

June 6, 2000

Mr. Harold W. Keiser
Chief Nuclear Officer & President -
Nuclear Business Unit
Public Service Electric & Gas
Company
Post Office Box 236
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SUBJECT: HOPE CREEK NUCLEAR GENERATING STATION AND SALEM NUCLEAR
GENERATING STATION, UNITS 1 AND 2 - EVALUATION OF RELIEF
REQUESTS: USE OF 1998 EDITION OF SUBSECTIONS IWE AND IWL OF
THE ASME SECTION XI CODE FOR CONTAINMENT INSPECTIONS
(TAC NOS. MA6865, MA6866, AND MA6867)

Dear Mr. Keiser:

By letter dated October 7, 1999, as supplemented February 22, and April 7, 2000, Public Service Electric and Gas Company (PSE&G), submitted Relief Requests Nos. RR-E1 and RR-L1, seeking relief from the requirements of Subsections IWE and IWL of the 1992 Edition and 1992 Addenda of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (the Code), for inspection of the Hope Creek Generating Station (Hope Creek) and Salem Nuclear Generating Station, Units 1 and 2, (Salem) containments. The relief requests proposed to use the provisions of Subsections IWE and IWL of the 1998 Edition of the Code, which has not yet been incorporated by reference into Title 10 of the Code of Federal Regulations, Section 50.55a (10 CFR 50.55a), as an alternative to the 1992 Edition and Addenda of the Code.

The Nuclear Regulatory Commission (NRC) staff, with assistance from the Idaho National Engineering and Environmental Laboratory (INEEL), has completed the review of the subject relief requests. The NRC staff's Safety Evaluation (SE) is enclosed; INEEL's Technical Letter Report is provided as an attachment to the SE.

Our SE concludes that the proposed alternatives will provide an acceptable level of quality and safety for ensuring the pressure boundary integrity of the Hope Creek and Salem containments. Therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(i).

H. Keiser

- 2 -

If you have any questions regarding this matter, please contact the Hope Creek Project Manager, Richard B. Ennis, at (301) 415-1420, or the Salem Project Manager, Robert J. Fretz, at (301) 415-1324.

Sincerely,

/RA/

James W. Clifford, Chief, Section 2
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket Nos. 50-354, 50-272, and 50-311

Enclosure: Safety Evaluation

cc w/encl: See next page

If you have any questions regarding this matter, please contact the Hope Creek Project Manager, Richard B. Ennis, at (301) 415-1420, or the Salem Project Manager, Robert J. Fretz, at (301) 415-1324.

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUESTS FOR CONTAINMENT INSPECTIONS

PUBLIC SERVICE ELECTRIC & GAS COMPANY

HOPE CREEK GENERATING STATION

SALEM NUCLEAR GENERATING STATION, UNITS 1 AND 2

DOCKET NOS. 50-354, 50-272, AND 50-311

1.0 INTRODUCTION

Title 10 of the Code of Federal Regulations (10 CFR), Section 50.55a(g)(6)(ii)(B), requires containment inspections to be performed in accordance with the requirements of Subsections IWE and IWL of the 1992 Edition up to and including the 1992 Addenda of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (the Code), as modified by 10 CFR 50.55a(b)(2)(ix) and 10 CFR 50.55a(b)(2)(x). Licensees of all operating nuclear power plants are required to complete their first period inspections by September 9, 2001.

By letter dated October 7, 1999, Public Service Electric and Gas Company (PSE&G or the licensee), submitted Relief Requests Nos. RR-E1 and RR-L1, seeking relief from the requirements of Subsections IWE and IWL of the 1992 Edition and 1992 Addenda of the Code for inspection of the Hope Creek Generating Station (Hope Creek) and Salem Nuclear Generating Station, Units 1 and 2, (Salem) containments. The relief requests proposed to use the provisions of Subsections IWE and IWL of the 1998 Edition of the Code, which has not yet been incorporated by reference into 10 CFR 50.55a, as an alternative to the 1992 Edition and Addenda of the Code. In the submittal, the licensee provided a table comparing the requirements of the 1998 Edition with the 1992 Edition and Addenda.

The Nuclear Regulatory Commission (NRC) staff, with the assistance of the Idaho National Engineering and Environmental Laboratory (INEEL), reviewed the licensee's submittal dated October 7, 1999, and provided a request for additional information (RAI) in a letter dated January 20, 2000. The licensee provided the additional information in letters dated February 22 and April 7, 2000. This evaluation addresses the acceptability of the licensee's proposed alternatives.

2.0 EVALUATION

INEEL, as contractor to the NRC, evaluated the content of the subject relief requests. The evaluation included a review and comparison of the requirements in Subsections IWE and IWL

ENCLOSURE

of the 1992 Edition and Addenda and the 1998 Edition, and an analysis and/or implications of the Code changes. INEEL's technical letter report (TLR), provided as an attachment to this Safety Evaluation, describes the licensee's basis for requesting relief, and discusses the implication of the alternatives in terms of quality and safety as it relates to the inspection of the Hope Creek and Salem containments. Appendix A of the TLR is a table of comparison for Subsection IWE. Appendix B is a table of comparison for Subsection IWL. The four columns of the tables provide the following information:

Column 1	The paragraph (sometimes includes articles and subarticles) corresponding to the 1992 Edition and Addenda of Subsections IWE and IWL of the Code.
Column 2	Changes between the 1992 Edition and Addenda and the 1998 Edition.
Column 3	Licensee's statement of significance and/or basis for use as an alternative examination.
Column 4	INEEL's recommended disposition/comments: INEEL's disposition is principally related to the acceptance of the requirements of the 1998 Edition of the Code in terms of quality and safety related to the containment inspection.

Based on the review of the comparative requirements, the staff identified seven significant issues that required additional information from the licensee. These issues are discussed in Sections 2.1 through 2.7 of this Safety Evaluation.

2.1 Visual Examination Methods and Personnel Qualification, IWE-2300

The 1992 Edition and Addenda (Table IWE-2500-1) invoke the use of IWA-2200 and IWA-2300 for visual, surface, and volumetric examination methods, and for qualification of personnel. The 1998 Edition of the Code (IWE-2300) requires the owner (i.e., licensee) to define requirements for visual examination of containment surfaces, and for qualifying the personnel performing visual examinations. Additionally, IWE-2320 requires the owner to designate a responsible individual who will be responsible for activities related to the containment surface visual examinations and personnel qualification.

In its letter dated February 22, 2000, the licensee provides acceptance criteria for the general and detailed visual examinations. The licensee states that the general and detailed visual examinations have been developed from VT-3 and VT-1 examinations, but do not incorporate all of the existing requirements. Resolution and illumination requirements for performing direct and remote general and detailed visual examinations are equivalent to those required for VT-3 and VT-1. The effectiveness of the procedures will be demonstrated using field conditions and various flaw sizes to demonstrate detectability under varying illuminations to the satisfaction of the Authorized Nuclear Inservice Inspector.

The 1992 Addenda has incorporated ASNI/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 examinations. The 1998 Edition relies on the responsible individual to direct the containment visual examinations. In its letter dated February 22, 2000, the licensee states:

Qualification of examination personnel for Detailed and General visual examinations will conform to the requirements for VT-1 and VT-3

respectively per the existing PSE&G written practice.

PSE&G's written practice satisfies the requirements of ANSI/ASNT CP-189 (1991 Edition) for containments only; and the supplemental requirements of the ASME Boiler and Pressure Vessel Code - Section XI (up to and including 1992 Edition with 1992 Addenda).

The staff concludes that the incorporation of these provisions into the licensee's containment inservice inspection procedures provides reasonable assurance that the licensee's defined visual examination methods and personnel qualification procedures are adequate.

2.2 IWE- 2500(b) Paint and Coatings

The requirement to examine paint or coating prior to removal was deleted in the 1998 Edition of the Code. The staff has no objection to this deletion. However, in the absence of any examination for detecting flaws or degradation in the containment base metal, the recoating may be applied to a degraded containment surface.

The licensee states that general visual examination of accessible surfaces, including coated surfaces, is performed using acceptance criteria that identifies coating deficiencies which could indicate degradation to the pressure boundary integrity. If coating is removed to perform visual examinations, the coating will be reapplied under the appropriate plant coating requirements. In addition, the licensee states in its letter dated October 7, 1999, that:

1. In areas important to containment integrity, coating deficiencies identified on the containment liner are brought to the attention of the IWE Responsible Engineer; and
2. Base metal conditions that could challenge the structural integrity of the containment are examined by properly qualified personnel.

The staff finds that the implementation of the above process will ensure that the base metal degradation will be identified, and appropriate action taken, prior to recoating the containment liner.

2.3 Visual Examination Acceptance Standards for Categories E-A and E-C

IWE 3510.1 and IWE 3511.1 of the 1998 Edition of the Code state that the owner is required to define the acceptance criteria for visual examination of containment surfaces when performing Category E-A and Category E-C examinations. However, the basic requirements for these examinations are provided in IWE-2310 as augmented by the licensee and described in Section 2.1 of this Safety Evaluation.

The staff finds that complying with the 1998 Edition of the Code, augmented by the specific requirements in the licensee's containment inspection program, will provide reasonable assurance that significant flaws and degradation of the containment are adequately identified during Category E-A and Category E-C examinations.

