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TECHNICAL EVALUATION REPORT

TECHNICAL EVALUATION REPORT ON THE FIRST 10-YEAR INTERVAL INSERVICE INSPECTION RELIEF REQUESTS: NIAGARA MOHAWK POWER CORPORATION, NINE MILE POINT NUCLEAR STATION, UNIT 1, DOCKET NUMBER 50-220

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Prepared for the
U.S. NUCLEAR REGULATORY COMMISSION

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ABSTRACT

This report presents the results of the evaluation of the Nine Mile Point Nuclear Station, Unit 1, inservice inspection (ISI) 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 for the first 10-year inspection interval.

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Operating Reactor Licensing Issues Program,
Review of ISI for ASME Code Class 1, 2, and 3 Components

SUMMARY

On April 1, 1987, the Licensee, Niagara Mohawk Power Corporation, submitted requests for relief from the ASME Code Section XI requirements which the Licensee has determined to be impractical for the first 10-year inspection interval. The available information in that submittal was reviewed. As a result of the review, a request for additional information was prepared describing the information and/or clarifications required from the Licensee in order to complete the review. The requested information and revised and additional relief requests were provided by the Licensee in letters dated March 15, 1988, September 30, 1988, December 23, 1988, February 24, 1989, and April 12, 1989.

Based on the review of the Licensee's relief requests and responses to the NRC request for additional information, it is concluded that the Licensee has demonstrated that specific Section XI requirements are impractical in all cases except Requests for Relief PSIRR2 (in part), 1IIRR6, and 1IIRR8A.

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1. INTRODUCTION

On April 1, 1987 (Reference 1), the Licensee, Niagara Mohawk Power Corporation, submitted requests for relief from the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI (Reference 2) requirements which the Licensee has determined to be impractical for the first 10-year inspection interval which ended June 1986.

As required by 10 CFR 50.55a(g)(5) (Reference 3), 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 available information in the Licensee's submittal was reviewed. In a letter dated December 15, 1987 (Reference 4), the NRC requested additional information that was required from the Licensee in order to complete the review of the first 10-year interval ISI relief requests. The requested information and revised and additional relief requests were provided by the Licensee in letters dated March 15, 1988 (Reference 5), September 30, 1988 (Reference 6), December 23, 1988 (Reference 7), February 24, 1989 (Reference 8), and April 12, 1989 (Reference 9).

The first 10-year interval relief requests are evaluated in Section 2 of this report. Unless otherwise stated, references to the Code in this section refer to the ASME Code, Section XI, 1974 Edition, including Addenda through Summer 1975 (74S75).

2. EVALUATION OF FIRST 10-YEAR INTERVAL RELIEF REQUESTS

Additional requests for relief from the ASME Code requirements which the Licensee has determined to be impractical for the first 10-year inspection interval are evaluated in the following sections. Requests for Relief 1IIRR3, 1IIRR4A, 1IIRR4B, 1IIRR7, 1IIRR13, 1IIRR14, and 1IIRR15 were withdrawn by the Licensee in the September 30, 1988, December 23, 1988, and February 24, 1989 submittals. Request for Relief 1IIRR22 was referenced in the Licensee's February 24, 1989 submittal; however, in a telephone conversation with the Licensee, the Licensee stated that this relief request does not currently exist.

2.1 Class 1 Components

2.1.1 Reactor Pressure Vessel

2.1.1.1 Request for Relief 1IIRR1, Revision 2, Examination Category B-D, Item B1.4, Reactor Pressure Vessel Nozzle-to-Vessel Welds and Nozzle Inside Radius Sections

Code Requirement: Section XI, Tables IWB-2500 and IWB-2600, Examination Category B-D, Item B1.4 requires a 100% volumetric examination of the Reactor Pressure Vessel (RPV) nozzle-to-vessel welds and inside radius sections as defined by Figure IWB-2500D.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume of the following 24 nozzle-to-vessel welds (w) and inside radius sections (r):

Examination Area [Nozzle Description]	Code-required Volume Examined: Inside Radius Section	Weld: Axial	Weld: Circ.	Limitation
RV1-565A(-r,-w) [RR Inlet]	60%	0%	0%	Bottom head, taper of shell thickness
RV1-565B(-r,-w) [RR Inlet]	60%	0%	0%	Bottom head, taper of shell thickness

(continued)

Examination Area [Nozzle Description]	Code-required Volume Examined: Inside Radius Section	Weld: Axial	Weld: Circ.	Limitation
RV1-565C(-r,-w) [RR Inlet]	60%	45%	16%	Bottom head, taper of shell thickness
RV1-565D(-r,-w) [RR Inlet]	60%	0%	0%	Bottom head, taper of shell thickness
RV1-565E(-r,-w) [RR Inlet]	60%	0%	0%	Bottom head, taper of shell thickness
RV1-568-25(-r,-w) [RPV Drain]	0%	0%	0%	CRD&FM housings & penetrations
RV2-566A(-r,-w) [EC System]	55%	28%	23%	Adjacent nozzle, Nonmovable bioshield
RV2-566B(-r,-w) [EC System]	65%	31%	23%	Adjacent nozzle, Nonmovable bioshield
RV2-567A(-r,-w) [CS System]	51%	36%	31%	Adjacent nozzle, Nonmovable bioshield
RV2-567B(-r,-w) [CS System]	33%	17%	31%	Adjacent nozzle, Nonmovable bioshield
RV3-565A(-r,-w) [RR Outlet]	73%	38%	31%	Lug, Adjacent nozzle, Nonmovable bioshield
RV3-565B(-r,-w) [RR Outlet]	73%	38%	31%	Nonmovable bioshield
RV3-565C(-r,-w) [RR Outlet]	54%	16%	26%	Lug, Adjacent nozzle, Nonmovable bioshield
RV3-565D(-r,-w) [RR Outlet]	73%	34%	31%	Nonmovable bioshield
RV3-565E(-r,-w) [RR Outlet]	54%	21%	26%	Lug, Thermocouple, Nonmovable bioshield

(continued)

Examination Area [Nozzle Description]	Code-required Volume Examined: Inside Radius Section	Weld: Axial	Weld: Circ.	Limitation
RV4-566A(-r,-w) [FW System]	90%	34%	24%	Adjacent nozzle, Nonmovable bioshield
RV4-566B(-r,-w) [FW System]	47%	31%	24%	Adjacent nozzle, Nonmovable bioshield
RV4-566C(-r,-w) [FW System]	90%	31%	24%	Adjacent nozzle, Nonmovable bioshield
RV4-566D(-r,-w) [FW System]	59%	31%	24%	Nonmovable bioshield
RV6-566A(-r,-w) [MS System]	54%	25%	21%	Adjacent nozzle, Nonmovable bioshield
RV6-566B(-r,-w) [MS System]	79%	30%	21%	Adjacent nozzle, Nonmovable bioshield
RV6-567(-r,-w) [CRD Return]	48%	34%	31%	Nonmovable bioshield
RV3-566A(-w) [FW System]		99%	82%	Thermocouple
RV3-566C(-w) [FW System]		99%	82%	Thermocouple

Licensee's Proposed Alternative Examination: None. The Licensee states that, in order to augment the partially performed Section XI Code examination, a surface examination of the inside nozzle bore and adjacent radius section was performed in accordance with NUREG-0619 (Reference 10). The nozzles which received a surface examination are RV4-566(A, B, C, & D) and RV6-567.

Licensee's Basis for Requesting Relief: The Licensee states that the nozzle sections listed above were not fully inspected

ultrasonically due to limitations of design. Access to perform nozzle examinations was not provided for in the original design. The vessel's permanent mirror insulation and 7 inch clearance to the biological shield wall prevented inspection. Movable sections in the insulation were subsequently installed. The opening through the movable doors of the biological shield and through the permanent insulation does not provide access for full coverage of the Code-required volume. Extremely long ultrasonic scan paths are required due to the large thickness of the vessel wall and nozzle barrel. The nozzle examination sections on the vessel closure head is restricted due to the curvature of the head and the proximity of the adjacent nozzles. Also, the vessel drain nozzle RV1-568-25 is completely obstructed due to proximity of the Control Rod Drive (CRD) and In-Core Flux Monitor (FM) penetrations. In the 1980 and later editions of Section XI Code, this nozzle is specifically exempted from ISI examinations.

