



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

December 5, 2019

Mr. Don Moul
Vice President, Nuclear Division and
Chief Nuclear Officer
Florida Power & Light Company
NextEra Energy Seabrook, LLC
Mail Stop: NT3/JW
15430 Endeavor Drive
Jupiter, FL 33478

SUBJECT: SEABROOK STATION, UNIT NO. 1 - ISSUANCE OF AMENDMENT NO. 163
RE: ONE-TIME CHANGE TO THE ONSITE POWER DISTRIBUTION
REQUIREMENTS (EPID L-2019-LLA-0216)

Dear Mr. Moul:

The U.S. Nuclear Regulatory Commission (the Commission) has issued the enclosed Amendment No. 163 to Renewed Facility Operating License No. NPF-86 for the Seabrook Station, Unit No. 1. This amendment consists of changes to the Technical Specifications (TSs) in response to your application dated October 3, 2019, as supplemented by letter dated October 30, 2019.

The amendment revises the TSs to allow for a one-time extension to the allowed outage time for Limiting Condition for Operation 3.8.3.1, "Onsite Power Distribution – Operating," to restore an inoperable alternating current vital panel from 24 hours to 7 days on the vital inverter EDE-I-1E. The one-time extension expires 45 days after issuance of this amendment.

A copy of the related safety evaluation is also enclosed. Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "Justin C. Poole", is written over a horizontal line.

Justin C. Poole, Project Manager
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-443

Enclosures:

1. Amendment No. 163 to NPF-86
2. Safety Evaluation

cc: Listserv



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NEXTERA ENERGY SEABROOK, LLC, ET AL.*

DOCKET NO. 50-443

SEABROOK STATION, UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 163
Renewed License No. NPF-86

1. The Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment filed by NextEra Energy Seabrook, LLC, et al. (the licensee), dated October 3, 2019, as supplemented by letter dated October 30, 2019, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act), and the Commission's rules and regulations set forth in 10 CFR Chapter I;
 - B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;
 - C. There is reasonable assurance: (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;
 - D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and
 - E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

*NextEra Energy Seabrook, LLC, is authorized to act as agent for the: Hudson Light & Power Department, Massachusetts Municipal Wholesale Electric Company, and Taunton Municipal Lighting Plant and has exclusive responsibility and control over the physical construction, operation and maintenance of the facility.

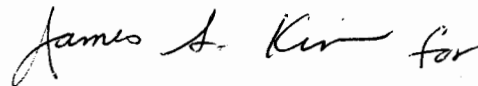
2. Accordingly, the license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 2.C.(2) of Renewed Facility Operating License No. NPF-86 is hereby amended to read as follows:

(2) Technical Specifications

The Technical Specifications contained in Appendix A, and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 163, are incorporated into the Renewed Facility Operating License No. NPF-86. NextEra Energy Seabrook, LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

3. This license amendment is effective as of its date of issuance and shall be implemented within 45 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

A handwritten signature in cursive script, reading "James G. Danna for".

James G. Danna, Chief
Plant Licensing Branch I
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed Facility Operating
License and Technical Specifications

Date of Issuance: December 5, 2019

ATTACHMENT TO LICENSE AMENDMENT NO. 163

SEABROOK STATION, UNIT NO. 1

RENEWED FACILITY OPERATING LICENSE NO. NPF-86

DOCKET NO. 50-443

Replace the following page of Renewed Facility Operating License No. NPF-86 with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove
3

Insert
3

Replace the following page of the Appendix A, Technical Specifications, with the attached revised page. The revised page is identified by amendment number and contains a marginal line indicating the area of change.

