[7590-01-P]

NUCLEAR REGULATORY COMMISSION

[Docket Nos. 50-266 and 50-301; NRC-2014-0167]

NextEra Energy Point Beach, LLC;

Point Beach Nuclear Plant, Units 1 and 2

AGENCY: Nuclear Regulatory Commission.

ACTION: Exemption; issuance.

SUMMARY: The U.S. Nuclear Regulatory Commission (NRC) is issuing an exemption in response to a January 15, 2013, letter, as supplemented on March 1, 2013, April 18, 2013, September 12, 2013, and March 11, 2014, from NextEra Energy Point Beach, LLC, requesting an exemption to revise certain reactor pressure vessel (RPV) initial nil-ductility reference temperature (RT_{NDT}) properties using Framatome Advanced Nuclear Power (now AREVA Nuclear Power) Topical Report BAW-2308, Revisions 1-A and 2-A, "Initial RT_{NDT} of Linde 80 Weld Materials."

ADDRESSES: Please refer to Docket ID **NRC-2014-0167** when contacting the NRC about the availability of information regarding this document. You may access publicly-available information related to this document using any of the following methods:

- **Federal Rulemaking Web site:** Go to http://www.regulations.gov and search for Docket ID NRC-2014-0167. Address questions about NRC dockets to Carol Gallagher; telephone: 301-287-3422; e-mail: Carol.Gallagher@nrc.gov. For technical questions, contact the individual listed in the FOR FURTHER INFORMATION CONTACT section of this document.
- **NRC's Agencywide Documents Access and Management System (ADAMS):**

You may access publicly available documents online in the ADAMS Public Documents collection at **http://www.nrc.gov/reading-rm/adams.html**. To begin the search, select "ADAMS Public Documents" and then select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, 301-415-4737, or by e-mail to pdr.resource@nrc.gov. The ADAMS accession number for each document referenced in this document (if that document is available in ADAMS) is provided the first time that a document is referenced.

- **NRC's PDR:** You may examine and purchase copies of public documents at the NRC's PDR, Room O1-F21, One White Flint North, 11555 Rockville Pike, Rockville, Maryland 20852.

FOR FURTHER INFORMATION CONTACT: Terry A. Beltz, Office of Nuclear Reactor Regulation, telephone: 301-415-3049; e-mail: Terry.Beltz@nrc.gov, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001.

I. Background

NextEra Energy Point Beach, LLC (NextEra or the licensee) is the holder of renewed Facility Operating License Nos. DPR-24 and DPR-27, which authorize operation of the Point Beach Nuclear Plant (Point Beach), Units 1 and 2, respectively. The license provides, among other things, that the facility is subject to all rules, regulations, and orders of the NRC now or hereafter in effect.

The facility consists of two pressurized-water reactors located in Manitowac County in Wisconsin.

II. Request/Action

Pursuant to Section 50.12 of Title 10 of the *Code of Federal Regulations* (10 CFR), "Specific exemptions," the licensee has, by letter dated January 15, 2013 (ADAMS Accession No. ML13016A208), as supplemented on March 1, April 18, and September 12, 2013, and March 11, 2014 (ADAMS Accession Nos. ML13063A292, ML13113A008, ML13256A064, and ML14071A405, respectively), requested an exemption from 10 CFR 50.61, "Fracture toughness requirements for protection against pressurized thermal shock events," and Appendix G to 10 CFR Part 50, "Fracture Toughness Requirements," to replace the use of the required Charpy V-notch (C_V) and drop weight-based methodology with BAW-2308, Revisions 1-A and 2-A, an alternate methodology for evaluating the integrity of certain RPV beltline welds, at Point Beach, Units 1 and 2. The methodology described in BAW-2308, Revisions 1-A and 2-A, utilized fracture toughness test data based on the use of the 1997 and 2002 editions of American Society for Testing and Materials (ASTM) Standard Test Method E 1921, "Standard Test Method for Determination of Reference Temperature T_0, for Ferritic Steels in the Transition Range," and American Society for Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Code Case N-629, "Use of Fracture Toughness Test Data to establish Reference Temperature for Pressure Retaining materials of Section III, Division 1, Class 1."