The Licensee states that the performance of additional volumetric examinations to supplement the current weld required volume achieved on certain Main Steam, Recirculation, Core Spray, and Emergency Condenser nozzles would result in an undue radiological burden without a compensating increase in assurance of weld integrity of plant safety.

The percentage of Code-required volume that was completely examined is tabulated above, first for the weld (w) section and next for the inner radius (r) section of the obstructed nozzles. This percentage of examination coverage was determined by averaging the coverage of each scan of the required volume from both sides for the weld and by using a weighted average of such coverage for the inner radius adjacent volume.

The 1983 Edition of ASME Section V, Article IV, Paragraph T-441.5, requires two-directional coverage

wherever feasible. Areas not covered in two directions shall be documented. With the above information, the examination of the nozzle weld area has been considered complete when scanned by two different angles (i.e., 45° and 60°). In addition, the adjacent base material has been considered as examined per the Code when scanned from one direction with two angle beam coverage as permitted by ASME Section V, Article IV, Paragraph T-441.5.1.

Radiation considerations are a basis for relief from performing supplemental examinations on the reactor pressure vessel nozzles. These additional examinations could result in additional personnel exposure in excess of 40 man-rems.

Evaluation: The volumetric examination of the subject welds and inner radius sections is impractical to perform to the extent required by the Code because of the obstructions listed above. The limited Section XI volumetric examination of the subject welds and nozzle inner radius sections, along with the Code-required hydrostatic test, provides reasonable assurance of the continued inservice structural integrity.

The Licensee reported in the April 12, 1989 submittal that, during the current refueling outage, an extensive review and evaluation of examinations needed to meet first interval ISI Program Plan requirements was performed. From this review, the Licensee determined that it is physically possible to achieve greater coverage of the required weld volume of the subject nozzles than previously stated in Relief Request 1IIRR1, Revision 1, dated February 24, 1989.

With the transmittal of Revision 2 of Relief Request 1IIRR1, the Licensee has amended the relief request to reflect this new information and to request further relief from performing these supplemental examinations.

The Licensee's ability to obtain added Code coverage stems from changes in volumetric examination practices. During previous outages, each RPV nozzle was subjected to a standard battery of examinations. The Licensee now takes into consideration the unique configuration and obstructions associated with each nozzle examination in order to obtain greater coverage of the required weld volume.

However, the Licensee has estimated that the exposure for completing the additional examinations would be in excess of 40 man-rem and that the work schedule for completing these additional examinations would take approximately 21 days of critical path time. Therefore, the Licensee proposes not to perform these additional examinations for the first 10-year inspection interval. Application of the additional volumetric examinations for the second 10-year inspection interval will be addressed in a separate submittal by the Licensee.

Although the obstructions listed above are consistent with those of other plants of similar design, the percentages of volumetric coverage reported by the Licensee are less. As stated above, the Licensee has determined that a greater percentage of the Code-required volume can be examined. Therefore, for successive inspection intervals, the Licensee should be required to examine a larger percentage of each of the subject welds and nozzle inside radius sections. The development of new or improved examination techniques should continue to be monitored by the Licensee. As improvements in these areas are achieved, the Licensee should incorporate these techniques in the ISI program plan examination requirements.

Conclusions: Based on the above evaluation, it is concluded that the volumetric examination is impractical to perform to the extent required by the Code. Therefore, it is recommended that relief be granted as requested.

2.1.1.2 Request for Relief 1IIRR2, Revision 1, Examination Category B-O, Item B1.18, Pressure Retaining Welds in Control Rod Drive Housings

Code Requirement: Section XI, Tables IWB-2500 and IWB-2600, Examination Category B-O, Item B1.18 requires a 100% volumetric examination of 10% of peripheral CRD housings. The area shall include the weld metal and base metal for one wall thickness beyond the edge of the weld.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume of 10% (equal to four) of the peripheral CRD housings. The housing welds which were partially ultrasonically examined are:

RV-CRD-R1
RV-CRD-S1
RV-CRD-T3
RV-CRD-U2

Licensee's Proposed Alternative Examination: The Licensee states that 50% of eight of the peripheral control rod drive housings would be volumetrically examined. This will result in an equivalent weld length being examined thereby meeting the intent of the Code requirement. The four additional housings being examined are:

RV-CRD-S3
RV-CRD-T7
RV-CRD-R5
RV-CRD-U6

Licensee's Basis for Requesting Relief: The Licensee states that the subject welds were not fully inspected ultrasonically due to limitations of design. The ultrasonic coverage of each of the four CRD housing welds is estimated to be 50% of the Code-required volume. A sector of approximately 180 degrees of each housing circumference is obstructed by adjacent housings and their hydraulic lines.

Evaluation: The volumetric examination of the subject welds is impractical to perform to the extent required by the Code because the welds are obstructed by the adjacent CRD housings and hydraulic lines. Although the Code requirement for these welds was not met during the first 10-year interval (which ended June 1986), the intent of the Code will be met by examining 50% of four additional CRD housing welds as committed to by the Licensee in the September 30, 1988 submittal.

The Licensee should be reminded that the examinations performed during the 1988 refueling outage to satisfy first 10-year inspection interval (which ended June 1986) requirements cannot be credited toward the examination requirements for the second 10-year interval.

Conclusions: Based on the above evaluation, it is concluded that the specific Code requirement is impractical for the CRD housing welds and that the Licensee's proposed alternative examination will meet the intent of the Code requirement. Therefore, it is recommended that relief be granted as requested.

2.1.1.3 Request for Relief 1IIRR17, Examination Category B-H, Item B1.12, Reactor Pressure Vessel Integrally Welded Supports

Code Requirement: Section XI, Tables IWB-2500 and IWB-2600, Examination Category B-H, Item B1.12 requires a 100% volumetric examination of at least 10% of the circumference of the reactor pressure vessel-to-skirt weld. The areas shall include the welds to the vessel and the base metal beneath the weld zone and along the support attachment member for a distance of two support thicknesses.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the reactor pressure vessel skirt integral attachment weld.

Licensee's Proposed Alternative Examination: None. The Licensee states that a surface examination of the outer surface was performed in accordance with the 1980 Edition, Winter 1981 Addenda (80W81) of ASME Code Section XI. The required leakage and hydrostatic tests were also performed.

Licensee's Basis for Requesting Relief: The RPV-to-skirt weld was not inspected ultrasonically due to limitations of design and geometry. The support skirt forging knuckle has non-parallel surfaces and no physical access to the inner surface. This geometry and design preclude meaningful ultrasonic examination. Surface examination of the inner surface or radiographic examination, as an alternative method, are not possible due to the same conditions which preclude ultrasonic examination.

Evaluation: The Licensee's submittal has been reviewed, including the sketch which shows the examination limitations. Based on the design of the support skirt attachment, the Code-required volumetric examination of the subject weld is impractical to perform. The Licensee's proposed alternative surface examination of the outer surface of the weld provides reasonable assurance of the continued inservice structural integrity of the weld. The remainder of the weld is inaccessible for surface examination.

Conclusions: Based on the above evaluation, it is concluded that the volumetric examination of the RPV skirt integral attachment weld is impractical to perform. Therefore, it is recommended that relief be granted as requested.

2.1.1.4 Request for Relief E-2, Revision 1, Examination Category B-B, Item B1.2, Pressure Retaining Welds in the Reactor Pressure Vessel

NOTE: Relief is requested from 100% volumetric examination of the required lengths of the circumferential and longitudinal

shell welds (other than those in Examination Category B-A) and meridional and circumferential head welds (other than those in Examination Category B-C). This request for relief was previously granted in the September 19, 1983 Safety Evaluation Report (Reference 11) based on access restrictions. However, since that date, the Licensee has determined that some additional access is possible due to removal of insulation and, therefore, has revised this request for relief to include examination of the additional accessible lengths of welds. Since the Licensee has revised this request for relief to include additional volumetric examinations and is not requesting additional relief for the subject welds, it is recommended that the disposition of this relief request remain unchanged and relief be granted as requested.

