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

May 20, 2015

Mr. Eric McCartney
Site Vice President
NextEra Energy Point Beach, LLC
Point Beach Nuclear Plant
6610 Nuclear Road
Two Rivers, WI 54241-9516

SUBJECT: POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2 – RELIEF REQUEST RR-8, RELIEF FROM THE REQUIREMENTS OF THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE FOR EXAMINATION OF BURIED COMPONENTS (TAC NOS. MF4140 AND MF4141)

Dear Mr. McCartney:

By letter dated May 13, 2014, NextEra Energy Point Beach, LLC (NextEra) submitted a request to the U.S. Nuclear Regulatory Commission (NRC) for relief from certain requirements specified in the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, at the Point Beach Nuclear Plant (Point Beach), Units 1 and 2.

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR), 50.55a(a)(3)(ii), NextEra submitted Relief Request RR-8, requesting relief from the examination requirements for buried components required by ASME Section XI, IWA-5244. In lieu of the required visual examination requirements, NextEra proposed to perform a flow test in accordance with ASME Section IX, IWA-5244(b)(2) to demonstrate an equivalent level of quality and safety.

The paragraph headings in 10 CFR 50.55a were changed by *Federal Register* notice dated November 5, 2014 (79 FR 65776), which became effective on December 5, 2014 (e.g., 10 CFR 50.55a(a)(3)(ii) is now 50.55a(z)(2)). See the cross-reference tables, which are cited in the notice, at ADAMS Accession No. ML14015A191 and ADAMS package Accession No. ML14211A050.

The NRC staff has reviewed the subject request and concludes, as set forth in the enclosed safety evaluation, that NextEra has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2).

If you have any questions, please contact Mahesh Chawla at (301) 415-8371, or via e-mail at Mahesh.Chawla@nrc.gov.

Sincerely,

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

Docket Nos. 50-266 and 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

RELIEF REQUEST NO. RR-8 REGARDING EXAMINATION OF BURIED COMPONENTS

NEXTERA ENERGY POINT BEACH, LLC

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

DOCKET NOS. 50-266 AND 50-301

1.0 INTRODUCTION

By letter dated May 13, 2014 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML14133A365), NextEra Energy Point Beach, LLC (NextEra or the licensee) requested relief from the requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) regarding associated system leakage tests for buried service water piping and buried fuel oil piping and tanks at Point Beach Nuclear Plant, Units 1 and 2 (PBNP).

Specifically, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(a)(3)(ii), the licensee requested to use the proposed alternative on the basis that complying with the specified requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

The paragraph headings in 10 CFR 50.55a were changed by *Federal Register* notice dated November 5, 2014 (79 FR 65776), which became effective on December 5, 2014 (e.g., 10 CFR 50.55a(a)(3)(ii) is now 50.55a(z)(2)). See the cross-reference tables, which are cited in the notice, at ADAMS Accession No. ML14015A191 and ADAMS package Accession No. ML14211A050.

2.0 REGULATORY EVALUATION

In this relief request the licensee requested authorization of an alternative to the requirements of ASME Section XI, IWA-5244 pursuant to 10 CFR 50.55a(z)(2).

Section 50.55a(g)(4) of 10 CFR specified that ASME Code class 1, 2, and 3 components (including supports) must meet the requirements, except the design and assess provisions and the pre-service examination requirements, set forth in the ASME Code, Section XI, "Rules for In-service Inspection (ISI) of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components.

Pursuant to 10 CFR 50.55a(z), alternatives to the ASME Code requirements may be authorized by the NRC if the licensee demonstrates that: (1) the proposed alternative provides an

Enclosure

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 the use of an alternative and the NRC to authorize the alternative proposed by the licensee.

3.0 TECHNICAL EVALUATION

3.1 The Licensee's Relief Request [or Alternative]

3.1.1 Component Identification

Class 3, Examination Category D-B, Item Number D2.10 piping in two areas:

- Approximately 90 feet of 30-in diameter carbon steel service water (SW) piping for both units, buried between the circulating water pump house and the turbine building. These sections of piping are not accessible for inspection during a pressure test.

- Approximately 1000 feet of 2-in diameter carbon steel fuel oil (FO) piping, buried between the diesel generator (DG) building and the turbine building. Two buried FO storage tanks, 35,000 gallon capacity each. The tanks and buried sections of piping are not accessible for inspection during a pressure test.