2.4 Ultrasonic Examinations, IWE-3511.3

In Paragraph IWE-3511.3 of the 1998 Edition of the Code, examination of Class CC metallic liners has been excluded from the acceptance criterion, which requires 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. The licensee states in its letter dated October 7, 1999, that the ultrasonic examinations required by IWE 3511.3 apply to Class CC components as well as to Class MC components. Specifically, if greater than 10% material loss is identified, the area shall be subject to acceptance by engineering evaluation or repair. This is equivalent to the requirements of the 1992 Addenda. Therefore, the staff concludes that the proposed acceptance criterion for wall thinning will ensure that the integrity of the liner plate is maintained and, thus, will provide an acceptable level of quality and safety.

2.5 Examination of Pressure Retaining Bolting, Table IWE-2500-1

In the 1998 Edition of IWE, the requirements for bolted connections have been moved to Examination Category E-A, Item E1.10 Containment Vessel Pressure Retaining Boundary and Item E1.11 Accessible Surface Areas. The 1998 Edition requires that 100% of the accessible surfaces areas of the containment vessel pressure retaining boundary be visually examined (general visual) during each inspection period. This corresponds to an examination of all bolted connections three times per inspection interval. Included in the examination are bolts, studs, nuts, bushings, washers, and threads in base material and flange ligaments between fastener holes. The Code does not require that the bolted connection be disassembled for performance of the examination.

The staff has determined that the Code requirements for visual examination of bolted connections are not fully satisfactory and recommends the following guidelines:

If during the performance of the general visual examination, flaws or degradation are indicated, the examination must be supplemented with a detailed visual examination on the suspect areas. In addition, indication of damage on assembled bolted connections will require that the connection be disassembled to facilitate the detailed visual examination. If a bolted connection is disassembled at the time of inspection, all accessible surface areas of the connection (including bushings, threads, and ligaments in the base material of flanges) shall be visually examined (general visual or if necessary, detailed visual). If a bolted connection is disassembled at times other than scheduled inspections, written maintenance procedures shall be followed to ensure that the integrity of reassembled bolted connections are maintained. The written procedures shall include acceptance criteria for the continued use of all parts of the connection including bolts, studs, nuts, bushings, washers, and threads in base material and flange ligaments between fastener holes.

The licensee's description of examination of containment pressure boundary bolted connections in its letter dated April 7, 2000, is consistent with the above guidelines and provides a

reasonable and practical approach to ensure that degraded and damaged bolting is adequately identified. Therefore, the staff finds that the licensee's proposed alternative provides an acceptable level of quality and safety.

2.6 IWL-2510 Examination of Concrete

The 1992 Edition and Addenda requires the use of visual examination procedures VT-3C and VT-1C. In the 1998 Edition, IWL-2310, these procedures have been changed to "general visual" and "detailed visual" examinations. The 1998 Code requires that the owner define the requirements for visual examination of tendon anchorage hardware, wire, and strands. In addition, it also requires that the owner define the qualification requirements for personnel performing examinations of concrete and tendon anchorage hardware, wire, and strands.

The licensee's letters dated October 7, 1999, and April 7, 2000, provide acceptance criteria for the general and detailed visual examinations along with an excerpt from a procedure that states that visual examinations will be developed to identify areas of concrete deterioration and distress as defined in ACI 201.1. It also states that the general and detailed visual examinations are equivalent to the VT-3C and VT-1C examinations in terms of assessing the condition and potential for deterioration within the containment system.

The licensee provided information on the required minimum initial training and work experience for VT containment method certification. It states that "personnel must be Level II trained and certified VT-1 and/or VT-3/4 accordingly, prior to receiving the appropriate supplementary training for containment examination certification."

The staff finds that the personnel qualification and visual acceptance criteria discussed above provide a reasonable and adequate method for performing visual examinations of concrete.

2.7 Examination of Suspect Areas

Table IWL-2500-1 of the 1998 Edition of the Code requires general visual examination for Item L1.12 (suspect area). The 1992 Addenda of the Code requires VT-1 examination. The licensee states in its letter dated October 7, 2000, that it "will perform a detailed inspection on suspect areas." The licensee's proposal meets the intent of the 1992 Code requirements and, therefore, is acceptable.

3.0 CONCLUSION

Based on the staff's review of the licensee's submittal and responses to the staff's RAI, the staff finds that the proposed alternatives will provide an acceptable level of quality and safety for ensuring the pressure boundary integrity of the Hope Creek and Salem containments. Therefore, the proposed alternatives are authorized pursuant to 10 CFR 50.55a(a)(3)(i).

Principal Contributor: M. Kotzalas

Date: June 6, 2000

Attachment: INEEL Technical Letter Report

TECHNICAL LETTER REPORT
ON SECOND 10-YEAR INTERVAL INSERVICE INSPECTION
CONTAINMENT REQUESTS FOR RELIEF RR-E1 AND RR-L1
FOR
PUBLIC SERVICE ELECTRIC AND GAS COMPANY
SALEM NUCLEAR GENERATING STATION, UNIT NOS. 1 & 2
AND HOPE CREEK NUCLEAR STATION, UNIT 1
DOCKET NUMBERS: 50-272, 50-311 AND 50-354

1.0 INTRODUCTION

By letter dated October 7, 1999, the licensee, Public Service Electric and Gas Company, submitted proposed alternatives to the IWE/IWL containment inspection requirements for Salem Nuclear Generating Station, Unit Nos. 1 & 2 and Hope Creek Nuclear Station, Unit 1, for the second 10-year inservice inspection (ISI) intervals. The licensee proposed to use the 1998 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, Subsections IWE and IWL, in lieu of the 1992 Edition with 1992 Addenda, as currently specified by the Regulation for containment inspections. The licensee provided additional information in response to an NRC request in letters dated February 22, 2000 and April 7, 2000. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject requests for relief is in the following section.

2.0 EVALUATION

The information provided by Public Service Electric and Gas Company in support of the requests for relief from Code requirements has been evaluated and the bases for disposition are documented below. The second 10-year intervals for Salem Nuclear Generating Station, Units 1 and 2, and Hope Creek Nuclear Station, Unit 1, began January 1, 1988, May 10, 1992, and December 13, 1997, respectively. The Code of record for containment inspections performed during the second 10-year inservice inspection (ISI) intervals at these plants is the 1992 Edition through 1992 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code.

2.1 Request for Relief RR-E1, Proposed Alternative to Use ASME Section XI, 1998 Edition, Subsection IWE, for Examination of Class MC and Metal Liners of Class CC Components

Code of Federal Regulation Requirement: 10 CFR 50.55a(g)(6)(ii)(B) requires that licensees implement the containment inservice examinations specified 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:

“The 1998 Edition of Subsection IWE provides the alternate examinations of this relief request. The requirements of the 1998 Edition of the Code are

augmented by the requirements described below.”

Licensee's Basis for Proposed Alternative:

“In the Federal Register, dated August 8, 1996 (61 FR 41303), the NRC amended its regulations to incorporate by reference the ASME Code Section XI, 1992 Edition with the 1992 Addenda of Subsection IWE for expedited examination of containments. Considerable comments were provided by the industry to this rule change, and the NRC Staff took appropriate action to provide exceptions to allow licensees a flexible implementation schedule and relaxation on specific areas to meet these requirements. Based on the effective date of the rule change of September 9, 1996, licensees have until September 9, 2001 to have a Containment ISI Program in place and to complete the first period inspection requirements contained in Section XI.

“ASME has made extensive changes to the Subsection IWE contained in the 1992 Edition and Addenda concerning the examination requirements for containments. These changes were based on industry concerns and comment and are now published in the 1998 Edition of the ASME Code Section XI. Publication of the 1998 Edition by the ASME, with NRC participation, provides the basis for the approval of these new 1998 Edition requirements that have been determined by the ASME consensus process to provide an acceptable level of quality and safety.

“The proposed alternative is to utilize the current ASME approve(d) 1998 Edition of Subsection IWE of Section XI in its entirety as augmented by the additional requirements contained in the “Alternative Examinations” section below. Utilizing the 1998 Edition of IWE in its entirety incorporates other exceptions to the 1992 Addenda stated in NRC rulemaking and provides more cohesiveness than could be achieved by requesting relief on several individual subjects separately. The examination requirements of the 1998 Edition of the Code were developed in accordance with the ASME Code Committee process with input from interested parties, other utilities, manufacturers, engineering organizations, Authorized Nuclear Inspection Agencies, EPRI and the NRC. The updating of requirements by this consensus process is intended to ensure the continued safe operation of nuclear power plants and specifically, in this case, ensures the continued leak-tight and structural integrity of metallic containment components. Therefore, the overall level of plant quality and safety will not be adversely affected by utilizing the requirements of the 1998 Edition of IWE.

“PSE&G has determined that the use of the 1998 Edition requirements as augmented by the additional requirements contained in the “Alternative Examinations” section below in lieu of the 1992 Edition and Addenda requirements for our Containment ISI Program represents an equivalent level of quality and safety. A line by line comparison was made of the 1998 Edition to the 1992 Edition and Addenda. The 1998 Edition provides an equivalent, and in some cases an increased, level of quality and safety to our proposed containment inspection program.