2.1.1.5 Request for Relief E-4, Revision 1, Examination Category B-G-1, Item B1.8, Reactor Pressure Vessel Closure Studs and Nuts

NOTE: Relief is requested from the Code-required surface examination of the RPV studs and nuts. This request for relief was previously granted in the September 19, 1983 Safety Evaluation Report based on the Parkerization of the studs and nuts which interferes with a liquid penetrant surface examination. However, the Licensee has since determined that a magnetic particle examination is capable of yielding meaningful results. The internal threads of the nuts, however, are not accessible for magnetic particle examination. Therefore, the Licensee now requests relief from performing the Code-required surface examination of only the threaded portions of the nuts inspected after 1984.

The Licensee states that the accessible portions of the RPV closure studs and nuts will receive a magnetic particle surface examination. The threaded sections of the nuts will receive an ultrasonic examination. Since the Licensee has revised this request for relief to include additional surface examinations

and is not requesting additional relief, it is recommended that the disposition of this relief request remain unchanged and relief be granted as requested.

2.1.2 Pressurizer (Does not apply to BWRs)

2.1.3 Heat Exchangers (No relief requests)

2.1.4 Piping Pressure Boundary

2.1.4.1 Request for Relief 1IIRR6, Examination Category B-F, Item B5.130, Dissimilar Metal Welds in Class 1 Piping

Code Requirement: Section XI, 80W81, Table IWB-2500-1, Examination Category B-F, Item B5.130 requires a 100% volumetric and surface examination of the dissimilar metal butt welds, nominal pipe size greater than or equal to 4 inches, as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric and surface examination of elbow-to-pipe weld 33-FW-RCU-10-2A.

Licensee's Proposed Alternative Examination: None. The Licensee states that the Code-required leakage, hydrostatic, and other pressure tests (as applicable) were conducted.

Licensee's Basis for Requesting Relief: The Licensee states that elbow-to-pipe weld 33-FW-RCU-10-2A was not inspected because the weld is located inside a containment penetration and is completely inaccessible.

Evaluation: The information in the Licensee's relief request does not agree with isometric drawing No. 1157-1 of the ISI Program Plan. Isometric drawing No. 1157-1 shows that weld 33-FW-RCU-10-2A is not located inside a containment

penetration and is accessible for surface and volumetric examinations. The Licensee has not provided information to show otherwise. Because of the conflicting information, relief should not be considered.

Conclusions: Based on the above evaluation, it is concluded that the Licensee has not shown that the subject weld is inaccessible for the Code-required surface and volumetric examinations. Therefore, it is recommended that relief be denied.

2.1.4.2 Request for Relief 1IIRR7, Revision 1, Examination Category B-J, Item B9.11, Pressure Retaining Circumferential Welds in Class 1 Piping

NOTE: This request for relief was withdrawn by the Licensee in the February 24, 1989 submittal. In that submittal, the Licensee stated that the required volume was examined during the 1988/89 refueling outage.

The Licensee should be reminded that the examinations performed during the 1988 refueling outage to satisfy the first 10-year inspection interval (which ended June 1986) requirements cannot be credited toward the examination requirements for the second 10-year interval.

2.1.4.3 Request for Relief 1IIRR11, Revision 2, Augmented Examination of Class 1 Piping Welds

Augmented Examination Requirement: NUREG-0313, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping," (Reference 12) requires augmented examination of nonconforming service sensitive Class 1 piping welds. The method of examination and volume of material to be examined, the allowable indication standards, and examination procedures should comply with the requirements

set forth in the applicable Edition and Addenda of the ASME Code, Section XI, specified in Paragraph (g), "Inservice Inspection Requirements," of 10 CFR 50.55a, "Codes and Standards."

Section XI, Table IWB-2500-1, Examination Category B-J, Items B9.11 and B9.12 require both 100% surface and volumetric examinations of Class 1 circumferential and longitudinal piping welds, nominal pipe size 4 inches and greater, as defined by Figure IWB-2500-8. Item B9.21 requires a 100% surface examination of Class 1 circumferential piping welds, nominal pipe size less than 4 inches, as defined by Figure IWB-2500-8.

Licensee's Augmented Examination Relief Request: Relief is requested from performing 100% of the augmented ultrasonic and/or surface examination of 19 of the scheduled nonconforming service sensitive piping welds. Relief is requested for the following welds:

RPV Head Spray and Vent System

Examination Area (Description)	Req'd Method	Extent Examined	Limitation
P-34-FW-17 (Valve-to-Pipe)	PT	None	Inaccessible inside Penetration
P-34-SW-2 (Reducer-to-Flange)	UT&PT	ID Surf. Exam.	Fitting configuration
P-NES-37-51 (Reducer-to-Flange)	UT&PT	ID Surf. Exam.	Fitting configuration

Shutdown Cooling System

Examination Area (Description)	Req'd Method	Extent Examined	Limitation
38-FW-4-D (Pipe Seam)	UT&PT	50%vol.	Inaccessible at Penetration
38-FW-22 (Pipe-to-Pipe)	UT&PT	86.9%vol.	Inaccessible at Penetration
38-FW-22-U (Pipe Seam)	UT&PT	None	Inaccessible inside Penetration

Core Spray System

Examination Area (Description)	Req'd Method	Extent Examined	Limitation
40-FW-16 (Valve-to-Pipe)	UT&PT	None	Inaccessible inside Penetration
40-FW-16-D (Pipe Seam)	UT&PT	None	Inaccessible Inside Penetration
40-FW-30 (Valve-to-Pipe)	UT&PT	None	Inaccessible inside Penetration
40-FW-34 (Valve-to-Pipe)	UT&PT	58%vol.	Fitting Configuration
40-FW-34A (Pipe-to-Elbow)	UT&PT	85%surf. 58%vol.	Permanent Hanger Interference
40-FW-55 (Pipe-to-Pipe)	UT&PT	82%vol.	Permanent Hanger Interference
40-SW-36C1 (Pipe-to-Pipe)	UT&PT	80%vol.	Fitting Configuration
40-SW-37A (Elbow-to-Pipe)	UT&PT	None	Inaccessible at Penetration
40-SW-37A-U (Pipe Seam)	UT&PT	None	Inaccessible Inside Penetration
40-SW-39E (Pipe-to-Elbow)	UT&PT	88%surf. 89%vol.	Obstructed by Snubber Attachment
40-SW-40E-D (Pipe Seam)	UT&PT	75%surf.	Obstructed by Adjacent Piping
40-SW-46A (Pipe-to-Pipe)	UT&PT	83%vol.	Inaccessible at Penetration
40-SW-46A-U (Pipe Seam)	UT&PT	None	Inaccessible at Penetration

Licensee's Proposed Alternative Examination: None. The Licensee states that the accessible areas of the subject welds received the required volumetric and surface examinations.

The Licensee states that the inner surfaces of two welds, P-34-SW-2 and P-NES-37-51, were examined by the dye penetrant method. Based on lessons learned at other nuclear facilities,

if IGSCC cracking were present in these weld areas, then dye penetrant tests would detect the flaws. It is the Licensee's opinion that the dye penetrant tests of the inside surfaces of these two welds is an acceptable alternative examination for the required volumetric inspection.

Licensee's Basis for Requesting Relief: The Licensee states that the subject welds were not fully inspected by ultrasonic and/or surface methods due to limitations of design, geometry, and material of construction.

The dendritic weld structure of the stainless steel material can result in both sound redirection and attenuation phenomena which limit ultrasonic interrogation. Thus, such welds necessitate examination from both sides in order to be fully examined. In particular, non-parallel surfaces and product form of the material of valves preclude meaningful ultrasonic examination from the valve side.

Four stainless steel welds were limited by fitting configuration, three primarily by permanent attachment to the piping, 11 by containment penetrations, and one by adjacent piping. The percentages of Code-required area and volume that were completely examined are listed in the table above.

Per NUREG-0313, the Core Spray System piping at Nine Mile Point, Unit 1, is defined as nonconforming service sensitive; therefore, the extent and frequency of examination is 100% of welds every refueling outage. Other system welds that were selected for this augmented examination program were also examined each outage and, thus, had been more frequently inspected than required by NUREG-0313.

Evaluation: The Licensee originally requested relief for 64 welds but that number was decreased to 19 welds in the Licensee's February 24, 1989 submittal. The volumetric and

surface examinations of the subject welds are impractical to perform to the extent required by the Code and NUREG-0313 because of the limitations listed above. The limited augmented examinations provide reasonable assurance of the continued inservice structural integrity of the subject welds. Because other similar welds received the augmented surface and volumetric examinations, the integrity of the subject welds was verified by sampling.

