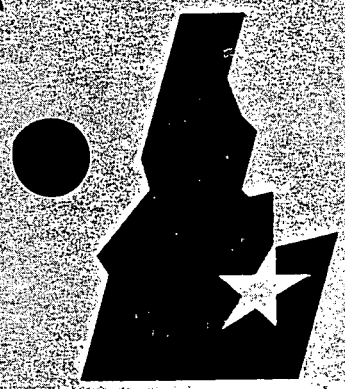

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TECHNICAL EVALUATION REPORT

TECHNICAL EVALUATION REPORT ON THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN: CONSOLIDATED EDISON COMPANY OF NEW YORK, INDIAN POINT STATION, UNIT 2, DOCKET NUMBER 50-247

B. W. Brown
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EG&G Idaho

Work performed under DOE Contract No. DE-AC07-76ID01570

Prepared for the
U.S. NUCLEAR REGULATORY COMMISSION

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ABSTRACT

This report presents the results of the evaluation of the Indian Point Station, Unit 2, Second 10-Year Interval Inservice Inspection (ISI) Program Plan, submitted September 30, 1985, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements which the Licensee has determined to be impractical. The Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan 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) exclusion criteria, and (d) compliance with ISI-related commitments identified during the Nuclear Regulatory Commission (NRC) previous preservice inspection (PSI) and ISI reviews. The requests for relief from the ASME Code requirements which the Licensee has determined to be impractical for the second 10-year inspection interval are evaluated in Section 3 of this report.

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FIN No. D6022, Project 5
Operating Reactor Licensing Issues Program,
Review of ISI for ASME Code Class 1, 2, and 3 Components

SUMMARY

The Licensee, Consolidated Edison Company of New York, has prepared the Indian Point Station, Unit 2, Second 10-Year Interval Inservice Inspection (ISI) Program Plan to meet the requirements of the 1980 Edition, Winter 1981 Addenda (80W81) of the ASME Code Section XI except that the extent of examination for Code Class 1 and Code Class 2 piping welds has been determined by the 1974 Edition through Summer 1975 Addenda (74S75) as permitted and required by 10 CFR 50.55a(b). The second 10-year interval began July 1, 1984 and ends June 30, 1994.

The information in the Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan, submitted September 30, 1985, was reviewed, including the requests for relief from the ASME Code Section XI requirements which the Licensee has determined to be impractical. As a result of this review, a Request for Additional Information (RAI) was prepared describing the information and/or clarification required from the Licensee in order to complete the review.

Based on the review of the Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan, the Licensee's responses to the NRC's RAI, and the recommendations for granting relief from the ISI examination requirements that have been determined to be impractical, it has been concluded that the Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan, with the exception of Requests for Relief 4, 5, 18, 20, 23, and 24, is acceptable and in compliance with 10 CFR 50.55a(g)(4).

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TECHNICAL EVALUATION REPORT ON THE
SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN:
CONSOLIDATED EDISON COMPANY OF NEW YORK,
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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) which 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 the second 120-month inspection interval shall 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 second 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 which are incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein. The Licensee, Consolidated Edison Company of New York, has prepared the Indian Point Station, Unit 2, Second 10-Year Interval Inservice Inspection (ISI) Program Plan, submitted September 30, 1985 (Reference 3), to meet the requirements of the 1980 Edition, Winter 1981 Addenda (80W81) of the ASME Code Section XI except that the extent of examination for Code Class 1 and Code Class 2 piping welds has been determined by the 1974 Edition through Summer 1975 Addenda (74S75) as permitted and required by 10 CFR 50.55a(b). The second 10-year interval began July 1, 1984 and ends June 30, 1994.

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 licensee shall submit information and justifications to the Nuclear Regulatory Commission (NRC) to support that determination.

Pursuant to 10 CFR 50.55a(g)(6), the NRC will evaluate the licensee's determinations under 10 CFR 50.55a(g)(5) that Code requirements are impractical. The NRC may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life or property or the common defense and security, and are 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.

The information in the Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan, submitted September 30, 1985, was reviewed, including the requests for relief from the ASME Code Section XI requirements which the Licensee has determined to be impractical. The review of the ISI Program Plan was performed using the Standard Review Plans of NUREG-0800 (Reference 4), Section 5.2.4, "Reactor Coolant Boundary Inservice Inspections and Testing," and Section 6.6, "Inservice Inspection of Class 2 and 3 Components."

In letters dated May 27, 1987 (Reference 5) and February 9, 1988 (Reference 6), the NRC requested additional information that was required in order to complete the review of the ISI Program Plan. The requested information was provided by the Licensee in letters dated June 25, 1987 (Reference 7), July 17, 1987 (Reference 8), September 3, 1987 (Reference 9), and April 8, 1988 (Reference 10).

The Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan 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) exclusion criteria, and (d) compliance with ISI-related commitments identified during the NRC's previous preservice inspection (PSI) and ISI 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,

1980 Edition, including Addenda through Winter 1981. Specific inservice test (IST) programs for pumps and valves are being evaluated in other reports.

2. EVALUATION OF INSERVICE INSPECTION PROGRAM PLAN

This evaluation consisted of a review of the applicable program documents to determine whether or not they are in compliance with the Code requirements and any license conditions pertinent to ISI activities. This section describes the submittals reviewed and the results of the review.

2.1 Documents Evaluated

Review has been completed on the following information provided by the Licensee:

(a) Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan, submitted September 30, 1985;

(b) Letter, dated April 21, 1987, submitting the Indian Point, Unit 2, Reactor Vessel Inservice Inspection Program (Reference 11);

(c) Letter, dated April 23, 1987, submitting a supplement to the ISI program adding Relief Request 24, and incorporating Code Case N-356 (Reference 12);

(d) Letter, dated June 25, 1987, discussing the schedule for Licensee's response to the NRC's RAI;

(e) Letter, dated July 17, 1987, containing the response to Items A through I and P of the NRC's May 27, 1987 RAI;

(f) Letter, dated September 3, 1987, containing the response to Items J through O of the NRC's May 27, 1987 RAI; and

(g) Letter, dated April 8, 1988, containing the response to the NRC's February 9, 1988 RAI.

2.2 Compliance with Code Requirements

2.2.1 Compliance with Applicable Code Editions

The Inservice Inspection Program Plan shall be based on the Code editions defined in 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(b). Based on the starting date of July 1, 1984, the Code applicable to the second interval ISI program is the 1980 Edition with Addenda through Winter 1981. As stated in Section 1 of this report, the Licensee has written the Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan to meet the requirements of the 1980 Edition, Winter 1981 Addenda of the Code except that the extent of examination for Code Class 1 and Code Class 2 piping welds has been determined by the 1974 Edition through Summer 1975 Addenda as permitted and required by 10 CFR 50.55a(b).

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). 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 Exclusion Criteria

The criteria used to exclude components from examination shall be consistent with Paragraphs IWB-1220, IWC-1220, IWC-1230, IWD-1220, and 10 CFR 50.55a(b). The exclusion 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 as specified in Section XI of the ASME Code, the Licensee has committed to perform augmented examinations in accordance with the following documents:

(a) Amendment 95 to Paragraph 4.2 of the Indian Point, Unit 2, Plant Technical Specifications (requires an augmented inspection of the reactor vessel);

(b) Ultrasonic examination of Reactor Pressure Vessel welds during ISI will be in compliance with Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," Revision 1 (Reference 13);

(c) NUREG-0800, Standard Review Plan, Section 3.6.1, "Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment;" and

(d) In the letter dated April 8, 1988, the Licensee committed to perform volumetric examination of 7.5% of the Class 2 piping welds in the RHR and Safety Injection Systems, whose piping has a greater than or equal to 3/8 inch nominal wall thickness and is greater than 4 inches in nominal pipe size.

2.3 Conclusions

Based on the review of the documents listed above, it is concluded that the Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan, submitted September 30, 1985, is acceptable and in compliance with 10 CFR 50.55a(g)(4).

3. EVALUATION OF RELIEF REQUESTS

The requests for relief from the ASME Code requirements which 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 6, Examination Category B-A, Item B1.21, Reactor Pressure Vessel Circumferential Head Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-A, Item B1.21 requires a 100% volumetric examination of the accessible length of the Reactor Pressure Vessel (RPV) circumferential head welds as defined by Figure IWB-2500-3.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of RPV circumferential head welds RVHC-1 and RPVC-5.

Licensee's Proposed Alternative Examination: None. The Licensee states that, in lieu of the above examination requirement, the weld areas will be visually examined for evidence of leakage during the performance of system hydrostatic tests.

Licensee's Basis for Requesting Relief: The Licensee states that the closure head peel segment-to-disc circumferential weld (RVHC-1) is completely enclosed within the pattern of Control Rod Drive Mechanism (CRDM) penetrations inside the shroud and, as such, is not accessible for volumetric examination as required by IWB-2500.

Volumetric examination of the bottom head peel segment-to-disc circumferential weld (RPVC-5) is restricted from inside the

vessel by the location of adjacent in-core instrumentation penetrations. Volumetric examination from the outside of the vessel is restricted by in-core instrumentation conduits which prevent sufficient scanning path for volumetric examination.

The Licensee states that there are no changes expected in the overall level of plant safety by performing the proposed alternative examinations. The reactor vessel was designed and constructed to codes in effect in the late 1960s. The codes did not fully provide for inservice inspection access which was established in later codes. The alternative examination techniques planned to be utilized for inservice examinations are the same techniques used since the start of plant operation and the same techniques approved by the NRC in 1983 for the ISI program used during the first inspection interval. Additionally, the continued integrity of the vessel has been demonstrated by satisfactory operation since the early 1970s. This is also supported by the general history of satisfactory vessel performance throughout the industry.

The Licensee states that, by performing the proposed alternative examinations, the overall level of plant safety will therefore be maintained consistent with the original plant design.

Evaluation: Due to the cluster of CRDM penetrations in the closure head, access to the closure head circumferential weld is not possible. The volumetric examination of the bottom head circumferential weld is precluded by the adjacent in-core instrumentation penetrations and conduits. Therefore, the Code-required volumetric examination of these welds is impractical to perform. The visual examination for evidence of leakage performed during system hydrostatic tests will provide reasonable assurance of the continued inservice structural integrity of the RPV circumferential head welds.

