



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

September 16, 2015

Mr. Eric McCartney  
Site Vice President  
NextEra Energy Point Beach, LLC  
6610 Nuclear Road  
Two Rivers, WI 54241

SUBJECT: POINT BEACH NUCLEAR PLANT, UNIT NO. 2 - EVALUATION OF RELIEF REQUEST RR-10 – EXAMINATION OF THE UNIT 2 STEAM GENERATOR FEEDWATER NOZZLE EXTENSION TO NOZZLE WELD FIFTH 10-YEAR INSERVICE INSPECTION PROGRAM INTERVAL (TAC NO. MF5012)

Dear Mr. McCartney:

By letter dated October 13, 2014, and supplemented by letter dated June 15, 2015 (Agencywide Document Access and Management System (ADAMS) Accession Nos. ML14286A094 and ML15166A146), NextEra Energy Point Beach, LLC (NextEra), (the licensee), submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for relief from the inservice inspection requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI inspection requirements for a unique weld configuration.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety.

The NRC staff has reviewed the proposed request and concludes as set forth in the enclosed safety evaluation, that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). The staff determines that the proposed alternative described in Request for Relief No. 10 provides an acceptable level of quality and safety. Therefore, the NRC staff authorizes Request for Relief No. 10 at Point Beach Nuclear Power Plant, Unit 2 for the fifth 10-Year Inservice Inspection Interval that is currently scheduled to end on July 31, 2022.

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

E. McCartney

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If you have any questions, please contact Mahesh Chawla of my staff at (301) 415-8371.

Sincerely,

A handwritten signature in black ink, appearing to read 'D. Pelton', with a long horizontal line extending to the right.

David L. Pelton  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-301

Enclosure:  
Safety Evaluation

cc w/encl: Distribution via Listserv



UNITED STATES  
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REGARDING THE FIFTH 10-YEAR INSERVICE INSPECTION INTERVAL

REQUEST FOR RELIEF NO. 10

POINT BEACH NUCLEAR POWER PLANT, UNIT NO. 2

NEXTERA ENERGY POINT BEACH, LLC

DOCKET NO. 50-301 (TAC NO. MF5012)

1.0 INTRODUCTION

By letter dated October 13, 2014 and supplemented by letter dated June 15, 2015 (Agencywide Document Access and Management System (ADAMS) Accession Nos. ML14286A094 and ML15166A146), NextEra Energy Point Beach, LLC (NextEra), (the licensee), submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for relief from the inservice inspection requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI inspection requirements for a unique weld configuration.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(z)(1), the licensee requested to use the proposed alternative on the basis that the alternative provides an acceptable level of quality and safety.

2.0 REGULATORY EVALUATION

Relief Request (RR) No. 10, dated October 13, 2014, cited 10 CFR 50.55a(a)(3)(i), which covered RRs for alternatives on the basis that the proposed alternative would provide an acceptable level of quality and safety. On December 5, 2015, the NRC reorganized 10 CFR 50.55a (*Federal Register* Volume 79 Number 214), and RRs that had been previously covered by 10 CFR 50.55a(a)(3)(i) are now covered under the equivalent 10 CFR 50.55a(z)(1).

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.

Paragraph 55a(z) of 10 CFR 50 states, in part, that alternatives to the requirements of 10 CFR 50.55a(g) may be used, when authorized by the NRC, if (1) the proposed alternatives would

Enclosure

provide an acceptable level of quality and safety or (2) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Based on the above, and subject to the following technical evaluation, the NRC staff finds that regulatory authority exists for the licensee to request and the Commission to authorize the alternative requested by the licensee.

### 3.0 TECHNICAL EVALUATION

#### 3.1 Licensee's Relief Request

##### Affected Component

The affected weld is a class 2 weld, numbered SG-A-8, between a feedwater nozzle and a nozzle extension. The licensee has classified the weld as an Examination Category C-B Item Number C2.21 Nozzle-to-Shell (Nozzle to Head or Nozzle to Nozzle).

The nozzle and nozzle extension were fabricated from SA-508 Cl. 3a ferritic steel.

##### ASME Code of Record

The 2007 Edition with the 2008 Addenda of the ASME Code Section XI is the code of record for the fifth 10-Year inservice inspection program interval which began on August 1, 2012.

##### Code Requirement

Examination category C-B, Item C2.21 requires a surface and volumetric examination in accordance with Appendix I of ASME Code Section XI.

As there is no specific provision for a nozzle-to-nozzle or a nozzle-to-nozzle extension weld in Appendix I, the nozzle-to-nozzle extension weld defaults to the requirements of ASME Code Section V Article 4, supplemented by ASME Code Section XI Appendix I Table I-2000-1. ASME Code Section XI Appendix I Table I-2000-1 requires the use of 45 degree and 60 degree inspection angles.