The Licensee should continue to monitor the development of new or improved examination techniques. As improvements in these areas are achieved, the Licensee should incorporate these techniques in the ISI program plan examination requirements.

Conclusions: Based on the above evaluation, it is concluded that the volumetric and/or surface examinations of the subject welds are impractical to perform to the extent required by NUREG-0313 and Section XI. Therefore, it is recommended that relief be granted as requested.

2.1.4.4 Request for Relief PSIRR1, Examination Category B-F, Item B5.130, Dissimilar Metal Welds in Class 1 Piping, and Examination Category B-J, Item B9.11, Pressure Retaining Circumferential Welds in Class 1 Piping

Code Requirement: Section XI, 80W81, Table IWB-2500-1, Examination Category B-F, Item B5.130 requires both 100% volumetric and surface examinations of the dissimilar metal butt welds, nominal pipe size greater than or equal to 4 inches, as defined by Figure IWB-2500-8. Examination Category B-J, Item B9.11 requires both 100% surface and volumetric examinations of circumferential welds, nominal pipe size greater than or equal to 4 inches, as defined by Figure IWB-2500-8.

Paragraph IWB-2200(c) requires examination of all replaced components.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required area and/or volume of the following pressure retaining welds replaced in the 1986 refueling outage:

Emergency Cooling System

Exam. Area (Description)	Code Category	Extent Examined	Limitation
39-FW-4043-016 (pipe-to-valve)	B-J	58%vol. 100%surf.	Fitting configuration
39-FW-4043-017 (valve-to-valve)	B-J	No UT 100%surf.	Fitting configuration
39-FW-4043-030 (pipe-to-valve)	B-J	58%vol. 100%surf.	Fitting configuration
39-FW-4043-031 (valve-to-valve)	B-J	No UT 100%surf.	Fitting configuration

Reactor Water Clean-Up

Exam. Area (Description)	Code Category	Extent Examined	Limitation
33-FW-0261-01 (pipe-to-valve)	B-J	62%vol. 100%surf.	Fitting configuration
33-FW-0261-02 (valve-to-pipe)	B-J	62%vol. 100%surf.	Fitting configuration
33-FW-0261-06 (pipe-to-valve)	B-J	62%vol. 100%surf.	Fitting configuration
33-FW-0261-04 (pipe-to-pipe)	B-F	90%vol. 90%surf.	Permanent hanger attachment

Licensee's Proposed Alternative Examination: The Licensee states that all replacement piping welds were examined by radiography in accordance with Section III of the ASME Code. The required surface examination was performed on all accessible welds, along with the required leakage and hydrostatic tests.

Licensee's Basis for Requesting Relief: The Licensee states that the subject welds were not fully inspected due to limitations of design, geometry, and material of construction. The dendritic weld structure of the stainless steel material can result in both sound redirection and attenuation phenomena which limit ultrasonic interrogation. Thus, such welds necessitate examination from both sides in order to be fully examined. In particular, non-parallel surfaces and product form of the material of valves preclude meaningful ultrasonic examination from the valve side. Ultrasonic examination of seven stainless steel welds was limited by fitting configuration, and examination of one stainless steel weld for ultrasonic and surface methods was limited by permanent attachment to the piping. The percentage of Code-required volume that was completely examined is listed in the table above, along with the nature of the obstruction.

Evaluation: The surface and volumetric examinations of the subject welds are impractical to perform to the extent required by the Code because of the limitations listed above. An acceptable percentage of the Code-required examinations has been performed. The seven Examination Category B-J welds received the full Code-required surface examination, five of which also received a significant percentage of the Code-required volumetric examination. The Examination Category B-F weld received approximately 90% of the Code-required surface and volumetric examinations. The limited Section XI surface and volumetric examinations, in conjunction with the Section III examinations of the replaced welds, provide reasonable assurance of the continued inservice structural integrity of the subject welds.

Conclusions: Based on the above evaluation, it is concluded that the volumetric and surface examinations of the subject welds are impractical to perform to the extent required by the Code. Therefore, it is recommended that relief be granted as requested.

2.1.4.5 Request for Relief PSIRR2, Class 1 Pressure Retaining Piping Welds Altered by Induction Heating for Stress Improvement

Code Requirement: Section XI, 80W81, Table IWB-2500-1, Examination Category B-J, Item B9.11 requires both 100% surface and volumetric examinations of circumferential welds, nominal pipe size greater than or equal to 4 inches, as defined by Figure IWB-2500-8. Paragraph IWB-2200(c) requires examination of altered components.

Licensee's Code Relief Request: Relief is requested from performing the Section XI surface examination on the 25 Class 1 piping welds in the Reactor Recirculation System which were altered during the first inspection interval by Induction Heating for Stress Improvement (IHSI) and from examining 100% of the Code-required volume of the following six of the 25 altered welds:

Exam. Area (Description)	Extent Examined	Limitation
32-FW-12S-5 (Valve-to-pipe)	58%	Fitting config., material
32-FW-13S-5 (Valve-to-pipe)	58%	Fitting config., material
32-FW-13D-6 (Pipe-to-valve)	58%	Fitting config., material
32-FW-14D-6 (Pipe-to-valve)	58%	Fitting config., material
32-FW-15D-3 (Tee-to-elbow)	62%	Fitting config., material
32-FW-15S-4 (Tee-to-pipe)	58%	Fitting config., material

Licensee's Proposed Alternative Examination: None. The Licensee states that the Code-required leakage and hydrostatic tests were performed.

Licensee's Basis for Requesting Relief: The Licensee states that the welds receiving IHSI were volumetrically examined. Alterations in the microstructure of the welds affected are not likely to be detected by surface examination. Heat treatment in accordance with acceptable procedures typically do not alter macroscopic features detectable by surface examination. The six welds listed above were not fully inspected volumetrically due to limitations of design, geometry, and/or material of construction. The dendritic structure of the stainless steel material of these welds can result in both sound redirection and attenuation phenomena which limit ultrasonic interrogation. Therefore, the welds necessitate examination from both sides in order to be fully examined.

Evaluation: The volumetric examination of the six welds listed above is impractical to perform to the extent required by the Code because of the limitations stated above. An acceptable percentage of the volumetric examination has been performed. The remainder is inaccessible for volumetric examination. Because the remaining 19 welds received the volumetric examination, the integrity of the subject welds was verified by sampling.

However, with regard to the surface examination of the subject 25 altered welds, the Licensee has not demonstrated that the Code-required surface examination is impractical to perform. Relief cannot be granted just because the Code-required examination is inconvenient to perform.

Conclusions: Based on the above evaluation, it is concluded that the volumetric examination of the six welds listed above is impractical to perform to the extent required by the Code.

It is further concluded that the Licensee has not demonstrated impracticality for surface examination of the 25 altered welds.

Therefore, the following is recommended: (a) relief should be granted for volumetric examination of the six welds listed above, and (b) relief should be denied for surface examination of all 25 of the altered welds.

2.1.5 Pump Pressure Boundary

2.1.5.1 Request for Relief 1IIRR3, Revision 2, Examination Category B-L-1, Item B5.6, Pressure Retaining Welds in Reactor Recirculation Pump Casings

NOTE: This request for relief was withdrawn by the Licensee in the September 30, 1988 submittal and revised in the December 23, 1988 submittal. In the December 23, 1988 submittal, the Licensee stated the following:

> *"Relief was requested from performing the volumetric examination of the core closure welds in the cast pump body. Paragraph IWA-2500, initially included in the Summer 1976 Addenda to ASME Section XI and all subsequent editions, including the Winter 1981 addenda, clarifies that core closure welds do not require examination."*

2.1.6 Valve Pressure Boundary

2.1.6.1 Request for Relief 1IIRR4A, Revision 1, Examination Category B-M-2, Item B6.7, Internal Pressure Boundary Surfaces of Class 1 Valve Bodies

NOTE: This request for relief was withdrawn by the Licensee in the September 30, 1988 submittal. In this submittal, the Licensee stated that the Code-required examination was completed during the 1988 refueling outage.

The Licensee should be reminded that the examinations performed during the 1988 refueling outage to satisfy the first 10-year inspection interval (which ended June 1986) requirements cannot

be credited toward the examination requirements for the second 10-year interval.

