February 19, 2008

James H. McCarthy
Site Vice President
FPL Energy Point Beach, LLC
6610 Nuclear Road
Two Rivers, WI 54241

SUBJECT: POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2 - THE FOURTH 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN REQUESTS FOR RELIEF NOS. RR-18, RR-19, AND RR-20 (TAC NOS. MD6346 AND MD6347)

Dear Mr. McCarthy:

By letter to the Nuclear Regulatory Commission (NRC) dated April 6, 2007, as supplemented by letter dated November 16, 2007, Nuclear Management Company, LLC (NMC, the licensee) submitted the Fourth 10-Year Interval Inservice Inspection (ISI) Program Plan relief requests (RR) Nos. RR-18, RR-19, and RR-20 for the Point Beach Nuclear Plant, Units 1 and 2 (PBNP). FPL Energy Point Beach, LLC has since become the current licensee, following a license transfer that occurred on August 28, 2007. Therefore, from hereon in, correspondence from NMC will be referred to as correspondence from the licensee.

For RR No. RR-18, the staff has reviewed the licensee's submittal and concludes that to require the licensee to perform the American Society of Mechanical Engineers Boiler and Pressure Vessel (ASME Code) examination requirements would be a hardship without compensating increase in quality and safety and that the licensee's proposed alternative will provide reasonable assurance of the structural integrity of reactor pressure vessel (RPV) support welds RPV-MK-16 and RPV-MK-17. Therefore, the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the fourth 10-year ISI interval for PBNP, Units 1and 2.

For RR No. RR-19, the staff has reviewed the licensee's submittal and concludes that the ASME Code-examination requirements are impractical. In order for the licensee to perform the ASME Code-required examination, the subject components would have to be redesigned placing a burden on the licensee. The licensee's proposed alternative to perform a VT-3 visual best effort examination will provide reasonable assurance of the structural integrity of the RPV support structure. Therefore, relief is granted for RR-19 pursuant to 10 CFR 50.55a(g)(6)(i) for the fourth 10-year ISI interval for PBNP, Units 1 and 2.

For the first part of RR No. RR-20, the staff concludes that the licensee's proposed alternative to use the Performance Demonstration Initiative (PDI) examination methodology in lieu the ASME Code, Section V, Article 4 examination requirements to perform ultrasonic test (UT) examinations on the RPV upper vessel shell-to-flange weld RPV-14-683 will provide an acceptable level of quality and safety. Therefore, the licensee's proposed alternative to use the PDI examination methodology is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI interval for PBNP, Units 1and 2.

For the second part of RR No. RR-20, the staff concludes that ASME Code requirements are impractical and the licensee's proposed alternative UT examination coverage will provide reasonable assurance of the structural integrity of RPV upper vessel shell-to-flange weld

RPV-14-683. Therefore, relief is granted for RR-20 pursuant to 10 CFR 50.55a(g)(6)(i) for the fourth 10-year ISI interval for PBNP, Units 1 and 2.

The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) for RR Nos. RR-19 and the second part of RR-20, is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest given 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 the subject requests for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/

Patrick Milano, Acting Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-266 and 50-301

Enclosure:
As stated

cc w/encl: See next page

RPV-14-683. Therefore, relief is granted for RR-20 pursuant to 10 CFR 50.55a(g)(6)(i) for the fourth 10-year ISI interval for PBNP, Units 1 and 2.

The NRC staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) for RR Nos. RR-19 and the second part of RR-20, is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest given 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 the subject requests for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Sincerely,

/RA/

Patrick Milano, Acting Chief
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-266 and 50-301

Enclosure:
As stated

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

FOURTH 10-YEAR INTERVAL INSERVICE INSPECTION

REQUEST FOR RELIEF NOS. RR-18, RR-19, and RR-20

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

FPL ENERGY POINT BEACH, LLC

DOCKET NUMBERS 50-266 AND 50-301

1.0 INTRODUCTION

The Nuclear Regulatory Commission (NRC) staff has reviewed and evaluated the information provided by the licensee in its letter dated April 6, 2007 as supplemented by letter dated November 16, 2007, which proposed its Fourth 10-year Interval Inservice Inspection (ISI) Program Plan Request for Relief (RR) Nos. RR-18, RR-19, and RR-20 for Point Beach Nuclear Plant, Units 1 and 2 (PBNP, Units 1 and 2).