Conclusions: Based on the above evaluation, it is concluded that the Code-required volumetric examination of the subject welds is impractical. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.1.2 Pressurizer

3.1.2.1 Request for Relief 7, Examination Category B-B, Items B2.11 and B2.12, Pressurizer Shell-to-Head Circumferential and Longitudinal Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-B, Items B2.11 and B2.12 both require a 100% volumetric examination of the pressurizer shell-to-head circumferential and longitudinal welds as defined by Figures IWB-2500-1 and -2.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of shell-to-head circumferential weld PZRC-5 and longitudinal weld PZRL-4.

Licensee's Proposed Alternative Examination: None. The Licensee states that indirect visual examination for evidence of leakage during system hydrostatic tests will be performed for welds PZRC-5 and PZRL-4. Examination of accessible portions of the bottom circumferential and longitudinal shell-to-head welds (PZRC-1 and PZRL-1) will be performed as required by IWB-2500.

Licensee's Basis for Requesting Relief: The Licensee states that the upper circumferential (PZRC-5) and longitudinal (PZRL-4) welds are enclosed in a biological and missile shield

and are therefore inaccessible for volumetric examination as required by IWB-2500.

The Licensee states that there are no changes expected in the overall level of plant safety by not performing the Code-required volumetric examination. The pressurizer and surrounding biological and missile shield were constructed in accordance with codes and fabrication bases in effect in the late 1960s. These codes and fabrication bases did not fully provide for inservice inspection access considerations of later codes and bases. The examination techniques planned to be utilized for inservice examinations are the same techniques used since the start of plant operation and the same techniques approved by the NRC for the ISI program used during the first inspection interval. Additionally, the continued integrity of the pressurizer has been demonstrated by satisfactory operation since the early 1970s. Satisfactory performance has also been demonstrated by the general pressurizer history throughout the industry. The overall level of plant safety will therefore be maintained consistent with original plant design and fabrication codes and bases.

Evaluation: The Code-required volumetric examination of the shell-to-head circumferential and longitudinal welds is impractical because these welds are enclosed in a biological and missile shield and are not accessible. The indirect visual examination for evidence of leakage performed during system hydrostatic tests is a practical and acceptable method of determining the condition of these welds.

Conclusions: Based on the above evaluation, it is concluded that the Code-required volumetric examination of the subject welds is impractical. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of

quality and safety. Therefore, it is recommended that relief be granted as requested.

3.1.2.2 Request for Relief 9, Examination Category B-D, Item B3.120, Pressurizer Nozzle Inside Radius Sections

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.120 requires a 100% volumetric examination of the pressurizer nozzle inside radius sections as defined by Figure IWB-2500-7.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of all pressurizer nozzle inside radius sections.

Licensee's Proposed Alternative Examination: None. The Licensee states that all nozzles will be visually examined during system hydrostatic tests as per IWB-2500.

Licensee's Basis for Requesting Relief: The Licensee states that the pressurizer nozzles are integrally cast with the vessel heads. The as-cast surface of the heads, combined with the geometry of this area effectively preclude ultrasonic examination of the nozzle inner radii.

The geometry and size of the nozzles are such that a radiographic examination is not feasible. Specifically, the radiographic film cannot be situated properly from the I.D. due to a lack of interior structure to work from. Placement of the source on the I.D. will not allow proper film to source distance, resulting in geometric unsharpness.

Additionally, with the manway slightly lifted from the manway flange, fields exterior to the pressurizer in the vicinity of the manway are 3-5 rem/hr. Although the fields within the pressurizer have not been specifically measured, they are

considerably higher and preclude the placement of radiographic film on the interior of the pressurizer. For practical reasons, the high fields also preclude a visual examination of the nozzle inside radius surface and, because the nozzles are clad on their surface, a visual examination would be of no significant value.

The Licensee states that there are no changes expected in the overall level of plant safety by not performing the Code-required volumetric examination. The pressurizer was designed and fabricated in accordance with codes in effect in the late 1960s. These codes did not fully provide for inservice inspection considerations such as surface finish and geometry to support examinations of nozzle inside radius sections. The examination techniques planned to be utilized for inservice examinations are the same techniques used since the start of plant operation. Additionally, the continued integrity of the pressurizer has been demonstrated by satisfactory plant operation since the early 1970s. Therefore, the overall level of plant safety will be maintained consistent with the original plant design.

Evaluation: The Indian Point Station, Unit 2, was designed and fabricated in accordance with codes in effect in the late 1960s. Thus, the nozzle sections were not designed for external examination of the inside radius using ultrasonic methods. Due to the component geometry and the as-cast surface of the pressurizer heads, the volumetric examination of the nozzle inside radius section from the external surface is difficult to perform with existing equipment. The curvature of the inner radius is not symmetric to the curvature of the outer radius in a typical nozzle configuration and changes in section thicknesses are also typical in this region. These geometric factors can cause the attenuation and redirection of ultrasonic signals, resulting in unreliable interpretation of examination data. However, the technology of volumetric testing is

changing rapidly and significant improvements can be expected in the future. It is the Licensee's obligation to monitor the development of new or improved examination techniques and, as improvements in these areas are achieved, to incorporate these techniques in the ISI program plan examination requirements.

Surface examination is not practical to perform because of the rough surface of the as-welded cladding and because inspection personnel would receive excessive radiation exposure.

Based on the difficulty of conducting volumetric examinations of the inside radius sections with currently available volumetric equipment and the potential for examination personnel to receive high radiation exposure while performing alternative examinations, the Code-required examination is impractical.

The visual examination for evidence of leakage performed during system hydrostatic tests will provide reasonable assurance of the continued inservice structural integrity of the pressurizer nozzle inside radius sections.

Conclusions: Based on the above evaluation, it is concluded that compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.1.2.3 Request for Relief 12 (Part 1 of 2), Examination Category B-F, Item B5.40, Pressurizer Nozzle-to-Safe End Butt Welds

NOTE: See the evaluation of this request for relief in section 3.1.7.1.

3.1.3 Heat Exchangers and Steam Generators

3.1.3.1 Request for Relief 8 (Part 1 of 2), Examination Categories B-B and B-D, Items B2.51, B2.61, B3.150, and B3.160, Welds and Nozzle Inside Radius Sections in Regenerative Heat Exchangers

NOTE: See the evaluation of this request for relief in section 3.1.7.2.

3.1.3.2 Request for Relief 10, Examination Category B-D, Item B3.140, Steam Generator Nozzle Inside Radius Sections

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-D, Item B3.140 requires a 100% volumetric examination of the steam generator nozzle inside radius sections as defined by Figures IWB-2500-7(a) through (d).

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of all nozzle inside radius sections in the steam generators (primary side).

Licensee's Proposed Alternative Examination: None. The Licensee states that a visual examination for evidence of leakage during system hydrostatic tests will be performed as required by IWB-2500.

Licensee's Basis for Requesting Relief: The Licensee states that the nozzles on the generators are cast with the vessel heads. The as-cast surface of the heads, combined with the geometry of this area effectively preclude ultrasonic examination of the nozzle inner radii.

Although the inner radii of the steam generator nozzles are potentially accessible for a surface examination, such examinations are unwarranted because the cladding precludes

surface examination of the base metal and this surface is a rough, manually deposited cladding which does not readily permit meaningful surface examinations.

The radiation levels in the interior vicinities of the nozzles have been determined to range from 25 to 40 rem/hr. These levels make a volumetric examination by radiography impracticable.

The Licensee states that there are no changes expected in the overall level of plant safety by not performing the Code-required volumetric examination. The steam generators were designed and fabricated in accordance with codes in effect in the late 1960s. These codes did not fully provide for inservice inspection considerations such as surface condition and geometry necessary to support examinations of the inside radius section of nozzles. The examination techniques planned to be utilized for inservice examinations are the same techniques used since the start of plant operation. Additionally, the continued integrity of the primary side of the steam generators has been demonstrated by satisfactory operation since the early 1970s. Therefore, the overall level of plant safety will be maintained consistent with the original plant design.

Evaluation: The Indian Point Station, Unit 2, was designed and fabricated in accordance with codes in effect in the late 1960s. Thus, the nozzle sections were not designed for external examination of the inside radius using ultrasonic methods. Due to the component geometry and the as-cast surface of the steam generator heads, the volumetric examination of the nozzle inside radius section from the external surface is difficult to perform with existing equipment. The curvature of the inner radius is not symmetric to the curvature of the outer radius in a typical nozzle configuration and changes in section thicknesses are also typical in this region. These geometric

factors can cause the attenuation and redirection of ultrasonic signals, resulting in unreliable interpretation of examination data. However, the technology of volumetric testing is changing rapidly and significant improvements can be expected in the future. It is the Licensee's obligation to monitor the development of new or improved examination techniques and, as improvements in these areas are achieved, to incorporate these techniques in the ISI program plan examination requirements.

Surface examination is not practical to perform because of the rough surface of the as-welded cladding and because inspection personnel would receive excessive radiation exposure.

Based on the difficulty of conducting volumetric examinations of the inside radius sections with currently available volumetric equipment and the potential for examination personnel to receive high radiation exposure while performing alternative examinations, the Code-required examination is impractical.

The visual examination for evidence of leakage performed during system hydrostatic tests will provide reasonable assurance of the continued inservice structural integrity of the steam generator nozzle inside radius sections.

Conclusions: Based on the above evaluation, it is concluded that compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.1.3.3 Request for Relief 12 (Part 2 of 2), Examination Category B-F, Item B5.70, Steam Generator Nozzle-to-Safe End Butt Welds

NOTE: See the evaluation of this request for relief in section 3.1.7.1.

3.1.4 Piping Pressure Boundary

3.1.4.1 Request for Relief 8 (Part 2 of 2), Examination Category B-J, Item B9.21, Class 1 Circumferential Piping Welds

NOTE: See the evaluation of this request for relief in section 3.1.7.2.

