February 2, 2005

Mr. Christopher M. Crane
President and Chief Nuclear Officer
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: OYSTER CREEK NUCLEAR GENERATING STATION (OCNGS) - THIRD 10-YEAR INSERVICE INSPECTION INTERVAL REQUESTS FOR RELIEF (TAC NOS. MB9636, MB9637, MB9638, AND MB9639)

Dear Mr. Crane:

By letter dated June 12, 2003, AmerGen Energy Company, LLC, proposed its Third 10-Year Interval Inservice Inspection (ISI) Program Plan Requests for Relief Nos. OC-32, OC-33, OC-34, and OC-35 for OCNGS. The subject of these requests is examination coverage of various welds. AmerGen provided additional information in its letters dated February 18 and December 20, 2004. The Nuclear Regulatory Commission (NRC) staff reviewed the referenced submittals against pertinent portions of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). Details of the review are set forth in the enclosed safety evaluation.

For Request for Relief OC-32, the NRC staff has concluded that the ASME Code requirements are a significant hardship without a compensating increase in quality and safety, and the licensee's proposed alternative provides reasonable assurance of structural integrity of the subject weld. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year ISI interval.

For Requests for Relief OC-33, OC-34, and OC-35, the NRC staff has concluded that the ASME Code coverage requirements are impractical for the subject welds, and that the examination coverage obtained by the licensee provides reasonable assurance of structural integrity of the subject components. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year ISI interval.

If you have any questions, please call the Project Manager, Mr. Peter Tam at 301-415-1451.

Sincerely,

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate 1
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-219

Enclosure: As stated

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUESTS OC-32, OC-33, OC-34, AND OC-35 FOR

THE THIRD 10-YEAR INSERVICE INSPECTION INTERVAL

OYSTER CREEK NUCLEAR GENERATING STATION (OCNGS)

AMERGEN ENERGY COMPANY, LLC

DOCKET NUMBER 50-219

1.0 INTRODUCTION

By letter dated June 12, 2003 (Accession No. ML031700362), AmerGen Energy Company, LLC (the licensee) proposed its Third 10-Year Interval Inservice Inspection Program Plan Requests for Relief Nos. OC-32, OC-33, OC-34, and OC-35 for OCNGS. The licensee provided additional information in its letters dated February 18, 2004 (Accession No. ML040570650), and December 20, 2004 (Accession No. ML043560075). The Nuclear Regulatory Commission (NRC) staff's review of the licensee's requests for relief follows.

2.0 REGULATORY REQUIREMENT

Inservice inspection (ISI) of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) Class 1, 2, and 3 components is performed in accordance with the ASME Code, Section XI, and applicable addenda as required by 10 CFR 50.55a(g), except where specific relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). In addition, 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable Code of Record for the third 10-year ISI

interval for OCNGS is the 1986 Edition of the ASME Code, Section XI. The third 10-year ISI Interval began on March 15, 1992, and ended on October 14, 2002.

3.0 TECHNICAL EVALUATION

3.1 Request for Relief OC-32

3.1.1 ASME Code Components Affected:

Code Class:	Class 1
Reference:	ASME Code, Section XI, 1986 Edition, Table IWB-2412-1 ("Inspection Program B"), and Table IWB-2500-1 ("Pressure Retaining Welds in Reactor Vessel")
Examination Categories:	B-A
Item Number:	B1.30
Description:	Deferral of Shell-to-Flange Weld Examination (Weld No. NR02 3-563)

3.1.2 ASME Code Requirement

The 1986 Edition of the ASME Code, Section XI, Table IWB-2412-1 for Inspection Program B requires that at a minimum 16% of the total inspection population be volumetrically and surface[1] examined in the first period of the 10-year ISI interval, and subsequently 50% and 100% of the total inspection population during the second and third periods of the interval, respectively.