3.1.2 Code Requirements for Which Relief is Requested

The 2007 Edition with 2008 Addenda of ASME Code, Section XI, Table IWD-2500-1, Examination Category D-B, Item No D2.10 requires a system leakage test and a VT-2 visual examination. For buried components where a VT-2 visual examination cannot be performed, IWA-5244(b)(1) requires that:

> The system pressure test for buried components that are isolable by means of valves shall consist of a test that determines the rate of pressure loss. Alternatively, the test may determine the change in flow between the ends of the buried components. The acceptable rate of pressure loss or flow shall be established by the Owner.

3.1.3 Licensee's Proposed Alternative

The licensee proposes to use the requirements of IWA-5244(b)(2), which states that:

> The system pressure test for non-isolable buried components shall consist of a test to confirm that flow during operation is not impaired.

Service Water

The unimpaired flow in the SW system will be verified during quarterly SW pump testing, as well as through visual examination of the ground surface areas above the buried SW piping.

Fuel Oil

The unimpaired flow in the FO system will be verified during monthly emergency diesel generator testing, as well as through weekly checks of the leak detection systems on the buried tanks and buried piping leak containment trench.

3.1.4 Licensee's Duration of Relief Request

The proposed alternative will be used for the fifth 10-year ISI interval of the ISI program for PBNP that commenced on August 1, 2012, and is scheduled to end on July 31, 2022.

3.1.5 Licensee's Basis for Relief

For both the SW and FO buried components, performing the specified examinations or testing would require either excavating the buried components, entering potential dual unit Technical Specification Action Statement, reducing the emergency power system redundancy, or performing major modifications to system piping. Therefore, compliance with the specified requirements is a hardship without a compensating increase in the level of qualify or safety.

Service Water

The SW buried suction piping for both units is configured with a ring header such that both sides of the system are supplying both units. The buried SW piping consists of two separate sections, totaling about 90 feet of 30-inch diameter carbon steel piping located between the circulating water pump house and the turbine building. These sections are approximately 7 feet underground with a road built over it. There is no access to the buried sections of piping without excavation. Further, no annulus was provided during original construction that would allow for examination of these buried sections of piping.

The two sections of buried piping use six butterfly valves for isolation. These valves are not suitable for performing a pressure isolation function since they were not designed to be leak-tight. Extensive maintenance or system modification would be required to conduct a rate of pressure loss test. The alternative test would be to determine the change in flow between the ends of buried components. However, sufficient length of accessible straight pipe is not available to utilize an ultrasonic flow measuring device. Therefore, the configuration of the buried SW system will not allow for determining the change in flow between the ends of the buried components.

The integrity of the buried piping will be verified during quarterly service water pump testing. Trending of the SW flow at a fixed differential pressure across each pump will indicate leakage through the buried piping assuming no pump degradation. The use of the inservice pump tests provided a means to ensure flow during operation is not impaired. The pump acceptance criteria also ensure the required safety flow is maintained for any buried piping leakage other

than system loss of flow and degradation. Significant through-wall leakage of a buried pipe would result in failed inservice pump tests for three of six SW pumps providing flow to this portion of buried pipe. This failure would result in a dual unit 72-hour Technical Specification Action Statement and lead to a plant shutdown to identify and correct the condition.

These buried sections of SW header are almost continuously in service. At least three SW pumps are typically running, which equates to roughly 7500 gallons per minutes through each section.

In addition, a VT-2 visual examination will be performed each period for evidence of leakage on ground surfaces in the vicinity of the buried SW headed, to identify potential through wall leakage.

Fuel Oil

The diesel generator (DG) building was constructed approximately 20 years ago, to house two additional DG for the site. In this building are the two safety-related FO storage tanks, which are buried beneath the building. The Class 3 tanks are installed with an outer leak-containment liner and leak detection capability. The FO piping is routed underground from the DG building to the two original DG that are housed within the control building, which is inside the turbine building. The buried FO piping consists of approximately 500 feet each of two separate 2-in lines, which are buried in a high density polyethylene trench along with leak detection points along its length. There is no access to these buried components other than excavation. No annulus was provided during original construction that would allow for testing or examination of these buried sections of piping.

There are isolation valves on each end of the buried section of piping, but pressure drop testing would require taking one of the four DG out of service for the duration of the test.

The integrity of the buried FO tanks and piping will be verified during monthly DG technical specification testing. These monthly tests start and run each diesel, which effectively confirms that flow through the buried portions of the FO system is not impaired. Additionally, the weekly check of the leak detection features attached to the leak containment, which surrounds both the FO tanks and piping, provide assurance that these components do not have though wall leakage. Should leakage be identified, the condition would be entered into the site corrective action program and appropriate actions would be taken to declare portions of the system out of service and affect needed repairs.