2.1.6.2 Request for Relief 1IIRR4B, Revision 1, Examination Category B-M-2, Item B6.7, Internal Pressure Boundary Surfaces of Class 1 Valve Bodies

NOTE: This request for relief was withdrawn by the Licensee in the September 30, 1988 submittal. In this submittal, the Licensee stated that the Code-required examination was completed during the 1988 refueling outage.

The Licensee should be reminded that the examinations performed during the 1988 refueling outage to satisfy the first 10-year inspection interval (which ended June 1986) requirements cannot be credited toward the examination requirements for the second 10-year interval.

2.1.6.3 Request for Relief 1IIRR5, Revision 2, Examination Category B-K-1, Item B10.30, Integral Attachments for Class 1 Valves

Code Requirement: Section XI, 80W81, Table IWB-2500-1, Examination Category B-K-1, Item B10.30 requires a 100% surface or volumetric examination, as applicable, of the integrally welded attachments of valves as defined by Figures IWB-2500-13, -14, and -15.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required surface of the following valve integrally welded attachments:

01-03-SW-1	38-12-SW-1
01-04-SW-1	40-02-SW-1
33-03-SW-1	40-12-SW-1
33-04-SW-1	42.1-03-SW-1
38-02-SW-1	301-112-SW-1

Licensee's Proposed Alternative Examination: None. These welds received the Code-required surface examination to the maximum extent possible (50%).

Licensee's Basis for Requesting Relief: The Licensee states that the subject welds could not receive the Code-required examination due to limitations of design. One side of the weld is inside a containment penetration; therefore, only 50% of the Code-required area was examined by the surface method.

Evaluation: The surface examination of the subject welds is impractical to perform to the extent required by the Code because half of each of the welds is inside a containment penetration as shown in the drawing included in the Licensee's February 24, 1989 submittal. The limited Section XI surface examination of these welds provides reasonable assurance of the continued inservice structural integrity.

Conclusions: Based on the above evaluation, it is concluded that the surface examination of the subject welded attachments is impractical to perform to the extent required by the Code. Therefore, it is recommended that relief be granted as requested.

2.1.7 General (No relief requests)

2.2 Class 2 Components

2.2.1 Pressure Vessels

2.2.1.1 Request for Relief 1IIRR8A, Examination Category C-A, Item C1.1, Feedwater Heat Exchanger Circumferential Welds

Code Requirement: Section XI, Tables IWC-2520 and IWC-2600, Examination Category C-A, Item C1.1 requires a 100% volumetric examination of the shell and head circumferential welds which

are gross structural discontinuities. This includes weld metal and base metal for one plate thickness beyond the edge of the weld joint.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the following two feedwater heat exchanger circumferential welds:

Exam. Area (Description)	Limitations
HX-30-06-Dome (Dome-to-tubesheet)	Tube plate, 2 lifting lugs, 2 pulling lugs, support saddle & two 16-in. dia. nozzles
HX-51-12-Dome (Dome-to-tubesheet)	Tube plate, 2 lifting lugs, 2 pulling lugs, support saddle & two 16-in. dia. nozzles

Licensee's Proposed Alternative Examination: None. The Licensee states that the required hydrostatic and pressure tests were performed.

Licensee's Basis for Requesting Relief: The Licensee states that the subject welds were not inspected due to limitations of design and geometry. Access to perform in-place vessel ultrasonic examinations was not provided for in the original design. The feedwater heat exchanger (heater) dome-to-tubesheet welds were not examined ultrasonically due to numerous attachments which would obstruct significant portions of the scan paths. Moreover, the geometry of the weld joint (i.e., shell curvature and weld end preparation) limits examination coverage. To produce a specific calibration standard and develop unique ultrasonic techniques in order to examine only partially the required welds would be an undue hardship. These efforts would not result in a compensating increase in assurance of weld integrity.

Evaluation: Any portions of the subject welds that are accessible for examination should be examined. The Licensee

has not provided an estimate of the percentage of the Code-required volume that is accessible for examination. However, in the March 15, 1988 submittal, the Licensee stated that, during the 1988 refueling outage, detailed data would be taken for each weld and that this information will be provided in a revised relief request.

With regard to the calibration standard(s), the Licensee has had a sufficient amount of time to obtain the proper calibration standard(s) for use during the inservice ultrasonic examinations.

Conclusions: Based on the above evaluation, it is concluded that the Licensee should perform at least a partial examination of the subject welds. Therefore, it is recommended that relief be denied.

2.2.1.2 Request for Relief 1IIRR8B, Examination Category C-B, Item C1.2, Feedwater Heat Exchanger Nozzle Welds

Code Requirement: Section XI, Tables IWC-2520 and IWC-2600, Examination Category C-B, Item C1.2 requires a 100% volumetric examination of nozzle-to-vessel attachment welds.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the following four Feedwater heat exchanger nozzle-to-vessel welds:

Exam. Area (Description)	Limitation
HX-30-06-IN (Nozzle-to-dome)	Fillet weld config., 3/4" NPS socket weld, 1 1/2" NPS socket weld
HX-30-06-ON (Nozzle-to-dome)	Fillet weld config., 3/4" NPS socket weld, 1 1/2" NPS socket weld
HX-51-12-IN (Nozzle-to-dome)	Fillet weld config., 3/4" NPS socket weld, 1 1/2" NPS socket weld
HX-51-12-ON (Nozzle-to-dome)	Fillet weld config., 3/4" NPS socket weld, 1 1/2" NPS socket weld

Licensee's Proposed Alternative Examination: None. The Licensee states that baseline magnetic particle examinations for the second inspection interval requirements were performed on the four nozzle welds.

Licensee's Basis for Requesting Relief: The Licensee states that the subject welds were not inspected due to limitations of design and geometry of the partial penetration weld joint. Access to perform in-place vessel ultrasonic examinations was not provided for in the original design. Calcium silicate insulation was excavated to gain access for surface examination. Also, 3/4-inch and 1 1/2-inch nominal pipe size attachments would obstruct significant portions of the scan paths. To excavate additional insulation, produce a specific calibration standard, and develop unique ultrasonic techniques in order to examine only partially the required welds would be an undue hardship. These efforts would not result in a compensating increase in assurance of weld integrity.

Evaluation: Based on the design of the heat exchanger nozzles in the Feedwater system, the required volumetric examination of the subject welds is impractical to perform. These welds are not full penetration welds and, therefore, are not amenable to ultrasonic examination. The surface examination performed by the Licensee provides reasonable assurance of the inservice structural integrity.

Conclusions: Based on the above evaluation, it is concluded that the Code-required volumetric examination is impractical to perform. Therefore, it is recommended that relief be granted as requested.

2.2.2 Piping

2.2.2.1 Request for Relief 1IIRR9, Revision 2, Examination Category C-F, Items C5.11 and C5.21, Pressure Retaining Welds in Class 2 Piping

Code Requirement: Section XI, 80W81, Table IWC-2500-1, Examination Category C-F, Item C5.11 requires a 100% surface examination of the circumferential piping welds, less than or equal to 1/2-inch nominal wall thickness, as defined by Figure IWC-2500-7. Item C5.21 requires both 100% surface and volumetric examinations of the circumferential piping welds, greater than 1/2-inch nominal wall thickness, as defined by Figure IWC-2500-7.

Licensee's Code Relief Request: Relief is requested from examining 100% of the Code-required volume or surface of the following seven piping welds:

Feedwater System

Weld Number (Description)	Code Item No.	Extent Examined	
29-FW-14 (Valve-to-elbow)	C5.21	100%surf.	83%vol.
29-FW-30 (Pipe-to-valve)	C5.21	100%surf.	83%vol.
30-FW-13 (Valve-to-pipe)	C5.21	100%surf.	83%vol.
30-FW-14 (Tee-to-valve)	C5.21	100%surf.	66%vol.
30-FW-28 (Elbow-to-valve)	C5.21	100%surf.	83%vol.
51-FW-1 (Pump nozzle-to-pipe)	C5.11	88%surf.	

Main Steam System

Weld Number (Description)	Code Item No.	Extent Examined	
03-SW-7A (Pipe-to-tee)	C5.21	100%surf.	83%vol.

Licensee's Proposed Alternative Examination: None. The accessible portions of all of the subject welds received the required volumetric and/or surface examination.