“The PSE&G program governing containment visual examinations and personnel qualifications includes the following:

“General Visual Examination’ criteria are developed from VT-3 procedures that are used to examine ASME Class 1, 2, and 3 components.

“Pressure retaining bolting examination criteria are developed from the VT-1 procedure used for Class 1 bolting.

“Moisture barriers are examined for tears, cracks, or damage that permits moisture to intrude.

“Detailed Visual Examination” criteria will be developed similar to VT-1 and VT-3 procedures.

“The containment visual examination procedure qualification requirement for lighting and illumination will be similar to, and developed from, the procedures used for VT-1 and VT-3 examinations of ASME Class 1, 2, and 3 components.

“In applications where remote visual examination systems are to be used, those systems will be demonstrated to have a resolution capability at least equivalent to that attainable by direct visual examination.

“Containment visual examination procedures will be demonstrated to the authorized nuclear inservice inspector for capability to detect flaws and degradation levels defined within the procedure.

“Containment visual examination program will be developed from the guidelines of SNT-TC-1A and ANSI N45.2.6. Certified personnel will have demonstrated skill, demonstrated knowledge, documented training, and documented experience required to properly perform the duties of a specific job.

“The PSE&G Program for examination of paints and coatings requires that procedures exist to ensure the following:

1. In areas important to containment integrity, coating deficiencies identified on the containment liner are brought to the attention of the IWE Responsible Individual; and
2. Base metal conditions that could challenge the structural integrity of the containment are examined by properly qualified personnel.

“The PSE&G Program requires that the ultrasonic examinations required by IWE-3511.3 apply to Class CC components as well as to Class MC components.

“Salem Generating Station Unit 1 is in its 2nd Interval, 3rd Period, Salem Generating Station Unit 2 is in its 2nd Interval, 2nd Period, and Hope Creek Generating Station Unit 1 is in its 2nd Interval, 1st Period. Based on schedules

and the requirements of the new rulemaking for full implementation by September 9, 2001, a containment ISI examination program must be established immediately. Implementing this relief request at the present time would reduce the overall impact to resources (PSE&G's and the NRC's) compared to incorporating the mandated Edition and Addenda of IWE in conjunction with the initial establishment of a containment ISI program followed by updating to a later edition or addenda or to a series of Code Cases at a later date (e.g., upon either formal NRC endorsement or during the next ten year issuance).

In the February 23, 2000 submittal, the licensee provided the following information:

"In accordance with ASME Section XI, 1998 Edition/Addenda, PSE&G will be performing General and Detailed visual examinations, using VT-1 (Detailed) and VT-3 (General) qualified personnel.

"The General and Detailed visual examinations do not incorporate all existing VT-1 and VT-3 requirements.

"The following are the attributes of our IWE/IWL visual examination program:

I. Acceptance Criteria for IWE (Ref. ASME Section XI, 92/92 Addenda)

A. General Visual

1. Coated metal containment surface examination (including welds and dissimilar metal welds) will be conducted to detect unacceptable evidence of flaking, blistering, peeling, discoloration, and other signs of distress that will affect either the containment structural integrity or leak tightness.
2. Non-coated metal containment surface examinations (including welds and dissimilar metal welds) will be conducted to detect unacceptable evidence of cracking, discoloration, wear pitting, excessive corrosion, arc strikes, gouges, surface discontinuities, dents and other signs of surface irregularities.
3. Bolting examinations will be conducted to detect unacceptable flaws that can cause violation of leak-tight boundary or structural integrity.
4. Moisture barrier examinations will be conducted to identify unacceptable wear, damage, erosion, tear, surface cracks, or other defects that permit intrusion of moisture against inaccessible areas of the pressure retaining surfaces of the containment shell or liner.

B. Detailed Visual

1. Coated metal containment surface examination will be conducted to detect unacceptable evidence of flaking, blistering, peeling, discoloration, and other signs of distress that will affect either the

containment structural integrity or leak tightness.

2. Non-coated metal containment surface examinations will be conducted to detect unacceptable evidence of cracking, discoloration, wear pitting, excessive corrosion, arc strikes, gouges, surface discontinuities, dents and other signs of surface irregularities.

II. Acceptance Criteria for IWL

A. General and Detailed Visual

1. General and Detailed Visual examinations of concrete containment surfaces will be conducted to identify unacceptable areas of concrete deterioration or distress, using ACI 201.1 (1984) for guidance, and/or a determination by the Responsible Engineer that any identified damage or degradation is not sufficient to warrant further evaluation or performance of repair/replacement activities, per IWL-3211 and IWL-2310(b) (98A98).

III. Examination Resolution Criteria

- A. General and Detailed Visual examinations will be performed either directly or remotely, based on the area(s) under examination with adequate illumination and by personnel with visual acuity sufficient to detect evidence of degradation as follows:

1. General Examination

- a. General examinations will be performed directly or remotely, with the use of optical aids, such as telescopes, borescopes, fiber optics, cameras, or other suitable instruments. The examinations, using natural or artificial lighting, shall be sufficient to resolve a 1/32 in. Black line on an 18% neutral gray card.

2. Detailed Examination

- a. Direct detailed examinations may be conducted when access is sufficient to place the eye within 24 in. Of the surface to be examined and at an angle not less the 30 deg. to the surface. Mirrors may be used to improve the angle of vision. The examination, using natural or artificial lighting, shall be sufficient to resolve a 1/64" black line on an 18% neutral gray card.
- b. Remote detailed examinations may be substituted for direct examination. Remote examination may use aids, such as telescopes, borescopes, fiber optics, cameras, or other suitable instruments, provided such systems have a resolution capability at least equivalent to that attainable by direct visual

examination.

IV. Personnel Qualifications

- A. Qualification of examination personnel for Detailed and General Visual examinations will conform to the requirements for VT-1 and VT-3 respectively per the existing PSE&G Written Practice.
- B. PSE&G's written practice satisfies the requirements of ANSI/ASNT CP-189 (1991 Edition) for containments only; and the supplemental requirements of the ASME Boiler and Pressure Vessel Code - Section XI (up to and including the 1992 Edition with 1992 Addenda).
- C. The initial experience requirements for qualification of concrete examination personnel shall be identified by the Responsible Engineer, as permitted within IWL-2300 [IWL-2310(d) and IWL-2320(b)] of Section XI (98A98).

"IWL-2410 allows for deferral of concrete visual exams to the next scheduled plant outage for portions of the concrete surface which cannot be examined within the stated time interval. PSE&G does not plan to take credit for these examinations across two successive intervals.

In the April 7, 2000 submittal, the licensee provided the following information:

"PSE&G plans to perform a General visual examination of pressure retaining containment bolting during each Inspection Period, in accordance with ASME Section XI 1998/1998 Addenda as follows:

- 1. The pressure retaining bolting will be examined at least once during each Inspection Period, as scheduled in the ISI Program Long Term Plan, either in place or removed.
NOTE: If the bolting is found installed, the bolting will be examined in-place. If the bolting is found removed, the bolting will be examined in the removed condition.
- 2. If the bolting is found to be outside the General visual acceptance criteria, then a Detailed examination will be performed on the unacceptable bolting.
NOTE: The unacceptable bolting examined in-place, will then be removed to perform the required Detailed visual examination.
- 3. Bolted connection will not be disassembled for the sole purpose of performing the General visual examination.

"The VT-1 visual examination will be replaced by the General and Detailed visual examination, in accordance with ASME Section XI 1998 Edition/ 1998 Addenda, Subsection IWE. The VT-1 visual examination requirements were primarily written for the examination of components and items within the reactor coolant pressure boundary. Bolted connections associated with primary containment are not subject to the service conditions (e.g., pressure,

temperature, loading, boric acid) as the bolting within the reactor coolant pressure boundary. VT-1 examinations are not required for Class 2 and 3 bolted connections. Bolted connections associated with the primary containment are not subject to conditions that cause accelerated degradation or aging.

“Additionally, pressure retaining containment bolted connections that are disassembled and not examined by ASME Section XI, would be examined using PSE&G procedures based on normal maintenance practices (i.e., mechanics working on IWE boundary bolted connections would examine and either reuse or replace the bolting as necessary, using their professional training and the skill of their craft).

“Also, when an IWE boundary component is disassembled then reassembled for maintenance activities, an Appendix J Local Leak rate test would be performed to determine the leak-tight integrity of the component.

“The General visual examination, in conjunction with the existing maintenance practices and the Appendix J Local Leak Rate Test, for disassembled bolted connections, provides an acceptable level of quality and safety.

Evaluation: 10CFR50.55a(g)(6)(ii)(B) requires that licensees implement the containment inservice examinations specified in Subsection IWE of the 1992 Edition with the 1992 Addenda. 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.

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.

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 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.

The licensee has provided acceptance criteria for the General and Detailed visual examinations. The licensee provided information that describes a containment inspection program that parallels, and meets the intent of, the 1992 Edition with the 1992 Addenda. The general and detailed visual examinations have been developed from VT-3 and VT-1 examinations for assessing containment integrity. Resolution and illumination requirements for performing direct and remote general and detailed visual examinations are equivalent to those required for VT-3 and VT-1. The effectiveness of the procedures were demonstrated using field conditions and various flaw sizes to demonstrate detectability under varying illuminations to the satisfaction of the Authorized Nuclear Inservice Inspector. 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 detailed and general 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. In the April 7, 2000 submittal, the licensee stated, in part:

“Qualification of examination personnel for Detailed and General Visual examinations will conform to the requirements for VT-1 and VT-3 respectively per the existing PSE&G Written Practice. PSE&G’s written practice satisfies the requirements of ANSI/ASNT CP-189 (1991 Edition) for containments only; and the supplemental requirements of the ASME Boiler and Pressure Vessel

Code - Section XI (up to and including the 1992 Edition with 1992 Addenda).”