Remove
3/4 8-17

Insert
3/4 8-17

- (3) NextEra Energy Seabrook, LLC, pursuant to the Act and 10 CFR Part 70, to receive, possess, and use at any time special nuclear material as reactor fuel, in accordance with the limitations for storage and amounts required for reactor operation, as described in the Final Safety Analysis Report, as supplemented and amended;
 - (4) NextEra Energy Seabrook, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use at any time any byproduct, source, and special nuclear material as sealed neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required;
 - (5) NextEra Energy Seabrook, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to receive, possess, and use in amounts as required any byproduct, source, or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and
 - (6) NextEra Energy Seabrook, LLC, pursuant to the Act and 10 CFR Parts 30, 40, and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility authorized herein.
 - (7) DELETED
- C. This renewed license shall be deemed to contain and is subject to the conditions specified in the Commission's regulations set forth in 10 CFR Chapter I and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

(1) Maximum Power Level

NextEra Energy Seabrook, LLC, is authorized to operate the facility at reactor core power levels not in excess of 3648 megawatts thermal (100% of rated power).

(2) Technical Specifications

The Technical Specifications contained in Appendix A, and the Environmental Protection Plan contained in Appendix B, as revised through Amendment No. 163, are incorporated into the Renewed Facility Operating License No. NPF-86. NextEra Energy Seabrook, LLC shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.

ELECTRICAL POWER SYSTEMS

ONSITE POWER DISTRIBUTION

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.3.1 (Continued)

- i. Train A, 125-volt D.C. Busses consisting of:
 - 1) 125-volt D.C. Bus #11A energized from Battery Bank 1A or 1C, and
 - 2) 125-volt D.C. Bus #11C energized from Battery Bank 1C or 1A.
- j. Train B, 125-volt D.C. Busses consisting of:
 - 1) 125-volt D.C. Bus #11B energized from Battery Bank 1B or 1D, and
 - 2) 125-volt D.C. Bus #11D energized from Battery Bank 1D or 1B.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

-----NOTE-----

Enter applicable ACTIONS of LCO 3.8.2.1, "DC Sources – Operating," for DC trains made inoperable by inoperable AC power distribution system.

- a. With one of the required trains of A.C. emergency busses (except 480-volt Emergency Bus # E64) not fully energized, reenergize the train within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
 - 1. With 480-volt Emergency bus #E64 not fully energized, reenergize the bus within 7 days or be in HOT STANDBY within 6 hours and COLD SHUTDOWN within the following 30 hours.
- b. With one A.C. vital panel either not energized from its associated inverter, or with the inverter not connected to its associated D.C. bus: (1) reenergize the A.C. vital panel within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and (2) reenergize the A.C. vital panel from its associated inverter connected to its associated D.C. bus within 24* hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.
- c. With one D.C. bus not energized from an OPERABLE battery bank, reenergize the D.C. bus from an OPERABLE battery bank within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

*A one-time AOT extension for an inoperable 120-volt A.C. Vital Panel #1E allows 7 days to restore the inverter to OPERABLE status. Compensatory measures within NEE Letter SBK-L-19104 dated October 3, 2019 will remain in effect during the extended AOT period. The one-time AOT extension shall expire 45 days after issuance of the amendment.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 163 TO

RENEWED FACILITY OPERATING LICENSE NO. NPF-86

NEXTERA ENERGY SEABROOK, LLC

SEABROOK STATION, UNIT NO. 1

DOCKET NO. 50-443

1.0 INTRODUCTION

By letter dated October 3, 2019, as supplemented by letter dated October 30, 2019 (Agencywide Documents Access and Management System (ADAMS) Accession Nos. ML19276G055 and ML19305A301, respectively), NextEra Energy Seabrook, LLC (NextEra, the licensee) submitted a license amendment request (LAR) (Request 19-02) for changes to the Seabrook Station, Unit No. 1 (Seabrook), Technical Specifications (TSs). Specifically, the licensee proposed to revise TS Limiting Condition for Operation (LCO) 3.8.3.1, "Onsite Power Distribution – Operating," ACTION b, to extend the allowed outage time (AOT) for restoring an inoperable alternating current (AC) vital panel from 24 hours to 7 days to allow for corrective maintenance and testing on the vital inverter 1E. The proposed extension would be applicable for a one-time extension and would expire 45 days after issuance of the amendment.