Licensee's Basis for Requesting Relief: The Licensee states that the subject welds were not fully inspected due to limitations of design, geometry, and materials of construction. Fitting configuration limits meaningful ultrasonic examination of the seven welds. The percentage of Code-required area and volume that was completely examined is listed in the table above.

Evaluation: The surface or volumetric examination of the subject welds is impractical to perform to the extent required by the Code because of the fitting configurations. A significant percentage of the Code-required examinations has been performed. The limited Section XI examinations provide reasonable assurance of the continued inservice structural integrity of the subject piping welds.

Conclusions: Based on the above evaluation, it is concluded that the surface or volumetric examinations of the subject welds, as applicable, are impractical to perform to the extent required by the Code. Therefore, it is recommended that relief be granted as requested.

2.2.2.2 Request for Relief 1IIRR12, Augmented Examination of Class 2 Piping Welds

Augmented Examination Requirement: NUREG-0313, "Technical Report on Material Selection and Processing Guidelines for BWR

Coolant Pressure Boundary Piping," requires augmented examination of nonconforming service sensitive Class 2 piping welds. The method of examination and volume of material to be examined, the allowable indication standards, and examination procedures should comply with the requirements set forth in the applicable Edition and Addenda of the ASME Code, Section XI, specified in Paragraph (g), "Inservice Inspection Requirements," of 10 CFR 50.55a, "Codes and Standards."

Section XI, Table IWC-2500-1, Examination Category C-F, Items C5.21 and C5.22 require both 100% surface and volumetric examinations of Class 2 circumferential and longitudinal piping welds, greater than 1/2-inch nominal wall thickness, as defined by Figure IWC-2500-7.

Licensee's Augmented Examination Relief Request: Relief is requested from performing 100% of the augmented surface and/or volumetric examination of the following seven Class 2 nonconforming service sensitive piping welds:

Shutdown Cooling System

Examination Area (Description)	Req'd Method	Extent Examined	Limitation
38-SW-100-U (Pipe seam)	UT&PT	None	Perm. hanger attachment
38-SW-102 (Tee-to-pipe)	UT&PT	86%vol. 100%surf.	Fitting configuration
38-SW-25A (Tee-to-pipe)	UT&PT	75%vol. 100%surf.	Adjacent circ. weld
38-SW-84 (Pipe-to-pipe)	UT&PT	75%vol. 100%surf.	Adjacent circ. weld

Emergency Cooling System

Examination Area (Description)	Req'd Method	Extent Examined	Limitation
39-FW-15 (Pipe-to-valve)	UT&PT	58%vol. 100%surf.	Fitting configuration, material
39-FW-40 (Pipe-to-nozzle)	UT&PT	97%vol. 100%surf.	Superficial gouge on weld
39-FW-7 (Pipe-to-valve)	UT&PT	58%vol. 100%surf.	Fitting configuration, material

Licensee's Proposed Alternative Examination: None. The Licensee states that the required surface and/or volumetric examination was performed on all accessible welds.

Licensee's Basis for Requesting Relief: The Licensee states that the subject welds were not fully inspected by surface and/or volumetric methods due to limitations of design, geometry, and material of construction. The dendritic weld structure of the stainless steel material can result in both sound redirection and attenuation phenomena which limit ultrasonic interrogation. Thus, such welds necessitate examination from both sides in order to be fully examined. In particular, non-parallel surfaces and product form of the material of valves preclude meaningful ultrasonic examination from the valve side. The percentage of Code-required volume that was completely examined is listed above with the nature of the obstruction.

Evaluation: The volumetric and surface examinations of the subject welds are impractical to perform to the extent required by the Code and NUREG-0313 because examination of three stainless steel welds is limited by fitting configuration, one by permanent attachment to the piping, two by adjacent circumferential piping weld, and one by a superficial gouge. A significant percentage of the surface and volumetric examinations has been performed. Because the remaining 59 welds (of the required 66 welds) received 100% of the required

surface and volumetric examinations, the integrity of the subject welds was verified by sampling.

Conclusions: Based on the above evaluation, it is concluded that the volumetric and surface examinations are impractical to perform to the extent required by the Code and NUREG-0313 and that the limited surface and volumetric examinations provide reasonable assurance of the continued inservice structural integrity of the subject welds. Therefore, it is recommended that relief be granted as requested.

2.2.3 Pumps

2.2.3.1 Request for Relief 1IIRR10, Revision 1, Examination Category C-F, Item C3.1, Core Spray and Containment Spray Pump Casing Welds

Code Requirement: Section XI, 74S75, Tables IWC-2520 and IWC-2600, Examination Category C-F, Item C3.1 requires a 100% volumetric examination of the Class 2 pump casing welds.

Section XI, 80W81, Table IWC-2500-1, Examination Category C-G, Item C6.10 requires a 100% surface examination of the Class 2 pump casing welds. The examination may be performed from either the inside or outside surface of the component.

Licensee's Code Relief Request: Relief is requested from performing the Code-required volumetric examination of the pump casing welds in one of the multiple streams of the Core Spray and Containment Spray piping systems in the first inspection interval. Relief is also requested from performing surface examination of inaccessible welds on the pump casing.

Licensee's Proposed Alternative Examination: The Licensee states that surface examination of the accessible welds has been performed in accordance with the Winter 1981 Code

requirements. In addition, a visual inspection of the pump internals is conducted when the pump is disassembled for maintenance.

Licensee's Basis for Requesting Relief: The Licensee states that the pressure retaining pump casing welds were not ultrasonically inspected due to limitations of design and geometry. Due to fillet weld joints or right angle surfaces of the nozzles, top column, internal flanges, and outer casing, ultrasonic examination of accessible welds would not result in a meaningful examination. Relief is requested for casing welds in one of each of core spray multi-stage vertical and containment spray pumps.

The Licensee also states that radiography as an alternate examination of pump casing welds would not result in a meaningful examination. The differing surface curvatures at right angles to each other would necessitate multiple exposures at multiple locations, compounding evaluation of results. Radiographic examination in addition to examinations performed would result in an undue burden without a compensating increase in assurance of pump casing weld integrity or plant safety.

In 1984, the program plan was updated to the 1980 Edition, Winter 1981 Addenda of Section XI. This edition requires surface examination of the pump casing welds. Three welds on each pump are inaccessible for surface examination from the pump exterior. These welds: 80-PM-03-SW-8, 80-PM-03-SW-9, 80-PM-03-SW-11, 81-PM-24-SW-8, 81-PM-24-SW-9, and 81-PM-24-SW-11 are located on the lower section of the pump housing and are encased in concrete.

Evaluation: Updating the program plan to later approved editions and addenda of the ASME Code Section XI is permitted by 10 CFR 50.55a(g)(2). Editions and addenda later than the 1974 Edition, Summer 1975 Addenda require surface examination

of Class 2 pump casing welds and does not require volumetric examination. Therefore, since the program plan was updated to the 1980 Edition, Winter 1981 Addenda of Section XI, relief is not required from performing the volumetric examination of the pump casing welds.

The Code-required surface examination of the six welds listed above is impractical to perform because they are encased in concrete. The surface examination of the accessible welds performed by the Licensee provides reasonable assurance of the pump casing weld integrity.

Conclusions: Based on the above evaluation, it is concluded that the Code-required surface examination of the welds encased in concrete is impractical to perform. Therefore, it is recommended that relief be granted as requested for the pump casing welds encased in concrete and relief is not required for the remaining welds.

2.2.4 Valves (No relief requests)

2.2.5 General (No relief requests)

2.3 Class 3 Components (No relief requests)

2.4 Pressure Tests

2.4.1 Class 1 System Pressure Tests

2.4.1.1 Request for Relief 1IIRR20, Visual Examination During Hydrostatic Pressure Test of Recirculation Loop Class 1 Piping

Code Requirement: Section XI, Articles IWA-5000 and IWB-5000 require visual (VT-2) examination during system hydrostatic pressure test.

Licensee's Code Relief Request: Relief is requested from the requirement to re-perform the system hydrostatic pressure test of ASME Class 1 1-inch nominal pipe size instrument line portions which are part of the Reactor Recirculation System for the sole purpose of documenting the VT-2 examination.

Licensee's Proposed Alternative Examination: The Licensee states that a system leakage test of the Reactor Pressure Vessel is scheduled to be completed at the end of the 1988 refueling outage. The test will be performed at a nominal pressure of 1035 psig and 200°F per IWB-5221. A visual VT-2 examination will be performed as part of the system leakage test.

