NUCLEAR REGULATORY COMMISSION

Docket Nos. 50-266 and 50-301

NextEra Energy Point Beach, LLC

Point Beach Nuclear Plant, Units 1 and 2

Exemption

I. Background.

NextEra Energy Point Beach, LLC (NextEra, 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, Units 1 and 2 (Point Beach), respectively. The licenses provide, among other things, that the facility is subject to all rules, regulations, and orders of the U.S. Nuclear Regulatory Commission (NRC, the Commission) now or hereafter in effect. The facility consists of two pressurized-water reactors (PWRs) located in Manitowoc County, Wisconsin.

In 1996, the NRC identified Generic Safety Issue (GSI)-191, "Assessment of Debris Accumulation on PWR Sump Performance," associated with the effects of debris accumulation on PWR sump performance during design-basis accidents. As part of the actions to resolve GSI-191, the NRC issued Generic Letter (GL) 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation during Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML042360586), to holders of operating licenses for PWRs. In GL 2004-02, the NRC staff requested that these licensees perform an evaluation of their emergency core cooling system (ECCS) and containment spray system (CSS) recirculation functions considering the potential for debris-laden coolant to be circulated by the ECCS and the CSS after a loss-of-coolant accident (LOCA) or high-energy line break inside containment and, if appropriate, take

additional actions to ensure system function. GL 2004-02 required that these licensees provide a written response to the NRC, pursuant to Title 10 of the *Code of Federal Regulations* (10 CFR) section 50.54(f), describing the results of their evaluation and any modifications made, or planned, to ensure ECCS and CSS system function during recirculation following a design-basis event, or any alternate action proposed, and the basis for its acceptability.

II. Request/Action.

By application dated July 29, 2022 (ML22210A086), as supplemented by letter dated June 9, 2023 (ML23163A022), the licensee, pursuant to 10 CFR 50.12, "Specific exemptions," requested, in part, an exemption from certain requirements of 10 CFR 50.46, "Acceptance criteria for emergency core cooling systems for light-water nuclear power reactors," to allow the use of a risk-informed methodology instead of the traditional deterministic methodology to resolve the concerns associated with GSI-191 and to respond to GL 2004-02 for Point Beach.

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 the public health and safety, and are consistent with the common defense and security and (2) special circumstances are present. Under 10 CFR 50.12(a)(2)(ii), special circumstances are present when "[a]pplication of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule." Under 10 CFR 50.12(a)(2)(iii), special circumstances are present when "[c]ompliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was

adopted, or that are significantly in excess of those incurred by others similarly situated."

NextEra submitted a request for exemption under 10 CFR 50.12 for Point Beach from certain requirements of 10 CFR 50.46(a)(1) as it relates to using specific deterministic methodology to evaluate the effects of debris generated from breaks on long-term core cooling. The licensee stated that the scope of the requested exemption applies to all debris effects addressed in the risk-informed element of the Point Beach methodology described in NextEra's July 29, 2022, submittal responding to GL 2004-02. NextEra stated that the addressed debris effects are those associated with breaks that potentially generate and transport debris amounts that exceed the Point Beach-specific tested/analyzed debris limits.

The licensee is requesting an exemption related to these breaks to allow evaluation of the debris effects using a risk-informed methodology in lieu of a deterministic methodology. The licensee stated that the key elements of the exemption request are that (1) the exemption will apply only to the effects of debris as described in Enclosure 4 of the submittal dated July 29, 2022, and (2) the exemption will apply to any breaks that can generate and transport debris that is not bounded by Point Beach-specific tested/analyzed debris limits, provided that the change in core damage frequency (ΔCDF) and the change in large early release frequency (ΔLERF) remain within the acceptance guidelines identified as Region III of Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 3, dated January 2018 (ML17317A256).

The NRC staff performed an integrated review of the risk-informed approach proposed to be used in lieu of a deterministic methodology by the requested exemption, considering the five key principles of risk-informed decision-making set forth in

RG 1.174. The five key principles are: (1) the proposed change meets the current regulations unless it is explicitly related to a requested exemption; (2) the proposed change is consistent with the defense-in-depth (DID) philosophy; (3) the proposed change maintains sufficient safety margins; (4) when proposed changes result in an increase in risk, the increases should be small and consistent with the intent of the Commission's policy statement on safety goals for the operations of nuclear power plants (51 FR 30028); and (5) the impact of the proposed change should be monitored using performance measurement strategies.