The supplement dated October 30, 2019, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the U.S. Nuclear Regulatory Commission (NRC, the Commission) staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on October 28, 2019 (84 FR 57781).

2.0 REGULATORY EVALUATION

2.1. 120-Volt Vital AC Instrument Power System

The 120-volt (V) vital AC instrument power system is composed of six independent AC buses (1A through 1F), each having its own uninterruptible power supply (UPS). The system provides power for the reactor protection, reactor control, and balance-of-plant (BOP) instrumentation systems.

The primary function of the UPS is to continuously supply power to critical safety-related loads that cannot tolerate momentary power interruptions under normal operating, accident, and

emergency conditions. Vital AC panel EDE-PP-1E, which is powered by UPS EDE-I-1E, only supplies power to BOP instrumentation systems.

Each UPS unit consists of a rectifier section that converts three-phase 460V AC power to a nominal 125V direct current (DC) power, and an inverter section that inverts the DC power to single-phase 120V AC power. The 125V DC batteries, via a diode, provide an alternate source to the inverter section, but only if 460V AC is lost or the UPS rectifier section fails.

Should the UPS inverter fail, an alternate, emergency diesel generator (EDG) backed, 120V AC, non-safety-related (NSR) supply is automatically connected through a static transfer switch. Operators can also bypass the static transfer switch to manually move to the NSR supply when taking the UPS out of service for maintenance. No interruption of power to AC vital panel EDE-PP-1E will occur when transferring to the maintenance supply by either the automatic or manual method. In the event of a loss of offsite power while using the NSR supply, the AC vital panel EDE-PP-1E will experience a 12-second loss of power while the EDG starts up. On each UPS, instrumentation is provided to monitor AC and DC input currents, as well as output current and voltage. Alarms are provided on the facility's computer for loss of AC voltage on the vital instrument bus.

2.2 Licensee's Proposed Changes

The licensee proposed to revise TS LCO 3.8.3.1, ACTION b, as follows (added text shown in bold) from:

- b. With one A.C. vital panel either not energized from its associated inverter, or with the inverter not connected to its associated D.C. bus: (1) reenergize the A.C. vital panel within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and (2) reenergize the A.C. vital panel from its associated inverter connected to its associated D.C. bus within 24 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

to:

- b. With one A.C. vital panel either not energized from its associated inverter, or with the inverter not connected to its associated D.C. bus: (1) reenergize the A.C. vital panel within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours; and (2) reenergize the A.C. vital panel from its associated inverter connected to its associated D.C. bus within 24 hours * or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

***A one-time AOT extension for an inoperable 120-volt A.C. Vital Panel #1E allows 7 days to restore the inverter to OPERABLE status. Compensatory measures within NEE Letter SBK-L-19104 dated October 3, 2019 will remain in effect during the extended AOT period. The one-time AOT extension shall expire 45 days after issuance of the amendment.**

2.3 Regulatory Review

The NRC staff reviewed the licensee's application to determine whether (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that the activities proposed will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public. The NRC staff considered the following regulatory requirements, guidance, and plant-specific licensing and design-basis information during its review of the proposed changes.

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(a)(1) states, in part, that each applicant for an operating license shall include in the application proposed TSs in accordance with the requirements of 10 CFR 50.36, "Technical specifications."

Section 50.36(c) of 10 CFR requires that TSs include items in the following categories related to the facility's operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) surveillance requirements; (4) design features; and (5) administrative controls. Section 50.36(c)(2) states, in part, that LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility and that when an LCO is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

NUREG-0800, "Standard Review Plan [SRP] for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," Chapter 16.1, Revision 1, "Risk-Informed Decision Making: Technical Specifications" (ADAMS Accession No. ML070380228), states that licensees submitting risk information should address each of the principles of risk-informed regulation addressed in Regulatory Guide (RG) 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications" (ADAMS Accession No. ML100910008).