3.1.3 The Licensee's Code Relief Request (As stated in the February 18, 2004, letter)

> In accordance with 10 CFR 50.55a(a)(3)(ii), relief is requested from the requirements of Table IWB-2412-1 for examination category B-A in that reactor vessel weld examinations were not performed during the second period as required by Table IWB-2500-1. Examination items B1.20 [circumferential and meridional reactor head welds] and B1.40 [head-to-flange weld] of Table IWB-2500-1 were inspected in the first period in accordance with Table IWB-2412-1. However, performance of examination item B1.30 (shell-to-flange weld) was subsequently deferred to the third period as part of the reactor vessel shell weld examinations (B1.10) in order to gain greater coverage of the weld by accessing it from the inner diameter [ID] (i.e., the ID exam allowed scanning the weld from two directions) through use of the enhanced shell weld examination tooling. This relief is requested based on the financial hardship of the significant staging costs necessary for performing this examination during the second period, and the radiation dose that would be obtained for performing the exams manually as compared to performing the examinations utilizing the automated tooling. Additionally, based on the location of this weld and the associated limitations as identified in the attached diagram (contained in RR-33, drawing CE

[1]Under certain requirements a surface examination in addition to a volumetric examination is required in various Item numbers under ASME Code Categories B-A of the ASME Code, Section XI, Table IWB-2500-1.

232-587), better coverage would be expected utilizing automated ID examination tools versus a manual OD [outside diameter] examination. Therefore, performing the code examination during the second period would not result in a compensating increase in the level of quality or safety.

In summary, two items (B1.20 and B1.40) were inspected in the first period and two items (B1.10 and B1.30) in the third period, but no items were examined during the second period as required by Table IWB-2412-1. Table IWB-2412-1 provides the required distribution for these categories. This distribution was not followed for the inspection of these examination items.

3.1.4 The Licensee's Basis for Relief Request (As stated in the February 18, 2004, letter)

In accordance with 10 CFR 50.55a(a)(3)(ii), relief is requested from the distribution of examinations as provided on Table IWB-2412-1. Performance of examination item B1.30 (shell-to-flange weld) during the third period, as part of the reactor vessel shell weld examinations (B1.10), provided greater coverage of the weld (i.e., scanning the weld from the Vessel ID from two directions) through use of the enhanced shell weld examination tooling used as part of the shell weld examinations. Additionally, performing the B1.30 examination during the third period avoided the burden of the significant staging costs necessary for performing the examinations during the second period.

As an example, the required distribution provided in Table IWB-2412-1 of the 1986 version of the [ASME] Code has been updated in the 1995 Edition, up to the 1996 Addenda, to provide more flexibility in the examination of the Category B-A welds. Specifically, as discussed in the 1995 Edition, up to the 1996 Addenda, IWB-2412, "Inspection Program B", "if there are less than three items or welds to be examined in an Examination Category, the items or welds may be examined in any two periods, or in any one period if there is only one item or weld, in lieu of the percentage requirements of Table IWB-2412-1." Therefore, as discussed above in the 1995 version of the [ASME Code], if there are less than three (3) items or welds to be examined in an Examination Category during a period, which occurred at [OCNGS], the items or welds may be examined in any two periods during the interval, in lieu of the percentages of Table IWB-2412-1. Therefore, this example of the new version of the [ASME Code] would eliminate the need for this proposed relief.

3.1.5 Evaluation of the Licensee's Proposed Alternative

The licensee proposed to use the schedule of examinations that were utilized during this interval for these Category B-A welds.

The 1986 Edition of the ASME Code, Section XI, Table IWB-2412-1 for Inspection Program B requires that at a minimum 16% of the total inspection population be volumetrically and surface examined in the first period of the 10-year ISI interval and subsequently 50% and 100% of the total inspection population during the second and third periods of the interval, respectively.

Items B1.20 Circumferential and Meridional Reactor Head Weld and B1.40 Head-to-Flange Weld were examined in the first period and Items B1.10 Circumferential and Longitudinal Reactor Vessel Welds were examined in the third period. The licensee did not examine Item B1.30 Shell-to-Flange Weld No. NR02 3-563 during the second period as required by the ASME Code, Table IWB-2412-1. However, the licensee did examine the subject weld during the third period of the third 10-year ISI interval as part of the reactor vessel shell weld examinations in order to gain greater weld coverage through the use of the enhanced shell weld automated examination tooling. The licensee obtained a volumetric coverage of 66%[2] from two directions of the subject weld by utilizing automated ID examination tools versus a one-sided manual OD examination with an estimated volumetric coverage of 40%.[3] No reportable indications were identified in the 66% coverage.