In order to use the BAW-2308, Revision 1-A and 2-A, methodology, an exemption is required since Appendix G to 10 CFR part 50, through reference to Appendix G to Section XI of the ASME Code pursuant to 10 CFR 50.55(a), requires the use of a methodology based on C_v and drop weight data.

The licensee also requested an exemption from 10 CFR 50.61 to use an alternate methodology to allow the use of fracture toughness test data for evaluating the integrity of certain Point Beach, Units 1 and 2, RPV beltline welds based on the use of the 1997 and 2002

editions of ASTM E 1921 and ASME Code Case N-629. An exemption is required since the methodology for evaluating RPV material fracture toughness in 10 CFR 50.61 requires the use of the C_V and drop weight data for establishing the PTS reference temperature (RT_{PTS}). This exemption only modifies the methodology to be used by the licensee for demonstrating compliance with the requirements of 10 CFR part 50, Appendix G and 10 CFR 50.61, and does not exempt the licensee from meeting any other requirement of 10 CFR part 50, Appendix G and 10 CFR 50.61.

III. Discussion

Pursuant to 10 CFR 50.12, the Commission may, upon application by any interested person or upon its own initiative, grant exemptions from the requirements of 10 CFR part 50 when: (1) the exemptions are authorized by law, will not present an undue risk to public health or safety, and are consistent with the common defense and security; and (2) when special circumstances are present. Under 10 CFR 50.12(a)(2), special circumstances include, among other things, when application of the specific regulation in the particular circumstance would not serve, or is not necessary to achieve, the underlying purpose of the rule.

A. Special Circumstances

Special circumstances, in accordance with 10 CFR 50.12(a)(2)(ii), are present whenever application of the regulation in the particular circumstances is not necessary to achieve the underlying purpose of the rule. The underlying purpose of Appendix G to 10 CFR part 50, and 10 CFR 50.61, is to protect the integrity of the reactor coolant pressure boundary (RCPB) by ensuring each RPV material has adequate fracture toughness by setting forth fracture toughness requirements for ferritic materials of pressure-retaining components of the RCPB of

light water nuclear power reactors to provide adequate margins of safety during any condition of normal operation, including anticipated operational occurrences and system hydrostatic tests, to which the pressure boundary may be subjected over its service lifetime. The particular circumstance allowing the licensee an exemption is that the use of the alternate methodology specified in BAW-2308, Revisions 1-A and 2-A, for evaluating the integrity of certain RPV beltline welds at Point Beach, Units 1 and 2, continues to achieve the underlying purpose of the rules. Therefore, the NRC staff determined that special circumstances as required by 10 CFR 50.12(a)(2(ii) exist for granting an exemption from portions of the requirements of 10 CFR part 50, Appendix G and 10 CFR 50.61.

B. Authorized by Law

This exemption would allow the use of an alternate methodology to make use of fracture toughness test data for evaluating the integrity of the Point Beach RPV Linde 80 beltline materials, and would not result in changes to operation of the plant. Section 50.60(b) allows the use of proposed alternatives to the described requirements in 10 CFR part 50, Appendix G, or portions thereof, when an exemption is granted by the Commission under 10 CFR 50.12. As stated above, 10 CFR 50.12(a) allows the NRC to grant exemptions from portions of the requirements of 10 CFR part 50, Appendix G, and 10 CFR 50.61. The NRC staff has determined that special circumstances exist to grant the requested exemption, and that granting the exemption will not result in a violation of the Atomic Energy Act of 1954, as amended, or the Commission's regulations. Therefore, the NRC staff determined that the exemption is authorized by law.

C. No Undue Risk to Public Health and Safety

The underlying purpose of Appendix G to 10 CFR part 50 is to set forth fracture

toughness requirements for ferritic materials of pressure-retaining components of the reactor coolant pressure boundary of light-water nuclear power reactors to provide adequate margins of safety during any condition of normal operation, including anticipated operational occurrences and system hydrostatic tests, to which the pressure boundary may be subjected over its service lifetime. The methodology underlying the requirements of Appendix G to 10 CFR part 50 is based on the use of C_V and drop weight data because of reference to the ASME Code, as previously described. NextEra proposes to replace the use of the existing C_V and drop weight-based methodology by a fracture toughness-based methodology to demonstrate compliance with Appendix G to 10 CFR part 50.