The NRC staff finds that the proposed risk-informed approach meets the five key principles in RG 1.174. The proposed risk-informed approach is consistent with the DID philosophy, maintains sufficient safety margins, and is monitored using performance measurement strategies. The proposed risk-informed approach also explicitly relates to a requested exemption. Finally, the Point Beach risk evaluation results show that the risk associated with post-accident debris effects is within the RG 1.174 Region III acceptance guidelines as a "very small change" and, therefore, is consistent with the intent of the Commission's policy statement on safety goals for the operations of nuclear power plants.

A. The Exemption is Authorized by Law

The exemption would allow the use of a risk-informed methodology to show compliance with 10 CFR 50.46(a)(1), when considering debris in containment generated and transported by those breaks that exceed the plant-specific tested/analyzed debris limits. As stated above, 10 CFR 50.12 allows the NRC to grant exemptions from the requirements of 10 CFR part 50, including 10 CFR 50.46(a)(1), when the exemptions are authorized by law. The NRC staff has determined, as explained below, 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 exemption is authorized by law.

B. The Exemption Presents no Undue Risk to Public Health and Safety

The provisions of 10 CFR 50.46 establish criteria for the ECCS performance. The licensee submitted a request for an exemption under 10 CFR 50.12 for Point Beach from certain requirements of 10 CFR 50.46(a)(1) as it relates to using a specific deterministic methodology to evaluate the effects of debris generated from breaks on long-term core cooling. The licensee justified its requested exemption by stating that it is consistent with the purpose of the requirements in that the use of the proposed risk-informed approach would account for the effects of debris on the ECCS cooling performance and would support a high probability of successful ECCS performance, based on the risk results meeting the acceptance guidelines of RG 1.174. Additionally, the licensee stated that the Point Beach risk quantification showed that the ΔCDF and ΔLERF are below the threshold for RG 1.174 Region III "very small changes." The licensee stated that the proposed risk-informed approach would provide an equivalent level of assurance for sump performance as 10 CFR 50.46 without incurring significant cost and occupational dose associated with removing, replacing, or reinforcing insulation in containment.

The NRC staff finds that the risk associated with the requested exemption is consistent with the guidance in RG 1.174 for the use of probabilistic risk assessment and with the Commission's policy statement on safety goals for the operations of nuclear power plants; therefore, the requested exemption presents no undue risk to the public health and safety.

C. The Exemption is Consistent with the Common Defense and Security

The requested exemption would allow the licensee to use a risk-informed methodology to resolve a generic safety concern for PWRs associated with potential clogging of the ECCS and CSS strainers during certain design-basis events. The change

is adequately controlled by safety acceptance criteria and technical specification requirements and is not related to security issues. Because the common defense and security is not impacted by the exemption, the exemption is consistent with the common defense and security.

D. Special Circumstances

The requested exemption from 10 CFR 50.46(a)(1) would allow the licensee to use a risk-informed methodology in lieu of a deterministic methodology to show conformance with the ECCS and CSS performance criteria accounting for debris in containment for LOCAs. In its request, the licensee cited the special circumstances criteria of 10 CFR 50.12(a)(2)(ii) and (iii) and stated that application of the regulation in the particular circumstances would not serve the underlying purpose of the rule or is not necessary to achieve the underlying purpose of the rule and that compliance would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated.

The licensee stated that the intent of 10 CFR 50.46(a)(1) is to ensure that ECCS cooling performance design requirements imposed by 10 CFR 50.46 are determined by a rigorous method that provides a high level of confidence in ECCS performance. The licensee stated that its proposed risk-informed approach accounts for the effects of debris on the ECCS cooling performance and supports a high probability of successful ECCS performance based on the risk results meeting the acceptance guidelines of RG 1.174.

The licensee also stated that in order to meet a deterministic threshold value for sump debris loads, the debris sources in containment would need to be significantly reduced. The licensee stated that the amount of radiological exposure received during

the removal and/or modification of insulation from the Point Beach containments is dependent on the scope of the changes. The licensee estimated generically that the expected total dose for replacing calcium silicate and asbestos calcium silicate insulation in the Point Beach containment would be approximately 900 roentgen equivalent man (rem) for both units (total two-unit dose). An additional dose of 200 rem was estimated for replacing the mineral wool insulation on the resistance temperature detector lines.

Based on the above, the licensee concluded that the special circumstances described in 10 CFR 50.12(a)(2)(ii) and (iii) are present with respect to its requested exemption.