Furthermore, based on the location of this weld and the associated limitations, to perform a manual examination of the subject weld during the second period would mean less coverage, higher radiation exposure to the examiners, and scaffolding would have had to be erected, exposing the craft personnel to higher radiation doses and risk of injury.

Therefore, the NRC staff concludes that the required examination of the subject weld by a manual volumetric examination method during the second period of the third 10-year interval would result in hardship or unusual difficulty without a compensating increase in quality and safety. In addition, the third period volumetric examination of the reactor vessel shell-to-flange weld conducted by automated tooling provides reasonable assurance of structural integrity of the subject weld.

3.2 Request for Relief OC-33

3.2.1 ASME Code Components Affected:

Code Class:	Class 1
Reference:	ASME Code, Section XI, 1986 Edition, Table IWB-2500-1 ("Pressure Retaining Welds in Reactor Vessel"), Examination Item B1.30, Shell-to-Flange Weld, Weld No. NR02 3-563, drawing 232-587.
Examination Category:	B-A
Item Numbers:	B1.30
Description:	Reduced Coverage of the Reactor Vessel Shell-to-Flange Weld

3.2.2 ASME Code Requirement

ASME Code, Section XI, 1986 Edition, requires inspections of the shell-to-flange weld. As part of the examination coverage, examination of the shell-to-flange weld requires "essentially 100%" coverage.

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[2]The licensee submitted Request for Relief OC-33 in its letter dated February 18, 2004, for not obtaining essentially 100% volumetric coverage of the reactor vessel-to-shell weld. Request for Relief OC-33 has been reviewed in this safety evaluation.

[3]The licensee provided the estimated manual examination volumetric coverage of the shell-to-flange weld in its letter dated December 20, 2004.

3.2.3 The Licensee's Code Relief Request

Relief is requested from the Section XI requirement to examine "essentially 100%" (defined in 50.55a(g)(6)(ii)(A)(2) as greater than 90% coverage) of the volume of the shell-to-flange weld (Examination Item B1.30), which was performed during the third period, of the third inspection interval.

3.2.4 The Licensee's Basis for Relief Request (As stated in the February 18, 2004, letter)

> Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the Section XI requirement to examine "essentially 100%" (defined in 50.55a(g)(6)(ii)(A)(2) as greater than 90% coverage) of the volume of the shell-to-flange weld (Examination Item B1.30), which was performed during the third period of the third inspection interval.
>
> The examination category B1.30 examination performed in refueling outage 1R18 (2000) was performed using an automatic technique applied to the inner diameter of the vessel where the inspection coverage was taken in two directions (above and below the weld). Sixty-six percent (66%) of the shell-to-flange weld was inspected and no reportable indications were identified. The remaining sections of the flange-to-shell weld could not be inspected during 1R18 because of interferences due to guide rods, main steam nozzle plugs and hoses, and excessive clad roughness. Refer to attached drawing 232-587[4], which identifies obstructions that limit ID coverage. This diagram shows obstructions created by: 1) the guide rod brackets at elevation 54, and 2) the steam dryer brackets at elevation 48. The guide rods are connected to the guide rod brackets at 0 and 180 degrees, but are not shown in the diagram, and are also an obstruction. These limitations are the result of vessel internal structures and necessary outage in-vessel configurations. Removal of these interferences was impractical. The 66% of the weld that was examined was distributed around the circumference of the vessel, which provided a good representative sample of the weld. At the completion of the 1R18 outage this weld had been examined to the maximum extent practical. No reportable indications were identified in the 66% coverage.
>
> Additional weld examination would require [erecting] scaffolding off the biological shield completely around the vessel and the removal of the mirror insulation to gain access to the weld. For the personnel involved with [erecting] scaffolding, handling insulation, prepping the weld and performing the examination, the estimated dose was 8.6 person-rem.
>
> An assessment of the additional weld coverage which could have been achieved with this manual OD examination determined that a maximum of 17% additional coverage could have been obtained. Even if this manual OD examination would

[4]Drawing 232-587 was attached to the licensee's submittial dated February 18, 2004, and is not included in this safety evaluation.

have been performed, and if maximum expected coverage was achieved, total exam coverage would be 83% combining ID and OD examinations, which would still not meet the [ASME] Code requirement.