2.0 REGULATORY REQUIREMENTS

Inservice inspection of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Class 1, 2, and 3 components is performed in accordance with Section XI of the ASME Code and applicable addenda as required by Title 10 of the Code of *Federal Regulations* (10 CFR) 50.55a(g), except where specific relief has been granted by the NRC pursuant to 10 CFR 50.55a(g)(6)(i). 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 ten-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 ASME Code of record for the PBNP, Units 1 and 2 fourth 10-year interval inservice inspection program, is the 1998 Edition with the 2000 Addenda of Section XI of the ASME Code.

3.0 EVALUATION

RR-18

ASME Code Component Identification

Welded integral attachments on the outside surface of the reactor pressure vessel (RPV) for PBNP, Units 1 and 2.

ASME Code Requirement

ASME Code, Section XI, Examination Category B-K, Item B10.10 requires a surface examination of essentially 100 percent of the length of each weld for all welded attachments which meet the following conditions:

a.) The attachment is on the outside surface of a pressure-retaining component;

b.) The attachment provides component support as defined in ASME Code, Section III, NF-1110;

c.) The attachment weld joins the attachment either directly to the surface of the component or to an integrally cast or forged attachment to the component, and

d.) The attachment weld is a full penetration, fillet, or partial penetration (either continuous or intermittent) weld.

ASME Code Case N-460, *Alternative Examination Coverage for Class 1 and Class 2 Welds*, as an alternative approved for use by the NRC in Regulatory Guide (RG 1.147), Revision 14, *Inservice Inspection Code Case Acceptability*, *Section XI, Division 1* states that a reduction in examination coverage due to part geometry or interference for any ASME Class 1 or 2 weld is acceptable provided that the reduction is less than 10 percent, i.e., greater than 90 percent examination coverage is obtained.

Licensee's Basis for Relief Request (As Stated)

> The RPV welded attachments are identified in the PBNP ISI Plan as welds RPV-MK-16 and RPV-MK-17, which are located at vessel azimuths 88.5° and 268.5°, respectively. The configuration of the above identified welded attachments is similar to ASME [Code] Section XI, Figure IWB-2500-15. Access to the RPV inlet and outlet piping-to-nozzles is provided by the removal of sand plugs (blocks) located directly above each nozzle-to-reactor coolant piping connection weld. However, due to the placement of the welded attachments inside of permanent insulation and the biological shield wall/reactor vessel support structure, the welds are inaccessible for examination by either the surface or the visual examination method. In addition, due to its placement within a small annulus region between the biological shield wall and the reactor pressure vessel, a majority of the

vessel's support system is inaccessible for visual (VT-3) examination. The configuration of these welded attachments is shown in Figure 2[1]. During the First and Second Ten-Year Intervals, the welded attachments were examined utilizing ultrasonic (UT) techniques applied from the inside surface [inside diameter] (ID) using automated examination equipment during the 10-year RPV inservice inspection (ISI). These examinations revealed no recordable flaw-like indications for either unit. During the Third Ten-Year Interval, ASME Section XI, 1986 Edition, did not require the examination of these welds.

In order to gain access to either the welded attachments or to a majority (>90%) of the area of the RPV support structure, significant modifications of the currently installed biological shield wall, vessel support system, and permanent insulation would be required. These modifications would entail significant personnel radiation exposure without a compensating increase in the level of quality and safety.

Licensee's Proposed Alternative Examination (As Stated)

[Nuclear Management Company, LLC] proposes that a UT [ultrasonic] examination of the welded attachments be performed utilizing ASME [Code] Section XI, Appendix VIII, "Performance Demonstration for Ultrasonic Examination Systems," Supplement 6, "Qualification Requirements for Reactor Vessel Welds Other Than Clad/Base Metal Interface." The examinations will be performed with procedures/techniques consistent with the requirements of Appendix VIII, Supplement 6 during the regularly scheduled Fourth Interval Ten-Year RPV examinations. The examination area would be limited to the surface shown on [ASME Code, Section XI,] Figure IWB-2500-15 B-C, to a depth of one inch (1") into the material.