The NRC staff has concluded that the requested exemption to Appendix G to 10 CFR part 50 is justified based on the licensee utilizing the fracture toughness methodology specified in BAW-2308, Revisions 1-A and 2-A, within the conditions and limitations delineated in the NRC staff's safety evaluations (SEs) dated August 4, 2005, and March 24, 2008 (ADAMS Accession Nos. ML052070408 and ML080770349, respectively). The use of the methodology specified in the NRC staff's SEs will ensure that pressure-temperature limits developed for the Point Beach, Units 1 and 2, RPVs will continue to be based on an adequately conservative estimate of RPV material properties and ensure that the pressure-retaining components of the reactor coolant pressure boundary retain adequate margins of safety during any condition of normal operation, including anticipated operational occurrences. This exemption only modifies the methodology to be used by NextEra for demonstrating compliance with the requirements of 10 CFR part 50, Appendix G(II)(D)(i) and 10 CFR part 50, Appendix G(I)(A), and does not exempt the licensee from meeting any other requirement of Appendix G to 10 CFR part 50.

Based on the above information, no new accident precursors are created by allowing an exemption from the use of the existing C_V and drop weight-based methodology, and the use of an alternative fracture toughness-based methodology to demonstrate compliance with

Appendix G to 10 CFR part 50; thus, the probability of postulated accidents is not increased. Also, based on the above information, the consequences of postulated accidents are not increased. Therefore, there is no undue risk to public health and safety associated with the proposed exemption to Appendix G to 10 CFR part 50.

The underlying purpose of 10 CFR 50.61 is to establish requirements for evaluating the fracture toughness of RPV materials to ensure that a licensee's RPV will be protected from failure during a PTS event. The licensee seeks an exemption from 10 CFR 50.61 to use a methodology for the "determination of adjusted/indexing reference temperatures." The licensee proposes to use the methodology of BAW-2308, Revision 1-A, as an alternative to the C_v and drop weight-based methodology required by 10 CFR 50.61 for establishing the initial properties when calculating RT_{PTS} values. BAW-2308, Revision 2-A, is not applicable since Point Beach does not have welds with the specific heat numbers referenced in BAW-2308, Revision 2-A. The NRC staff has concluded that the exemption is justified based on the licensee utilizing the approved methodology specified in the NRC staff's SEs regarding BAW-2308, Revision 1-A. This topical report established an alternative method for determining initial RT_{PTS} values for RPV welds manufactured using Linde 80 weld flux (i.e., "Linde 80 welds") and established weld wire heat-specific and generic initial RT_{PTS} values for the Linde 80 welds. These weld wire heat-specific and generic values may be used in lieu of the initial RT_{NDT} values that were determined in accordance with Paragraph NB-2331 of Section III of the ASME Code. Appendix G to 10 CFR part 50 and 10 CFR 50.61 require that the initial RT_{NDT} be determined in accordance with the provisions of the ASME Code and provide the process for determination of RT_{PTS}, evaluated for the end of license fluence.

In BAW-2308, Revision 1-A, the Babcock and Wilcox Owners Group (B&WOG) proposed to perform fracture toughness testing based on the application of the Master Curve evaluation procedure, which permits data obtained from sample sets tested at different

temperatures to be combined, as the basis for redefining the initial material properties of Linde 80 welds based on T_0. NRC staff evaluated this methodology for determining Linde 80 weld initial material properties and uncertainty in those properties, as well as the overall method for combining unirradiated material property measurements based on T_o values (i.e., IRT_{To} in the BAW-2308 terminology), with property shifts from models in Regulatory Guide (RG) 1.99, Revision 2, "Radiation Embrittlement of Reactor Vessel Materials," which are based on C_v testing and a defined margin term to account for uncertainties in the NRC staff's August 4, 2005, SE of BAW-2308, Revision 1-A. Table 3 in the SE contains the NRC staff-accepted IRT_{To} and initial margin (denoted as σ_i) for specific Linde 80 weld wire heat numbers. In accordance with the conditions and limitations outlined in the NRC staff's SE for utilizing the values in Table 3, the licensee has utilized the appropriate NRC staff-accepted IRT_{To} and σ_i values for Linde 80 weld wire heat numbers; applied a minimum chemistry factor of 167°F (values greater than 167°F were used for certain Linde 80 weld wire heat numbers if RG 1.99, Revision 2, indicated higher chemistry factors); applied a value of 28°F for σ_Δ in the margin term; and submitted values for ΔRT_{NDT} and the margin term for each Linde 80 weld in the RPV through the end of the 50 effective full power years (the EFPYs for the proposed P-T limits). Additionally, the NRC's SE for BAW-2308, Revision 2-A concludes that the revised IRT_{T0} and σ_i values for Linde 80 weld materials are acceptable for referencing in plant-specific licensing applications as delineated in BAW-2308, Revision 2-A and to the extent specified under Section 4.0, Limitations and Conditions, of the SE, which states: "Future plant-specific applications for RPVs containing weld heat 72105, and weld heat 299L44, of Linde 80 welds must use the revised IRT_{To} and σ_i, values in BAW-2308, Revision 2." However, the staff notes that neither of these weld heats is used at Point Beach, Units 1 and 2. Thus, BAW-2308, Revision 2-A, is currently not applicable. All conditions and limitations outlined in the NRC staff SEs for BAW-2308, Revision 1-A, have been met for Point Beach, Units 1 and 2.