3.1.4.2 Request for Relief 11, Examination Category B-F, Item B5.10, Reactor Pressure Vessel Nozzle-to-Safe End Butt Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-F, Item B5.10 requires both 100% surface and volumetric examinations of the Reactor Pressure Vessel nozzle-to-safe end butt welds, nominal pipe size 4 inches or greater, as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from performing the Code-required surface examination of the following nozzle-to-safe end welds:

RPVS21-1A	RPVS23-1A
RPVS21-14A	RPVS23-14A
RPVS22-1A	RPVS24-1A
RPVS22-14A	RPVS24-14A

Licensee's Proposed Alternative Examination: None. The Licensee states that these welds are dissimilar metal welds between the carbon steel nozzle forgings and the stainless steel transition (spool) pieces of the reactor coolant piping. These welds will be volumetrically examined during the inspection interval from the inside diameter with the automated reactor vessel inspection tool. Indirect visual examination for evidence of leakage during the performance of system hydrostatic tests will be performed as per IWB-2500.

Licensee's Basis for Requesting Relief: The Licensee states that the only access to the reactor nozzle safe ends from the

outside surface is through removable plugs in the primary shield. These plugs are located above the nozzle safe ends and are removable through the refueling cavity floor. With the plugs removed, the top insulated surfaces (approximately 25%) of the nozzle safe ends are visible; however, the fixed insulation, designed as non-removable, precludes surface examination.

The Licensee states that insulation modifications to permit surface examination, even for a limited 25% of the weld area, are considered impractical and/or unnecessary for the following reasons: a) a two to three rem/hr radiation exposure field is expected on contact, b) the examination would be performed in an extremely confined work area, c) restrictive clothing would be required for anti-contamination, and d) a minimal value would be derived from such an inspection.

The Licensee states that there are no changes expected in the overall level of plant safety by not performing the Code-required surface examination. The codes and fabrication bases established in the 1960s did not fully provide for inservice inspection considerations such as access. In particular, access to the area of the outside of reactor vessel nozzles-to-safe end welds is severely restricted by a combination of plugs in the primary shield, an extremely confined work area and non-removable insulation. The examination techniques planned to be utilized for inservice inspection examinations are the same techniques used since the start of plant operation and the same techniques approved by the NRC for the ISI program used during the first inspection interval. Additionally, the Indian Point, Unit 2, vessel nozzle-to-safe end welds were weld overlayed on the outside and inside surfaces prior to initial operation, thereby adding increased assurance of long-term weld integrity. The continued integrity of these welds has also been demonstrated by satisfactory operation since the early 1970s. Therefore, the

overall level of plant safety will be maintained consistent with the original plant design.

Evaluation: The Code-required surface examination of the welds listed above is impractical because of the severe access limitations, the installed non-removable insulation, and the high personnel exposure necessary to remove and replace the insulation and inspect the welds. However, the required volumetric examination of the subject welds can and will be performed from the ID surface using the automated reactor vessel inspection tool. The proposed alternative of an ID volumetric examination and visual examination for evidence of leakage performed during the hydrostatic test is equivalent to the Code requirements and is acceptable provided that the Licensee meet the following conditions:

(1) The remote volumetric examination includes the entire weld volume and heat affected zone instead of only the inner one-third of the weld.

(2) The ultrasonic testing instrumentation and procedure are demonstrated to be capable of detecting OD surface-connected defects, in the circumferential orientation, in a laboratory test block. The defects should be cracks and not machined notches.

Conclusions: Based on the above evaluation, it is concluded that the proposed ID volumetric examination of the RPV nozzle-to-safe end welds, subject to the conditions defined in the above evaluation, along with the indirect visual examination for evidence of leakage during the performance of system hydrostatic tests, ensures an acceptable level of inservice structural integrity. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief

be granted provided that the Licensee meet the conditions defined in the above evaluation.

3.1.5 Pump Pressure Boundary (No relief requests)

3.1.6 Valve Pressure Boundary

3.1.6.1 Request for Relief 13, Examination Category B-M-2, Item B12.50, Visual Examination of Internal Surfaces of Class 1 Valve Bodies in the Residual Heat Removal System

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-M-2, Item B12.50 requires a 100% visual (VT-3) examination of the internal surfaces of Class 1 valve bodies greater that 4 inches nominal pipe size.

Licensee's Code Relief Request: Relief is requested from performing the Code-required visual (VT-3) examination of the internal surfaces of the 14 inch Motor Operated Gate Valves 730 and 731 in the Residual Heat Removal (RHR) System.

Licensee's Proposed Alternative Examination: None. The Licensee states that, subsequent to each refueling and prior to plant operation, the valves shall be visually examined for leakage during performance of the Reactor Coolant System hydrostatic test. In addition, the valves shall be leak tested per IWV-3240 during each refueling outage.

In the event the valve is disassembled for maintenance, a visual examination of the internal pressure boundary surface will be accomplished to the extent possible.

Licensee's Basis for Requesting Relief: The Licensee states that valves 730 and 731 are identical 14 inch motor operated gate valves, one of which would normally be disassembled for examination of the internal pressure boundary surfaces.

Valve 731 is the first isolation valve off the Reactor Coolant System (RCS). Access to the valve internals is precluded by high radiation fields and the need to maintain a water level in the refueling canal to shield personnel from the lower reactor internals. Although the fields in the area of valve 730 are significantly lower, disassembly of either valve at this time is considered to be unwarranted. Valve 730 is the second isolation valve. Opening this valve for inspection would result in only one isolation valve (731) between the opened valve (730) and the shielding water in the refueling canal. Maintaining only single valve isolation to support a visual examination is considered to be imprudent in this case. Although valve 731 has proven to be leak tight during various tests, if leakage did develop through this valve, there exists the potential of lowering the refueling canal water level, resulting in personnel exposures from the uncovering of the reactor lower internals. The intent of the Code-specified internal visual examinations is to verify continued integrity of the valve pressure boundary. Valves 730 and 731 are visually examined for leakage after each refueling outage during the hydrostatic tests of the RCS while subjected to full RCS pressure. The integrity of these valves' pressure boundary parts have therefore been well demonstrated by these continuing hydrostatic tests. Additionally, the valves have been added to the ASME Section XI Subsection IWV Inservice Testing Program and have been satisfactorily leak tested. These valves have also operated satisfactorily when required during plant operation since initial plant operation. The combination of hydrostatic tests, leak tests and satisfactory operation is sufficient to demonstrate continuing valve pressure boundary integrity without the need for valve disassembly. The valves will be visually examined in the event that they are disassembled for maintenance. Careful consideration of these overall factors indicates that it is in the best interest of plant operation and personnel safety to avoid valve disassembly until required.

Evaluation: The visual examination is to determine whether unanticipated severe degradation of the valve body is occurring due to phenomena such as erosion, corrosion, or cracking. However, previous experience during examination of valves at other plants has not shown any significant degradation of valve bodies. The concept of visual examination if the valve is disassembled for maintenance is acceptable. The disassembly of the valves for the sole purpose of inspection is a major effort and, in addition to the possibility of additional wear or damage to the internal surfaces of the valves, could result in personnel receiving large amounts of radiation exposure. However, if the valves are disassembled for maintenance, the internal surfaces would be examined, in which case relief would not be required for those particular valves.

Conclusions: Based on the above evaluation, it is concluded that compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that: (a) The Licensee's proposal to perform the visual examination (VT-3) of the internal surfaces of the valve bodies, whenever they are made accessible due to disassembly for maintenance purposes, should be accepted; and (b) Relief should be granted at the end of the interval if one of the subject valves, for which a visual examination is required, has not been disassembled for maintenance.

3.1.7 General

3.1.7.1 Request for Relief 12, Examination Category B-F, Items B5.40 and B5.70, Pressurizer and Steam Generator Nozzle-to-Safe End Butt Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-F, Items B5.40 and B5.70 require both 100% surface

and volumetric examinations of the pressurizer and steam generator nozzle-to-safe end butt welds, nominal pipe size 4 inches or greater, as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume of the following pressurizer and steam generator nozzle-to-safe end welds:

Pressurizer Nozzle-to-Safe End Welds

Item No.	Weld Number
B5.40	PZRS1
B5.40	PZRS4
B5.40	PZRS5
B5.40	PZRS6

Steam Generator Nozzle-to-Safe End Welds

Item No.	Weld Number
B5.70	SGS 21-4
B5.70	SGS 21-5
B5.70	SGS 22-4
B5.70	SGS 22-5
B5.70	SGS 23-4
B5.70	SGS 23-5
B5.70	SGS 24-4
B5.70	SGS 24-5

Licensee's Proposed Alternative Examination: None. The Licensee states that surface examinations will be performed on all nozzle-to-safe end welds per Code requirements. Partial ultrasonic examination will be performed on all welds and shall be consistent with that performed during the preservice inspection and the first inspection interval.

Licensee's Basis for Requesting Relief: The Licensee states that the 100% volumetric examination requirements for the pressurizer and steam generator nozzle-to-safe end weld surfaces are limited by the following:

(a) The contours of the nozzle-to-safe end weld surfaces (the as-fabricated contours of these welds are rounded with relatively high crowns of non-uniform heights);

(b) the as-cast geometry of the nozzles with respect to the vessel head;

(c) nozzle reinforcement welds;

(d) adjacent welds on thermal sleeves and rolled-in liners; and

(e) the configuration of elbows connected to safe ends.

The combination of weld crown contours, the as-cast geometry of nozzles, nozzle reinforcement welds, adjacent welds, and elbows preclude volumetric examination of nozzle-to-safe end welds per Code requirements.

The Licensee further states that an evaluation of the requirements for ultrasonic inspection was conducted considering the various angles and directions from which these welds are required to be examined. Weighting factors were applied to examinations that were completed (1), partial (.5), and not examined (0). The results of this tabulation indicate that approximately 42% of the volume of weld metal was examined.

The Licensee also states that there are no changes expected in the overall level of plant safety by performing the limited Section XI volumetric examination. The codes and fabrication bases established in the 1960s did not fully provide for inservice inspection consideration of weld crown contours, as-cast geometry and surface finish, proximity of welds, thermal sleeves, rolled-in clad, etc. These conditions restrict the extent of ultrasonic examination that can be performed on these nozzles. The examination techniques for inservice examinations will consist of surface examinations and ultrasonic examinations to the maximum extent practical. These examinations will be consistent with the examinations performed since the start of plant operations and the same techniques approved by the NRC in 1983 for the ISI program used during the first inspection interval. The continued integrity of the pressurizer and steam generators nozzle-to-safe end welds has been demonstrated by satisfactory operation since the early

1970s. Therefore, the overall level of plant safety will be maintained consistent with the original plant design bases.