Staff's Evaluation

Although the licensee has requested relief in accordance with 10 CFR 50.55a(g)(5)(iii), the NRC staff has evaluated RR-18 as an alternative pursuant to 10 CFR 50.55a(a)(3)(ii) because the licensee proposed an alternative to use the performance demonstration initiative (PDI) UT examination methodology in the ASME Code, Appendix VIII, Supplement 6 in lieu of the ASME Code surface examination requirements.

The ASME Code requires a surface examination of essentially 100 percent of the weld length of RPV welded attachments. These attachments are used to support the RPV and are welds RPV-MK-16 and RPV-MK-17, which are located at vessel azimuths 88.5° and 268.5°, respectively. The licensee is unable to perform the ASME Code-required surface examinations due to the inaccessibility of the subject welds. In lieu of the ASME Code surface examinations the licensee has proposed to perform a UT examination of the subject welded attachments from the inside surface of the RPV by utilizing the PDI methodology of the ASME Code, Appendix VIII, Supplement 6. The proposed examination would be limited to the area shown on ASME Code, Section XI, Figure IWB-2500-15, as modified by the licensee.

1. Figure 2 is not included in this safety evaluation (SE) and can be found in the licensee's letter dated April 6, 2007.

The subject RPV attachment welds are inaccessible for examination by either the surface or visual examination method due to the location of the welded attachments in a small annulus region between the permanent insulation and biological shield wall/reactor vessel support structure. Based on the licensee's description of the examination area, photographs, and drawings of the subject supports, the NRC staff determined that to require the licensee to perform the ASME Code-required surface examination would be a hardship without compensating increase in quality and safety.

The licensee proposes to use examination procedures, personnel, and equipment qualified in accordance with ASME Code, Section XI, Appendix VIII, Supplement 6, as modified by 10 CFR 50.55a in lieu of the surface examination required by the ASME Code. 10 CFR 50.55a limits the use of ASME Code, Section XI, Appendix VIII to the 2001 Edition of the ASME Code with no Addenda. ASME Code, Section XI, Appendix VIII is a performance-based UT method. Examinations are performed with the scanning requirements for Supplement 6 that are provided in 10 CFR 50.55a(b)(2)(xv)(G), and the scanning volume identified in the ASME Code, Section XI, Figure IWB-2500-15 area B-C for RPV support welds RPV-MK-16 and RPV-MK-17. The procedures, equipment, and personnel qualified to Appendix VIII through the PDI program have shown a high probability of flaw detection and have increased the reliability of examinations of weld configurations within the scope of the PDI program. The staff determined that the licensee's proposed UT examinations should detect significant patterns of degradation, if any are occurring. The staff also determined that the volumetric examinations to be performed should provide reasonable assurance of the structural integrity of RPV support welds RPV-MK-16 and RPV-MK-17.

RR-19

ASME Code Component Identification

RPV supports for both PBNP, Units 1 and 2

ASME Code Requirement

ASME Code, Section XI, Examination Category F-A, Item F1.40 requires a Visual, VT-3 for 100 percent of the supports other than piping supports (Class 1, 2, 3, and MC).

ASME Code Case N-460, *Alternative Examination Coverage for Class 1 and Class 2 Welds*, as an alternative approved for use by the NRC in Regulatory Guide (RG 1.147), Revision 14, *Inservice Inspection Code Case Acceptability*, *Section XI, Division 1* states that a reduction in examination coverage due to part geometry or interference for any ASME Class 1 or 2 weld is acceptable provided that the reduction is less than 10 percent, i.e., greater than 90 percent examination coverage is obtained.

Provided By the Licensee in Its RAI Response Dated November 16, 2007 (As Stated)

> The Category F-A, Item F1.40, portion of the RPV support structure for each unit consists of a ring girder supported by six legs. There are two attachments welded to the RPV (considered to be Category B-K as discussed in RR-18) and a weld deposit support pad on each nozzle that sits on the ring girder. The welds within the Category F-A support

assembly as a whole are not individually identified. The component supports (rings/legs) for the [PBNP, Units 1 and 2] RPVs are identified as RPV-Support for each unit.