The use of the methodology in BAW-2308, Revision 1-A, will ensure the PTS evaluation developed for the Point Beach, Units 1 and 2, RPVs will continue to be based on an adequately conservative estimate of RPV material properties and ensure the RPVs will be protected from failure during a PTS event. Also, when additional fracture toughness data relevant to the evaluation of Point Beach, Units 1 and 2, RPV welds is acquired as part of the surveillance program, this data must be incorporated into the evaluation of the Point Beach RPV fracture toughness requirements.

Based on the above, no new accident precursors are created by allowing an exemption to use an alternate methodology to comply with the requirements of 10 CFR 50.61 in determining adjusted/indexing reference temperatures, thus, the probability of postulated accidents is not increased. Also, based on the above, the consequences of postulated accidents are not increased. Therefore, the NRC staff determined that there is no undue risk to public health and safety.

D. Consistent with the Common Defense and Security

The licensee's exemption request would allow the use of alternate methodologies from those specified in Appendix G to 10 CFR part 50, and 10 CFR 50.61, to allow the use of fracture toughness test data for evaluating the integrity of Point Beach, Units 1 and 2, RPV beltline welds. This change has no effect on security issues. Therefore, the NRC staff determined that this exemption does not impact, and thus is consistent with, the common defense and security.

E. Environmental Considerations

The NRC staff determined that the exemption discussed herein meets the eligibility criteria for the categorical exclusion set forth in 10 CFR 51.22(c)(9) because it is related to a requirement concerning the installation or use of a facility component located within the

restricted area, as defined in 10 CFR part 20, and issuance of this exemption involves: (i) no significant hazards consideration, (ii) no significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, and (iii) no significant increase in individual or cumulative occupational radiation exposure. Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the NRC's consideration of this exemption request. The basis for the NRC staff's determination is discussed as follows with an evaluation against each of the requirements in 10 CFR 51.22(c)(9)(i) - (iii).

Requirements in 10 CFR 51.22(c)(9)(i)

The NRC staff evaluated whether the exemption involves no significant hazards consideration using the standards described in 10 CFR 50.92(c), as presented below:

1. Does the proposed exemption involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The exemption would allow the use of alternate methodologies from those specified in Appendix G to 10 CFR part 50, and 10 CFR 50.61, to allow the use of fracture toughness test data for evaluating the integrity of RPV beltline welds. Use of the alternate methodology for determining the initial, unirradiated material reference temperatures of the Linde 80 weld materials present in the RPV beltline region will not result in changes in operation of configuration of the facility. The change in reactor vessel material initial properties will continue to satisfy the intent of 10 CFR 50, Appendix G, and 10 CFR 50.61. The change does not adversely affect accident initiators or precursors, nor alter the design assumptions, conditions, or the manner in which the plant is operated and maintained. The change does not alter or prevent the ability of structures, systems or components from performing their intended function

to mitigate the consequences of an initiating event with the assumed acceptance limits. There will be no adverse change to normal plant operating parameters, engineered safety feature actuation setpoints, accident mitigation capabilities, or accident analysis assumptions or inputs. The change does not affect the source term, containment isolation, or radiological release assumptions used in evaluating the radiological consequences of an accident previously evaluated. Further, the change does not increase the types of amounts of radioactive effluent that may be released offsite, nor significantly increase individual or cumulative occupational/public radiation exposures.