RG 1.174, Revision 3, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis" (ADAMS Accession No. ML17317A256), describes a risk-informed approach acceptable to the NRC for assessing the nature and impact of proposed licensing basis changes by considering engineering issues and applying risk insights. This RG also provides risk acceptance guidelines for evaluating the results of such evaluations.

RG 1.177, Revision 1, describes an acceptable risk-informed approach to TS changes, specifically for changes to completion times (CTs). This RG also provides risk acceptance guidelines for evaluating the results of such assessments and lists five key principles that TS changes should meet.

RG 1.200, Revision 2, "An Approach for Determining the Technical Adequacy of Probabilistic Risk Assessment Results for Risk-Informed Activities" (ADAMS Accession No. ML090410014), describes an acceptable approach for determining whether the quality of the probabilistic risk assessment (PRA) models, in total, or the parts that are used to support an application, is sufficient to provide confidence in the results such that the PRA models can be used in regulatory decisionmaking for light-water reactors.

Regulatory Issue Summary 2007-06, "Regulatory Guide 1.200 Implementation" (ADAMS Accession No. ML070650428), describes how the NRC will implement its technical adequacy

review of plant-specific PRAs used to support risk-informed licensing actions after the issuance of RG 1.200.

"Safety Goals for the Operations of Nuclear Power Plants" (Commission's Safety Goal Policy) (51 FR 28044; August 4, 1986), as corrected and republished (51 FR 30028; August 21, 1986), establishes the Commission's goals that broadly define an acceptable level of radiological risk.

3.0 TECHNICAL EVALUATION

The NRC staff evaluated the licensee's application to determine whether the proposed changes are consistent with the regulatory requirements, guidance, and plant-specific licensing and design-basis information discussed in Section 2.3 of this safety evaluation (SE).

3.1 Method of Staff Review

An acceptable approach for making risk-informed decisions about proposed TS changes, including both permanent and temporary changes, is to show that the proposed changes meet the five key principles stated in RG 1.174, Revision 3, Section C, and RG 1.177, Revision 1, Section B. These key principles are:

Principle (1): The proposed change meets the current regulations unless it is explicitly related to a requested exemption.

Principle (2): The proposed change is consistent with the defense-in-depth philosophy.

Principle (3): The proposed change maintains sufficient safety margins.

Principle (4): When the proposed change results in an increase in core damage frequency (CDF) and/or large early release frequency (LERF), the increase should be small and consistent with the intent of the Commission's Safety Goal Policy statement.

Principle (5): The impact of the proposed change should be monitored using performance measurement strategies.

3.2 Key Principle 1: The Proposed Change Meets Current Regulations

No exceptions or exemptions from applicable codes and standards relevant to safe plant operation are proposed by the LAR. During the proposed outage time, AC vital panel EDE-PP-1E will be powered by its maintenance supply (NSR Motor Control Center MCC-E531 through 480/120V single-phase transformer ED-X-31E), which is backed by the EDG. The NRC staff noted that a brief power interruption to AC vital panel EDE-PP-1E could occur for approximately 12 seconds while the EDG starts, following a loss of offsite power. As such, the NRC staff finds that vital panel EDE-PP-1-E is capable to perform all required functions consistent with applicable requirements and that safety analysis assumptions will be maintained during the proposed one-time AOT extension.

3.3 Key Principle 2: The Proposed Change is Consistent with Defense-in-Depth Philosophy

Defense in depth is an approach to designing and operating nuclear facilities involving multiple independent and redundant layers of defense to compensate for human and system failures.

As stated in Section 3.2 of this SE, the AC vital panel EDE-PP-1E will be powered by its alternate power supply – the maintenance supply, which is also backed by the EDG. The proposed one-time AOT extension is only applicable to the Train A BOP instrumentation. The AOT for the Train B BOP bus and the other four vital instrument bus inverters that provide power to the reactor protection and engineered safety features actuation systems is 24 hours and will remain unchanged.

