

**Technical Evaluation Report on the  
Second 10-year Interval Inservice Inspection Program Plan:  
Public Service Electric and Gas Company,  
Salem Generating Station, Unit 2,  
Docket Number 50-311**

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## SUMMARY

The licensee, Public Service Electric and Gas Company, has prepared the *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan*, through Revision 1A, to meet the requirements of the 1986 Edition of the American Society of Mechanical Engineers (ASME) Code, Section XI, except that the extent of examination of Class 1 piping welds has been determined by the 1974 Edition with Addenda through Summer 1975 as permitted by 10 CFR 50.55a(b). The second 10-year interval began May 10, 1992 and ends May 10, 2002.

The information in the *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan*, Revision 0, submitted May 4, 1992, was reviewed. Included in the review were the requests for relief from the ASME Code Section XI requirements that the licensee has determined to be impractical. As a result of the review of Revision 0, a request for additional information (RAI) was prepared describing the information and/or clarification required from the licensee in order to complete the review. The licensee provided the requested information in the submittal dated December 28, 1994. In addition, by letter dated December 28, 1994, the licensee submitted Revision 1 to the ISI program plan, in part due to the request for additional information (RAI). As a result of the review of the response to the RAI, a conference call between the licensee and the NRC was held to request clarification on the RAI information submittal. Based on this call, the licensee provided additional clarification, including Revision 1A to the program plan.

Based on the review of the *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan*, through Revision 1A, the licensee's response to the Nuclear Regulatory Commission's RAI, and the recommendations for granting relief from the ISI examinations that cannot be performed to the extent required by Section XI of the ASME Code, no deviations from regulatory requirements or commitments were identified in the *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan*, Revision 1A, with the exception of Relief Request RR-B1 (Part 1).

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TECHNICAL EVALUATION REPORT ON THE  
SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN  
PUBLIC SERVICE ELECTRIC AND GAS COMPANY  
SALEM GENERATING STATION, UNIT 2  
DOCKET NUMBER 50-311

1. INTRODUCTION

Throughout the service life of a water-cooled nuclear power facility, 10 CFR 50.55a(g)(4) (Reference 1) requires that components (including supports) that are classified as American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Class 1, Class 2, and Class 3 meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code Section XI, *Rules for Inservice Inspection of Nuclear Power Plant Components* (Reference 2), to the extent practical within the limitations of design, geometry, and materials of construction of the components. This section of the regulations also requires that inservice examinations of components and system pressure tests conducted during successive 120-month inspection intervals comply with the requirements in the latest edition and addenda of the Code incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month inspection interval, subject to the limitations and modifications listed therein. The components (including supports) may meet requirements set forth in subsequent editions and addenda of this Code that are incorporated by reference in 10 CFR 50.55a(b), subject to the limitations and modifications listed therein, and subject to Nuclear Regulatory Commission (NRC) approval. The licensee, Public Service Electric and Gas Company, has prepared the *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan*, through Revision 1A (References 3, 4, and 5), to meet the requirements of the 1986 Edition, except that the extent of examination of Class 1 piping welds has been determined by the 1974 Edition with Addenda through Summer 1975 as permitted by 10 CFR 50.55a(b). The second 10-year interval began May 10, 1992 and ends May 10, 2002.

As required by 10 CFR 50.55a(g)(5), if the licensee determines that certain Code examination requirements are impractical and requests relief from them,

The *Salem Generating Station, Unit 2, Second 10-Year Interval ISI Program Plan* through Revision 1A, is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during the NRC's previous reviews.

The requests for relief are evaluated in Section 3 of this report. Unless otherwise stated, references to the Code refer to the ASME Code, Section XI, 1986 Edition. Specific inservice test (IST) programs for pumps and valves are being evaluated in other reports.