Licensee's Basis for Requesting Relief: The Licensee states that the system hydrostatic test was conducted during the 1986 refueling outage. However, a visual examination (VT-2) of the instrument piping was not documented. There is reason to believe that the piping was inspected and did not show evidence of leakage. There were two teams of VT-2 Inspectors for the Reactor Recirculation Pumps, one team in the drywell and another team outside the drywell. Any leakage would have been identified during the visual examination of the five Reactor Recirculation Pumps and the associated piping.

The piping shown in Figure 1 of the Licensee's submittal was subjected to the required test pressure. The instrument lines shown in Figure 2 of the Licensee's submittal are not subjected to the system pressure during normal operation nor during a hydrostatic pressure test. They are exposed to the system pressure only if there is a catastrophic failure of the recirculation pump seals. Normal pressure for these lines is 500 psig.

The entire reactor coolant system would have to be pressurized to hydrostatically retest the recirculation loop piping shown

in Figure 1 of the Licensee's submittal. The reactor vessel is designed for a limited number of hydrostatic tests during the plant lifetime. These tests are normally performed at the end of the ten-year inservice inspection interval or after major maintenance.

Evaluation: Because the entire reactor coolant system would have to be pressurized to hydrostatically retest these portions of the recirculation loop piping, it is impractical to re-perform the hydrostatic pressure test of the recirculation loop piping solely to perform the VT-2 visual examination which was performed but was not properly documented during the 1986 refueling outage. As stated by the Licensee, this piping received a VT-2 visual examination during a system leakage test of the Reactor Pressure Vessel performed during the 1988 refueling outage. The examination performed during the system leakage test provides reasonable assurance of the continued inservice structural integrity. However, the Licensee should be more diligent in documenting examinations and examination results during subsequent intervals.

Conclusions: Based on the above evaluation, it is concluded that it is impractical to re-perform the hydrostatic pressure test of this piping for the sole purpose of documenting the VT-2 visual examination. Therefore, it is recommended that relief be granted as requested.

2.4.2 Class 2 System Pressure Tests

2.4.2.1 Request for Relief 1IIRR15, Revision 2, Hydrostatic Test of Main Steam System Class 2 Piping

NOTE: This request for relief was withdrawn by the Licensee in the September 30, 1988 submittal and revised in the December 23, 1988 submittal. In the December 23, 1988 submittal, the Licensee states the following:

"This relief request is withdrawn. The Main Steam System piping from the outboard isolation valves to the turbine stop valves is not safety related. This piping is included in the ISI program because it is high energy piping whose operation is important to the reliability of the plant. This piping was erroneously designated as ASME Class 2 piping in the ISI program plan. The nondestructive examinations and hydrostatic pressure test performed in conjunction with the Reactor Pressure Vessel Hydrostatic test at 1145 psig provide an acceptable level of assurance of piping system integrity."

The Licensee should be reminded that the examinations and hydrostatic pressure tests performed during the 1988 refueling outage to satisfy the first 10-year inspection interval (which ended June 1986) requirements cannot be credited toward the examination and hydrostatic pressure test requirements for the second 10-year interval.

2.4.2.2 Request for Relief 1IIRR16, Revision 1, Hydrostatic Test of Control Rod Drive Class 2 Piping

Code Requirement: Section XI, Articles IWA-5000 and IWC-5000 require visual examination of Class 2 pressure retaining components during system hydrostatic pressure tests. Paragraph IWC-5220(a) requires that the system hydrostatic test pressure shall be at least 1.25 times the system design pressure.

Licensee's Code Relief Request: Relief is requested from performing the Code-required hydrostatic pressure test of the portion of the insert and withdraw lines inboard to the RPV from valves 101 (CRD-E) and 102 (CRD-F) at elevated pressure (2188 psig).

Licensee's Proposed Alternative Examination: Functional testing of the CRD mechanisms was performed and the CRD housings were re-examined for leakage prior to plant startup after the 1986 refueling outage. At the time of Class 1 RPV

and Class 2 CRD hydrostatic pressure testing, any leakage at terminations of the insert withdraw line portions would have been recorded in the examination report. Insert and withdraw lines have been visually examined during leakage pressure tests of previous refueling outages.

A system inservice test of the Control Rod Drive system will be performed at restart of the plant after the 1988 refueling outage. This will provide additional proof of system integrity.

Licensee's Basis for Requesting Relief: The insert and withdraw line portions were pressurized at the Class 1 hydrostatic pressure of 1145 psig in conjunction with the RPV and Class 1 systems. The design of the control rod drive mechanism allows leakage past the drive piston and collet piston. This leakage makes it impossible to pressurize this portion to Class 2 hydrostatic pressure without overpressurizing the RPV and the unisolatable portions of Class 1 piping.

Evaluation: The hydrostatic testing of these portions of Class 2 CRD piping is impractical to perform at the Code-required test pressure because they are unisolatable from the RPV and portions of Class 1 piping. The hydrostatic test of this piping was performed at 1145 psig (or 1035 psig less than the Code-required test pressure); this is the maximum test pressure that this piping could be tested to without overpressurizing the RPV and the unisolatable portions of Class 1 piping. The Licensee's proposed alternative test provides reasonable assurance of the continued inservice structural integrity.

Conclusions: Based on the above evaluation, it is concluded that the Code-required hydrostatic pressure test of the subject

components is impractical to perform. Therefore, it is recommended that relief be granted as requested.

2.4.2.3 Request for Relief 1IIRR25, Revision 0, Hydrostatic Test of Portions of Class 2 Reactor Core Spray System Piping

Code Requirement: Section XI, Articles IWA-5000 and IWC-5000 require a system hydrostatic pressure test. 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. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the system design pressure shall be substituted for the system pressure.

Licensee's Code Relief Request: Relief is requested from the 10-year interval requirement to hydrostatically test the following portions of Reactor Core Spray piping at the Code-required pressure (390 psig):

(a) Motor Cooler for Core Spray Pump #111, from the first union to the inlet and outlet of the cooler.

(b) Motor Cooler for Core Spray Pump #112, from the first union to the inlet and outlet of the cooler.

(c) Motor Cooler for Core Spray Pump #121, from the first union to the inlet and outlet of the cooler.

(d) Motor Cooler for Core Spray Pump #122, from the first union to the inlet and outlet of the cooler.

(e) Bearing Coolers for Core Spray Topping Pump #111, from the first union at PCV 81-57 to valves CS-C-2 and CS-C-3.

(f) Bearing Coolers for Core Spray Topping Pump #112, from the first union at PCV 81-58 to valves CS-C-2 and CS-C-3.

(g) Bearing Coolers for Core Spray Topping Pump #121, from the first union at PCV 81-59 to valves CS-C-2 and CS-C-3.

(h) Bearing Coolers for Core Spray Topping Pump #122, from the first union at PCV 81-60 to valves CS-C-2 and CS-C-3.

Licensee's Proposed Alternative Examination: A system inservice test of the Reactor Core Spray System will be performed at restart of the plant after the 1988 refueling outage. This will provide additional proof of system integrity.

Licensee's Basis for Requesting Relief: The Licensee states that there is potential for damage to the Core Spray Pump Motor Coolers if they are subjected to pressures in excess of 100 psi (the hydrostatic pressure for this system is 390 psig).

There is potential for damage to the Core Spray Topping Pump Bearing Coolers if they are subjected to pressures in excess of 75 psi (the hydrostatic pressure for this system is 390 psig).

Also, with the system design/configuration (location of the relief valves), this section of pipe and coolers will never see system operating pressure.

Evaluation: The Code-required hydrostatic test of the subject piping is impractical to perform because the Core Spray Pump Motor Coolers and Core Spray Topping Pump Bearing Coolers could be damaged if pressurized above 100 and 75 psi, respectively, without extensive modifications. The Licensee's alternative test provides reasonable assurance of the continued inservice structural integrity of the subject Class 2 piping.

Conclusions: Based on the above evaluation, it is concluded that the Code-required hydrostatic test of the subject piping is impractical to perform. Therefore, it is recommended that relief be granted as requested.