Licensee's Basis for Relief Request (As Stated)
Access to the RPV inlet and outlet piping/nozzles is provided by the removal of sand plugs (blocks) located directly above each nozzle-to-reactor coolant piping connection weld. However, due to its placement within a small annulus region between the biological shield wall and the RPV, a majority of the RPV support system is inaccessible for visual (VT-3) examination.

In order to gain access to a majority of the area (>90 percent) of the RPV support structure, significant modifications of the currently installed biological shield wall, vessel support system, and permanent insulation would be required. These modifications would entail significant personnel radiation exposure without a compensating increase in the level of quality and safety.

Licensee's Proposed Alternative Examination (As Stated)

NMC [the licensee] proposes that a visual examination (VT-3) of the portions of the RPV support system accessible through the four reactor coolant nozzle/piping access holes, as well as the portions available from below the RPV, be performed in accordance with the currently approved Inservice Inspection Program Fourth Interval Class 1, 2, and 3 Plan.

Staff's Evaluation

The staff evaluated granting relief under the provisions of 10 CFR 50.55a(g)(6)(i). ASME Code, Section XI, Examination Category F-A, Item F1.40 requires a VT-3 visual examination for 100 percent of the RPV supports. The licensee is unable to fully access the area of the RPV supports. In order for the licensee to access the area to perform the ASME Code VT-3 visual examination, it must remove sand plugs (blocks) located directly above each nozzle-to-reactor coolant piping connection weld. These supports are located in a small annulus region between the biological shield wall and the RPV. As a result of the limited access, a majority of the RPV support system is inaccessible for visual examination. In order for the licensee to access this area to perform the visual inspections, it would have to be redesigned to gain access to a majority of the area (>90 percent) of the RPV support structure. Based on the licensee's description of the examination area, photographs, and drawings of the subject supports, the staff determined that to require the licensee to perform the ASME Code-required surface examination would be a burden since the area would have to be redesigned. Therefore, the ASME Code-required VT-3 visual examination is impractical.

As an alterative, the licensee proposed to perform VT-3 visual examinations of the portions of the RPV supports accessible through the four reactor coolant nozzle/piping access holes, as well as the portions visible from below the RPV. The staff determined that the licensee's proposed VT-3 examinations should detect significant patterns of degradation, if any are occurring. The staff also determined that the VT-3 visual examinations provide reasonable assurance of structural integrity of the subject RPV supports.

RR-20

ASME Code Component Identification

Reactor Pressure Vessel (RPV) Upper Vessel Shell-to-Flange Weld RPV-14-683

ASME Code Requirement

ASME Code, Section XI, Examination Category F-A, Item F1.40 requires a Visual, VT-3 for 100 percent of the supports other than piping supports (Class 1, 2, 3, and MC).

ASME Code, Section XI, Table IWB-2500-1, Category B-A, Item Number B1.30 requires an essentially 100 percent ultrasonic examination of the RPV shell-to-flange weld length.

In accordance with ASME Code, Section XI, paragraph IWA-2232, "Ultrasonic examinations shall be conducted in accordance with Appendix I." Further, in accordance with Appendix I, Paragraph I-21 10(b), "Ultrasonic examination of reactor vessel-to-flange welds, closure head-to-flange welds, and integral attachment welds shall be conducted in accordance with Article 4 of Section V, except that alternative examination beam angles may be used."

ASME Code Case N-460, *Alternative Examination Coverage for Class 1 and Class 2 Welds*, as an alternative approved for use by the NRC in Regulatory Guide (RG 1.147), Revision 14, *Inservice Inspection Code Case Acceptability*, *Section XI, Division 1* states that a reduction in examination coverage due to part geometry or interference for any ASME Class 1 or 2 weld is acceptable provided that the reduction is less than 10 percent i.e., greater than 90 percent examination coverage is obtained.