The NRC staff summarized its evaluation of the proposed risk-informed approach related to the exemption request in a safety evaluation (ML23208A095). Since 10 CFR 50.46(a)(1) requires a deterministic approach, an exemption is an appropriate means to grant the licensee relief to use an alternative, risk-informed approach. The underlying purpose of the regulation is to protect the public health and safety in the event of a LOCA by establishing criteria for the ECCS. In its safety evaluation, the NRC staff concluded, in part, that the licensee adequately demonstrated that the change in risk attributable to debris in postulated LOCAs is very small. The NRC staff also concluded that the licensee's proposal for demonstrating compliance with the ECCS and the CSS performance requirements meets the risk acceptance guidelines in RG 1.174, because the approach is related to a permissible exemption request, is consistent with DID philosophy, maintains sufficient safety margins, results in an increase in risk that is small and consistent with the intent of the Commission's policy statement on safety goals for the operations of nuclear power plants, and is monitored by the licensee using performance measurement strategies. Therefore, the NRC staff finds that the licensee's use of the proposed risk-informed approach to consider the impacts of debris meets the

underlying intent of 10 CFR 50.46 to ensure that a licensee demonstrates that the ECCS and the CSS will provide adequate cooling for the reactor core and containment following postulated design-basis accidents.

The NRC staff also finds that the licensee demonstrated that using the required deterministic approach as opposed to the proposed risk-informed approach would result in undue hardship or other costs that are significantly in excess of those contemplated when the regulation was adopted, or that are significantly in excess of those incurred by others similarly situated.

Based on the above, the special circumstances described in 10 CFR 50.12(a)(2)(ii) and (iii) are present for the requested exemption.

E. Environmental Considerations

The NRC staff determined that the exemption discussed herein meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9) because it is related to a requirement concerning the installation or use of facility components located within the restricted area, as defined in 10 CFR part 20, and the granting of the exemption involves: (i) no significant hazards consideration, (ii) no significant change in the types or 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 to be prepared in connection with the issuance of the exemption. The basis for this NRC staff determination is discussed as follows with an evaluation against each of the requirements in 10 CFR 51.22(c)(9).

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

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

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

Response: No.

The proposed change that would be implemented as a result of the exemption is a methodology change for assessment of debris effects that adds the results of a risk-informed evaluation to the Point Beach licensing basis. This is a viable approach for the resolution of GL 2004-02 per SECY-12-0093, “Closure Options for Generic Safety Issue - 191, Assessment of Debris Accumulation on Pressurized-Water Reactor Sump Performance,” dated June 9, 2012 (ML121310648). The analysis that supports the methodology change concludes that the functionality of the ECCS and CSS during design-basis accidents is confirmed by the very small risk increase due to strainer failures associated with the debris effects, supported by the fact that the safety margin and DID are maintained with high probability. The proposed change addresses mitigation of LOCAs and has no effect on the probability of the occurrence of a LOCA. The proposed change does not implement any changes in the facility or plant operation that could lead to a different kind of accident. The containment sump is not an initiator of any accident previously evaluated. The containment sump is a passive component, and the proposed change does not increase the likelihood of a malfunction of the sump. The design and the capability of the containment sump assumed in the accident analysis are not changed. As a result, the probability of an accident is unaffected by the proposed change.

The proposed change does not involve a significant increase in the consequences of an accident previously evaluated. The proposed change confirms that required structures, systems, and components (SSCs) supported by the containment sumps will perform their safety functions with a high probability, as required, and does

not alter or prevent the ability of SSCs to perform their intended function to mitigate the consequences of an accident previously evaluated within the acceptance limits. The proposed change has no impact on existing barriers that prevent the release of radioactivity. The safety analysis acceptance criteria in the Point Beach Final Safety Analysis Report (FSAR) continue to be met for the proposed change.

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

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

Response: No.

The proposed change that would be implemented as a result of the exemption is a methodology change for assessment of debris effects that adds the results of a risk-informed evaluation to the Point Beach licensing basis. The proposed change does not install or remove any plant equipment, or alter the design, physical configuration, or mode of operation of any plant SSCs. The proposed change does not introduce any new failure mechanisms or malfunctions that can initiate an accident. No new credible accident is created that is not encompassed by the existing accident analyses that assume the functioning of the containment sump.

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

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

Response: No.

The proposed change that would be implemented as a result of the exemption is a methodology change for assessment of debris effects that adds the results of a risk-

informed evaluation to the Point Beach licensing basis. The effects from a full spectrum of LOCAs and secondary side breaks inside containment, including double-ended guillotine breaks, are analyzed. Appropriate redundancy and consideration of loss of offsite power and worst-case single failure are retained, such that DID is maintained.