### 2.2.2 Acceptability of the Examination Sample

Inservice volumetric, surface, and visual examinations shall be performed on ASME Code Class 1, 2, and 3 components and their supports using sampling schedules described in Section XI of the ASME Code and 10 CFR 50.55a(b). For Class 1 piping welds, the licensee is not able to comply strictly with the selection criteria of the 1986 Edition of Section XI, because Salem Unit 2 was designed to ANSI B31.1, and stress intensity range and usage factors are not available. Therefore, as allowed by 10 CFR 50.55a(b)(2)(ii), the extent of examinations for Class 1 piping welds was determined by the requirements of Tables IWB-2500 and IWB-2600, Category B-J, of the 1974 Edition through and including the Summer 1975 Addenda. The licensee has scheduled Class 1 piping examinations based on the previous interval selection criteria performed in accordance with the 1974 Edition through and including the Summer 1975 Addenda. The previous interval selection of Class 1 piping welds included high stress areas. Therefore, it is concluded that the sample size and weld selection have been implemented in accordance with the Code and 10 CFR 50.55a(b) and appear to be correct.

### 2.2.3 Exemption Criteria

The criteria used to exempt components from examination shall be consistent with Paragraphs IWB-1220, IWC-1220, IWC-1230, IWD-1220, and 10 CFR 50.55a(b). The exemption criteria have been applied by the licensee in accordance with the Code, as discussed in the ISI Program Plan, and appear to be correct.

### 2.2.4 Augmented Examination Commitments

In addition to the requirements specified in Section XI of the ASME Code, the licensee has committed to perform the following augmented examinations:

- (a) Reactor pressure vessel examinations will be performed in accordance with Regulatory Guide 1.150, Revision 1 (Reference 9).

### 3. EVALUATION OF RELIEF REQUESTS

The requests for relief from the ASME Code requirements that the licensee has determined to be impractical for the second 10-year inspection interval are evaluated in the following sections.

#### 3.1 Class 1 Components

##### 3.1.1 Reactor Pressure Vessel

###### 3.1.1.1 Request for Relief RR-B1 (Part 1), Examination Category B-A, Items B1.11 and B1.12, Reactor Pressure Vessel Shell Welds

In the response to the RAI, the licensee stated that the augmented reactor pressure vessel weld examinations required by 10 CFR 50.55a(g)(6)(ii)(A) were performed in the spring of 1992, during the final outage of the Salem, Unit 2, first 10-year inspection interval. However, based on a review of Relief Request RR-B1, it appears that the percentage of weld coverage obtained for several welds does not comply with the Code-required essentially 100% coverage. The licensee further stated that they intend to comply with the augmented reactor pressure vessel examination by examining essentially 100% of all of the required reactor pressure vessel welds scheduled for the year 2000.

The INEL staff has concluded that review of the subject request for relief for reactor pressure vessel shell welds, Items B1.11 and B1.12, should not be included with this Technical Evaluation Report. Therefore, it is recommended that Request for Relief RR-B1 (Part 1) be denied.

<u>Component ID &amp; Description</u>	<u>Code Coverage Obtained</u>	<u>Examination Limitation</u>
2-RPVCH-14-46F Meridional Weld	54%	CRD Penetrations and Shroud Support Ring and Lifting Lug Interference
2-RPVCH-64-46B Dollar Plate Weld	35%	CRD Penetration Interference

Licensee's Basis for Requesting Relief (as stated):

"During the inservice examinations performed at SALEM NUCLEAR GENERATING STATION UNIT 2 it has been the position of PUBLIC SERVICE ELECTRIC AND GAS COMPANY that examinations which could not be performed completely, (i.e., performed from both sides of the weld or because of component configuration or restrictions from permanent structures) would be performed to the greatest extent possible and whatever limitation that existed be documented.

"It has also been PUBLIC SERVICE ELECTRIC AND GAS COMPANY's position that when there was a "removable" structure, (i.e., hanger, support) these items were removed, when practical, providing greater access to the component being examined.

"It is PUBLIC SERVICE ELECTRIC AND GAS COMPANY's practice to utilize approved technical procedures written in accordance with the applicable Section/Paragraph of the ASME Code in regard to the area/volume to be examined and the specified requirements of the examination. Recognizing that because of component design, construction, etc. there are cases when examinations can only be performed 'to the greatest extent possible'. In those cases, plant procedures require the documentation of the location of and cause of the limitation. For the Class 1 Examination Limitation Listing, see Appendix "C" of this manual."