3.2 NRC Staff Evaluation

The Code of Record for PBNP, Units 1 and 2, requires a system pressure test for the buried portion of SW piping and FO components that will determine either a rate of pressure loss or a change in flow at the ends of the buried piping. The buried SW piping uses butterfly valves at the ends, which were not designed for pressure isolation and, therefore, are unsuitable to determine meaningful rate of pressure loss. The NRC staff notes that the ends of the buried piping are not instrumented for flow measurement, therefore does not permit measurement of change in flow. The FO system is also inaccessible because it is primarily buried in a trench with no annulus to provide access for testing or examination of the piping. However, the

licensee performs a weekly check of the leak detection features attached to the leak containment surrounding both the FO tanks and piping, which provides assurance that these components do not have through-wall leakage. In addition, the only way to conduct the pressure drop test in the buried section of the FO piping would require taking a DG out of service for the duration of the test. Therefore, the ASME Code-required test cannot be performed. The ASME Code, however, allows for flow testing of non-isolable buried components to confirm that flow during operation is not impaired.

The NRC staff has reviewed the licensee's approach that unimpaired flow in the SW buried piping can be qualitatively assessed during quarterly inservice testing (IST) surveillance of SW pumps and has found it acceptable. Using the flow instrument downstream from the pump discharge, a reference flow rate could be established which would correspond to a target pump head. A decrease in pump head may indicate increase in flow due to through-wall leakage in the buried piping. From trending of head loss (pressure drop) during a pump test at the reference flow, an assessment can be made on the integrity of buried piping. An issue related to this mode of testing is that pump head loss may be caused by the deterioration of the pump performance rather than the leakage in the buried pipe. As the performance of the pump deteriorates, the developed head decreases at the reference flow. In addition, neither the ASME Code required test nor the proposed alternative will be able to identify small leaks in the piping. The staff notes that the licensee has proposed an alternative that is comparable to the ASME Code required test in that both would identify leakage from the piping under consideration before the piping lost structural integrity. Based on the above, the staff finds that both the ASME Code required test and the proposed alternative are capable of detecting leakage prior to loss of structural integrity. As such, a compensating increase in the level of safety or quality is not achieved by conducting the ASME Code required test. Also, based on the above, the NRC staff finds that neither of the tests is capable of detecting small leakage, and as such, no compensating increase in the level of safety or quality is evidenced.

The NRC staff also agrees that the approach that unimpaired flow in the FO tanks and piping can be verified through monthly DG testing. These tests start and run each diesel, which confirms, in combination with the leak detection capabilities, that flow through the buried portions of the FO system is not impaired. The licensee has stated that if leakage is identified, the condition would be entered into the site corrective action program, and appropriate actions would be taken to declare the system out-of-service and affect needed repairs. In addition, neither the ASME Code required test nor the proposed alternative are capable of detecting small leaks. Both the ASME Code required test and the licensee's proposed alternative will detect large leaks prior to either (1) structural failure of the pipe or (2) when the flow through the pipe fails to meet that required for the piping to perform its intended safety function. While the FO piping and tanks are not contained in annuli and therefore do not strictly meet the requirements of the ASME Code, they are contained in secondary containment in which leak detection is possible. While not meeting the letter of the ASME Code, the NRC staff finds that the licensee's proposed alternative is capable of meeting the Code objective of detection of both small and large leaks through the use of the FO leak detection system.

The NRC staff has determined that the licensee's proposed alternative to test the buried portion of SW and FO piping in conjunction with quarterly IST of SW pumps and monthly testing of the DG would detect significant through-wall leakage, if present, in the subject line and would provide reasonable assurance of structural integrity. Compliance with the ASME Code

requirement would require installation of additional flow measuring device at the inlet end of buried piping or shut down of a DG, which would result in hardship without a compensating increase in the level of quality and safety.

4.0 CONCLUSION

As set forth above, the NRC staff determines that the proposed alternative provides reasonable assurance of structural integrity of the subject components and that complying with the requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Accordingly, the NRC staff concludes that the licensee has adequately addressed all of the regulatory requirements set forth in 10 CFR 50.55a(z)(2). Therefore, the NRC staff authorizes the use of the proposed alternative for the fifth 10-Year inservice inspection interval at PBNP, Units 1 and 2.

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

Principal Contributor: M. Audrain

Date: May 20, 2015

If you have any questions, please contact Mac Chawla at (301) 415-8371, or via e-mail at Mahesh.Chawla@nrc.gov.

Sincerely,

/RA/

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

Docket Nos. 50-266 and 50-301

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Safety Evaluation

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