Licensee's Basis for Relief Request (As Stated)

> Performance of ultrasonic (UT) examinations which have been qualified through the ASME [Code,] Section XI, Appendix VIII/Performance Demonstration Initiative (PDI) process provides a superior examination compared to ASME [Code,] Section V, Article 4 examinations. The proposed alternative represents the best techniques, procedures, and qualifications available to perform UT of RPV welds.
>
> The RPV examination vendor reviewed PBNP drawings and has estimated about 60 percent coverage will be obtained on [weld] RPV-14-683. This is due to the configuration of the flange forging and its proximity to the weld (see Drawing 2 in Enclosure 2). The design of the flange forging is such that there are both inside and outside surface tapers that interfere with placement of remote examination modules. In addition, the outside surface of the RPV is inaccessible due to its placement inside the biological-shield wall (Photos 2 and 3 in Enclosure 2)[2]. The RPV examination vendor will perform examinations designed to achieve the maximum coverage possible utilizing PDI qualified procedures and personnel.

2. Photos 2 and 3 in Enclosure 2 are not included in this safety evaluation (SE) and can be found in the licensee's letter dated April 6, 2007.

Licensee's Proposed Alternative Examination (As Stated)

The listed weld is the only circumferential shell [weld] in each RPV that is not examined in accordance with the requirements of ASME [Code,] Section XI, Appendix VIII, as mandated in 10 CFR 50.55a with the issuance of the rule change contained in Federal Register 64 FR 51370, dated September 22, 1999. This rule change mandated the use of ASME Section XI, Appendix VIII, Supplements 4 and 6 for the conduct of all other RPV weld examinations.

ASME [Code,] Section V, Article 4, describes the required techniques to be used for the ultrasonic test (UT) of welds in ferritic pressure vessels with wall thicknesses greater than two inches. The techniques were first published in ASME [Code,] Section V in the 1974 Edition, Summer 1975 Addenda.

The calibration techniques, recording criteria and flaw sizing methods are based upon the use of a distance-amplitude-correction curve (DAC) derived from machined reflectors in a basic calibration block. UT performed in accordance with Regulatory Guide 1.150, "Ultrasonic Testing of Reactor Vessel Welds During Preservice and Inservice Examinations," Revision 1 and [ASME Code,] Section V, Article 4, used recording thresholds of 50 percent DAC for the outer 75 percent of the required examination volume and 20 percent DAC from the clad/base metal interface to the inner 25 percent region of the examination volume. Indications detected in the designated exam volume portions, with amplitudes below these thresholds, were therefore not required to be recorded.

Use of the Appendix VIII (PDI) processes would enhance the quality of the examination results reported. The detection sensitivity is more conservative and the procedure requires the examiner to evaluate all indications determined to be flaws regardless of their associated amplitude. The recording thresholds in [ASME Code,] Section V, Article 4, of the guidelines of Regulatory Guide 1.150, Revision 1 are generic and do not take into consideration such factors as flaw orientation, which can influence the amplitude of UT responses.

EPRI Report NP-6273, "Accuracy of Ultrasonic Flaw Sizing Techniques for Reactor Pressure Vessels," dated March 1989, established that UT flaw sizing techniques based on tip diffraction are the most accurate. The qualified prescriptive-based UT procedures of ASME [Code,] Section V, Article 4 have been applied in a controlled process with mockups of RPVs which contained real flaws and the results statistically analyzed according to the screening criteria in Appendix VIII of ASME Section XI. The results show that the procedures in [ASME Code,] Section V, Article 4, are less effective in detecting flaws than procedures qualified in accordance with [ASME Code, Section XI,] Appendix VIII as administered by the PDI processes. [ASME Code, Section XI,] Appendix VIII/PDI qualification procedures use the tip diffraction techniques for flaw sizing. The proposed alternative [ASME Code, Section XI,] Appendix VIII/PDI UT methodology uses analysis tools based upon echo dynamic motion and tip diffraction criteria which have been validated. This methodology is considered more sensitive and accurate than the [ASME Code,] Section V, Article 4 processes.

UT performed in accordance with the [ASME Code,] Section V, Article 4 processes requires the use of beam angles of 0°, 45°, and 60° with recording criteria that precipitates equipment changes. Having to perform these process changes results in increased radiation exposure for examination personnel. Using these examination processes, personnel must examine the weld manually from the seal surface during reactor pressure vessel (RPV) head lift activities to achieve the maximum coverage of the weld(s). Compliance with the specific [ASME Code,] Section XI, Appendix I requirements for the RPV circumferential shell-to-flange weld when the data is obtained using a less technically advanced process, results in an examination that does not provide a compensating increase in quality and safety for the higher personnel exposures incurred.