2.4.3 Class 3 System Pressure Tests

2.4.3.1 Request for Relief 1IIRR14, Revision 1, Hydrostatic Test of Fuel Pool Cooling System Class 3 Piping

NOTE: This request for relief was withdrawn by the Licensee in the September 30, 1988 submittal. In this submittal, the Licensee states the following:

> *"Relief was requested from the ten year interval requirement to hydrostatically test at elevated pressure the fuel pool cooling system ASME safety class portions identified as Block 1 of N1-ISI-HYD-54.*
>
> *The hydrostatic pressure test of this portion of the system will be performed during the current (1988) outage."*

The Licensee should be reminded that the hydrostatic pressure tests performed during the 1988 refueling outage to satisfy the first 10-year inspection interval (which ended June 1986) requirements cannot be credited toward the hydrostatic pressure test requirements for the second 10-year interval.

2.4.3.2 Request for Relief 1IIRR21, System Pneumatic Test Pressure for Portions of Class 3 Piping in the Nitrogen Purge System

Code Requirement: Section XI, Article IWD-5000 for Class 3 requires the system pneumatic test pressure to be at least 1.10 times the system design pressure.

Licensee's Code Relief Request: Relief is requested from the requirement to test at elevated pressure three portions of ASME Class 3 piping from the Nitrogen Storage Tank 201.9-01 to their respective isolation valves, and six portions of ASME Class 3 piping from Nitrogen Storage Tank 12 to their respective isolation valves.

Licensee's Proposed Alternative Examination: The Licensee states that a functional pressure test of the system was performed during the 1986 refueling outage.

Licensee's Basis for Requesting Relief: The Licensee states that both Nitrogen Storage Tanks are equipped with rupture disks. Testing at elevated pressure would result in damage to the disks.

Evaluation: The Code-required pneumatic test of the Class 3 piping adjacent to the Nitrogen Storage Tanks is impractical to perform at the Code-required test pressure because damage to the Nitrogen Storage Tank rupture disks would result. Because of the low operating pressures in these tanks, failure to perform the pneumatic test of this piping at the elevated pressure will not significantly affect the assurance of the continued inservice structural integrity.

Conclusions: Based on the above evaluation, it is concluded that the Code requirement is impractical for these portions of Class 3 piping. Therefore, it is recommended that relief be granted as requested.

2.4.3.3 Request for Relief 1IIRR24, Revision 0, Hydrostatic Test of Portions of Class 3 Control Rod Drive System Piping

Code Requirement: Section XI, Articles IWA-5000 and IWD-5000 require a system hydrostatic pressure test. 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. The system pressure shall be the lowest pressure setting among the number of safety or relief valves provided for overpressure protection within the boundary of the system to be tested. For systems (or portions of systems) not provided with safety or relief valves, the

system design pressure shall be substituted for the system pressure.

Licensee's Code Relief Request: Relief is requested from the 10-year interval requirement to hydrostatically test the following portions of Control Rod Drive (CRD) piping at elevated pressure (165 psig):

(a) Bearing and Gear Oil Coolers for CRD Pump #11, from the first union at relief valve PSV 301-16A to valves CRD-73A and CRD-75B.

(b) Bearing and Gear Oil Coolers for CRD Pump #12, from the first union at relief valve PSV 301-16B to valves CRD-74A and CRD-76B.

Licensee's Proposed Alternative Examination: The Licensee states that a system inservice test of the CRD system will be performed at restart of the plant after the 1988 refueling outage. This test will provide additional proof of system integrity.

Licensee's Basis for Requesting Relief: The Licensee states that there is potential for damage to the Bearing and Gear Oil Coolers if they are subjected to pressures in excess of 150 psig (the hydrostatic pressure for this system is 165 psig).

Also, with the system design/configuration (location of the relief valves), this section of pipe and coolers will never see system operating pressure. CRD pump discharge pressure is 1500 psig.

Evaluation: The Code-required hydrostatic test of this piping is impractical to perform because the Bearing and Gear Oil Coolers could be damaged if pressurized above 150 psig without extensive modifications. The Licensee's alternative test provides reasonable assurance of the continued inservice structural integrity of the subject Class 3 piping.

Conclusions: Based on the above evaluation, it is concluded that the Code-required hydrostatic test of the subject piping is impractical to perform. Therefore, it is recommended that relief be granted as requested.

2.4.4 General

2.4.4.1 Request for Relief 1IIRR13, Revision 1, Nonisolatable Portions of Class 2 and Class 3 Piping Systems

NOTE: This request for relief was withdrawn by the Licensee in the September 30, 1988 submittal. In this submittal, the Licensee states the following:

> *"Relief was requested from the ten year interval requirements to hydrostatically test at elevated pressure the portion of ASME safety class piping identified as Block 3 in N1-ISI-HYD-57/91 and Blocks 11 and 13 in N1-ISI-HYD-70/70.1.*
>
> *These hydrostatic pressure tests will be performed during the current (1988) outage."*

The Licensee should be reminded that the hydrostatic pressure tests performed during the 1988 refueling outage to satisfy the first 10-year inspection interval (which ended June 1986) requirements cannot be credited toward the hydrostatic pressure test requirements for the second 10-year interval.

2.5 General (No relief requests)

3. 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 PSIRR2 (in part), 1IIRR6, and 1IIRR8A, the Licensee has demonstrated that specific Section XI requirements are impractical for the first 10-year interval. Requests for Relief 1IIRR3, 1IIRR4A, 1IIRR4B, 1IIRR7, 1IIRR13, 1IIRR14, and 1IIRR15 were withdrawn by the Licensee in the September 30, 1988, December 23, 1988, and February 24, 1989 submittals. Request for Relief 1IIRR22 was referenced in the Licensee's February 24, 1989 submittal; however, in a telephone conversation with the Licensee, the Licensee stated that this relief request does not currently exist.

This technical evaluation report has not identified any practical method by which the Licensee can meet all the specific inservice inspection requirements of Section XI of the ASME Code for the existing Nine Mile Point Nuclear Station, Unit 1, facility. Requiring compliance with all the exact Section XI required inspections would delay the re-startup of the plant in order to redesign a significant number of plant systems, obtain sufficient replacement components, install the new components, and obtain 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 if granting the relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

The development of new or improved examination techniques should continue to be monitored. As improvements in these areas are achieved, the Licensee should incorporate these techniques in the ISI program plan examination requirements.

4. REFERENCES

1. Letter, dated April 1, 1987, T. E. Lempges [Niagara Mohawk Power Corporation (NMPC)] to NRC, "Relief Requests for Nine Mile Point, Unit 1, First and Second 10-Year Interval Inservice Inspection Program Plans."

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

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

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

4. Letter, dated December 15, 1987, R. A. Benedict (NRC) to C. V. Mangan (NMPC), request for additional information with regard to the first and second 10-year interval inservice inspection relief requests.

5. Letter, dated March 15, 1988, C. V. Mangan (NMPC) to NRC, response to the NRC's request for additional information.

6. Letter, dated September 30, 1988, C. D. Terry (NMPC) to NRC, submits revised and additional relief requests for the first 10-year inspection interval.

7. Letter, dated December 23, 1988, C. D. Terry (NMPC) to NRC, submits revised relief requests for the first 10-year inspection interval.

8. Letter, dated February 24, 1989, C. D. Terry (NMPC) to NRC, submits revised and additional relief requests for the first 10-year inspection interval and lists those relief requests applicable to systems required for the fuel loading scheduled for early May 1989.

9. Letter, dated April 12, 1989, C. D. Terry (NMPC) to NRC, submits Revision 2 to Relief Request 1IIRR1 for the first 10-year inspection interval.

10. NUREG-0619, "BWR Feedwater Nozzle and Control Rod Drive Return Line Nozzle Cracking," November 1980.

11. Letter, dated September 19, 1983, D. B. Vassallo (NRC) to G. K. Rhode (NMPC), "Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Requests for Relief from Inservice Inspection Requirements, Niagara Mohawk Power Corporation, Nine Mile Point Unit 1, Docket No. 50-220."

12. NUREG-0313, "Technical Report on Material Selection and Processing Guidelines for BWR Coolant Pressure Boundary Piping," Revision 1, July 1980.

NRC FORM 336 (2-84) NRCM 1102, 3201, 3202

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This report presents the results of the evaluation of the Nine Mile Point Nuclear Station, Unit 1, inservice inspection (ISI) 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 for the first 10-year inspection interval.

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