are adequate. Detailed visual will use well-defined standards for VT-1 and VT-3, currently defined by the 1998 Code.	Authorize per 10 CFR 50.55a(a)(3)(i).
IWE-2500 - Deleted the requirement to examine paint or coatings prior to removal.	Covered in Callaway Plant's Safety Related Coatings program. Ongoing visual examination of the entire liner plate (general and detailed visual examination) in conjunction with comprehensive acceptance criteria for the detailed inspection ensures any significant patterns of degradation will be detected.	Authorize per 10 CFR 50.55a(a)(3)(i).
IWE-3510.1 and IWE -3511.1 - The owner shall define acceptance criteria for visual examination of containment surfaces.	General visual will use a "general visual reference standard" to represent relevant defects or deterioration which include excessive corrosion; blistered, flaking, or peeling paint; and general deformation, bulges, or other signs of distress. Detailed visual will use VT-3 and VT-1 criteria.	Authorize per 10 CFR 50.55a(a)(3)(i).

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Initial 1998 Code Proposed Alternative	Supplemented Proposed Alternative (7/9/99 and 9/10/99 responses)	Recommendations/Comments
Paragraph IWE-3511.3 eliminated minimum wall thickness acceptance criteria for Class CC metallic liners.	Any defect or deterioration that exceeds a depth of 10% the nominal wall thickness will be documented and receive engineering evaluation.	Authorize per 10 CFR 50.55a(a)(3)(i).
Table IWE-2500-1 - Notes - Revised to include welds and bolting as part of the pressure retaining boundary requiring examination.	The leak-tight integrity of bolting, seals and gaskets per Appendix J, Type A test.	Authorize per 10 CFR 50.55a(a)(3)(i).
Table IWE-2500-1, Examination Category E-C - Visible surfaces requiring an augmented examination receive a Detailed Visual Exam.	Detailed Visual exam criteria developed from VT-1 and VT-3 procedures.	Authorize per 10 CFR 50.55a(a)(3)(i).
Table IWE-2500-1, Examination Category E-G - Eliminated requirements for pressure-retaining bolting	VT-1 examination when bolting disassembled.	Authorize per 10 CFR 50.55a(a)(3)(i).

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