Relief was previously requested for weld RPV-14-683 for both Unit 1 and Unit 2 on March 3, 1999, via Relief Requests 1-19 and 2-25. A Safety Evaluation from the NRC dated January 28, 2000, approved Relief Requests 1-19 and 2-25 (ML003677847). The expected coverage for the upcoming inspection of weld RPV-14-683 is consistent with the coverage approved in Relief Requests 1-19 and 2-25. Therefore, the use of PDI techniques to examine the available volume of the shell-to-flange weld will provide reasonable assurance of maintaining safety.

Procedures, equipment and personnel qualified via the [ASME Code.] Appendix VIII, Supplements 4 and 6 PDI programs have been demonstrated to have a high probability of detection of flaws and are generally considered superior to the techniques employed earlier for RPV examinations. Accordingly, approval of this alternative evaluation process is requested pursuant to 10 CFR 50.55a(a)(3)(i). Pursuant to 10 CFR 50.55a(g)(5)(iii), relief is also being requested from the requirement for "essentially 100 percent" volumetric coverage of RPV-14-683, upper vessel shell-to-flange welds.

Staff's Evaluation

ASME Code, Section XI requires volumetric examination of essentially 100 percent of the weld length of the upper vessel shell-to-flange weld RPV-14-683. The licensee has proposed to use the PDI examination methodology in lieu the ASME Code, Section V, Article 4 examination requirements. The licensee also requested relief from the ASME Code requirement for "essentially 100 percent" volumetric coverage of RPV-14-683, upper vessel shell-to-flange welds. The NRC staff will evaluate this relief in two parts: (1) the proposed alternative to use a PDI examination methodology will be evaluated as an alternative pursuant to 10 CFR 55a(a)(3)(i), and (2) the licensee's request to obtain less than the ASME Code-required volumetric coverage when the examination is performed in the fourth 10-year ISI interval pursuant to 10 CFR 50.55a(g)(5)(iii).

The 1998 Edition, 2000 Addenda of ASME Code, Section XI, IWA-2232 states, "Ultrasonic examination shall be conducted in accordance with Appendix I." Subarticle I-2120 states that vessels greater than 2 inches in thickness shall be examined in accordance with ASME Code, Section V, Article 4, as supplemented by Table I-2000-1. ASME Code, Section V, Article 4 provides prescriptive requirements for qualifying UT procedures and conducting examinations. ASME Code, Section V, Article 4 examinations are detailed criteria for setting up and calibrating equipment, calculating coverage, and detecting indications. The capability of an ASME Code, Section V, Article 4 examination is demonstrated with calibration blocks made from representative material containing holes and notches. Performance-based UT requires that

detailed criteria be used for performance demonstration tests. The results for the tests are compared against statistically developed screening criteria. The tests are performed on representative mockups containing flaws similar to those found in operating plants. The performance-based tests demonstrate the effectiveness of UT personnel and procedures.

The licensee proposes to use procedures, personnel, and equipment qualified in accordance with ASME Code, Appendix VIII, Supplements 4 and 6, as modified by 10 CFR 50.55a in lieu of the ASME Code, Section V, Article 4 angle beam. 10 CFR 50.55a limits the use of ASME Code, Section XI, Appendix VIII to the 2001 Edition of the ASME Code with no Addenda. Examinations are to be performed with the scanning requirements for Supplements 4 and 6 that are provided in 10 CFR 50.55a(b)(2)(xv)(G), and the scanning volume identified in the ASME Code, Section XI, Figure IWB-2500-4 for the shell-to-flange weld. The scanning requirements are: (1) for the examination of the inner 15 percent of the through-wall volume, scanning will be performed in four orthogonal directions to the maximum extent possible with procedures and personnel qualified to ASME Code, Section XI, Appendix VIII, Supplement 4 or; (2) if the inner 15 percent through-wall volume examination is not possible as required above, the inner 15 percent of the through-wall volume is considered fully examined if coverage is obtained in at least one parallel and one perpendicular direction using personnel and procedures qualified for single-side examination in accordance with ASME Code, Section XI, Appendix VIII, Supplement 6; and (3) the remaining 85 percent through-wall volume is considered fully examined if coverage is obtained in one parallel and one perpendicular direction using procedures and personnel qualified for single-side examination. Single-side qualification criteria are provided in 10 CFR 50.55a(b)(2)(xv)(G)(2) and 10 CFR 50.55a(b)(2)(xvi).