Therefore, given the substantial personnel dose and cost considerations which would have been incurred to achieve the incremental coverage using an OD manual inspection approach, and the fact that essentially 100% coverage still would not have been achieved with these additional manual exams, inspections beyond the B1.30 examination that was performed in outage 1R18 would constitute an undue burden.

3.2.5 The Licensee's Proposed Alternative

The licensee proposed to accept the 66% weld coverage for the shell- to-flange weld.

3.2.6 Evaluation of the Licensee's Proposed Alternative

The 1986 ASME Code, Section XI requires a volumetric examination of essentially 100% of Shell-to-Flange Weld No. NR02 3-563 during the inspection interval. The licensee was unable to meet the ASME Code requirements due to access limitations resulting from guide rods, main steam nozzle plugs and hoses, and excessive clad roughness. The licensee considered additional weld coverage could be obtained through OD examinations; however, the licensee would have had to erect scaffolding off the biological shield completely around the vessel. In addition, the licensee would have had to remove mirror insulation to gain access to the weld, exposing personnel involved with erecting scaffolding, handling insulation, prepping the weld, and performing the examination to 8.6 person-rem.

Therefore, the NRC staff determined that examination of the subject weld to the extent required by the ASME Code is impractical. In order for the licensee to perform the examination as required by the ASME Code, the subject component would have to be redesigned. Therefore, imposing the ASME Code requirements on the licensee would result in a burden. The licensee examined 66% of the weld volume and the volume examined was distributed around the circumference of the vessel. The 66% volumetric examination coverage obtained provided a representative sample of the weld volume, and if any significant patterns of degradation were present, they would have been detected. The licensee did not identify any flaws in the examined area. Based on the results obtained from the volumetric examinations of the accessible portions of the subject weld, the results from the licensee's volumetric examinations of other RPV welds of similar material and operating conditions, such as the head-to-flange weld, the licensee's examination results provide reasonable assurance of continued structural integrity of shell-to-flange Weld No. NR02 3-563.

3.3 Request for Relief OC-34

3.3.1 ASME Code Components Affected:

Code Class:	Class 1
Reference:	ASME Code, Section XI, 1986 Edition, Figure IWB-2500-7(d)
Examination Categories:	B-D
Item Numbers:	B3.90 and B3.100

Description: Limited ASME Code Coverage on Nozzle to Vessel Weld Examinations
References: ASME Code, Section XI, 1986 Edition, Figure IWB-2500-7(d), drawing 104R858 (Overhead View of Vessel)

3.3.2 ASME Code Requirement

ASME Code, Section XI, 1986 Edition, Examination Category B-D, Items B3.90 and B3.100 require 100% volumetric examination of nozzle-to-vessel welds and nozzle inside radius sections, as defined by Figure IWB-2500-7(d).

3.3.3 The Licensee's Code Relief Request (As stated in the February 18, 2004, letter)

> Relief is requested from the [ASME] Code required 100% volumetric examination of the reactor vessel nozzle welds listed below due to nozzle forging configuration and access restrictions.