Licensee's Proposed Alternative Examination (as stated):

"Alternate examinations were considered for each exam area, where a limitation exists. It has been determined that alternate exams are not practical at this time, therefore no alternate examinations are proposed in Appendix "C".

"An inservice system leakage test, with associated VT-2 examinations, will be conducted on the Class 1 pressure boundaries, which will provide an acceptable level of assurance of system integrity and Plant Safety."

Licensee's Code Relief Request: The licensee requested relief from the Code-required 100% volumetric examination coverage of the reactor pressure vessel shell-to-flange Weld 2-RPV-7442.

Licensee's Basis for Requesting Relief: See Section 3.1.1.2 for the licensee's basis. Specifically, the licensee stated that the flange taper limits scanning, reducing coverage to 60%.

Licensee's Proposed Alternative Examination: See Section 3.1.1.2 for the licensee's alternative.

Evaluation: The Code requires that the subject reactor pressure vessel shell-to-flange weld be 100% volumetrically examined during the inspection interval. The licensee has requested relief from the Code-required 100% examination area coverage because the flange taper limits scanning. Based on a review of the scanning interference and the breakdown of coverages obtained with multiple scanning angles, it has been determined that it is impractical to examine the weld to the extent required by the Code. It is noted that the reduced coverage is primarily the result of scans used to detect flaws transverse to the weld. Approximately 94% coverage is being obtained with scans directed at right angles to the weld. To obtain complete volumetric coverage, design modifications would be necessary to eliminate scanning limitations. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposes to perform the volumetric examinations to the extent practical. The licensee can obtain 60% combined coverage of the required examination volume. Based on the percent of coverage obtainable, it can be concluded that significant degradation, if present, will be detected. As a result, reasonable assurance of continued structural integrity will be provided.

Conclusions: Based on the above evaluation, it is concluded that obtaining the Code-required volumetric coverage is impractical

the complete volumetric examination, design modifications would be necessary to eliminate the scanning limitation, causing a considerable burden on the licensee.

The licensee proposes to perform the volumetric examinations to the extent practical. Based on the high percent of coverage obtainable with scans directed for detection of flaws parallel to the weld in conjunction with the scans directed to detect flaws transverse to the weld, it can be concluded that significant degradation, if present, will be detected. As a result, reasonable assurance of structural integrity will be provided.

Conclusions: Based on the above evaluation, it is concluded that obtaining complete Code-required volumetric coverage for the subject nozzle-to-shell welds is impractical for Salem, Unit 2. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.1.1.5 Request for Relief RR-B2, Examination Category B-D, Items B3.90 and B3.100, Reactor Pressure Vessel Nozzle-to-Shell Welds and Nozzle Inner Radius Sections

Code Requirement: Table IWB-2500-1, Examination Category B-D, Items B3.90 and B3.100 require 100% volumetric examination of the reactor pressure vessel nozzle-to-shell welds and the nozzle inner radius sections as defined by Figure IWB-2500-7. At least 25% but not more than 50% (credited) of the nozzles shall be examined by the end of the first inspection period, and the remainder by the end of the inspection interval.

Licensee's Code Relief Request: The licensee requested relief from examining at least 25% of the Examination Category B-D welds and inside radius sections in the reactor pressure vessel at Salem Generating Station, Unit 2, by the end of the first inspection period.

schedule for examination of Examination Category B-D, Items B3.90 and B3.100 welds in conjunction with the second 10-year interval RPV examinations should be authorized provided that when deferring nozzle inspections to the end of the interval, there will be no more than ten years between inspections, except where the length of a 10-year interval is adjusted in accordance with IWA-2430.

Conclusion: The licensee has established a current level of quality and safety for the reactor pressure vessel nozzles by examination of the subject areas during the last period of the previous interval. Based on these examinations, a new schedule for successive examinations can be established that maintains essentially ten years between examinations. Therefore, it is recommended that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(i), provided that when deferring nozzle inspections to the end of the interval, there will be no more than ten years between inspections, except where the length of a 10-year interval is adjusted in accordance with IWA-2430.