Application of the risk-informed methodology showed that the increase in risk from the contribution of debris effects is very small as defined by RG 1.174 and that there is adequate DID and safety margin, which are extensively evaluated in Enclosure 5 of the July 29, 2022, submittal and which evaluation is found to be acceptable in the related NRC staff safety evaluation. This evaluation showed that there is substantial DID and safety margin that provide a high level of confidence that the calculated risk for the effects of debris is conservative and that the actual risk is likely much lower. Consequently, the licensee determined that the risk-informed method demonstrates that the containment sumps will continue to support the ability of safety-related components to perform their design functions when the effects of debris are considered. This risk-informed approach was identified as viable for the response to GL 2004-02 per SECY-12-0093. The proposed change does not alter the manner in which safety limits are determined or the acceptance criteria associated with a safety limit. The proposed change does not implement any changes to plant operation and does not affect SSCs that respond to safely shut down the plant and to maintain the plant in a safe shutdown condition. The proposed change does not significantly affect the existing safety margins in the barriers to the release of radioactivity. There are no changes to any of the safety analyses in the FSAR.

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

Based on the above, the NRC staff concludes that the requested exemption

involves no significant hazards consideration and, therefore, satisfies 10 CFR 51.22(c)(9)(i)).

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

No physical modifications or changes to operating requirements are proposed for the facility as part of the requested exemption, including changes to any SSCs relied upon to mitigate the consequences of a LOCA. No changes are made to the safety analyses in the FSAR. Approval of the exemption will require the calculated risk associated with post-accident debris effects to meet the Region III acceptance guidelines in RG 1.174, thereby maintaining the public health and safety. As such, the NRC staff concludes that the requested exemption does not involve significant change in the types or significant increase in the amounts of any effluents that may be released offsite. Therefore, the requested exemption satisfies 10 CFR 51.22(c)(9)(ii).

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

No new operator actions are implemented that could affect occupational radiation exposure. No physical modifications or changes to operating requirements are proposed for the facility as part of the requested exemption, including changes to any SSCs relied upon to mitigate the consequences of a LOCA. No changes are made to the safety analyses in the FSAR. As such, the NRC staff concludes that the requested exemption does not involve significant increase in individual or cumulative occupational radiation exposure. Therefore, the requested exemption satisfies 10 CFR 51.22(c)(9)(iii).

Conclusion

Based on the above, the NRC staff concludes that the requested 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 issuance of the

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 are present. Therefore, the Commission hereby grants NextEra's request for an exemption from 10 CFR 50.46(a)(1) to allow the use of a risk-informed methodology in lieu of a deterministic methodology to show conformance with the ECCS and CSS performance criteria accounting for debris in containment for those breaks that exceed the Point Beach-specific tested/analyzed debris limits.

This exemption is effective upon issuance.

V. Availability of Documents.

The documents identified in the following table are related to the requested exemption and available to interested persons through the NRC's ADAMS at https://adams.nrc.gov/wba/.

DOCUMENT	ADAMS ACCESSION NO.
NextEra letter, "Exemption Request, License Amendment Request and Revised Response in Support of a Risk-informed Resolution of Generic Letter 2004-02" (L-2022-121), dated July 29, 2022.	ML22210A086
NextEra letter, "Response to Request for Additional Information (RAI) Regarding Exemption Request, License Amendment Request and Revised Response in Support of a Risk-Informed Resolution of Generic Letter 2004-02" (L-2023-075), dated June 9, 2023.	ML23163A022
NRC Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors," dated September 13, 2004.	ML042360586
Regulatory Guide 1.174, Revision 3, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated January 2018.	ML17317A256

DOCUMENT	ADAMS ACCESSION NO.
NRC letter, “Point Beach Nuclear Plant, Units 1 and 2 - Issuance of Amendment Nos. 273 and 275 Regarding Revising Licensing Basis to Address Generic Safety Issue 191 and to Respond to Generic Letter 2004-02 Using a Risk-Informed Approach,” dated August 28, 2023.	ML23208A095
NextEra letter, “Response to Generic Letter 2004-02, Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized-Water Reactors” (NRC 2007-0085), dated November 16, 2007	ML073230345
NextEra letter, “Updated Final Response to NRC Generic Letter 2004-02” (NRC 2017-0045), December 29, 2017	ML17363A253

Dated: August 28, 2023.

For the Nuclear Regulatory Commission.

Victor G. Cusumano

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