Evaluation: The volumetric examination of the subject nozzle-to-safe end welds, to the extent required by the Code, is impractical because of the examination limitations discussed above. However, partial volumetric examinations of the nozzle-to-safe end welds, in addition to the full Code-required surface examinations, can and will be performed. Based on the reported limiting features, an acceptable percentage of the Code-required volume of the subject welds will be examined.

Conclusions: Based on the above evaluation, it is concluded that the limited Section XI volumetric examinations, along with the full Code-required surface examinations, ensure an acceptable level of inservice structural integrity. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.1.7.2 Request for Relief 8, Examination Categories B-B and B-D, Items B2.51, B2.61, B3.150, and B3.160, Welds and Nozzle Inside Radius Sections in Regenerative Heat Exchangers, and Examination Category B-J, Item B9.21, Class 1 Circumferential Piping Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-B, Item B2.51 requires a 100% volumetric examination of the circumferential head welds in heat exchangers (primary side) as defined by Figures IWB-2500-1 and -3. Item B2.61 requires a 100% volumetric examination of the tubesheet-to-shell welds (primary side) as defined by Figure IWB-2500-6.

Examination Category B-D, Items B3.150 and B3.160 require a 100% volumetric examination of the nozzle-to-vessel welds and

the nozzle inside radius sections, respectively, in heat exchangers (primary side) as defined by Figures IWB-2500-7(a) through (d).

Examination Category B-J, Item B9.21 requires a 100% surface examination of Class 1 circumferential piping welds, less than 4 inch nominal pipe size, as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the following circumferential head welds, tubesheet-to-shell welds, nozzle-to-vessel welds, and nozzle inside radius sections in the regenerative heat exchanger (tube and shell sides):

Circumferential Head Welds (Item No. B2.51)

RGXC 1-1	RGXC 2-4
RGXC 1-4	RGXC 3-1
RGXC 2-1	RGXC 3-4

Tubesheet-to-Shell Welds (Item No. B2.61)

RGXC 1-2	RGXC 2-3
RGXC 1-3	RGXC 3-2
RGXC 2-2	RGXC 3-3

Nozzle-to-Vessel Welds (Item No. B3.150)

RGXN 1-1	RGXN 2-3
RGXN 1-2	RGXN 2-4
RGXN 1-3	RGXN 3-1
RGXN 1-4	RGXN 3-2
RGXN 2-1	RGXN 3-3
RGXN 2-2	RGXN 3-4

Nozzle Inside Radius Sections (Item No. B3.160)

RGXN 1-1	RGXN 2-3
RGXN 1-2	RGXN 2-4
RGXN 1-3	RGXN 3-1
RGXN 1-4	RGXN 3-2
RGXN 2-1	RGXN 3-3
RGXN 2-2	RGXN 3-4

Relief is also requested from performing the Code-required surface examination of the following circumferential piping welds, less than 4 inches NPS, in the regenerative heat exchanger piping system:

Circumferential Piping Welds (Item No. B9.21)

19-2	RGXP 2-1
27-2	RGXP 2-2
79-25	RGXP 2-3
80-24	RGXP 2-4
RGXP 1-2	RGXP 3-1
RGXP 1-3	RGXP 3-2

Licensee's Proposed Alternative Examination: None. The Licensee states that all component parts and welds associated with the Regenerative Heat Exchanger will be visually examined during hydrostatic testing per IWB-2500.

Licensee's Basis for Requesting Relief: The Licensee states that the total personnel exposure that would be involved in performing the inspections required by the Code, based on the measured values of 25 rem/hr at the tubesheet end of the Heat Exchanger and 10 rem/hr at the opposite end, is estimated at 1100 rem. This estimate includes the time required for health physics surveys and monitoring, erecting and removing scaffolding, removing and replacing shielding, removing and replacing insulation, performing the inspections, cleaning the welds, and general cleanup.

No significant reduction in exposure rate is anticipated as a result of flushing or decay because the radioactive material, which has a long half-life, is entrapped in crevices or deposits not amenable to flushing. Because of the high radiation fields, a modification is planned to install permanent shielding to permit work in the area. The permanent shielding will have leak collection lines that will support visual examinations for leakage from the Regenerative Heat Exchangers. The leak collections system will provide a

positive method of ensuring that the Regenerative Heat Exchanger is operating safely.

The Licensee states that there are no changes expected in the overall level of plant safety. The regenerative heat exchanger was designed and fabricated in accordance with codes and fabrication bases in effect in the late 1960s. These codes and fabrication bases did not provide for inservice inspection access considerations in areas where the function and design of the component resulted in localized high radiation areas. The examination techniques planned to be utilized for inservice inspection examinations are the same techniques approved by the NRC for the ISI program used during the first inspection interval. Additionally, the continued integrity of the Regenerative Heat Exchanger has been demonstrated by satisfactory operation since the early 1970s. Therefore, the overall level of plant safety will be maintained consistent with the original plant design.

Evaluation: The Code-required volumetric and/or surface examinations of the subject welds would result in personnel receiving excessive radiation exposure. Examining the welds of the regenerative heat exchanger in a 25 rem/hr radiation field is not consistent with ALARA concerns. Based on the man-rem exposure necessary to perform these examinations, the Code-required volumetric examination of the regenerative heat exchanger welds and nozzle inside radius sections and associated piping welds is impractical to perform. The visual examination for evidence of leakage performed during the system hydrostatic tests will provide reasonable assurance of the continued inservice structural integrity of the regenerative heat exchanger welds and nozzle inside radius sections.

Conclusions: Based on the above evaluation, it is concluded that the visual examination of all component parts and welds associated with the Regenerative Heat Exchanger, performed

during hydrostatic testing, ensures an acceptable level of inservice structural integrity. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.2 Class 2 Components

3.2.1 Pressure Vessels

3.2.1.1 Request for Relief 14, Examination Category C-A, Items C1.10 and C1.20, Class 2 Pressure Vessel (Seal Water Return Filter) Shell and Head Circumferential Welds

NOTE: This request for relief was withdrawn by the Licensee in the September 3, 1987 submittal.

3.2.1.2 Request for Relief 15, Examination Category C-A, Items C1.10 and C1.20, Class 2 Pressure Vessel (Seal Water Heat Exchanger) Shell and Head Circumferential Welds

NOTE: This request for relief was withdrawn by the Licensee in the September 3, 1987 submittal.

3.2.1.3 Request for Relief 16, Examination Categories C-A, C-B, and C-C, Items C1.10, C1.20, C2.31, and C3.10, Class 2 Pressure Vessel Welds

Code Requirement: Section XI, Table IWC-2500-1, Examination Category C-A, Items C1.10 and C1.20 require a 100% volumetric examination of the shell circumferential welds at gross structural discontinuities and the head circumferential welds, respectively, in Class 2 pressure vessels as defined by Figure IWC-2500-1.

Examination Category C-B, Item C2.31 requires a 100% surface examination of the reinforcing plate welds to nozzle and vessel on all nozzles at terminal ends of piping runs as defined by Figure IWC-2500-4(c).

Examination Category C-C, Item C3.10 requires a 100% surface examination of integrally welded attachments to Class 2 pressure vessels as defined by Figure IWC-2500-5.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the following Residual Heat Exchanger shell-to-flange and shell-to-head welds:

Shell-to-Flange Welds

Item No.	Weld Number
C1.10	RHX C21-1
C1.10	RHX C22-1

Shell-to-Head Welds

Item No.	Weld Number
C1.20	RHX C21-2
C1.20	RHX C22-2

Relief is also requested from performing the Code-required surface examination of the following reinforcing plate welds to nozzle and vessel and the integrally welded attachments to the Residual Heat Exchangers:

Reinforcing Plate Welds to Nozzle and Vessel

Item No.	Weld Number
C2.31	RHX N21-1
C2.31	RHX N21-2
C2.31	RHX N22-1
C2.31	RHX N22-2

Integrally Welded Attachments

Item No.	Weld Number
C3.10	RHX 21A
C3.10	RHX 21B
C3.10	RHX 22A
C3.10	RHX 22B

Licensee's Proposed Alternative Examination: None. The Licensee states that the RHR heat exchangers will be visually examined for leakage during the system hydrostatic test.

Licensee's Basis for Requesting Relief: The Licensee states that access for examination of the shell and head circumferential welds, reinforcing plate welds to nozzle and vessel, and integrally welded attachments is precluded by a combination of insulation design and high radiation fields. Specifically, the insulation was not designed for removal and replacement to support examinations. The Residual Heat Removal (RHR) heat exchangers are vertically mounted. The insulation of the bottom head is designed as essentially one unit supported by the shaping of the insulation around the inlet and outlet piping. Removing the portion of the insulation required for examination access will result in removing vertical support for the insulation on the head. Carefully controlled removal of the insulation will require erection of scaffolding and significant work activity near the head where radiation fields are in the order of 30-35 rem/hr. The effort to erect scaffolding, remove the insulation, prepare surfaces for examination, conduct the examinations, replace the insulation, and disassemble the scaffolding is considered unwarranted in view of the high radiation fields where these activities will take place. Considering the high fields, the visual examination during hydrostatic testing is sufficient to demonstrate continuing integrity of the RHR heat exchangers.

The Licensee states that there are no changes expected in the overall level of plant safety. The RHR heat exchangers were constructed in accordance with codes in effect in the late 1960s. These codes and fabrication bases did not provide for inservice inspection access considerations in areas where the function and design of the components resulted in localized high radiation areas. The examination techniques planned to be utilized for inservice inspection examinations are the same

techniques used since the start of plant operation and the same techniques approved by the NRC for the ISI program used during the first inspection interval. Additionally, the continued integrity of the RHR heat exchangers has been demonstrated by satisfactory operation since the early 1970s. The overall level of plant safety will therefore be maintained consistent with original plant design and fabrication bases.