Component ID	Component Description	Code Item #	Estimated % of CRV Achieved (1)	Description of Limitation
NR02 4-566A	FW nozzle to vessel weld N4A	B3.90	62.4%	Restricted access due to adjacent N13B and N6A nozzles
NR02 4-566B	FW nozzle to vessel weld N4B	B3.90	71.2%	Nozzle geometry
NR02 4-566C	FW nozzle to vessel weld N4C	B3.90	61.7%	Restricted access due to adjacent N15B and N6B nozzles and nozzle geometry
NR02 4-566D	FW nozzle to vessel weld N4D	B3.90	71.2%	Nozzle geometry and surface conditions
NR02 6-567	CRD return line nozzle to vessel weld (N9 nozzle)	B3.90	52%	Automated exams restricted due to the proximity of N17B Instrumentation nozzle
NR02 2-567A	CS nozzle to vessel weld N6A	B3.90	34.1%	Restricted access at left side of bio-shield opening
NR02 2-567A	CS nozzle N6A (INNER RADIUS)	B3.100	50%	Restricted access at left side of bio-shield opening
NR02 3-576	Nozzle to top head weld (N7B nozzle)	B3.90	53.8%	Nozzle geometry
NR02 5-576	Nozzle to top head weld (N8 nozzle)	B3.90	45.3%	Nozzle geometry

(1) The volume coverage that was achieved utilizing automated and manual UT techniques (composite coverage).

3.3.4 The Licensee's Basis for Relief Request (As stated in the February 18, 2004, letter)

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from ASME [Code] Section XI, 1986 Edition, Examination Category B-D, Items B3.90 and B3.100, which require 100% volumetric examination of nozzle-to-vessel welds and nozzle inside radius sections, as defined by Figure IWB-2500-7(d).

[OCNGS] has twenty-four Reactor Vessel nozzles that apply to this B-D examination category. Due to the nozzle forging configuration and access restrictions, portions of the [ASME] Code required examination volume can not be completely examined with automated or manual techniques. The curvature of the blend radius of several nozzle forgings are such that ultrasonic scanning of the weld is interrupted due to loss of contact of the ultrasonic search unit. This limitation affects both transverse and parallel scanning of the [ASME] Code required examination volume. The nozzle and vessel material is carbon steel that is typically not susceptible to IGSCC [intergranular stress corrosion cracking] or other typical degradation mechanisms at a BWR [boiling-water reactor]. An Oyster Creek service history review found that no outside nozzle and vessel surfaces are exposed to wetting from concentrated chloride bearing environments. Also, in support of ALARA [as low as reasonably achievable radiation protection guideline], many of the nozzle to vessel welds are examined utilizing a remote automated nozzle scanner. These techniques, however, further limit the examination coverage due to scanning limitations caused by scanner design. Attached Figures 1[5] and 2[5] provide a typical example of a limited nozzle examination. Also attached is drawing 104R858[6], which provides an overhead view of the vessel. This diagram is an example of the close proximity of the Core Spray and Feedwater nozzles to each other. This close proximity results in limited coverages for the nozzle examinations, as shown in the coverages presented in the previous Table.

The CRD [control rod drive] return nozzle (N9) is still utilized for return flow to the reactor at Oyster Creek. The nozzle internal thermal sleeve was replaced with an improved design that protects the nozzle ID surfaces from thermal fatigue by not allowing the return flow to contact the nozzle ID surfaces. The nozzle ID is inaccessible for an EVT-1 examination due to access limitations. Figure 3[7] provides a diagram of this return nozzle.

All examinations were performed to the maximum extent practical utilizing automated and manual techniques. The volumetric examination coupled with

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[5]Figures 1 and 2 were included in the licensee's submittials dated June 12, 2003, and February 18, 2004, and are not included in this safety evaluation.

[6]Drawing 104R858 was included in the licensee's submittials dated June 12, 2003, and February 18, 2004, and is not included in this safety evaluation.

[7]Figure 3 was included in the licensee's submittials dated June 12, 2003, and February 18, 2004, and is not included in this safety evaluation.

> the visual examination requirements of [ASME] Code Examination Category B-P during system pressure testing provide reasonable assurance of weld structural integrity.
>
> Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the [ASME] Code required 100% volumetric examination of the reactor nozzle welds listed in the above table.

No alternate provisions are practical for the subject welds. Examinations were performed to the maximum extent feasible.