3.1.1.6 Request for Relief RR-B4, Examination Category B-G-1, Item B6.10, Reactor Vessel Closure Head Nuts

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-G-1, Item B6.10 requires a 100% surface examination of all reactor vessel closure head nuts.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required surface examination of the reactor vessel closure head nuts as specified in Table IWB-2500-1.

Licensee's Basis for Requesting Relief (as stated):

"In ASME Section XI, 1986 Edition, the examination requirements and the acceptance standard are in the course of preparation. To provide further guidance, the 1989 addenda of ASME Section XI, 1989 Edition has changed the examination method to Visual, VT-1."

Licensee's Basis for Requesting Relief: See Section 3.1.1.2 for the licensee's basis. Specifically, the licensee stated that the nozzle-to-safe end configuration limits scanning, reducing coverages to 74% and 84%, respectively.

Licensee's Proposed Alternative Examination: See Section 3.1.1.2 for the licensee's alternative.

Evaluation: The Code requires that the subject pressurizer nozzle-to-safe end welds receive 100% volumetric and surface examinations. However, due to the nozzle-to-safe end configuration, complete volumetric examination is impractical. To obtain complete volumetric coverage, design modifications or replacement of the nozzle-to-safe end design with one providing for complete examination would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposes to perform the volumetric examinations to the extent practical, resulting in estimated coverages of 74% and 84%, respectively. Based on the significant percent of coverage obtainable, in combination with the Code-required surface examination, it can be concluded that significant degradation, if present, will be detected. As a result, reasonable assurance of structural integrity will be provided.

Conclusion: Based on the above evaluation, it is concluded that performing the Code-required volumetric examination of the subject safe end welds is impractical for Salem, Unit 2. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

impractical. To obtain complete volumetric coverage, design modifications of the permanent insulation supports would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposes to perform the examinations to the extent practical, resulting in estimated coverages ranging from 73% to 86%. Based on the significant percent that can be examined, it can be concluded that degradation, if present, will be detected. As a result, reasonable assurance of structural integrity is provided.

Conclusion: Based on the above evaluation, it is concluded that performing the Code-required volumetric examination for the subject inner radius sections to the extent required by Code, is impractical for Salem, Unit 2. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

#### 3.1.4 Piping Pressure Boundary

##### 3.1.4.1 Relief Request RR-B1 (Part 7), Examination Category B-F, Item B5.130, Class 1 Piping Dissimilar Metal Welds

Code Requirement: Table IWB-2500-1, Examination Category B-F, Item B3.130 requires 100% volumetric and surface examinations of Class 1 dissimilar metal welds as defined in Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from the Code-required 100% volumetric examination of the following Class 1 piping dissimilar metal welds due to nozzle configuration and acoustic properties:

<u>Component ID &amp; Description</u>	<u>Coverage Obtained</u>
31-RC-1240-1, Nozzle-to-Elbow	50%
31-RC-1230-1, Nozzle-to-Elbow	50%
31-RC-1220-1, Nozzle-to-Elbow	50%

detected. As a result, reasonable assurance of structural integrity will be provided.

Conclusion: Based on the above evaluation, it is concluded that performing the Code-required volumetric examination for the subject nozzle-to-safe end welds is impractical for Salem, Unit 2. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.1.4.2 Relief Request RR-B1 (Part 8), Examination Category B-J, Items B9.11 and B9.12, Class 1 Piping Welds

Code Requirement: Table IWB-2500-1, Examination Category B-J, Items B9.11 and 9.12 require 100% volumetric and surface examination of Class 1 piping that is nominal pipe size 4 inches or larger as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from the Code-required 100% volumetric examination of the following Class 1 piping welds:

<u>Component ID &amp; Description</u>	<u>Code Coverage Obtained</u>	<u>Examination Limitation</u>
31-RC-1230-4LU-I, Longitudinal	0%	Acoustic properties of casting
31-RC-1230-4LU-O, Longitudinal	0%	Acoustic properties of casting
31-RC-1230-4, Elbow-to-Pipe	75%	Acoustic properties of casting and branch connection configuration
31-RC-1220-4LU-I, Longitudinal	0%	Acoustic properties of casting
31-RC-1220-4LU-O, Longitudinal	0%	Nozzle configuration & acoustic properties
31-RC-1220-4, Elbow-to-Pipe	84%	Branch connection configuration and acoustic properties
8-SJ-1245-1, Tee-to-Valve 24k.127	36%	Radius of tee and valve configuration

recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.1.4.3 Relief Request RR-B1 (Part 9), Examination Category B-J, Item B9.31, Class 1 Branch Connection Welds