Evaluation: Access to examine the subject welds would entail modifications to permanently installed insulation. The Code-required volumetric and surface examinations of the welds listed above would result in personnel receiving excessive radiation exposure. Examining the welds of the RHR heat exchanger in a 30-35 rem/hr radiation field is not consistent with ALARA concerns. Based on the installed non-removable insulation and the high personnel exposure necessary to remove the portion of the insulation required for examination access and to perform the examinations, the Code-required volumetric and surface examinations of these welds are impractical to perform. The visual examination for evidence of leakage performed during the system hydrostatic test will provide reasonable assurance of the continued inservice structural integrity of the RHR heat exchanger welds.

Conclusions: Based on the above evaluation, it is concluded that the visual examination during hydrostatic testing of the RHR heat exchangers is sufficient to demonstrate continuing inservice structural integrity. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality or safety. Therefore, it is recommended that relief be granted as requested.

3.2.2 Piping (No relief requests)

3.2.3 Pumps (No relief requests)

3.2.4 Valves (No relief requests)

3.2.5 General (No relief requests)

3.3 Class 3 Components

3.3.1 Piping (No relief requests)

3.3.2 Pumps (No relief requests)

3.3.3 Valves (No relief requests)

3.3.4 General

3.3.4.1 Request for Relief 4, Class 3 Components Made Inaccessible for Examination Due to High Radiation Fields for Lines 408 and 409 in the Service Water System

Code Requirement: Section XI, Table IWD-2500-1, Examination Category D-B, Item D2.10 requires a 100% visual (VT-2) examination of the Class 3 pressure retaining components as defined by IWA-5000/IWD-5223.

Licensee's Code Relief Request: Relief is requested from performing the Code-required visual (VT-2) examination of components made inaccessible for examination due to high radiation fields for Service Water Lines 408 and 409.

Licensee's Proposed Alternative Examination: The Licensee states that the provisions of paragraph IWA-5244 of Section XI (80W81), regarding the examination of buried components, will be extended to cases where components are made inaccessible for inspection by virtue of high radiation fields. In addition, paragraph IWA-5244(a), which is currently limited to non-redundant systems, shall apply to redundant systems.

Licensee's Basis for Requesting Relief: The Licensee states that there are no provisions in the 80W81 Code which allow for alternative examinations (i.e. pressure loss test or change in flow test) in instances where visual examination is precluded by high radiation fields. In such cases, the alternative examination provisions as specified in IWA-5244 will apply, thus clarifying the criteria for these cases.

The provisions of paragraph IWA-5244 of Section XI provide various methods of satisfying visual examination (VT-2) requirements for inaccessible (buried) components other than by a visual (VT-2) examination. The Code in effect recognizes that, for inaccessible (buried) components, other test methods involving measurements or verification of flow changes, pressure drops, or flow rates are equally suitable in lieu of a visual examination.

Paragraph IWA-5244(a), which applies to non-redundant systems, will also be applied to redundant systems. This is necessary because the provisions of IWA-5244 currently discuss only three potential cases of redundancy and isolability. A fourth case, redundant systems where the buried components are isolatable by means of valves, exists in some systems (i.e. Service Water System). By applying the provisions of IWA-5244(a) to this case, all possible conditions of redundancy/isolability are covered.

Evaluation: The Licensee has not discussed why there is high radiation in the Class 3 Service Water System and has not specified what the radiation levels are in the examination area. If it is confirmed that the subject components are in a high radiation area, the Licensee should consider remote visual examinations as permitted by the Code. Because the Licensee has not technically justified the determination that the Code requirement is impractical, relief should not be considered.

Conclusions: Based on the above evaluation, it is concluded that the Licensee has not provided sufficient information to justify the determination of impracticality. Therefore, it is recommended that relief be denied.

3.4 Pressure Tests

3.4.1 Class 1 System Pressure Tests (No relief requests)

3.4.2 Class 2 System Pressure Tests

3.4.2.1 Request for Relief 17, Test Pressure Requirement for the Hydrostatic Testing of Class 2 Containment Spray Line Segments

Code Requirement: Section XI, Paragraph IWC-5222(a) requires that the system hydrostatic test pressure shall be at least 1.10 times the system design pressure for systems with design temperature of 200°F or less and not provided with safety or relief valves.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic pressure test of line number 51, from valve 867A to valves 866A and 866B, at 1.10 times the system design pressure.

Licensee's Proposed Alternative Examination: The Licensee states that the line segment identified above shall be visually examined during an inservice test of Containment Spray Pump No. 21, during which the line segment will be subjected to pump discharge pressure.

Licensee's Basis for Requesting Relief: Check valve 867A precludes pressurization of this line segment from upstream of valve 867A. The design pressure of the line upstream of valves 866A and 866B precludes pressurizing this line segment to 1.10

times its design pressure. The line segment will therefore be visually examined during an inservice test of Containment Spray Pump No. 21, during which the line segment will be subjected to pump discharge pressure.

The Licensee states that there are no changes anticipated in the overall level of plant safety by performing the proposed alternative examination. The maximum pressure that the line segment between valve 867A and valves 866A and 866B is expected to see during plant operation is equivalent to pump discharge pressure, which is the test pressure for the alternative visual examination. Additionally, this line segment is examined at the weld location and adjacent base metal via surface examination techniques in accordance with Section XI, IWC requirements. The combination of the above examinations and tests is sufficient to ensure continued integrity for this line segment. These examinations and tests are equivalent to those accomplished during the first ISI interval. Therefore, the overall level of plant safety will continue to be maintained consistent with the early operational history.

Evaluation: The system's design does not permit pressurizing the sections of piping to the Code-required pressure without either extensive modifications or overpressurizing connected piping. Because of this, the required test pressure is impractical to attain. The Licensee's proposed alternative test will subject the piping to the pump discharge pressure which is the maximum pressure that the line segment is expected to see during plant operation. The required visual inspection of the piping at the alternative test pressure and other required NDE of the welds in the system will provide adequate assurance of the continued structural integrity.

Conclusions: Based on the above evaluation, it is concluded that the Code-required test pressure is impractical and that

the alternative test proposed by the Licensee, in conjunction with the other NDE requirements, will ensure an acceptable level of inservice structural integrity. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.4.2.2 Request for Relief 21, Hydrostatic Tests of Class 2 Piping in the Safety Injection System

NOTE: This request for relief was withdrawn by the Licensee in the September 3, 1987 submittal.

3.4.2.3 Request for Relief 23, Test Pressure Requirement for Hydrostatic Testing of Steam Generators and Connecting Non-isolatable Main Steam, Blowdown, and Feedwater Piping and Valves

Code Requirement: Section XI, Paragraph IWC-5222 requires that the system hydrostatic test pressure shall be at least 1.25 times the system pressure for systems with design temperature above 200°F.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic pressure test of the steam generators (secondary side) and connecting non-isolatable main steam, blowdown, and feedwater piping and valves at the test pressure of 1.25 times the system design pressure for systems with a design temperature above 200°F per IWC-5222.

Licensee's Proposed Alternative Examination: The Licensee states that each steam generator and connecting non-isolatable piping shall be tested in accordance with IWB-5222 of Section XI (80W81) which is based on operating pressure in lieu of design pressure.

Licensee's Basis for Requesting Relief: The Licensee states that the steam generators (primary and secondary side) were designed in accordance with the requirements of ASME Code Section III Class A (1965 Edition) to the same requirements as the Indian Point, Unit 2, Reactor Vessel and Pressurizer. Accordingly, the steam generator secondary side and connecting non-isolatable piping classification shall be upgraded, for hydrostatic test purposes only, consistent with its construction to the classification of the Reactor Vessel and Pressurizer. The provisions of IWB-5222 in lieu of IWC-5222 will therefore apply.

The secondary side of the steam generators was designed as Class A, ASME Code Section III (65S66). The design criteria is the same as for the reactor vessel, pressurizer, and primary side of the steam generators. The Section XI hydrostatic testing requirements for such designed components are based on Code Class 1 IWB-5222, which stipulates a test pressure of 1.02 times nominal operating pressure at 100% rated power over 500°F. The intent of the Code in specifying such test pressures, as compared to higher test pressures specified for Code Class 2 components, is to take into account the high quality resulting from the rigorous and detailed design analysis and design stress intensity values used for Code Class 1 components with a consequent lower hydrostatic test pressure margin specified. Testing the secondary side of the steam generators in accordance with IWB-5222 is therefore consistent with the overall approach of Section XI with regard to Section III components, and consistent with the other plant Section III Class A main loop components.

Additionally, the Section XI requirements for Code Class 2 components stipulate hydrostatic test pressures of 1.25 times system pressure for systems over 200°F. The Licensee states that, although the steam generators were designed to withstand

such tests, their design is limited to only five such tests over their operating life. The capability to withstand such tests was designed into the steam generators to support conducting tests during fabrication, installation, and subsequent potential repairs during plant operations. This design margin was not intended to provide a capability to perform periodic proof tests during plant operation absent any other initiating cause. Therefore, performing such tests could potentially impact the design life of the steam generators and is not practical.

The tests that will be performed as a substitute for the IWC-5222 tests shall be based on IWB-5222. More specifically, the Licensee will conduct a visual examination for leakage during hot shutdown conditions with the pressure in the non-isolatable portion of the piping at a minimum of 770 psig, which corresponds to 1.02 times the operating pressure at 100% reactor power. The actual test pressures may be higher depending on particular plant conditions.

The Licensee states that the overall level of plant quality and safety will not change but will continue to be maintained since a potential decrease in the steam generator design life will be precluded by use of the IWB-5222 criteria in lieu of IWC-5222.

Evaluation: The Licensee has not justified the determination that the Code requirement is impractical. This request for relief is unacceptable for the following reasons:

(1) The information that the Licensee has provided shows that the Code-required hydrostatic test of the steam generators and associated piping can be performed.

(2) Steam generators at other similar plants have been found to have flaws in the girth welds. These are considered suspect areas and, therefore, should receive the Code-required test.

(3) The Code-required hydrostatic pressure test (IWC-5222) of the steam generators and associated piping is required to be performed once each interval. Four tests over the life of the plant does not exceed the design limitations.

(4) Upgrading the subject Class 2 components from Class 2 requirements to Class 1 requirements lowers the test pressure for the hydrostatic pressure test. Lowering the hydrostatic test pressure is not considered an upgrade as stated by the Licensee.