3.3.5 Evaluation of the Licensee's Proposed Alternative

Section XI of the 1986 Edition of the ASME Code requires 100% volumetric examination of nozzle-to-vessel welds and nozzle inside radius sections, as defined by Figure IWB-2500-7(d). The licensee noted that there are 24 reactor vessel nozzles that apply to the B-D examination category for OCNGS. The licensee requested relief from the ASME Code requirements. Because of the nozzle forging configuration and access restrictions, the licensee was unable to obtain 100% volumetric examination coverage of the subject nozzle-to-vessel welds and nozzle inside radius sections. Ultrasonic scanning of the weld was interrupted due to loss of contact of the ultrasonic search unit because of the curvature of the blend radius of the nozzle forgings. Both transverse and parallel scanning of the required examination volume were limited by the configuration of the nozzles. The nozzle and vessel material is of carbon steel which is not normally susceptible to IGSCC or other typical degradation mechanisms in a BWR. A review of the service history found that no outside nozzle and vessel surfaces are exposed to wetting from concentrated chloride-bearing environments. The nozzle-to-vessel welds are examined utilizing a remote automated nozzle scanner in order to reduce radiation exposure. However, some of these techniques limit the examination coverage due to scanning limitations caused by scanner design. Therefore, the NRC staff determined that examination of the subject welds to the extent required by the ASME Code is impractical. In order for the licensee to perform the ASME Code required examinations, the subject components would have to be redesigned. If the Code requirements were imposed, they would constitute a significant burden on the licensee.

For the CRD return nozzle (N9), the nozzle internal thermal sleeve was replaced with an improved design that protects the nozzle ID surfaces from thermal fatigue by not allowing the return flow to contact the nozzle ID surfaces. The CRD return nozzle is still utilized for return flow to the reactor. However, the licensee is unable to perform an EVT-1 visual examination of the nozzle ID due to access limitations because of the bioshield of the CRD return nozzle.

Therefore, the NRC staff determined that examination of the subject weld to the extent required by the ASME Code is impractical. In order for the licensee to perform the examination as required by the ASME Code, the subject components would have to be redesigned. Imposing the ASME Code requirements on the licensee would be a burden. The licensee examined between 34.1% and 71.2% for each of the subject nozzle-to-vessel welds and nozzle inside radius sections, respectively. The volumetric examination coverages obtained provide a representative sample of the weld volume and if any significant patterns of degradation were present they would have been detected. The licensee did not identify any flaws in the examined area. Based on the results obtained from the volumetric examinations of the

accessible portions of the subject welds, the results from the licensee's volumetric examinations of other RPV welds of similar material and operating conditions, the licensee's examinations provide reasonable assurance of continued structural integrity of the subject welds.

3.4 Request for Relief OC-35

3.4.1 ASME Code Components

Code Class:	Class 1 and 2
Reference:	ASME Code, Section XI, 1986 Edition, Table IWB-2500-1, and Table IWC-2500-1
Examination Categories:	B-J, C-F-1, C-F-2 and C-B
Item Numbers:	Various
Description:	Limited ASME Code Coverage on Piping Weld Examinations (Performance Demonstration Initiative (PDI))

3.4.2 ASME Code Requirement

ASME Code, Section XI, 1986 Edition, requires 100% volumetric examination of Class 1 and 2 piping welds as defined by Table IWB-2500-1 and Table IWC-2500-1.

10 CFR 50.55a(b)(2)(xv)(A) requires the following examination coverage when applying Supplement 2 of Appendix VIII [to Section XI]:

1. Piping must be examined in two axial directions, and when examination in the circumferential direction is required, the circumferential examination must be performed in two directions, provided access is available.

2. Dissimilar metal welds must be examined axially and circumferentially.

3. Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds or dissimilar metal welds[8].

4. Where examination from both sides is not possible on austenitic welds (and dissimilar metal welds), full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld.

[8]Statement for dissimilar metal welds should read that pursuant to 10 CFR50.55a(b)(2)(xv)(A)(2) for dissimilar metal welds full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix V III demonstration using flaws on the opposite side of the weld.

3.4.3 Licensee's Code Relief Request (As stated in the February 18, 2004, letter)

Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the new examination coverage requirements for austenitic piping welds with single side access as required in 10 CFR 50.55a(b)(2)(xv)(A)(2), in that procedures were not available at the time of the examination of the welds below to perform a single-sided Appendix VIII demonstration using flaws on the opposite side of the weld.