In Section 3.2 of its application, the licensee provided the following compensatory measures that will be in effect during the proposed one-time AOT extension:

- (1) No testing or maintenance activities will be performed during the extended AOT that could potentially cause a plant transient.
- (2) No testing or surveillances will be performed on the vital inverters during the extended AOT.
- (3) Operations will guard the following equipment in accordance with NextEra procedure OP-AA-102-1003, Guarded Equipment:
 - i. MCC-531 (I-1E maintenance supply)
 - ii. EDE-BC-1A,
 - iii. DC-Bus 11A.
- (4) Operations will monitor the weather for adverse conditions and factor the weather conditions into work planning for corrective maintenance on the 1E inverter prior to starting work.
- (5) Operations will ensure grid conditions are stable and the extended AOT interval will not be entered during a Master/Local Control Center Procedure No. 2 (M/LCC 2) - Abnormal Conditions Alert situation.
- (6) Just-in-time training will be performed on procedure OS1247.02, Loss of 120 V AC Vital Instrument Bus PP1E or PP1F, Revision 16.

Given the above, the NRC staff finds that the proposed change involves multiple independent and redundant layers of defense to compensate for human and system failures and, therefore, is acceptable.

3.4 Key Principle 3: The Proposed Change Maintains Sufficient Safety Margins

In Attachment 2 of its application, the licensee provided a table summarizing the potential effects to the facility upon loss of power to vital panel EDE-PP-1E and its sub-panel EDE-PP-11E. The NRC staff reviewed the table and found that no specific contingency actions are required, and that loss of this vital panel will not adversely affect safety.

3.5 Key Principle 4: Change in Risk Is Consistent with the Safety Goal Policy Statement

The evaluation presented below addresses the NRC staff's philosophy of risk-informed decisionmaking. For proposed changes resulting in a change in CDF or risk, the increase should be small and consistent with the intent of the Commission's Safety Goal Policy Statement. The licensee stated that the inverter is not included in the Seabrook PRA and does

not result in a plant transient. For this evaluation, inverters EDE-I-1E, EDE-I-1F, and other functions supporting the 1E and 1F buses were added to the PRA model to evaluate the impact on CDF and LERF for the requested one-time extension of the AOT to 7 days. The NRC staff evaluated Key Principle 4 using the three-tiered approach described in SRP Chapter 16.1 and RG 1.177:

- Tier 1 - The first tier evaluates the licensee's PRA and the impact of the change on plant operational risk, as expressed by the change in CDF and change in LERF. The change in risk is compared to the acceptance guidelines presented in RG 1.174. The first tier also aims to ensure that plant risk does not increase unacceptably during the period when equipment is taken out of service (OOS) per the license amendment, as expressed by the incremental conditional core damage probability (ICCDP) and incremental conditional large early release probability (ICLERP). The incremental risk is also compared to the acceptance guidelines presented in RG 1.177.
- Tier 2 - The second tier addresses the need to preclude potentially high-risk plant configurations that could result if equipment, in addition to that associated with the proposed license amendment, is taken out of service simultaneously, or if other risk-significant operational factors, such as concurrent system or equipment testing, are also involved. The objective of this part of the review is to ensure that appropriate restrictions on dominant risk-significant plant configurations associated with the CT (or AOT) extension are in place.
- Tier 3 - The third tier addresses the licensee's overall configuration risk management program (CRMP). The purpose of the CRMP is to ensure that equipment removed from service prior to or during the proposed extended CT (or AOT) period will be appropriately assessed from a risk perspective.

This three-tiered approach ensures that adequate programs and procedures are in place to identify risk-significant plant configurations resulting from maintenance or other operational activities and to take appropriate compensatory measures to avoid such configurations. In order to determine whether the PRA used in support of the proposed CT (or AOT) extension is of sufficient quality, scope, and level of detail, the NRC staff evaluated the relevant information provided by the licensee in its submittal and considered the results of the PRA reviews. Consistent with RG 1.177, Revision 1, the NRC staff's review of the licensee's submittal focused on the capability of the licensee's PRA model to analyze the risks stemming from the proposed CT (or AOT) extension and did not involve an in-depth review of the licensee's PRA.