Conclusions: Based on the above evaluation, it is concluded that the Licensee has not justified the determination of impracticality and that imposing the Code requirement on the Licensee would not result in hardship. Therefore, it is recommended that relief be denied.

3.4.2.4 Request for Relief 24, Hydrostatic Testing of Class 2 Piping Prior to Resumption of Service Following Repairs or Replacements

Code Requirement: Section XI, Subarticle IWA-5214, "Repairs and Replacements," states:

"(a) A component repair or replacement shall be pressure tested prior to resumption of service if required by IWA-4400 and IWA-4600. (b) The test pressure and temperature for a system hydrostatic test subsequent to the component repair or replacement shall comply with the system test pressure and temperature specified in IWB-5222, IWC-5222, and IWD-5223, as applicable to the system which contains the repaired or replaced component. (c) Where repaired or replaced components are isolable within a portion of the system, only that portion need be pressure tested. (d) Where the system hydrostatic test of (b) above imposes system conditions which conflict with limitations included in the plant Technical Specifications, a system inservice test [IWA-5211(c)] at nominal operating temperature shall be acceptable in lieu of the system hydrostatic test. (e) If only disassembly and reassembly of mechanical joints of a component are involved (e.g. bolted flange connection), a system pressure test of IWA-5211(a), (b), or (c) shall be acceptable in lieu of the system hydrostatic test of (b) above."

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic pressure test of Class 2 steam trap piping connected to main steam lines

prior to resumption of service following repairs or replacements per IWA-5214.

Licensee's Proposed Alternative Examination: The Licensee states that, in lieu of performing a hydrostatic pressure test on steam trap piping prior to resumption of service following repairs or replacements, a system leakage test at operating pressure - corresponding to steam generator pressure at 100% power - will be performed in conjunction with a visual examination for leakage. If the repair or replacement involves partial penetration welding of the pressure boundary, such welds shall be surface examined with liquid penetrant or magnetic particle examination techniques. Full penetration welds shall be volumetrically examined. Additionally, a system hydrostatic test per IWC-5222 shall be performed during the next refueling outage.

Licensee's Basis for Requesting Relief: The Licensee states that there are five typical steam trap configurations on each of four main steam lines. Should replacement or repair of this piping and associated valves and steam traps be required, it is highly desirable to do so during power operation so as to maintain good plant material condition, maintain good thermal performance, and to minimize thermal cycling of the unit, including key safety related systems.

The Licensee states that the requirement to perform a hydrostatic test on this piping immediately following repairs or replacements is impractical. During plant operation, such a hydrostatic test has the potential for injecting water into the main steam flow path in the event of valve leakage. The consequences of any such leakage would potentially include damage to the turbine, in the form of increased turbine vibrations and a possible plant trip, or longer term increased potential for corrosion of turbine blading. In lieu of a hydrostatic test utilizing water as a test medium, the system

leakage test will be accomplished using steam for the test medium.

The Licensee states that the planned system leakage test in conjunction with, as required, the welding examinations is sufficient to establish the adequacy of repairs or replacements during normal operation while avoiding potential adverse impacts on plant components. The hydrostatic test per IWC-5222 which shall be performed during the next refueling outage will provide additional assurance of system operability following any repairs or replacements.

Evaluation: This request for relief should not be included in the 10-year interval ISI program plan because hydrostatic testing of the steam trap piping following repairs is not a Code requirement until the repair is necessary. The Licensee has not stated that a repair is needed. Therefore, relief should not be considered.

Conclusions: Based on the above evaluation, it is concluded that the Licensee has not shown that relief is necessary. Therefore, it is recommended that relief be denied.

3.4.3 Class 3 System Pressure Tests

3.4.3.1 Request for Relief 18, Hydrostatic Testing of the Auxiliary Cooling System Supply Header and Discharge Header

Code Requirement: Section XI, Subarticle IWD-5223 requires the system hydrostatic test pressure shall be at least 1.10 times the system pressure for systems with design temperature of 200°F or less, and at least 1.25 times the system pressure for systems with design temperature above 200°F.

Licensee's Code Relief Request: Relief is requested from performing the Code-required system hydrostatic pressure test of the Auxiliary Cooling System supply header and discharge header.

Licensee's Proposed Alternative Examination: The Licensee states that the Auxiliary Cooling System supply header and discharge header shall be tested using an inservice test at nominal operating pressure.

Licensee's Basis for Requesting Relief: The Licensee states that the Auxiliary Cooling System removes heat from various components in all modes of plant operation. Although any redundant component in the system can, and shall be isolated, tested, and repaired, if necessary, without affecting plant safety, the supply and discharge headers, because they are part of a non-redundant single loop system, cannot be isolated long enough for testing. The Licensee further states that there is no time in the life of the plant when these lines can readily be removed from service for the period of time required to perform tests and make repairs, if required.

For example, if repairs were required in the discharge header subsequent to pressure tests and the repair area was located in a pipe tunnel where accessibility is very restricted, the total time required to isolate the header, pressure test it, repair it, retest it, and restore it to service would be prolonged such that design temperature limits of the Spent Fuel Pool may be exceeded. The potential for such a situation will be minimized by substituting inservice tests at nominal operating pressure for hydrostatic tests.

The Licensee states that there is no change anticipated in the overall level of plant safety by performing the proposed alternative examinations. As discussed above, the extent of time required to conduct system hydrostatic tests and perform potential follow-up activities such as repair and retest could potentially impact temperatures in the Spent Fuel Pool. By performing the alternative examinations, the overall level of plant safety will be maintained by precluding such potential temperature increases.

Evaluation: The information that the Licensee has provided shows that the Code-required hydrostatic test of the supply and discharge headers can be performed. The amount of time required to make repairs is not justification for requesting relief from performing the test which will detect the need for repairs.

Conclusions: Based on the above evaluation, it is concluded that the determination of impracticality has not been justified and that requiring the Licensee to perform the Code-required hydrostatic test would not result in hardship. Therefore, it is recommended that relief be denied.

3.4.3.2 Request for Relief 19, Hydrostatic Testing of Class 3 Open Ended Portions of the Service Water System

Code Requirement: Section XI, Paragraph IWD-5223(d) requires that, for open ended portions of discharge lines beyond the last shutoff valve in nonclosed systems (e.g. service water systems), confirmation of adequate flow during system operation shall be acceptable in lieu of system hydrostatic test.

Licensee's Code Relief Request: The Licensee states that the provisions of IWD-5223(d) of Section XI do not clarify the criteria to be used for hydrostatic testing of Class 3 components which take suction from a river. Relief is requested from performing the system hydrostatic test of the open ended portions of the Service Water System suction lines up to the first shutoff valves.

Licensee's Proposed Alternative Examination: The Licensee states that the provisions of IWD-5223(d) of Section XI (80W81) shall be applied to open ended portions of Service Water suction lines up to their first shutoff valves.

Licensee's Basis for Requesting Relief: The Licensee states that, in view of the fact that the 80W81 provisions do not

clarify the criteria to be used for Class 3 components which take suction from a river, the application of the criteria of Paragraph IWD-5223(d) to the open ended portions of the Service Water suction lines up to their first shutoff valves will establish the criteria to be used in this case.

The Licensee states that there is no change anticipated in the overall level of plant safety by performing the proposed alternative examination. The alternative provisions specified in the relief request are simply clarification of the criteria to be used for testing Class 3 system lines which take suction from a river. The Code does not address this particular case, although various other cases are discussed in IWD-5223. The overall level of plant safety will therefore continue to be maintained.

Evaluation: The Code-required system hydrostatic test of the subject portions of the Service Water System suction lines is impractical because they are open ended. The application of the provisions of IWD-5223(d) of Section XI (i.e. confirmation of adequate flow during system operation) to open ended portions of the Service Water suction lines up to their first shutoff valves will provide adequate assurance of the continued structural integrity of the piping.

Conclusions: Based on the above evaluation, it is concluded that the alternative test proposed by the Licensee will ensure an acceptable level of inservice structural integrity. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality or safety. Therefore, it is recommended that relief be granted as requested.

3.4.3.3 Request for Relief 22, Test Pressure Requirement for Hydrostatic Testing of the Diesel Generator Coolers

Code Requirement: Section XI, Article IWD-5000 requires that the system hydrostatic test pressure shall be at least 1.10 times the system pressure for systems with Design Temperature of 200°F or less.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic pressure test of the Diesel Generator Coolers of the Service Water System at a test pressure of at least 1.10 times the system design pressure per IWD-5000.

Licensee's Proposed Alternative Examination: The Licensee states that the Diesel Generator Coolers will be tested at 142 psi in lieu of 165 psig (1.10 times Service Water System design pressure) as specified by IWD-5000.

Licensee's Basis for Requesting Relief: The Licensee states that, in accordance with the manufacturer's operating manual, operation of the equipment is precluded under conditions which exceed component name plate data. In the case of the coolers, maximum permissible pressure is limited to 150 psig. Discussion with the supplier indicated that if this pressure is exceeded, the equipment would potentially be degraded.

To preclude potential equipment degradation, the diesel cooler pressure test will be established at 142 psig (6% less than 150 psig) with the test relief valves set at 150 psig to provide for a test operating range.

The 142 psig test is more than sufficient to demonstrate component integrity because it significantly exceeds normal operating pressure and also exceeds maximum possible pressure - the Service Water pump shutoff head. Specifically, the normal

operating pressure is only 60-80 psig and pump shutoff head is 137 psig.

The Licensee states that there are no changes expected in the overall level of plant safety by performing the proposed alternative examinations. Testing the Diesel Generator Coolers to the Code specified pressure of 165 psig could potentially degrade the equipment. Testing the equipment to 142 psig is sufficient to demonstrate continuing integrity of the cooler, since normal operating pressure is only 60-80 psig. The level of plant safety will therefore continue to be maintained, since potential degradation of equipment will be precluded.

Evaluation: Because the maximum permissible pressure of the Diesel Generator Coolers is limited to 150 psig by the manufacturer's operating manual, the Code-required test pressure of 165 psig is impractical. The coolers will be subjected to a pressure significantly higher than normal operating pressure. Therefore, the Code-required visual examination of the coolers at the alternate test pressure will provide adequate assurance of the continued structural integrity.