Code Requirement: Table IWB-2500-1, Examination Category B-J, Item B9.31 requires 100% volumetric and surface examination of Class 1 branch connection welds as defined by Figures IWB-2500-9, -10, and -11, as applicable.

Licensee's Code Relief Request: Relief is requested from the Code-required 100% volumetric examination of branch connection Welds 27.5-RC-1230-1BC-5, 27.5-RC-1210-1BC-3, and 27.5-RC-1210-1BC-4.

Licensee's Basis for Requesting Relief: See Section 3.1.1.2 for the licensee's basis. Specifically, the licensee stated that in all cases examination coverage is limited due to the branch connection configuration and set-on weld configuration.

Licensee's Proposed Alternative Examination: See Section 3.1.1.2 for the licensee's alternative.

Evaluation: The Code requires that the subject branch connection welds receive 100% volumetric and surface examinations. The licensee stated that 52% to 55% of the required volumetric examination can be obtained. Based on the review of branch connection configuration sketches<sup>1</sup> (set-on weld design) and examination coverage plots, it has been determined that complete Code-required volumetric examination coverage is impractical. To perform the complete volumetric examination, design modifications or replacement of the branch connection with one of a configuration that provides for complete coverage would be

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<sup>1</sup>Sketches provided by the licensee are not included with this evaluation.

4-SJ-1282-23PL-1 thru 4  
22-PMP-LUGS 1, 2, 3

4-SJ-1272-23PL-1 thru 4  
21-PMP-LUGS 1, 2, 3

Licensee's Basis for Requesting Relief: See Section 3.1.1.2 for the licensee's basis. Specifically, the licensee stated that examination coverages are limited by lug locations on the component or because the integral attachments are within a penetration.

Licensee's Proposed Alternative Examination: See Section 3.1.1.2 for the licensee's alternative.

Evaluation: The Code requires that the subject integral attachment welds receive a 100% volumetric or surface examination, as applicable. The licensee stated that the Code-required examination of the subject piping integral attachment welds is impractical due to accessibility constraints. The limitations identified include the location of the integral attachment on the component and the integral attachment being within a penetration.

Based on a review of sketches<sup>1</sup> of these piping integral attachments, it has been determined that greater coverage is precluded because of accessibility. To perform the Code-required examination, design modifications to provide access for examination of the integral attachments would be required. Imposition of this requirement would cause a considerable burden on the licensee.

For integral attachments to pumps, the licensee can obtain 67% examination coverage. By review of sketches of these integral attachments, it has been determined that greater coverage is precluded because portions of the lugs are obstructed by the pump support structure. Based on the coverage that can be obtained, it can be concluded that significant degradation, if present,

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<sup>1</sup>Sketches provided by the licensee are not included with this evaluation.

Evaluation: The Code requires that the subject pump bolting receive a 100% volumetric examination. The licensee stated that because piping obstructs access to three bolts on Pump 23, three bolts on Pump 22, and four bolts on Pump 21, the Code-required examinations are impractical. Based on this information, it has been determined that design modifications to eliminate the pipe obstructions would be required to perform these examinations, resulting in a burden on the licensee.

The licensee proposes to perform the volumetric examinations on the accessible bolting, examining 21 of 24 bolts on Pumps 22 and 23, and 20 of 24 bolts on Pump 21. Based on the significant number of bolts being examined, including 100% of the bolting in Pump 24, it can be concluded that a pattern of degradation, if present, will be detected. As a result, reasonable assurance of structural integrity will be provided.