Based on the statements above, the INEEL staff concludes that the licensee’s containment inspection program parallels, or meets the intent of, the 1992 Edition with the 1992 Addenda for examination personnel qualification requirements. Therefore, it is concluded that the licensee’s proposed alternative provides an acceptable level of quality and safety in this area.

Successive Examinations

IWE-2420(c) (1992 Edition) requires areas containing flaws, areas of degradation, or repairs that were found acceptable by engineering evaluation, to 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 either in 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 Salem and Hope Creek Stations, general visual examination of accessible surfaces, including coated surfaces, is performed using acceptance criteria that identifies coating deficiencies which could indicate degradation to the pressure boundary integrity. If coating is removed to perform visual examinations, the coatings will be reapplied under the appropriate plant coatings requirements. The licensee has also added steps to the maintenance rule manual to notify the Responsible Engineer when degradation of the containment liner or coating is observed. This will

assure that examinations of the containment pressure boundary are performed prior to removal of coatings by mechanical means that could remove evidence of surface degradation and prior to reapplication of the coating. Therefore, the INEEL staff concludes that the licensee has included adequate provisions to ensure the integrity and compatibility 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 containment welds, the elimination of any direct reference 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 NRC staff has determined that verification of leak-tight integrity through Appendix J testing also verifies the integrity of bolted connections, seals and gaskets. Regarding the condition of bolted connections, the NRC staff has established a technical position that requires all accessible bolted connections to be visually examined each inspection period per the requirements of the 1998 Edition of IWE, Table IWE-2500-1, Category E-A. This corresponds to an examination of all bolted connections three times per inspection interval. In addition, licensees shall perform a general visual examination (VT-3 or equivalent) on the exposed portions of the connection. Bolted connections need not be disassembled solely for the performance of VT-3 examinations. If the general visual examination indicates possible areas of degradation or damage, a detailed visual examination (VT-1 or equivalent) is required. If potentially degraded bolting is assembled, the bolted connection shall be disassembled to facilitate the detailed examination. Furthermore, if a bolted connection is disassembled at the time of inspection, all accessible surface areas of the connection shall be visually examined (VT-3 or VT-1, if necessary). If a disassembled connection is not visually examined by a VT-3 or VT-1 qualified individual before reassembly, written maintenance procedures shall be followed to ensure that the integrity of reassembled bolted connections are maintained. The written procedures shall include acceptance criteria for the continued use of all parts of the connection including bolts, studs, nuts, bushings, washers, and threads in base material and flange ligaments between fastener holes. The licensee's proposed alternative is as follows:

"PSE&G plans to perform a General visual examination of pressure retaining containment bolting during each Inspection Period, in accordance with ASME Section XI 1998/1998 Addenda as follows:

- The pressure retaining bolting will be examined at least once during each Inspection Period, as scheduled in the ISI Program Long Term Plan, either in place or removed.
NOTE: If the bolting is found installed, the bolting will be examined in-place. If the bolting is found removed, the bolting will be examined in the removed condition.
- If the bolting is found to be outside the General visual acceptance criteria, then a Detailed examination will be performed on the unacceptable bolting.
NOTE: The unacceptable bolting examined in-place, will then be removed to perform the required Detailed visual examination.
- Bolted connection will not be disassembled for the sole purpose of performing the General visual examination.

“Additionally, pressure retaining containment bolted connections that are disassembled and not examined by ASME Section XI, would be examined using PSE&G procedures based on normal maintenance practices (i.e., mechanics working on IWE boundary bolted connections would examine and either reuse or replace the bolting as necessary, using their professional training and the skill of their craft).

“Also, when an IWE boundary component is disassembled then reassembled for maintenance activities, an Appendix J Local Leak rate test would be performed to determine the leak-tight integrity of the component.

“The General visual examination, in conjunction with the existing maintenance practices and the Appendix J Local Leak Rate Test, for disassembled bolted connections, provides an acceptable level of quality and safety.

Based on the statements above, the INEEL staff concludes that the licensee’s containment inspection program is consistent with the NRC position. Therefore, it is concluded that the licensee’s proposed alternative provides an acceptable level of quality and safety in this area.

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 requires 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. For the Salem and Hope Creek Units, the PSE&G Program requires that the ultrasonic examinations specified by IWE-3511.3 apply to Class CC components as well as to Class MC components. 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.

In summary, 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 existing Regulatory requirements. However, in letters dated February 22, 2000, and April 7, 2000, the licensee provided further information and committed to supplement the requirements of the 1998 Code. Based on the above evaluation, it is concluded that the use of 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).

2.2 Request for Relief RR-L1, Proposed Alternative to Use ASME Section XI, 1998 Edition, Subsection IWL, for Examination of Class CC Concrete Components

Code of Federal Regulation Requirement: 10 CFR 50.55a(g)(6)(ii)(B) requires that licensees implement the inservice examinations specified in Subsection IWL 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 IWL components. The licensee stated:

"The 1998 Edition of Subsection IWL provides the alternate examinations of this relief request. The requirements of the 1998 Edition of the Code are augmented by the requirements described below."

Licensee's Basis for Proposed Alternative (as stated):

"In the Federal Register, dated August 8, 1996, (61 FR 41303), the NRC amended its regulations to incorporate by reference the ASME Code Section XI, 1992 Edition and Addenda of Subsection IWL for expedited examination of containments. Considerable comments were provided by the industry to this rule change and the NRC staff took appropriate action to provide exceptions to allow licensees a flexible implementation schedule and relaxation in specific areas to meet these requirements. Based on the effective date of the rule change of September 9, 1996, licensees have until September 9, 2001 to have a Containment ISI program in place and to complete the first period inspection requirements contained in Section XI.

"ASME has made extensive changes to the Subsection IWL contained in the 1992 Edition and Addenda concerning the examination requirements for containments. These changes were based on industry concerns and comments and are now published in the 1998 Edition of the ASME Code Section XI. The 1998 Edition provides the Responsible Engineer, adds a requirement to train personnel, and establishes the examination categories of general and detailed visual. The 1998 Edition also provides additional inspections of tendon caps, as well as guidelines to inspect for leakage of corrosion protection medium. Publication of the 1998 Edition by ASME, with

NRC participation, provides the basis for the approval of these new 1998 Edition requirements that have been determined by the ASME consensus process to provide an acceptable level of quality and safety.

“The proposed alternative is to utilize the current ASME approved 1998 Edition of Subsection IWL of Section XI in its entirety as augmented by the additional requirements contained in the “Alternative Examinations” section below. Utilizing the 1998 Edition of IWL in its entirety incorporates other exceptions to the 1992 addenda stated in NRC rulemaking and provides more cohesiveness than could be achieved by requesting relief on several individual subjects separately. The examination requirements of the 1998 Edition of the Code were developed in accordance with the ASME Code committee process with input from interested parties, other utilities, manufacturers, engineering organizations, Authorized Nuclear Inspection Agencies, EPRI, and the NRC. The updating of requirements by this consensus process is intended to ensure the continued safe operation of nuclear power plants and specifically, in this case, ensures the continued leak-tight and structural integrity of concrete containment components. Therefore, the overall level of plant quality and safety will not be adversely affected by utilizing the requirements of the 1998 Edition of IWL.

“PSE&G has determined that the use of the 1998 Edition requirements as augmented by the additional requirements contained in the “Alternative Examinations” section below in lieu of the 1992 Edition and Addenda requirements for our Containment ISI program represents an equivalent level of quality and safety. A line by line comparison has been made of the 1998 Edition to the 1992 Edition and Addenda. The 1998 Edition provides an equivalent, and in some cases an increased, level of quality and safety to our proposed containment inspection program.

“Salem Generating Station Unit 1 is in its 2nd Interval, 3rd Period, Salem Generating Station Unit 2 is in its 2nd Interval, 2nd Period, and Hope Creek Generating Station Unit 1 is in its 2nd Interval, 1st Period. Based on schedules and the requirements of the new rulemaking for full implementation by September 9, 2001, a containment ISI examination program must be established immediately. Implementing this relief request at the present time would reduce the overall impact to resources (PSE&G’s and the NRC’s) compared to incorporating the mandated edition and addenda of IWL in conjunction with the initial establishment of a containment ISI program followed by updating to a later edition and or addenda of to a series of Code Cases at a later date (e.g., upon either formal NRC endorsement or during the next ten year ISI plan issuance).

“The PSE&G program governing containment visual examinations and personnel qualifications includes the following:

- General and Detailed Visual Examinations are developed to identify areas of concrete deterioration and distress as defined in ACI 201.1 and are equivalent to the VT-3C and VT-1C examinations in terms of

assessing the condition and potential for deterioration within the containment system.