Conclusions: Based on the above evaluation, it is concluded that the Code-required test pressure is impractical and that the alternative test proposed by the Licensee will ensure an acceptable level of inservice structural integrity. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.4.4 General

3.4.4.1 Request for Relief 1, Paragraphs IWA-4400(a), "Pressure Test," and IWA-4600, "Replacements"

Code Requirement: Section XI, Paragraph IWA-4400(a), "Pressure Test," states: "After repairs by welding on the pressure retaining boundary, a system hydrostatic test shall be performed in accordance with IWA-5000."

Paragraph IWA-4600, "Replacements," states that the rules and requirements of Article IWA-4000, "Repair Procedures," shall apply to the attaching of replacements (as defined in IWA-7110) to the system where such attachment is by welding.

Licensee's Code Relief Request: Relief is requested from the provisions of IWA-4400(a) and IWA-4600 regarding the performance of system hydrostatic tests after repairs and/or replacements by welding on the pressure retaining boundary.

Licensee's Proposed Alternative Examination: The Licensee states that, in cases where Class 2 or 3 piping cannot be isolated by existing valves or that requires securing safety or relief valves for isolation, the system hydrostatic test required subsequent to repair or replacement of Class 2 and 3 piping may be deferred until the next regularly scheduled system hydrostatic test provided both of the following conditions are met:

(a) Prior to or immediately upon return to service, a visual examination (VT-2) for leakage shall be conducted during a system functional test or during a system inservice test in the repaired or replaced portion of the piping system.

(b) The repair or replacement welds shall be examined in accordance with IWA-4000 and IWA-7000 using volumetric examination methods (IWA-2230) for full penetration welds or surface examination methods (IWA-2220) for partial penetration welds.

Licensee's Basis for Requesting Relief: The Licensee states that ASME Code Case N-416, "Alternate Rules for Hydrostatic Testing of Repair or Replacement of Class 2 Piping," identified the provisions stipulated above as acceptable alternate inspections for assuring the integrity of Class 2 piping following repairs or replacement. The alternative provisions stipulated in Code Case N-416 shall be extended to include Class 3 piping systems since the rationale of substituting examinations during fabrication and leakage tests as alternatives to immediate hydrostatic tests is equally applicable to Class 3 systems.

The requirement to secure safety or relief valves and/or the lack of ability to isolate portions of piping systems make the requirement to perform immediate hydrostatic tests impractical. The deferral of the hydrostatic tests allows for orderly design and implementation of system modifications to support performance of hydrostatic tests subsequent to repairs or replacements. The alternative examinations stipulated above provide increased plant operating flexibility while still assuring the suitable quality of repairs and replacements.

The Licensee states that there is no change anticipated in the overall level of plant safety by performing the proposed alternative examination in lieu of the examination required by Section XI. The reasoning is that the alternative visual examinations conducted during a system inservice or functional test will, in combination with volumetric or surface examinations, provide sufficient assurance of the adequacy of repair or replacements comparable generally to the required visual examinations during system hydrostatic tests. Additionally, the required examinations are simply deferred, not substituted for, for increased operational flexibility.

Evaluation: The deferral of the system hydrostatic test required by the Code for repair or replacement of Class 2

piping that cannot be isolated by existing valves or that requires securing safety or relief valves for isolation is acceptable per ASME Code Case N-416. Code Case N-416 is listed as NRC-approved in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI Division 1" (Reference 14). The rationale of substituting examinations during fabrication and leakage tests as alternatives to immediate hydrostatic tests is equally applicable to Class 3 systems. The alternative examinations proposed by the Licensee will provide adequate assurance of the continued structural integrity of the piping.

Conclusions: Based on the above evaluation, it is concluded that the alternative examinations proposed by the Licensee will ensure an acceptable level of inservice structural integrity. Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.4.4.2 Request for Relief 20, Hydrostatic Testing of Class 1, 2, and 3 Components During Shutdown Only

Code Requirement: Section XI, Paragraph IWA-5211 states, in part:

"The pressure retaining components within each system boundary shall be subject to system pressure tests under which conditions visual examination VT-2 is performed in accordance with IWA-5240 to detect leakages. The required system pressure tests and examinations, as referenced in Table IWA-5210-1, may be conducted in conjunction with one or more of the following system tests or operations: ...(d) a system hydrostatic test conducted during a plant shutdown at a pressure above nominal operating pressure or system pressure for which overpressure protection is provided."

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic tests per IWA-5211(d), during plant shutdown only, of Class 1, 2, and 3 components.

Licensee's Proposed Alternative Examination: The Licensee states that system hydrostatic tests may be conducted either while the plant is in operation or shutdown.

Licensee's Basis for Requesting Relief: The Licensee states that the provisions of IWA-5211(d) stipulate that hydrostatic tests can be performed during plant shutdown only. Greater scheduling flexibility will result if hydrostatic tests are permitted to be performed during plant operation.

Performing hydrostatic tests during plant operation will also provide a reduction in challenges to piping systems. Generally, the pressure variation between atmospheric pressure and test pressure will produce a greater increase in fatigue usage factor and larger thermal stresses than the pressure variation between operating pressure and test pressure. Adherence to Plant Technical Specification requirements will assure proper plant operation during the performance of system hydrostatic tests.

The Licensee states that there is no change anticipated in the overall level of plant safety by performing the required system hydrostatic tests either while the plant is in operation or shut down. Adherence to Plant Technical Specification requirements which govern the plant operation criteria assures maintenance of overall level of plant safety.

In discussing the performance of hydrostatic tests, the Code limits the case to plant shutdowns only since testing of auxiliary systems during plant operation can increase operational flexibility while plant safety is maintained via Technical Specification adherence. It is the Licensee's belief that the Code intended to mean that system hydrostatic tests should be conducted while the particular system tested is not in operation. Limiting the performance of hydrostatic tests to only shutdowns is not overwhelmingly impractical; it is more a

matter of unduly restricting the period of time during which testing could reasonably be done, thereby unnecessarily adding to work required during refueling shutdown periods.

Evaluation: The Licensee has not provided explicit information for specific systems (lines) to justify granting relief. The regulations do not provide for granting generic relief requests. In order to evaluate the effects on the overall plant safety by performing system hydrostatic tests while the plant is in operation, the specific systems (lines) for which relief is being requested would have to be evaluated.

Conclusions: Based on the above evaluation, it is concluded that the information provided by the Licensee is not specific enough to determine if overall plant safety can be maintained during the system hydrostatic tests that would be performed while the plant is in operation. Explicit information would be required in order to evaluate the relief request. Therefore, it is recommended that relief be denied.

3.5 General

3.5.1 Ultrasonic Examination Techniques

3.5.1.1 Request for Relief 2, Weld Preparation and Scanning Methods

Code Requirement: Section XI, Paragraph IWA-2200(b), "Examination Methods," states: "When preparation of a surface for nondestructive examination is required, the preparation shall be by a mechanical method. Such surfaces shall be blended into the surrounding area as may be required to perform the examination. The wall thickness shall not be reduced below the minimum thickness required by design."

Section V, Article 5, Paragraph T-547.2.1, "Surface Preparation of Pipe Weldments," requires: "Surface preparation shall be

performed to the requirements of T-546.2.1." Paragraph T-546.2.1 requires that the base metal on each side of the weld shall be free of weld spatter, surface irregularities, or foreign matter that might interfere with the examination. Where the weld surface interferes with the examination, the weld shall be prepared as needed to permit examination.

Paragraph T-547.2.2.2, "Angle Beam Scanning of Pipe Weldments," requires that angle beam scanning of pipe welds shall be performed according to the requirements of T-546.2.2.3 and T-546.2.2.4. Paragraph T-546.2.2.4, "Angle Beam Scanning for Reflectors Oriented Transverse to the Weld," states:

"The angle beam shall be directed essentially parallel to the weld axis. The search unit shall be manipulated so that the angle beam passes through the required volumes of weld and adjacent base metal specified by the referencing Code Section. The scanning shall be performed at a gain setting at least two times the primary reference level. Evaluation shall be performed with respect to the primary reference level. The search unit shall be rotated 180 deg. and the examination repeated."

Licensee's Code Relief Request: Relief is requested from the provisions of Paragraph IWA-2200(b) of Section XI (80W81) and Paragraphs T-547.2.1, T-547.2.2.2, and T-546.2.2.4 of Section V (1980), Article 5 for the following components:

Class 1 Welds

Code Item Number	Weld Identification	Code Item Number	Weld Identification
B2.11	PZRC1	B9.11	61-2
B2.40	SGC 21-8	B9.11	61-3
B2.40	SGC 22-8	B9.11	61-12
B2.40	SGC 23-8	B9.11	61-13
B2.40	SGC 24-8	B9.11	351-2
B5.40	PZRS2	B9.11	351-3
B5.40	PZRS3	B9.11	352-10
B8.20	PZR IWS-A	B9.11	352-11
B9.11	10-4	B9.11	358-10
B9.11	10-4A	B9.11	358-11
B9.11	10-17		

Class 2 Welds

Code Item Number	Weld Identification	Code Item Number	Weld Identification
C1.10	NRX C1	C5.21	3-22
C1.10	RCF C2	C5.21	3-23
C1.10	SGC 21-3	C5.21	6-10
C1.10	SGC 21-4	C5.21	6-11
C1.10	SGC 21-6	C5.21	7-13
C1.20	NRX C2	C5.21	355-6
C1.20	RCF C1	C5.21	355-7
C1.20	RCF C3	C5.21	355-8
C1.20	SGC 21-1	C5.21	361-26
C1.30	SGC 21-7	C5.21	361-27
C5.11	2-35	C5.21	361-47
C5.11	2-36	C5.21	361-48
C5.21	2-8	C5.21	361-50
C5.21	2-9	C5.21	361-51
C5.21	2-29	C5.21	361-57
C5.21	3-21	C5.21	361-59

Licensee's Proposed Alternative Examination: The Licensee states that, in lieu of preparing the surface of welds for nondestructive examination and of utilizing the techniques stipulated in paragraphs T-547.2.2.2 and T-546.2.2.4, in instances where joint geometry and/or the surface finish of the weld precludes these techniques an alternative ultrasonic technique will be used. This technique places the search unit on the surface adjacent to the weld and directs the sound beam into the material parallel to the weld axis. The search unit is then angled a maximum of 15 degrees towards the weld to direct the beam into the weld material. The transducer is rotated from 0 to 15 degrees towards the weld while moving along the weld edge around the joint, indexing with at least 10 percent overlap. The examination is then repeated in the reverse direction along the same weld edge. Calibration of the technique will be done with the sound beam directed into the material normal to the axis of the calibration reflector.