Conclusion: Because the subject pump studs are inaccessible, it has been determined that the Code-required examinations are impractical. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

#### 3.1.6 Valve Pressure Boundary (No relief requests)

#### 3.1.7 General

##### 3.1.7.1 Request for Relief RR-B3, Examination Categories B-L-2 and B-M-2, Items B12.20 and B12.50, Pump Casing and Valve Body Internal Surfaces

Code Requirement: Section XI, Table IWB-2500-1, Examination Categories B-L-2 and B-M-2, Items B12.20 and B12.50 require a VT-3 visual examination of the internal surfaces of at least one pump and valve in a group of pumps and valves performing similar functions each interval.

that the internal surface visual examination requirement is only applicable to pumps or valves that are disassembled for reasons such as maintenance, repair, or volumetric examination. Therefore, the concept of visual examination of the internal surfaces of the pumps and valves, if disassembled for maintenance, repair, or volumetric examination, is acceptable.

Conclusion: The use of later approved editions and addenda of Section XI is allowed by 10 CFR 50.55a(g)(4)(iv). Portions of editions or addenda may be used provided that all related requirements of the respective editions or addenda are met. Therefore, the requirements of Table IWB-2500-1, Examination Categories B-L-1 and B-M-2, Items B12.20 and B12.50, of the 1989 Edition of Section XI may be applied for the subject examinations. This allows the examination of pumps and valves only when disassembled for maintenance as stated in Note 2. Therefore, it is recommended that the 1989 Edition of Section XI, Table IWB-2500-1, Examination Categories B-L-1 and B-M-2, Items B12.20 and B12.50, be approved for use at Salem Unit 2, pursuant to 10 CFR 50.55a(g)(4)(iv).

### 3.2 Class 2 Components

#### 3.2.1 Pressure Vessels

##### 3.2.1.1 Request for Relief RR-C1 (Part 1), Examination Category C-A, Items C1.10 and C1.20, Class 2 Pressure Vessel Shell Welds

Code Requirement: Table IWC-2500-1, Examination Category C-A, Items C1.10 and C1.20 require 100% volumetric examination of essentially 100% of shell and head circumferential welds as defined by Figure IWC-2500-1. These examinations may be limited to one of multiple vessels or distributed among multiple vessels.

Licensee's Code Relief Request: The licensee requested relief from the Code-required volumetric examination of the following Class 2 vessel shell welds:

"An inservice system leakage test, with associated VT-2 examinations, will be conducted on the Class 2 pressure boundaries, which will provide an acceptable level of assurance of system integrity and Plant Safety."

Evaluation: The Code requires that the Class 2 pressure vessel circumferential welds selected be 100% volumetrically examined. Based on the review of data records and examination coverage plots,<sup>1</sup> it has been determined that complete volumetric examination of the subject welds is impractical because of the support leg plate interference, weld and flange configuration, and nozzle and support plate configuration. To perform complete volumetric examinations, design modifications or replacement of the components with those of a design providing for complete examination would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposes to perform the volumetric examinations to the extent practical, resulting in an estimated 20% to 79% coverage of the Code-required examination volume. Based on the percentages of examinations that can be performed, in conjunction with examinations performed on similar Code Items, it can be concluded that a pattern of degradation, if present, will be detected.

Conclusion: Because of the examination area interferences, it has been determined that for the subject Class 2 pressure vessel shell welds, Code-required examination coverages are impractical. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

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<sup>1</sup>Coverage plots and data record provided by the licensee are not included with this evaluation

The licensee proposes to perform the volumetric examination to the extent practical, resulting in an estimated 45% coverage of the Code-required examination volume. Based on this volumetric examination, in combination with the Code-required surface examination and other examinations performed for the same Code Items, it can be concluded that a pattern of degradation, if present, will be detected. As a result, reasonable assurance of structural integrity will be provided.

Conclusion: Because of the nozzle configuration and its as-welded condition, the Code-required examination of the residual heat removal heat exchanger nozzle-to-shell Weld 21-RHRHEX-OUT is impractical. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.2.1.3 Request for Relief RR-C1 (Part 3), Examination Category C-C, Items C3.10, C3.20, and C3.30, Integral Attachments to Vessels, Pumps, and Piping

Code Requirement: Table IWC-2500-1, Examination Category C-C, Items C3.10, C3.20, and C3.30 require 100% surface examination of integral attachment welds as defined by Figure IWC-2500-5. For vessels and pumps, the examinations may be conducted on one component or distributed among multiple components.