3.5.1 Tier 1: PRA Capability and Insights

3.5.1.1 Evaluation of the PRA Model

Section 2.3.2 of RG 1.177 states that, as a minimum, the licensee should perform evaluations of CDF and LERF to support any risk-informed changes to TSs. The scope of the analysis should include all hazard groups (i.e., internal events (IE), internal flooding (IF), internal fires, seismic events, high winds, transportation events, and other external hazards). Section 2.3.1 of RG 1.174 states that a qualitative treatment of the missing modes and hazard groups may be sufficient when the licensee can demonstrate that those risk contributions would not affect the decision.

RG 1.200 describes one acceptable approach for determining whether the technical acceptability of a PRA is sufficient for use in regulatory decisionmaking for light-water reactors.

As discussed below, for the evaluation of the licensee's proposed change, the scope of the licensee's evaluation should include an assessment of the change in risk for IE, IF, internal fires, and seismic events. The licensee provided a quantitative assessment of the change in risk using a PRA model – Level 1 and Level 2 model, which includes assessment of IE, internal flood events, a comprehensive assessment of internal fire events, other external hazards, and seismic events.

3.5.1.2 Integrated PRA Model

Internal Events PRA (Includes Internal Floods)

In the letter dated October 3, 2019, the licensee provided a summary of the peer review history for the IEs portion of the Seabrook PRA. The Seabrook IEPR (includes internal floods) has been subjected to four peer reviews (1999, 2005, 2009, and 2012) against IE and internal floods supporting requirements (SRs). In addition, the licensee noted four self-assessments against the IE SRs from the PRA standard were performed. The licensee further stated, "The 2011 Self-Assessment represents the most current status of Seabrook PRA capability, except for element LE." The previous self-assessment (2010) evaluated the 2009 PRA against each of the 254 IEs SRs using the ASME/ANS RA-Sa-2009 PRA standard as endorsed by the NRC, in addition to reviewing the results from previous peer reviews.

In October 2017, NextEra performed an independent assessment (IA) for closure of the IEPR (includes internal floods) findings. In Section 3.3 of the LAR, the licensee stated, "all resolved findings were reviewed to Appendix X to NEI 05-04, NEI 07-12 and NEI 12-13, ... as accepted by the NRC in the staff memorandum dated May 3, 2017" (ADAMS Accession No. ML17079A427). To confirm that the IA was performed consistent with the accepted Appendix X guidance (ADAMS Accession No. ML16158A035), the NRC staff requested in a Request for Additional Information (RAI) (ADAMS Accession No. ML19296D912), that the licensee (1) confirm that the closure review team was provided with a written assessment and justification of whether the resolution of each facts and observation (F&O) constituted a PRA upgrade or maintenance update as defined in the ASME/ANS RA-Sa-2009 PRA standard, and (2) confirm whether the F&O closure review scope included all finding-level F&Os, including those finding-level F&Os that are associated with "met" SRs at Capability Category (CC)-II.

In its October 30, 2019, response to the NRC staff's RAI, the licensee stated, in part, "The documentation reviewed by the [IA] team and the final report document the Appendix X review of resolved findings do not contain detailed evaluations documenting the bases for Maintenance Update determination for each finding." The licensee also provided a table that included the findings, along with the disposition and acceptability evaluation performed by the IA team. The licensee confirmed that all finding-level F&Os were included in the scope of the IA closure review. The NRC staff reviewed the findings and concluded that there was no impact to the decision rendered for this application; therefore, the NRC staff finds the IEPR (includes internal floods) appropriate for this risk-informed application.

Fire, Seismic, and Other External Events

Section 2.4 of RG 1.174, Revision 3, states, in part, "When the calculated increase in CDF is very small (i.e., the increase in CDF falls within Region III of Figure 4), which is taken as being

less than 10^{-6} per reactor year, the change is considered regardless of whether there is a calculation of the total CDF." In Section 3.3 of the LAR, the licensee provided the calculated risk impacts. The increase in delta CDF and delta LERF was estimated to be $7.85\text{E-}08$ and $5.06\text{E-}09$, respectively.