Licensee's Basis for Requesting Relief: The Licensee states that the Indian Point Station, Unit 2, piping systems were designed and constructed to codes in effect in the late 1960s. These codes did not fully provide for inservice inspection

considerations such as inspection access, weld joint geometry, or weld surface finish which were established in later codes. Examinations as stipulated in paragraphs T-547.2.2.2 and T-546.2.2.4 are impractical to accomplish in some cases. Generally, these limitations exist at pipe-to-fitting welds where, due to the geometry of the fitting, the examination can only be performed from one side. They also exist in instances where the surface finish or the high geometry of the weld crown precludes the placement of the search unit directly on the weld surface. Where these cases exist, the Licensee will use the special technique described above to provide as much inspection coverage as is reasonably achievable. The alternative examination techniques planned to be utilized for inservice examinations are the same techniques approved by the NRC in 1986 for the ISI program used during the first inspection interval. No changes in the welds and adjacent pipe material have been noted. Additionally, the integrity of the piping involved has been generally demonstrated by satisfactory operation since the early 1970s. The overall level of plant safety will therefore be maintained consistent with the original plant design.

Evaluation: The Code-required techniques discussed above are impractical in some cases in that the Indian Point, Unit 2, piping systems were built to codes which did not fully provide for inservice inspection considerations such as inspection access, weld joint geometry, or weld surface finish. The use of the proposed examination technique is a best effort examination and will provide adequate assurance of structural reliability of the piping systems on which the proposed technique is used.

Conclusions: Based on the above evaluation, it is concluded that the Code requirements for the subject welds are impractical and that the proposed examination technique will ensure an acceptable level of inservice structural integrity.

Compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety. Therefore, it is recommended that relief be granted as requested.

3.5.2 Exempted Components (No relief requests)

3.5.3 Other

3.5.3.1 Request for Relief 3, Weld Reference System

Code Requirement: Section XI, Paragraph IWA-2610, "Weld Reference System - General," requires that a reference system shall be established for all welds and areas subject to surface or volumetric examination. Each such weld and area shall be located and identified by a system of reference points. The system shall permit identification of each weld, location of each weld center line, and designation of regular intervals along the length of the weld.

Licensee's Code Relief Request: Relief is requested from establishing a weld reference system for all welds and areas subject to surface or volumetric examination.

Licensee's Proposed Alternative Examination: The Licensee states that datum reference markings will be established in the event that recordable indications are to be reported. Such datum points shall either be marked on the components or have their locations adequately described in inspection documentation so that subsequent relocation can be achieved.

Licensee's Basis for Requesting Relief: The Licensee states that, at the time of construction of Indian Point Station, Unit 2, application of a reference system was not required. Application of such markings to each and every item or area

subject to surface or volumetric examination is deemed impractical for an operating plant. In many instances, no physical access is available to permit such markings. In other instances, exposure levels prohibit their application. These alternate provisions will provide adequate traceability between the areas inspected and inspection results.

Evaluation: For an operating plant, establishing a weld reference system for all welds and areas subject to surface or volumetric examination is a major effort and, in some cases, is prohibited due to inaccessibility and/or high radiation levels. Therefore, the Code requirement for establishing a weld reference system is impractical for an operating plant. However, as inservice examinations are performed, each weld examined should receive the required reference markings.

Conclusions: Based on the above evaluation, it is concluded that the Code requirement is impractical and that compliance with the specific requirements of Section XI would result in hardship or unusual difficulties without a compensating increase in the level of quality or safety. Therefore, it is recommended that relief be granted provided that each weld examined receives the required reference markings as the inservice examinations are performed.

3.5.3.2 Request for Relief 5, Paragraph IWA-6230, "Summary Report Submittal"

Code Requirement: Section XI, Paragraph IWA-6230, "Summary Report Submittal," requires: "Within 90 days of the completion of the inservice inspection conducted during a refueling outage, the Owner shall file inservice inspection summary reports for Class 1 and 2 pressure retaining components and their supports with the enforcement and regulatory authorities having jurisdiction at the plant site."

Licensee's Code Relief Request: Relief is requested from the 90-day provision for Summary Report submittal.

Licensee's Proposed Alternative Examination: The Licensee states that the report submittal will be attempted to be accomplished within the 90 day requirement stipulated in IWA-6230, however, if this time period is not feasible, the report will be submitted as soon as practical after 90 days.

Licensee's Basis for Requesting Relief: The Licensee states that results of previous preservice and inservice examinations indicate that the time required to compile, edit, review, and evaluate the large quantities of documentation involved may preclude meeting the 90-day reporting requirement. If the ISI summary reports cannot be filed with enforcement and regulatory authorities within 90 days after completion of the inservice inspection, they will be submitted as soon as practical after 90 days.

Evaluation: The ASME Code Committee, of which many members are from Licensee companies, has determined that 90 days is a reasonable length of time for submitting Summary Reports. The Licensee should make every effort to meet this deadline.

Conclusions: Based on the above evaluation, it is concluded that the Licensee has not justified the determination that the Code requirement is impractical and that imposing the Code requirement on the Licensee would not result in hardship. Therefore, it is recommended that relief be denied.

4. CONCLUSION

Pursuant to 10 CFR 50.55a(g)(6), it has been determined that certain Section XI required inservice examinations are impractical to perform. In all cases except Requests for Relief 4, 5, 18, 20, 23, and 24, the Licensee has demonstrated that either the proposed alternatives would provide an acceptable level of quality and safety or that compliance with the requirements would result in hardships or unusual difficulties without a compensating increase in the level of quality and safety. For Requests for Relief 4, 5, 18, 20, 23, and 24, it is concluded that: (a) the Licensee has not provided information to support the determination that the Code requirement is impractical and (b) requiring the Licensee to comply with the Code requirement would not result in hardship.

This technical evaluation report has not identified any practical method by which the existing Indian Point Station, Unit 2, can meet all the specific inservice inspection requirements of Section XI of the ASME Code. Requiring compliance with all the exact Section XI required inspections would require redesign of a significant number of plant systems, sufficient replacement components to be obtained, installation of the new components, and a baseline examination of these components. Even after the redesign efforts, complete compliance with the Section XI examination requirements probably could not be achieved. Therefore, it is concluded that the public interest is not served by imposing certain provisions of Section XI of the ASME Code that have been determined to be impractical. Pursuant to 10 CFR 50.55a(g)(6), relief is allowed from these requirements which are impractical to implement.

The development of new or improved examination techniques will continue to be monitored. As improvements in these areas are achieved, the NRC may require that these techniques be incorporated in the next inspection interval ISI program plan examination requirements.

Based on the review of the Indian Point Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan, the Licensee's responses to the NRC's Request for Additional Information, and the recommendations for

granting relief from the ISI examination requirements that have been determined to be impractical, it has been concluded that the Indian Point Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan, with the exception of Requests for Relief 4, 5, 18, 20, 23, and 24, is acceptable and in compliance with 10 CFR 50.55a(g)(4).

5. REFERENCES

1. Code of Federal Regulations, Volume 10, Part 50.

2. American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, Division 1:

   1980 Edition through Winter 1981 Addenda
   1974 Edition through Summer 1975 Addenda

3. Indian Point Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan, submitted September 30, 1985.

4. NUREG-0800, Standard Review Plans, Section 3.6.1, "Plant Design for Protection Against Postulated Piping Failures in Fluid Systems Outside Containment," 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.

5. Letter, dated May 27, 1987, M. M. Slosson (NRC) to M. Selman [Consolidated Edison Company of New York (ConEd)], "Request for Additional Information for Review of the Indian Point Station, Unit 2, Second 10-Year Interval Inservice Inspection Program Plan."

6. Letter, dated February 9, 1988, M. M. Slosson (NRC) to S. B. Bram (ConEd), request for additional information.

7. Letter, dated June 25, 1987, M. Selman (ConEd) to Document Control Desk (NRC), schedule for Licensee's response to the NRC's Request for Additional Information.

8. Letter, dated July 17, 1987, M. Selman (ConEd) to Document Control Desk (NRC), response to Items A through I and P of the NRC's May 27, 1987 Request for Additional Information.

9. Letter, dated September 3, 1987, M. Selman (ConEd) to Document Control Desk (NRC), response to Items J through O of the NRC's May 27, 1987 Request for Additional Information.

10. Letter, dated April 8, 1988, S. B. Bram (ConEd) to NRC, response to the NRC's February 9, 1988 RAI.

11. Letter, dated April 21, 1987, M. Selman (ConEd) to Document Control Desk (NRC), submitting the Indian Point, Unit 2, Reactor Vessel Inservice Inspection Program.

12. Letter, dated April 23, 1987, M. Selman (ConEd) to Document Control Desk (NRC), submitting a supplement to the ISI program adding Relief Request 24 and incorporating Code Case N-356.

13. Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," Revision 1, February 1983.

14. Regulatory Guide 1.147, Revision 5, "Inservice Inspection Code Case Acceptability, ASME Section XI Division 1," August 1986.

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This report presents the results of the evaluation of the Indian Point Station, Unit 2, Second 10-Year Interval Inservice Inspection (ISI) Program Plan, submitted September 30, 1985, including the requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI requirements which the Licensee has determined to be impractical. The Indian Point Station, Unit 2, Second 10-Year Interval ISI Program Plan 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) exclusion criteria, and (d) compliance with ISI-related commitments identified during the Nuclear Regulatory Commission (NRC) previous preservice inspection (PSI) and ISI reviews. The requests for relief from the ASME Code requirements which the Licensee has determined to be impractical for the second 10-year inspection interval are evaluated in Section 3 of this report.

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