- In applications where remote visual examination systems are to be used, those systems will be demonstrated to have a resolution capability at least equivalent to that attainable by direct visual examination.
- Containment visual examination procedures will be demonstrated to the authorized nuclear inspector for capability to detect flaws and degradation levels defined within the procedure, and
- The containment visual examination program is developed from the guidelines of SNT-TC-1A and ANSI/ASNT CP-189. Certified personnel will have “demonstrated skill, demonstrated knowledge, documented training, and documented experience required to properly perform the duties of a specific job.”

“The PSE&G Program requires a detailed inspection on suspect areas (Item L1.12).

Evaluation: 10CFR50.55a(g)(6)(ii)(B) requires that licensees perform the inservice examinations which are specified in Subsection IWL of the 1992 Edition with the 1992 Addenda, corresponding to the number of years of plant operation. The licensee is proposing to implement the 1998 Edition of Section XI, Subsection IWL 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 IWL of the 1998 Code and compared it with the 1992 Edition, 1992 Addenda. Appendix B 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 the areas of personnel qualification and visual examination procedure qualification. Each of these issues will be discussed below.

Personnel Qualification

The 1992 Addenda incorporates ANSI/ASNT CP-189 for the qualification of examination personnel. Subsection IWL of the 1998 Edition, takes exception to the certification requirements of the remainder of the Code and invokes plant-specific personnel certification requirements for visual examination. By deleting the VT-1C and VT-3C visual examinations, replacing them with the general and detailed visual examinations, and excluding the personnel qualification requirements of IWA-2300, NDE personnel are not needed to perform containment visual examinations. Subsection IWL of the 1998 Edition relies on the Responsible Engineer to direct the containment visual examinations. The INEEL staff believes that this approach has the potential for substantial inconsistency with respect to containment ISI. For this reason, the 1998 Edition does not provide an acceptable level of quality.

However, the licensee’s qualification of examination personnel for detailed and

general visual examinations will conform to the requirements for VT-1 and VT-3, respectively, per the existing PSE&G Written Practice. PSE&G's written practice satisfies the requirements of ANSI/ASNT CP-189 (1991 Edition) for containments only; and the supplemental requirements of the ASME Boiler and Pressure Vessel Code - Section XI (up to and including the 1992 Edition with 1992 Addenda). The INEEL staff concludes that the licensee's containment inspection program parallels, or meets the intent of, the 1992 Edition with the 1992 Addenda for examination personnel qualification requirements. Therefore, it is concluded that the licensee's proposed alternative provides an acceptable level of quality and safety in this area.

Visual Examination

The 1992 Edition with 1992 Addenda, Subsection IWL, used VT-1C and VT-3C to designate visual examinations to be performed on concrete containment structures. In addition, minimum illumination, maximum direct examination distance, and procedure demonstration using specified lower case character height are required by IWA-2210. The licensee's proposed alternative (1998 Edition) takes exception to the IWA-2210 requirements for visual examination. Consequently, new Code examinations (general visual and detailed visual) have been introduced. The definition of these new Code examinations has been left up to individual licensees. The INEEL staff considers this change to be inconsistent with other Code visual examination prerequisites, and too generic in nature. Therefore, specific details pertaining to the Containment Inspection Program at PSE&G are required in order to establish an acceptable level of quality and safety in the proposed alternative.

For the Salem and Hope Creek Units, the licensee has provided acceptance criteria for the general and detailed visual examinations, with procedures that follow the guidance of ACI 201.1 (1984); and/or include a justification by the Responsible Engineer of any identified damage or degradation that is not sufficient to warrant further evaluation or performance of repair/replacement activities, per IWL-3211 and IWL-2310(b) (98A98). The licensee provided information that describes a containment inspection program that parallels, and meets the intent of, the 1992 Edition, with the 1992 Addenda. The general and detailed visual examinations have been developed that are essentially equivalent to VT-3 and VT-1 examinations for assessing containment integrity. Therefore, it is concluded that the licensee's proposed alternative provides an acceptable level of quality and safety.

The licensee has proposed to use the 1998 Edition of Section XI, Subsection IWL, 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 IWL of the 1998 Code has revealed several areas that do not appear to provide an equivalent level of quality and safety when compared to the 1992 Addenda. Consequently, the 1998 Edition should not be considered an acceptable alternative to the Regulatory requirements without supplemental information from the licensee. However, in letters dated February 22, 2000, and April 7, 2000, 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 of Subsection IWL 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).

3.0 CONCLUSION

Based on the review of the proposed alternatives to IWE and IWL Containment Inspections and commitments included in the licensee's response to the NRC's request for additional information, it is concluded that for Relief Request RR-E1 and RR-L1, the intent of the Regulations will be satisfied at Salem Generating Station, Units 1 and 2 and Hope Creek Generating Station, Unit 1. The licensee's proposed alternative, to use the 1998 Edition of Subsection IWE and IWL as supplemented by specific details contained in the PSE&G 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).

APPENDIX A
SALEM UNITS 1 AND 2 - and HOPE CREEK UNIT 1
IWE COMPARISON TABLE

APPENDIX A -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – 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	ASME Section XI generic wording change from repair, replacement and/or modification terms to repair/replacement activities.	Non significant	
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	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.	The 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.	Examination of welds is optional in 10 CFR 50.55a – Acceptable
	Changed wording from “80% of the surface area” to “80% of the pressure retaining boundary” and stated exclusions from that 80%.	The exclusions from 80% incorporate an existing Table IWE-2500-1 note and clarify that areas made inaccessible during construction are also excluded.	Acceptable
	Reworded paragraph b).	Change to b) is for clarity and is non significant	Acceptable
IWE-1232	ASME XI generic change from repair and/or replacement to repair/replacement activities.	Non significant	Acceptable
	Deleted paragraph (a)(3) addressing inaccessible welded joints	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.	Examination of welds is optional in 10 CFR 50.55a – Acceptable
IWE-1241	Added stiffeners and, by reference to IWE-2420, flaws accepted by evaluation as areas requiring augmented examination.	Clarifies the intent of the Code that areas identified in IWE 2420(b) require an augmented exam in the next period.	Appears to be a conservative change – Acceptable

APPENDIX A -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – 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
1242	Changed (c) to (b).	Non significant	
IWE-2000	No Change	n/a	
IWE-2100	Added new Subarticle 2100 - “General” - to provide reference to IWA-2000 with exceptions from IWA-2210, -2300, -2500 and-2600.	The containment examinations are completely defined within the jurisdiction of IWE, and thus reference to IWA 2210, and IWA 2300 are not applicable. However, to ensure that industry wide consistency is maintained with respect to containment visual examinations and personnel qualifications, the PSE&G program governing these areas is described in the “Alternative Examinations” section of Relief Request RR-E1. The exceptions to IWA-2500, and IWA-2600 are to weld base exams, which do not apply to IWE. The examinations of IWE in the 19998 Edition coupled with the described PSE&G program governing containment visual examinations and personnel qualifications provide an equivalent level of quality and safety as defined in IWA of the 1992 Edition.	<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.
IWE-2200	Deleted paragraph c) which provided allowances for the use of shop or field examinations in lieu of on site preservice examinations.	The deletion of an allowance for an alternative examination ensures that proper pre-service examinations are performed and documented.	Appears to be a conservative change – Acceptable
	Deleted paragraph g) which required the condition of new coating to be documented in the preservice examination record.	The deletion of the requirement to document the condition of “new” non-pressure retaining coatings in the pre-service examination record provides for more efficient program implementation without affecting component integrity. See the discussion under Paragraph 2500 for additional discussion on PSE&G’s coating program.	See the discussion under Paragraph 2500 for additional discussion on PSE&G’s coating program.
	ASME XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Acceptable

APPENDIX A -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – 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-2300	Added new Subarticle -2300 -“Visual Examination, Personnel Qualification and Responsible Individual”	The philosophy of IWE to be an engineering inspection under the direction of the Responsible Individual is contained in this new sub-article. The most significant change is the definition of the roles and responsibilities of the Responsible Individual. This individual will be accountable for the entire inspection program which will meet or exceed the level of quality and safety defined in the 1992 Edition. The specific paragraphs added will be discussed below. Also, see discussion under IWE-2100 above.	See below.
IWE-2310	<p>Added new paragraph -2310 - “Visual Examinations”- which states:</p> <p>a) the owner shall define requirements for visual examination of containment surfaces;</p>	<p>a) The VT-3 and VT-1 inspections of IWA have been replaced by Owner (Responsible Individual) defined general and detailed visual exams, respectively. As defined in IWE-2100 above, to ensure that industry-wide consistency is maintained with respect to containment visual examinations and personnel qualification, the PSE&G program governing these areas is described in the “Alternative Examinations” section of Relief Request RR-E1. The definition of critical examination items and acceptable conditions has not changed, such that any conditions adversely affecting quality or safety are not impacted by this change.</p>	<p>Consistency with existing ISI visual examination requirements provide for an efficient internal program, coupled with the program established by PSE&G should provide uniformity and consistency industry wide. 1998 Code with specific details from the licensee should be acceptable.</p>