Component ID	Component Description	Estimated % of CRV Achieved	Description of Limitation
NG-A-0002	Elbow to Pipe Weld	50%	Exam performed from Elbow side only due to Tee configuration
NG-C-0001A	Safe-End to Elbow Weld	50%	Exam performed from Elbow side only due to Safe-end configuration
NG-D-0022A	Pipe to Safe-End Weld	50%	Exam limited to Safe-End side due to Safe-End configuration
NG-E-0001A	Safe-End to Elbow Weld	50%	Exam from Elbow side only due to Safe-End configuration
NU-3-0001	Pipe to Branch Weld	50%	Exam from Pipe side only due to Branch connection configuration
NU-4-0001	Branch to Tee Weld	50%	Exam performed from Tee side only due to branch configuration
NU-2-0037	Pipe to Valve Weld	75%	Exam performed from pipe side due to valve configuration
ND-10-0021	Pipe to Valve Weld	50%	Exam performed from pipe side due to valve configuration
NG-A-0006	Pipe to Valve Weld	50%	Exam performed from pipe side due to valve configuration
NG-B-0005	Pipe to Valve Weld	50%	Exam performed from pipe side due to valve configuration
NZ-3-0023	Pipe to Valve Weld	50%	Exam performed from pipe side due to valve configuration
NU-3-0006	Valve to Pipe Weld	50%	Exam performed from pipe side due to valve configuration
NZ-3-0069	Pipe to Valve Weld	50%	Exam performed from pipe side due to valve configuration
NZ-3-0081	Pipe to Valve Weld	50%	Exam performed from pipe side due to valve configuration
ND-1-0209	Valve to Pipe Weld	50%	Exam performed from pipe side due to valve configuration
ND-1-0208	Elbow to Valve Weld	50%	Exam performed from elbow side due to valve configuration
NE-2-0255	Valve to Pipe 'Weld (PSI)	50%	Exam performed from pipe side due to valve configuration
NE-2-0256	Pipe to Valve Weld (PSI)	50%	Exam performed from pipe side due to valve configuration
NE-2-0257	Valve to Pipe Weld (PSI)	50%	Exam performed from pipe side due to valve configuration
NZ-3-0004	Pipe to Valve Weld	50%	Exam performed from pipe side due to valve configuration
NE-2-238	Tee to Pipe Weld	75%	Exam performed from pipe side due to tee configuration
NQZ-1-0054	Reducing Tee to Pipe Weld	68%	Exam performed from pipe side. Due to weld crown geometry the scans could not be performed on the weld crown.
NQ-2-0053	Valve to Pipe Weld	52%	Exam was limited by the weld crown and the valve configuration
NQ-2-0160	Flange to Pipe Weld	64%	Exam was limited due to flange and weld crown configuration

Component ID	Component Description	Estimated % of CRV Achieved	Description of Limitation
CD-14-001A 211-S-5	Isolation Condenser (Steam Side) Weld (PSI)	50%	Exam performed from the head side due to nozzle configuration
CD-14-001A 211-C-5	Isolation Condenser (Condenser Side) Weld (PSI)	50%	Exam performed from the head side due to nozzle configuration
CD-14-001A 211-S-6	Isolation Condenser (Steam Side) Weld (PSI)	50%	Exam performed from the head side due to nozzle configuration
CD-14-001A 211-C-6	Isolation Condenser (Condenser Side) Weld (PSI)	50%	Exam performed from the head side due to nozzle configuration