Therefore, the proposed exemption does not involve a significant increase in the probability or consequences of an accident previously evaluated.

2. Does the proposed exemption create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

The exemption would allow the use of alternate methodologies from those specified in Appendix G to 10 CFR part 50, and 10 CFR 50.61, to allow the use of fracture toughness test data for evaluating the integrity of RPV beltline welds. Use of the alternate methodology for determining the initial, unirradiated material reference temperatures of the Linde 80 weld materials present in the RPV beltline region will not result in changes in operation or configuration of the facility. The change does not impose any new or different requirements or eliminate any existing requirements. The change is consistent with the current safety analysis assumptions and current plant operating practice. No new accident scenarios, transient precursors, failure mechanisms, or limiting single failures are introduced as a result of the proposed change. Equipment important to safety will continue to operate as designed. The change does not result in any event previously deemed incredible being more credible. The

change does not result in any adverse conditions or result in any increase in the challenges to safety systems.

Therefore, the proposed exemption does not create the possibility of a new or different kind of accident from any previously evaluated.

3. Does the proposed exemption involve a significant reduction in a margin of safety?

Response: No.

The proposed exemption does not alter safety limits, limiting safety system settings, or limiting conditions for operation. The setpoints at which protective actions are initiated are not altered by the change. There are no new or significant changes to initial conditions contributing to accident severity or consequences. The exemption will not otherwise affect plant protective boundaries, will not cause a release of fission products to the public, nor will it degrade the performance of any other structures, systems or components important to safety.

Therefore, the proposed exemption does not involve a significant reduction in a margin of safety.

Based on the above evaluation of the standards set forth in 10 CFR 50.92(c), the NRC staff concludes that the proposed exemption involves no significant hazards consideration. Accordingly, the requirements of 10 CFR 51.22(c)(9)(i) are met.

Requirements in 10 CFR 51.22(c)(9)(ii)

The proposed exemption would allow use of an alternate method for determining the initial, unirradiated material reference temperatures of the Linde 80 weld materials present in the RPV beltline region. The proposed change in reactor vessel material initial properties will continue to satisfy the intent of 10 CFR 50, Appendix G, and 10 CFR 50.61. Thus, the use of this alternate methodology will not significantly change the types of effluents that may be

released offsite, or significantly increase the amount of effluents that may be released offsite. Therefore, the requirements of 10 CFR 51.22(c)(9)(ii) are met.

Requirements in 10 CFR 51.22(c)(9)(iii)

The proposed exemption would allow use of an alternate method for determining the initial, unirradiated material reference temperatures of the Linde 80 weld materials present in the RPV beltline region. The proposed change in reactor vessel material initial properties will continue to satisfy the intent of 10 CFR 50, Appendix G, and 10 CFR 50.61. Thus, the use of this alternate methodology will not significantly increase individual occupational radiation exposure, or significantly increase cumulative occupational radiation exposure. Therefore, the requirements of 10 CFR 51.22(c)(9)(iii) are met.

Conclusion

Based on the above, the NRC staff concludes that the proposed exemption meets the eligibility criteria for the categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, in accordance with 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the NRC's proposed issuance of this exemption.

IV. Conclusions

Accordingly, the Commission has determined that, pursuant to 10 CFR 50.12, the exemption is authorized by law, will not present an undue risk to the public health and safety, and is consistent with the common defense and security. Also, special circumstances pursuant to 10 CFR 50.12(a)(2)(ii) are present. Therefore, the Commission hereby grants NextEra Energy Point Beach an exemption from the requirements of Appendix G to 10 CFR part 50 and

10 CFR 50.61, to allow an alternative methodology as described in BAW-2308, Revisions 1-A and 2-A, that is based on using fracture toughness test data to determine initial, unirradiated properties for evaluating the integrity of the RPV beltline welds at the Point Beach Nuclear Plant, Units 1 and 2.

This exemption is effective upon issuance.

Dated at Rockville, Maryland, this 30th day of June 2014.

For The Nuclear Regulatory Commission.

Michele G. Evans, Director,
Division of Operating Reactor Licensing,
Office of Nuclear Reactor Regulation.

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