APPENDIX A -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – 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
	b) defines general visual examinations; and	b) The general visual examination is equivalent to the VT-3 exam in terms of assessing the general condition and potential for deterioration within the containment system. The use of owner defined inspection types allows for the involvement of qualified engineering personnel with backgrounds in programs such as the Maintenance Rule, containment coatings, and Appendix J. This provides for a containment inspection program that is performed by individuals with knowledge in containment degradation mechanisms.	There are no acceptance criteria specified since the proposal maintains owner defined examination requirements. Don’t agree with the philosophy of a new visual examination method for IWE examinations. 1998 Code is unacceptable. The licensee has provided specific acceptance criteria for general and detailed visual examinations – Acceptable
	c) defines detailed visual examinations; and	c) The detailed visual examination is equivalent to the VT-1 exam in terms of assessing the general condition and potential for deterioration within the containment system. The use of owner defined inspection types allows for the involvement of qualified engineering personnel with backgrounds in programs such as the Maintenance Rule, containment coatings, and Appendix J. This provides for a containment inspection program that is performed by individuals with knowledge in containment degradation mechanisms.	There are no acceptance criteria specified since the proposal maintains owner defined examination requirements. Don’t agree with the philosophy of a new visual examination method for IWE examinations. 1998 Code is unacceptable. The licensee has provided specific acceptance criteria for general and detailed visual examinations – Acceptable
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

APPENDIX A -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – 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-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>The qualifications along with the roles and responsibilities of the Responsible Individual are clearly delineated within this sub-article. This section clearly states the expectations for the Responsible Individual, and brings accountability for the entire program to an individual knowledgeable in containments and their degradation mechanisms. This individual will develop the inspection plans, train personnel, direct or perform inspections, and finally evaluate the results. The cohesiveness of the inspection program has been improved by the addition of this sub-article. This, along with the containment visual examinations and personnel qualification program described in the “Alternative Examinations” section of Relief Request RR-E1, results in an increase of the level of quality and thus no adverse impact on safety.</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>Adding requirements for the owner to define personnel qualification requirements is consistent with the philosophy that the Responsible Individual must qualify the inspection personnel. The code recognizes that the qualifications may differ depending on the containment type and even the inspection period in question. This change is consistent with the other changes discussed above and serves to improve the level of quality and thus has no adverse impact on safety.</p>	<p>Personnel should be qualified in accordance with Subsection IWA. 1998 Code is unacceptable. The licensee provided specific details on personnel qualification - 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 qualification requirements for direct and remote visual examinations – Acceptable.</p>
IWE-2400	INSPECTION SCHEDULE		
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	Deleted a subparagraph discussing decreasing and extending inspection periods. Added a subparagraph detailing requirements for the scheduling of added welds or components.	The deleted subparagraph eliminates duplication with IWA-2400. The added requirements for the scheduling have added welds or components to ensure that a representative sampling of examinations is maintained.	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	Removed repaired areas as areas requiring re-examinations during the next successive inspection period, and	Repaired areas that are likely to experience accelerated degradation and aging are already subject to augmented examinations per IWE-1241. Some repairs may be located in non-augmented areas and may be necessary to correct physical damage caused by construction or craft activities.	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.
	changed paragraph (c) to require that areas which remain essentially unchanged for the next inspection period no longer require augmented examinations. The 1992 Edition required three consecutive examinations to reach this conclusion.	The evaluation that determines that flaws or areas of degradation remain unchanged is sufficient to conclude that there is no active corrosion mechanisms present.	
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.
IWE-2500	Reworded the existing subparagraphs consistent with the previous paragraph changes and with Table IWE-2500-1 changes.	The reworded subparagraphs add clarity and provide consistency within IWE.	Acceptable
	Deleted the requirement to examine paint or coatings prior to removal.	The codes jurisdiction is the pressure boundary, and not the non-pressure retaining coatings. Eliminating this requirement does not adversely impact the level of quality or the safety of the containment inspection program.	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 addressed base metal examinations – 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
	Replaced the requirement for one foot square grids in thickness measurements with a reference to Table IWE-2500-2.	The new Table IWE-2500-2 provides more detailed requirements for thickness measurement gridding and is discussed below.	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.
	Added a reference to IWE-5000 for pressure tests.	The added reference to IWE-5000 provides direction for the performance of pressure test.	Acceptable
IWE-2600	Deleted a sentence discussing compatibility of paint and coating systems and a requirement to examine the new paint.	The jurisdiction of the code does not include the quality and compatibility of containment coating systems. This change has no impact on the scope of IWE inspections.	Elimination of this sentence considered acceptable when covered by existing nuclear coatings program.
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		
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 scheme, 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.

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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-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.	The Regulations do not require the licensees to submit their containment inspection programs -- Acceptable
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	
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

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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-3410	Replaced the reference to Table IWE-3410-1 with a reference to Subarticle IWE-3500.	Non significant	Acceptable
IWE-3430	No Change	n/a	
IWE-3500	ACCEPTANCE STANDARDS	n/a	
IWE-3510	Reconciled acceptance standards with the IWE-2300 changes discussed above and the Table IWE-2500-1 changes discussed below by: Adding the requirement in IWE-3510.1 that <i>The owner shall define acceptance criteria for visual examination of containment surfaces;</i>	Previously examination requirements were contained in the acceptance standards of IWE-3500. This section has been restructured by the addition of IWE-2300 as discussed above. This change directly corresponds to the addition of IWE-2310(a) discussed above.	Owner defined visual examination requirements do not provide uniformity and consistency industry wide. 1998 Code is unacceptable without specifics provided by licensee. Specifics have been provided by the licensee. – Acceptable.
	Removing the wording for responsible individual and for personnel qualifications;	This change directly corresponds to the addition of IWE-2320 discussed above.	Acceptable
	Incorporating IWE-3511;3513,3514 and 3515 with changes into IWE-3510.	These changes correspond to the changes in the examination categories of Table IWE-2500-1 as discussed below and to the removal of examination requirements from the acceptance standards paragraphs per the addition of IWE-2310(e)(3) and (4) as discussed above.	Acceptable
	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.	The resulting acceptance standards for bolting provide for more practical containment ISI program implementation without adversely affecting containment leak tight or structural integrity.	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	Deleted subparagraph which addressed examination category E-B.	Examination category E-B has been incorporated into examination category E-A per the changes to Table IWE-2500-1 discussed below.	Owner defined acceptance criteria do not provide consistency through out the industry. Therefore, the 1998 Code is unacceptable. PSE&G has provided those specifics. – Acceptable
IWE-3512	Renumbered subparagraph to IWE-3511. Reconciled acceptance standards with the IWE-2300 changes discussed above and the Table IWE-2500-1 changes discussed below.	The subparagraph was renumbered based on the deletion of previous IWE-3511 as discussed above. Previously examination requirements were contained in the acceptance standards of IWE-3500. This section has been restructured by the addition of IWE-2300 as discussed above.	Based on Regulatory requirements excluding containment welds, the elimination of any direct references to containment weld examinations in the Code – Acceptable
	Added the requirement that the owner shall define acceptance criteria for visual examination of containment surfaces.	This change directly corresponds to the addition of IWE-2310(a) discussed above.	
	Combined 3512.2 and 3512.3 with changes into 3511.2 and removed specific VT-1 examination attribute wording; and	These changes directly correspond to the addition of IWE-2310(e)(1) and (2) discussed above and eliminate potential duplication or contradiction of requirements.	
	Reworded ultrasonic examination subparagraph.	This change is for clarity and is non-significant.	
IWE-3513	Deleted subparagraph IWE-3513, which addressed examination category E-D.	Examination category E-D has been incorporated into examination category E-A per the changes to Table IWE-2500-1 discussed below.	
IWE-3514	Deleted subparagraph IWE-3514 which addressed examination category E-F.	Examination category E-F has been incorporated into examination category E-A per the changes to Table IWE-2500-1 discussed 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-3515	Deleted subparagraph IWE-3515 which addressed examination category E-G.	Examination category E-G has been incorporated into examination category E-A per the changes to Table IWE-2500-1 discussed below.	
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-5222	ASME XI generic change from repair and or replacement to repair/replacement activities. Changed repair to weld. Added (DN25).	Non significant DN25 is a standard measurement identification.	Acceptable
IWE-5240	Replaced a reference to IWA 5240 with requirements to perform detailed visual examination of repair/replacement areas during pressure tests.	The types of examinations performed in the containment program are all contained in IWE 2300. The requirements of IWA 5240 to detect evidence of leakage will be satisfied through the use of the detailed visual examination of IWE 2300.	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. IWE-4000 now IWA-4000.	Non significant	Acceptable
IWE-7100	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
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
	Added note: first period completion percentage for any exam category exceeds 34%, at least 16% of required exams shall be performed in the second period.	Ensures allocation of exams are done throughout the 10 year interval.	
Table IWE-2500-1 Examination Category E-A	Revised all EXAMINATION CATEGORIES E-A. Item E1.11: Revised frequency of examination from “prior to each type A test” to “100%” during each period”.	Removing the requirement to coordinate examinations with type A tests, and requiring a general visual every inspection period is more restrictive. This change corresponds with the rule as stated in 10CFR50.55a.	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