Licensee's Code Relief Request: The licensee requested relief from the Code-required surface examinations of integral attachment welds for the following examination areas.

<u>Component ID &amp; Description</u>	<u>Coverage Obtained</u>	<u>Examination Limitation</u>
2-CVCT-2VS-1 & 2, Chemical Volume and Control Tank	89%	Permanent I-beam vessel support leg plate
2-CVCT-2VS-3, 4, 5, 6, 7 & 8, Chemical Volume and Control Tank,	89%	Support leg interference

<u>Component ID &amp; Description</u>	<u>Coverage Obtained</u>	<u>Examination Limitation</u>
32-MS-2231-1PS-1, Pipe Support	0%	Support is within a sleeve
32-MS-2221-1PS-1, Pipe Support	0%	Support is within a sleeve
32-MS-2211-1PS-1, Pipe Support	0%	Support is within a sleeve
30-MS-2241-8PL-1 & 2, Pipe Lug	0%	Inaccessibility precludes examination
30-MS-2231-8PL-1 & 2, Pipe Lug	0%	Support is within a floor penetration
30-MS-2221-7PL-1 & 2, Pipe Lug	0%	Support is within a floor penetration
30-MS-2211-8PL-1 & 2, Pipe Lug	0%	Inaccessibility precludes examination
6-MS-2231, 2-MSAA-111,	0%	Examination area is within an encapsulation
6-MS-2231-21PS, Pipe Support	0%	Examination area is within an encapsulation
12-RH-2252-5PL-1 thru 6, Pipe Lug	33%	No examination of lug Nos. 2, 3, 4, and 5. Lugs are within a penetration
12-RH-2252-38PS-1 & 2, Pipe Support	71%	Proximity of a permanent support
12-RH-2252-38PS-3, Pipe Support	71%	Proximity of adjacent piping

Licensee's Basis for Requesting Relief: See Section 3.2.1.1 for the licensee's basis. Specifically, see the table above for examination coverage and limitation information.

Licensee's Proposed Alternative Examination: See Section 3.2.1.1 for the licensee's alternative.

Evaluation: The Code requires that the subject Class 2 integral attachment welds receive 100% surface examination. However, due to inaccessibility and/or interferences, complete surface examination of the subject welds is impractical. To perform the

<u>Component ID &amp; Description</u>	<u>Coverage Obtained</u>	<u>Examination Limitation</u>
14-BF-2211-2 Pipe-to-Elbow	84%	Surface and volumetric examination limited due to a permanent support column lug
12-PR-2201-1 Cap-to-Pipe	78%	Volumetric examination coverage limited due to pipe support and cap configuration
14-RH-2212-1 Valve 2RH2-to-Pipe	87%	Volumetric examination coverage limited due to valve configuration
14-SJ-2224-1 Valve 22SJ44-to-Elbow	75%	Volumetric examination coverage limited due to valve configuration
12-RH-2252-38 Pipe-to-Pipe	67%	Volumetric examination coverage limited due a welded plug and proximity of adjacent piping
4-CV-2257-1 Flange-to-Pipe	86%	Volumetric examination coverage limited due flange configuration
3-CV-2257-7 Valve 2CV82-to-Pipe	80%	Volumetric examination coverage limited due valve configuration

Licensee's Basis for Requesting Relief:

See Section 3.2.1.1 for the licensee's basis. Specifically, see the table above for examination and limitation information.

Licensee's Proposed Alternative Examination:

See Section 3.2.1.1 for the licensee's alternative.

Evaluation: The Code requires that the subject piping welds receive 100% volumetric examination. Based on a review of data records and examination coverage plots, it has been determined that the Code-required 100% volumetric examination is impractical. To perform the required volumetric examination, design modifications and/or replacement of the components with those of designs providing for complete examination would be required. Imposition of this requirement would cause a considerable burden on the licensee.