3.4.4 The Licensee's Basis for Relief Request (As stated in the February 18, 2004, letter)

> As discussed in 10 CFR 50.55a(b)(2)(xv)(A)(1) and 10 CFR 50.55a(b)(2)(xv)(A)(2), if access is available, the weld shall be ultrasonically scanned in both directions parallel to the weld and both directions perpendicular to the weld, where required. Full credit for examination coverage may be claimed for single side exams on ferritic piping welds. However, for austenitic piping welds, an ultrasonic examination procedure must be qualified with flaws located in the inaccessible side of the weld.
>
> There were no qualified PDI ultrasonic examination procedures available for single-sided coverage that demonstrates equivalency to ultrasonic examination two-sided coverage on austenitic piping welds at the time of the examinations for the welds above.
>
> At Oyster Creek, qualified PDI ultrasonic examination techniques have been used since 2000. However, qualified PDI procedures were not available at the time of the examination of the welds above to perform a single-sided Appendix VIII demonstration using flaws on the opposite side of the weld as required by 10 CFR 50.55a(b)(2)(xv)(A)(2).
>
> The table above provides the weld, the [ASME Code] required volume achieved, and the basis for not achieving full coverage.
>
> Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is requested from the new examination coverage requirements for austenitic piping welds with single side access.

The licensee stated that no alternate provisions are practical for the subject welds, and that examinations were already performed to the maximum extent feasible.

3.4.5 Evaluation of the Licensee's Proposed Alternative

Section XI of the 1986 Edition of the ASME Code, Tables IWB-2500-1 and IWC-2500-1 require 100% volumetric examination of the subject Class 1 and 2 welds, and 10 CFR 50.55a(b)(2)(xv)(A) requires the following examination coverage when applying Supplement 2 of Appendix VIII to Section XI:

1. Piping must be examined in two axial directions, and when examination in the circumferential direction is required, the circumferential examination must be performed

in two directions, provided access is available. Dissimilar metal welds must be examined axially and circumferentially.

2. Where examination from both sides is not possible, full coverage credit may be claimed from a single side for ferritic welds. Where examination from both sides is not possible on austenitic welds or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld.

The current coverage requirements are based on utilizing a procedure qualified to ASME Section XI, Appendix VIII, Performance Demonstration Initiative (PDI). At the time of the examinations, no PDI program existed for single-side austenitic welds. The NRC's requirement at 10 CFR 50.55a(b)(2)(xv) specifies that if access is available, the weld shall be scanned in each of the four directions (parallel and perpendicular to the weld on each side of the weld centerline). Coverage credit may be taken for single side exams on austenitic piping if a procedure is qualified with flaws on the inaccessible side of the weld. This procedure must demonstrate single-side access examinations equivalency to "two-sided" examinations. Current technology is not capable of reliably detecting or sizing flaws on the inaccessible side of an austenitic weld for configurations common to U.S. nuclear applications. Instead of a full single-side qualification, PDI offers a best-effort approach, which demonstrates that the best available technology is applied. PDI Performance Demonstration Qualification Summary (PDQS) austenitic piping certificates list the limitation that single side examination is performed on a best effort basis. This requires the inaccessible side of the weld to be listed as an area of no coverage. This examination provides, to the maximum extent practical, reasonable assurance of structural integrity of the subject welds.

Due to the limitations in technology and the inaccessibility of the component, the staff concludes that the Code-required 100% volumetric examinations of the subject welds are impractical. In order to examine the subject welds according to Code requirements, the licensee would have to replace the subject valves, nozzles, flanges, pipe-tees, elbows, and branch connections. Replacing all these components would result in a burden on the licensee.

The subject welds were examined using the best available techniques, equipment and personnel as qualified through the PDI for ASME Section XI, Appendix VIII. If significant degradation is present, the degradation would be detected during an UT examination, to the maximum extent practical, from accessible surface area of the weld.

4.0 CONCLUSION

For Request for Relief OC-32, the NRC staff has concluded that the Code requirements are a significant hardship without a compensating increase in quality and safety, and the licensee's proposed alternative provides reasonable assurance of structural integrity of the subject weld. Therefore, the proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the third 10-year ISI interval.

For Requests for Relief OC-33, OC-34, and OC-35, the NRC staff has concluded that the ASME Code coverage requirements are impractical for the subject welds, and that the examination coverage obtained by the licensee provides reasonable assurance of structural integrity of the subject components. Therefore, relief is granted and the alternatives imposed pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year ISI interval. The staff has determined

that granting Requests for Relief OC-33, OC-34, and OC-35 pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and 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.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in this review remain applicable, including third party review by the Authorized Nuclear Inservice Inspector.

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Date: February 2, 2005

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