The procedures, equipment, and personnel qualified to ASME Code, Section XI, Appendix VIII through the PDI program have shown a higher probability of flaw detection than that of the ASME Code, Section V, Article 4 examinations. The PDI program has increased the reliability of examinations of weld configurations within the scope of the program. Therefore, the proposed alternative will provide an acceptable level of quality and safety.

In addition, the licensee requested relief from the ASME Code coverage of essentially 100 percent of the weld length. The licensee noted that the expected coverage for the upcoming inspection of weld RPV-14-683 in the fourth 10-year ISI interval is consistent with the 60 percent coverage obtained in the third 10-year interval as noted in NRC's safety evaluation dated January 28, 2000 (ML003677847).

The licensee will be examining the subject welds to the maximum extent practicable as the licensee is unable to obtain the ASME Code-required volumetric coverage, because of the geometric configuration of the weld and other interferences. In order for the licensee to achieve the ASME Code-required volumetric coverage, design modifications to facilitate access for volumetric examinations would be required. Imposition of the ASME Code-required examinations would place a burden on the licensee. Considering that the ASME Code requires essentially a 100 percent examination of the subject welds, and the licensee will examine the welds to the maximum extent practicable, any existing patterns of degradation would be detected by the cumulative coverages achieved. Therefore, the NRC staff determined that the ASME Code requirements are impractical and that the proposed UT examination coverage will provide reasonable assurance of structural integrity of RPV upper vessel shell-to-flange weld.

Staff Conclusions

For RR No. RR-18, the staff has reviewed the licensee's submittal and concludes that to require the licensee to perform the ASME Code examination requirements would be a hardship without compensating increase in quality and safety and that the licensee's proposed alternative will provide reasonable assurance of the structural integrity of RPV support welds RPV-MK-16 and RPV-MK-17. Therefore the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the fourth 10-year ISI interval for PBNP, Units 1and 2.

For RR No. RR-19, the staff has reviewed the licensee's submittal and concludes that the ASME Code-examination requirements are impractical. In order for the licensee to perform the ASME Code-required examination, the subject components would have to be redesigned placing a burden on the licensee. The licensee's proposed alternative to perform a VT-3 visual best effort examination will provide reasonable assurance of the structural integrity of the RPV support structure. Therefore, relief is granted for RR-19 pursuant to 10 CFR 50.55a(g)(6)(i) for the fourth 10-year ISI interval for PBNP, Units 1 and 2.

For the first part of RR No. RR-20, the staff concludes that the licensee's proposed alternative to use the PDI examination methodology in lieu the ASME Code, Section V, Article 4 examination requirements to perform UT examinations on the RPV upper vessel shell-to-flange weld RPV-14-683 will provide an acceptable level of quality and safety. Therefore, the licensee's proposed alternative to use the PDI examination methodology is authorized pursuant to 10 CFR 50.55a(a)(3)(i) for the fourth 10-year ISI interval for PBNP, Units 1and 2.

For the second part of RR No. RR-20, the staff concludes that ASME Code requirements are impractical and the licensee's proposed alternative UT examination coverage will provide reasonable assurance of the structural integrity of RPV upper vessel shell-to-flange weld RPV-14-683. Therefore, relief is granted for RR-20 pursuant to 10 CFR 50.55a(g)(6)(i) for the fourth 10-year ISI interval for PBNP, Units 1 and 2.

The staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) for RR Nos. RR-19 and RR-20, is authorized by law and will not endanger life or property, or the common defense and security, and is otherwise in the public interest given 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 the subject requests for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

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Date: February 19, 2008