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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 Examination Category E-A (con't)	Item E1.12: Redesignated item from “ <i>accessible surface areas</i> ” to “ <i>wetted surfaces of submerged areas</i> ”. Replaced examination method VT-3 with general visual.	Replacing the accessible surface area designation (which is included in E1.11) with wetted surface areas (which were previously included in E1.12 footnote 4) does not eliminate or reduce any required examination areas. The conditions of distress which would be detected by a VT-3 exam are the same conditions that will be detected by a general visual exam, as defined in IWE 2300. The requirement to perform a detailed exam on any suspect area has not changed. The new requirement to perform general visual exams every inspection period increases the total number of potential examinations on the containment surface in the interval. The overall impact of this change is to increase the level of quality and does not adversely affect the safety of the containment inspection program.	Acceptable with licensee provided general visual examination requirements and acceptance criteria.
	Item E1.20: Added BWR to item description. Replaced examination method VT-3 with general visual.	See the above for a description of the equivalency of the general visual to the VT-3, and the increased frequency of exams. This change has no impact on the level of quality or the safety of the containment inspection program.	The change to general visual removes the emphasis on containment welds. Should be acceptable when visual criteria provided.
	Item E1.30: Added item for moisture barriers with a general VT required each period.	This item is not applicable to Callaway Plant's containment because we have no moisture barriers.	Acceptable
	All items no.'s - Replaced reference to IWE-3510 for examination requirements with IWE-2310.	Non significant - Previously some examination requirements were contained in IWE-3500. They now exist in IWE-2300.	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
Table IWE-2500-1 Examination Category E-A (con't)	Notes – Revised to specifically include welds and bolting as part of the pressure retaining boundary requiring examination.	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. This change will not alter the level of quality or adversely affect the safety of the containment inspection program.	Acceptable with licensee provided general visual examination requirements and acceptance criteria.
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 addressed above.	10 CFR 50.55a makes containment weld inspections optional – Acceptable
Table IWE-2500-1 Examination Category E-C	Item E4.11: Replaced examination method VT-1 with detailed visual.	The conditions of distress or deterioration which would be detected by a VT-1 are the same conditions that will be detected by a detailed visual exam, as defined in IWE 2300.	Acceptable with licensee provided general visual examination requirements and acceptance criteria.
	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
	All item no.'s - Added examination requirement paragraph number references. Updated acceptance standard references.	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.	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
Table IWE-2500-1 Examination Category E-C (con't)	Notes - Changed note 2 from requiring augmented examination until an area remains unchanged for three consecutive inspection periods to the next inspection period. Deleted note 3 which discussed inspection deferrals.	Three inspection periods cover a ten year interval. Performing augmented examinations for at least two periods while continuing general visual examinations each period provides for more efficient program implementation without adversely affecting component integrity. Deletion of note 3 is non-significant.	Change from three consecutive periods to one period consistent with the requirements for Class 2 components – Acceptable
	Extent and Frequency of Examination 2500: (c) is changed to (b).	Non-significant.	
Table IWE-2500-1 CAT. E-D	Deleted examination category which addressed seals, gaskets and moisture barriers.	Moisture barriers have been included in examination category E-A as addressed above. Seals and gaskets previously required examination once per an interval with the acceptance criteria of leak tightness. Leak tight integrity is verified during each 10CFR50 App. J leak test. Removing these inspection items has been approved by the staff in relief requests submitted by Davis-Besse and others.	Appendix J, Type A test considered sufficient for determining the leak-tight integrity. - Acceptable
Table IWE-2500-1 CAT. E-F	Deleted examination category which addressed dissimilar metal welds.	Dissimilar metal welds are now included in examination category E-A as addressed above.	10 CFR 50.55a makes containment weld inspections optional – Acceptable
Table IWE-2500-1 CAT. E-G	Deleted examination category which addressed pressure retaining bolting.	Pressure retaining bolting is now included in Examination Category E-A as addressed above.	1992 required VT-1 visual of bolting when a connection was disassembled. The 1998 Edition requires general visual, in place, with no requirement when the joint is disassembled. Licensee has agreed to conditions as stated in the NRC position.
Table IWE-2500-1 CAT. 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

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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-2500-2	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
IWL COMPARISON TABLE

APPENDIX B -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – IWL COMPARISON TABLE

Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
IWL-1100	ASME Section XI generic wording change from repair, replacement and or modification terms to repair/replacement activities.	Non significant	None
IWL-1200	No Change	n/a	
IWL-1210	No Change	n/a	
IWL-1220	No Change	n/a	
IWL-2100	Changed "Inspection" to "General" in heading.	Non significant	
	(a) Provided reference to IWA-2000 with exceptions from IWA-2210 and -2300 for visual examinations and for qualification of visual examination personnel.	The containment examinations are completely defined within the jurisdiction of IWL, and thus references to IWA 2210, and IWA 2300 are not applicable.	IWL examinations will not require the visual examinations identified in IWA-2100. Personnel will not have to be certified to CP-189 (IWA-2300). Licensee has written practice meeting the requirements of SNT-TC-1A -- Acceptable
	(b) Provided requirements for Authorized Nuclear Inservice Inspectors.	Not addressed by licensee	Inspector responsibilities addressed in IWA - Acceptable
IWL-2200	Delete reference to IWL 2500.	The reference to IWL 2500 in the 1992 Edition was incorrect, and this non-significant change is associated with a subsequent inquiry.	Acceptable
IWL-2210	No Change	n/a	
IWL-2220	No Change	n/a	
IWL-2230	ASME Section XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Acceptable

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Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
IWL-2300	No change; content changes in IWL-2310.	The philosophy of IWL to be an engineering inspection under the direction of the Responsible Engineer is contained in this revised sub-article. This individual will be accountable for the entire inspection program which will meet or exceed the level of quality and safety defined in the 1992 Edition. The specific changes to IWL-2310 and IWL-2320 will be discussed below.	
IWL-2310	(a) Replaced VT-1C and VT-3C visual examination terminology with new VT general and VT detailed examination terms.	<p>The VT-3C and VT-1C inspections of IWA have been replaced by Owner (Responsible Engineer) defined general and detailed visual exams, respectively. The definition of critical examination items and acceptable conditions has not changed, such that any conditions adversely affecting quality or safety are not impacted by this change.</p> <p>The general and detailed visual examinations are equivalent to the VT-3C and VT-1C exams in terms of assessing the general condition and potential for deterioration within the containment system. The use of owner defined inspection types allows for the involvement of qualified engineering personnel with backgrounds in programs such as the Maintenance Rule, R.G. 1.435, and Appendix J. This provides for a containment inspection program that is performed by individuals with knowledge in containment degradation mechanisms.</p>	Open-ended, owner defined visual examination requirements do not provide uniformity and consistency industry wide. 1998 Code is unacceptable and proposed alternative cannot be found acceptable without specific details from the licensee. The 1998 Code is unacceptable. Acceptable as supplemented by the licensee.
	(b) Replaced reference to IWA-2210 for illumination levels, examination distances and resolution requirements with specific examination attributes.	IWL-2310(c) defines the visual acuity requirements which will be accessed by the Responsible Engineer in the inspection plan. This is consistent with the rules in 10 CFR50.55a.	Specific illumination and resolution details from the licensee's program should be provided. The 1998 Code is unacceptable, Acceptable as supplemented by the licensee.

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Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
IWL-2310 (con't)	(c) Replaced reference to IWA-2300 for concrete examination personnel qualification requirements with provisions for the owner to define the examination personnel qualification requirements.	The Responsible Engineer has accountability for personnel qualification, and all the requirements are contained within IWL.	Consistency with existing ISI visual examination requirements could provide for an efficient internal program. However, open-ended, owner-defined visual examination requirements do not provide uniformity and consistency industry-wide. The 1998 Code is unacceptable. Acceptable as supplemented by the licensee.
IWL-2320	Changed wording slightly.	Non significant - clarifies wording.	Acceptable
	Made the ASME Section XI generic change from repair and or replacement to repair/replacement activities.	Non significant	Acceptable
	Added a responsibility for the Responsible Engineer to review certain pressure test procedures.	The added pressure test responsibilities for the Responsible Engineer ensures proper performance of pressure testing activities.	Acceptable
IWL-2400	No Change	n/a	
IWL-2410	Added to (c) condition which allows for deferral of concrete visual exams to the next scheduled plant outage for inaccessible portions of concrete surface.	This change insures that all surfaces that can be inspected are examined, but recognizes the personnel safety of the inspectors.	Acceptable, licensee agrees that credit for both intervals will not be taken.
IWL-2420	No Change	n/a	
IWL-2421	Changed wording for sites with more than one plant. Changed frequencies by adding "and every 10 years thereafter".	Non significant - clarifies wording and accommodates plant life extensions.	Acceptable
IWL-2500	No Change	n/a	Acceptable
IWL-2510	Changed heading.	Non significant.	