##### Proposed Alternative

A surface and ultrasonic examination will be performed once each interval. The ultrasonic examination will utilize 30 degree and 45 degree beam angles to interrogate the lower third of the weld and adjacent base material. The 30 degree angle has been chosen to be used from the nozzle taper. Scan coverage with the 45 degree search unit is limited due to short physical length of the nozzle boss, but will be performed to the maximum extent possible.

##### Basis for Alternative

The proposed technique has been demonstrated to the Authorized Inspection Agency on a mock-up with two implanted weld solidification flaws 0.085 inches deep (1.99 percent through-

wall extent). The circumferential flaw was placed in the region of the block which would equate to the weld centerline to demonstrate the ability of the 30 degree search unit to detect a flaw while scanning on the nozzle taper. The axial flaw was placed at a convenient location on the block away from the calibration reflectors (side and end-drilled holes).

### Duration of Proposed Alternative

The proposed alternative will be used for the fifth 10-Year Inservice Inspection Interval that is currently scheduled to end on July 31, 2022.

### 3.2 Staff Evaluation

The licensee is proposing to use an alternative ultrasonic inspection procedure for a nozzle to nozzle extension weld in the feedwater system for a steam generator on the basis that the alternative provides an acceptable level of quality and safety.

The licensee has classified the weld as a category C-B, Item C2.21 inspection. ASME Code Section XI Appendix I does not specifically describe the requirements for a nozzle to nozzle extension weld, and the weld defaults to an ASME Code Section V Article 4 inspection with the requirement to follow ASME Code Section XI Appendix I Table I-2000-1. The NRC staff considered the possibility that the weld could also be considered a piping butt weld, which would require an inspection performed to meet the requirements of ASME Code Section XI Appendix VIII. The classification of the weld is ultimately relatively unimportant in this case, as the small area available to scan the weld would result in significant missed volumetric inspection coverage for either a Section V Article 4 or a Section XI Appendix VIII examination. This missed coverage would almost certainly result in the inspection achieving less than essentially 100 percent coverage, resulting in the need for a relief request under 10 CFR 50.55a(g)(5)(iii). While the licensee also has the option of inspecting the weld with a procedure incapable of achieving sufficient coverage and then submitting a relief pursuant to 10 CFR 50.55a(g)(5)(iii), using an alternate inspection procedure that is effective over the entire weld provides a stronger basis for assuring structural integrity and leak tightness for the component.

The proposed ultrasonic inspection is designed to be conducted from the flat nozzle "boss" area on either side of the weld using a 45 degree search unit and from the nozzle taper using a 30 degree search unit. The inspection from the tapered area covers the entire wetted surface of the weld and the 45 degree inspections from the flat nozzle boss area cover the upper regions of the inspection area. This procedure was able to detect axial and circumferential 0.085 inch deep,  $\approx$ 2 percent through-wall, weld solidification cracks. This combination of 100 percent coverage of the inner diameter (ID) wetted surface and demonstrated ability to find small flaws provides a technical basis showing that the proposed inspection is preferable to a limited-access inspection performed to ASME Code requirements that would not be able to scan the ID surface and would not achieve essentially 100 percent coverage.

The calculated cumulative usage factor (CUF) for the component over its remaining lifetime is 0.9276. Based on this calculation, cracking is not expected to occur in this component. The CUF is relatively close to 1, but if thermal fatigue cracks do develop they are expected to take more than one 10-Year interval before they would challenge the structural integrity or leak tightness of the weld.

#### 4.0 CONCLUSION

As set forth above, the NRC staff determines that the proposed alternative described in Request for Relief No. 10 provides an acceptable level of quality and safety. Accordingly, the staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(1). Therefore, the NRC staff authorizes Request for Relief No. 10 at Point Beach Nuclear Power Plant, Unit No. 2 for the fifth 10-Year Inservice Inspection Interval that is currently scheduled to end on July 31, 2022.

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

Principal Contributor: S.Cumblidge, NRR/DE/EPNB

Date: September 16, 2015

E. McCartney

- 2 -

If you have any questions, please contact Mahesh Chawla of my staff at (301) 415-8371.

Sincerely,

*/RA/*

David L. Pelton  
Plant Licensing Branch III-1  
Division of Operating Reactor Licensing  
Office of Nuclear Reactor Regulation

Docket No. 50-301

Enclosure:  
Safety Evaluation

cc w/encl: Distribution via Listserv

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**ADAMS Accession No.: ML15246A305**

(\*) memo dated 8/27/2015

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DATE	9/10/2015	9/08/2015	8/27/2015	9/16/2015

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