#### 4. CONCLUSION

Pursuant to 10 CFR 50.55a(g)(6)(i), it has been determined that certain inservice examinations cannot be performed to the extent required by Section XI of the ASME Code. In the cases of Requests for Relief RR-B1 (Parts 2 through 11) and RR-C1 (Parts 1 through 4), the licensee has demonstrated that specific Section XI requirements are impractical; it is therefore recommended that relief be granted as requested. The granting of relief will not endanger life, property, or the common defense and security and is otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Pursuant to 10 CFR 50.55a(a)(3), it is concluded that for Requests for Relief RR-B2 and RR-B4, the licensee's proposed alternative will (i) provide and acceptable level of quality and safety, or (ii) Code compliance will result in hardship or unusual difficulty without a compensating increase in safety. In these cases, it is recommended that the proposed alternative be authorized for RR-B4 and authorized with the condition stated in the evaluation for RR-B2.

For RR-B3, it is recommended that the requirements of Table IWB-2500-1, Examination Categories B-L-1 and B-M-2, Items B12.20 and B12.50, of the 1989 Edition of Section XI, be approved for use pursuant to 10 CFR 50.55a(g)(4)(iv).

Request for Relief RR-B1 (Part 1) addresses augmented reactor pressure vessel shell weld examinations. Based on the licensee's statement of intent to examine essentially 100% of the shell welds during examinations scheduled for the year 2000, it is recommended that this relief request be denied.

Request for Relief RR-F1 addresses inservice inspection requirements for snubbers. This relief request is considered a part of IST and is, therefore, not evaluated in this report.

This technical evaluation has not identified any practical method by which the licensee can meet all the specific inservice inspection requirements of Section XI of the ASME Code for the existing Salem Generating Station, Unit 2,

## 5. REFERENCES

1. Code of Federal Regulations, Title 10, Part 50.
2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 1:  

1986 Edition  
1974 Edition Through the Summer 1975 Addenda
3. *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan*, Revision 0, dated May 4, 1992.
4. *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan*, Revision 1, dated December 28, 1994.
5. NUREG-0800, *Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants*, Section 5.2.4, "Reactor Coolant Boundary Inservice Inspection and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components," July 1981.
6. Letter dated June 13, 1994, J. C. Stone (NRC) to S. Miltenberger (PSE&G) containing NRC Request for Additional Information (RAI).
7. Letter dated December 28, 1994, J. J. Hagen (PSE&G) to Document Control Desk (NRC) containing the response, including Revision 1 to the program plan, to the June 13, 1994 Request for Additional Information.
8. Letter dated June 7, 1995, J. J. Hagen (PSE&G) to Document Control Desk (NRC) containing additional information, including Revision 1A to the program plan, in response to a March 10, 1995 telephone conversation.
9. NRC Regulatory Guide 1.150, *Reactor Pressure Vessel Beltline Weld Examinations*, Rev. 1, February 1983.
10. NRC Regulatory Guide 1.14, Revision 1, *Reactor Coolant Pump Flywheel Integrity*, August 1975.
11. IE Bulletin 82-02, *Degradation of Threaded Fasteners in the Reactor Coolant Pressure Boundary of PWR Plants*, June 2, 1982.
12. NRC Bulletin NO. 88-08, *Thermal Stresses in Piping Connected to Reactor Coolant Systems*, June 22, 1988.

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10. SUPPLEMENTARY NOTES

11. ABSTRACT (200 words or less)

This report documents the results of the evaluation of the *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection (ISI) Program Plan*, through Revision 1A, submitted May 4, 1992, December 28, 1994, and June 7, 1995, including the request for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements that the licensee has determined to be impractical. The *Salem Generating Station, Unit 2, Second 10-Year Interval Inservice Inspection (ISI) Program Plan*, through Revision 1A is evaluated in Section 2 of this report. The ISI Program Plan is evaluated for (a) compliance with the appropriate edition/addenda of Section XI, (b) acceptability of examination sample, (c) correctness of the application of system or component examination exclusion criteria, and (d) compliance with ISI-related commitments identified during previous Nuclear Regulatory Commission (NRC) reviews. The request for relief is evaluated in Section 3 of this report.

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