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Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
IWL-2510 (con't)	Eliminated the reference to VT-3C and VT-1C and refers to the general and detailed visual exams of IWL-2310.	The conclusion that this change to owner defined inspection types has no adverse impact on the level of quality or safety is reached in the IWL-2310 discussion.	
	Adds the requirement to (b) that the Responsible Engineer will designate areas as suspect and requiring additional examinations.	Increases the level of quality and safety of the examinations.	
	Adds the requirement (c) for a visual examination of all tendon anchorage areas and tendon end caps shall be examined for specific conditions.	This change is applicable to plants with post-tensioning systems. The change increases the level of quality of the exams associated with the tendon anchorage and end caps. This requirement is consistent with the rule in 10CFR50.55a.	
IWL-2520	No Change	n/a	
IWL-2521	No Change	n/a	
IWL-2522	Changed the heading and added a subparagraph to address tendon elongation.	The added details ensure proper tendon examinations.	Acceptable
IWL-2523	No Change	n/a	
IWL-2524	Eliminated the VT-1 exam and replaced it with the detailed visual exam described in IWL-2310 above.	This change is consistent with the changes described in IWL-2310 above, and the change in IWE 2310 which eliminated the VT-1 exam and replaced with a detailed visual exam.	Acceptable with licensee provided general visual examination requirements and acceptance criteria.
IWL-2525	Changed wording for sample analysis.	Non significant.	Acceptable
IWL-2526	Added a subparagraph addressing replacement of corrosion protection medium.	The new paragraph provides the Responsible Engineer some options from which to specify corrosion medium replacement.	Acceptable
IWL-3100	No Change	n/a	

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Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
IWL-3110	No Change	n/a	
IWL-3111	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable
IWL-3112	No Change	n/a	
IWL-3113	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable
IWL-3120	No change.	n/a	
IWL-3200	No change.	n/a	
IWL-3210	Removed the word concrete from the heading.	Non-significant.	
IWL-3211	Added tendon end and anchorage areas to the scope of the subparagraph and added corrosion protection medium leakage and end cap deformation as acceptance criteria attributes.	The acceptance criteria has expanded to recognize that the surface area being examined per IWL-2510 includes the concrete surrounding the tendon end anchorage, and the tendon end caps. This increases the overall quality of the exam, and is consistent with the rule in 10CFR50.55a.	Added clarification - Acceptable
	ASME Section XI generic change from repair and/or replacement to repair/replacement activities.	Non-significant.	
IWL-3212	No change.	Not Applicable.	
IWL-3213	ASME Section XI generic change from repair and/or replacement to repair/replacement activities.	Non-significant.	

APPENDIX B -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – IWL COMPARISON TABLE

Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
IWL-3220	No Change	n/a	
IWL-3221	Added acceptance criteria attributes for unbonded post-tensioning systems in the following areas: 3221.1(c) evaluates the predicted force for the next scheduled exam meets the minimum design prestress force. 3221.1(d) compares the elongation with the last measurement and specifies that it can not vary by more than 10%. 3221.3(e) added evidence of free water as an unacceptable condition. 3221.4 added criteria to compare the difference of the amount of corrosion protection medium removed with that replaced.	The additions to the acceptance criteria of IWL-3221 have provided further assurance that the Responsible Engineer will evaluate all potential conditions that could impact the post-tensioning system integrity. The changes are applicable to plants with a post-tensioning system. These enhancements to the 1998 Edition increase the level of quality of the inspection program and has no adverse impact on the safety of the inspection program described in the 1992 Edition. These additions are consistent with the requirements of the rule as stated in 10CFR 50.55a.	Acceptable
IWL-3222	No Change	n/a	
IWL-3223	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	
IWL-3300	No Change	n/a	
IWL-3310	Added applicability for other plants at the same site.	Non significant.	Acceptable
	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable

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Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
IWL-3320	Deleted paragraph which addressed engineering evaluations being subject to review by authorities.	Non significant - there were no submittal or retention requirements changed by the deletion of the subparagraph.	Acceptable. The Regulations do not require the licensees to submit their containment inspection programs.
IWL-4000	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant - all related repair and replacement requirements have been consolidated into IWL-4000.	Acceptable
IWL-4100	No Change	n/a	
IWL-4110	Exempted grease cups and installation screws from the scope.	Non significant - the exempted items are non structural items.	Acceptable
	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable
IWL-4200	ASME Section XI generic change from repair and/or replacement to replace/replacement activities.	Non significant.	Acceptable
-----	Added a new paragraph -4210 to require Repair/Replacement Plans to be developed under the direction of a Responsible Engineer.	Non significant - this is a paragraph numbering change from the 1992 Edition.	Acceptable
IWL-4210	Changed paragraph number to 4220, removed the word repair from heading and changed referenced paragraph numbers consistent with the addition of a new paragraph 4210 above.	Non significant	Acceptable
	Changed wording consistent with the changes to IWL-2310 addressed above.	Non significant	Acceptable
	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant	Acceptable

APPENDIX B -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – IWL COMPARISON TABLE

Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
	Changed repair material to new material in several places.	Non significant	Acceptable
IWL-4220	Changed paragraph number to 4230.	Non significant	Acceptable
IWL-4230	Changed paragraph number to 4240 and clarified by removing the word repair.	Non significant.	Acceptable
	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable
	Added detailed requirements for the contents of a repair/replacement plan.	The 1998 Edition is more prescriptive in terms of the details which are expected to be addressed in the repair/replacement plan developed by the Responsible Engineer.	Acceptable
IWL-4300	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable
IWL-5100	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable
IWL-5200	No Change	n/a	
IWL-5210	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable
IWL-5220	No Change	n/a	
IWL-5230	Changed wording by removing some specific IWE related requirements while maintaining the reference to IWE-5000.	Non significant - the removed wording was IWE specific and is contained in IWE-5000.	Acceptable

APPENDIX B -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – IWL COMPARISON TABLE

Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee's statement of significance and/or basis for use as an alternative examination	Disposition/Comments
IWL-5240	Deleted paragraph which addressed the scheduling of pressure tests.	Non significant - the schedule of pressure tests are contained in IWE-5000 as referenced in IWL-5230.	Acceptable
IWL-5250	Changed wording regarding the role of the Responsible Engineer in pressure test activities.	The clarified role of the Responsible Engineer ensures proper pressure test procedures and examinations.	Acceptable
	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant.	Acceptable
	Changed VT terminology consistent with the changes to IWL-2310 addressed above.	The VT terminology changes are discussed in IWL-2310 above.	Acceptable
IWL-5260	Changed heading from Corrective Measures to Correction Action.	Non significant	Acceptable
	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant	Acceptable
IWL-5300	ASME Section XI generic change from repair and or replacement to replace/replacement activities.	Non significant	Acceptable
IWL-7000	Deleted Article including IWL-7000, -7110, -7120 consistent with the IWL-4000 changes above.	Non significant - all related repair and replacement requirements have been incorporated into IWL-4000.	Acceptable
Table IWL-2500-1	Changed Item L1.11 from all areas to all accessible areas.	The addition of accessible provides consistency with the requirements of the scope of IWL-1000, and does not alter the level of quality of the inspection plan described in the 1992 Edition.	Acceptable

APPENDIX B -- SALEM UNITS 1 AND 2 and HOPE CREEK UNIT 1 – IWL COMPARISON TABLE

Paragraph	Changes between IWL 1992 Edition/ 1992 Addenda and the 1998 Edition	Licensee’s statement of significance and/or basis for use as an alternative examination	Disposition/Comments
	Replaced the VT-3C, VT-1C, and the VT-1 exams with general visual and detailed visual, respectively, as described in the paragraph IWL-2310 changes above.	The acceptability of the change to a owners defined general and detailed visual inspection is discussed in the IWL-2310 section.	Acceptable with licensee provided general visual examination requirements and acceptance criteria.
Table IWL-2521-1	Changed inspection periods to state every 5 th year in lieu of listing out each year and changed note 2 for having to meet acceptance criteria from “each of the earlier inspections” to “for the last 3 inspections”.	Non significant - accommodates plant life extensions for tendon examinations.	Acceptable
Table IWL-2525-1	Added optional test methods for corrosion protection medium analysis.	Non significant - additional test method options provides for more practical test implementation.	Acceptable

Appendix C
PSE&G Supplements to 1998 Code

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PSE&G Supplemental Information to the 1998 Code Edition

Initial 1998 Code Proposed Alternative	Supplemented Proposed Alternative	Recommendations/Comments
IWE-2310 - "Visual Examinations"- a) the owner shall define requirements for visual examination of containment surfaces.	<ul style="list-style-type: none"> • General Visual criteria developed from VT-3 procedures that are used to examine ASME Class 1, 2, and 3 components. • Pressure retaining bolting recording criteria developed from the VT-1 procedure used for Class 1 bolting. • Moisture barriers examined for tears, cracks or damage that permits moisture to intrude. • Detailed Visual exam criteria developed from VT-1 and VT-3 procedures 	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.	The Containment Visual Examination Program is developed from the guidelines of SNT-TC-1A and ANSI N45.2.6. Certified personnel will have "demonstrated skill, demonstrated knowledge, documented training, and documented experience required to properly perform the duties of a specific job."	Authorize per 10 CFR 50.55a(a)(3)(i).
IWE-2500 - Deleted the requirement to examine paint or coatings prior to removal.	None.	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.	See IWE-2310 above.	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.	See criteria defined in IWE-2310 above.	Authorize per 10 CFR 50.55a(a)(3)(i).

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Initial 1998 Code Proposed Alternative	Supplemented Proposed Alternative	Recommendations/Comments
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).
IWL-2310 - Replaced VT-1C and VT-3C visual examinations with General Visual and Detailed Visual Examinations and removed reference to visual examination procedure qualification.	General Visual exams performed in sufficient detail to identify areas of concrete deterioration and distress defined in ACI 201.1.	Authorize per 10 CFR 50.55a(a)(3)(i).