By letter dated March 31, 2016 (ADAMS Accession No. ML16095A278), as supplemented by letters dated May 31, October 27, November 17, and December 30, 2016 (ADAMS Accession Nos. ML16159A194, ML16302A397, ML16327A065, and ML17003A273, respectively), the licensee submitted to the NRC an LAR for a one-time extension of containment leakage rate test frequency. As part of this request, the licensee provided assessments for fire, seismic, and other external events in Appendix A to Attachment 3. This information was reviewed, and the request was approved by the NRC staff on March 15, 2017 (ADAMS Accession No. ML17046A443). For fire, seismic, and other external events, the NRC staff reviewed the licensee's assessments and determined that the baseline CDF and LERF values were appropriate to assess the delta CDF and delta LERF for this risk-informed application because the licensee used the same PRA model. The NRC staff finds that the inclusion of the comprehensive material used in the Seabrook model to evaluate the internal fire events, seismic events, and other external events is appropriate for this application because the increase in CDF and increase in LERF for this risk-informed application is very small and consistent with RG 1.174, Revision 3.

PRA Capability Conclusions

RG 1.177 states, "The licensee should provide the rationale that supports the acceptability of the proposed changes by integrating probabilistic insights with traditional considerations to arrive at a final determination of risk." In summary, the licensee has evaluated the Seabrook IEs PRA against the currently endorsed ASME PRA standard (i.e., ASME/ANS RA-Sa-2009) and RG 1.200, Revision 2; evaluated the findings developed during the peer review of IEs PRA; addressed the findings or evaluated their impact; and included a quantitative assessment of the contribution of fire, seismic, and other external events.

Furthermore, to address integrating the probabilistic insights and traditional considerations, the NRC staff reviewed the compensatory risk management actions (RMAs) discussed in the letter dated October 3, 2019. In Section 3.2 of the LAR, regarding defense in depth, the licensee provided a list of compensatory actions that would be in effect during the proposed one-time AOT extension.

In its October 30, 2019, response to the NRC staff RAI, the licensee confirmed for compensatory measure No. 2 that the RMA is intended to address all vital inverters during the extended AOT. The NRC staff finds that the compensatory actions provided by the licensee are appropriate for this risk-informed application. Further, NRC staff review of the Tier 2 and Tier 3 analysis to support the identified compensatory actions is provided in Section 3.5.1.2 of this SE.

The NRC staff reviewed the IEs peer review findings provided in the licensee's letter dated October 30, 2019, in addition to the compensatory actions provided in the LAR submittal, as supplemented, and concludes that the dispositioned findings have been adequately addressed for this application, and that the compensatory actions are sufficient for this risk-informed application. Based on the above, the NRC staff finds that the PRA used by the licensee is of sufficient technical adequacy for the requested one-time TS change.

PRA Modeling

As discussed above, satisfaction of the fourth key principle of risk-informed decisionmaking may be demonstrated with reasonable assurance by comparing risk metrics that reflect the proposed TS changes to the numerical risk acceptance guidelines in RG 1.174, Revision 3, and RG 1.177, Revision 1.

RG 1.177, Revision 1, Section 2.3.3.1, states that to evaluate a TS change, specific systems or components involved in the change should be modeled in the PRA. The model should also be able to treat the alignments of components during periods when testing and maintenance are being carried out. Typically, LCOs and surveillance requirements relate to the system trains or components that are modeled in the system fault trees of a PRA. System fault trees should be sufficiently detailed to specifically include all the components for which surveillance tests and maintenance are performed and are to be evaluated.

For the preventive maintenance case, because such maintenance is planned to minimize plant risk consistent with the Maintenance Rule, 10 CFR 50.65(a)(4), the licensee added inverter EDE-I-1E and other functions supporting the 1E bus to the PRA model where they were not added previously because upon inverter failure, there is an automatic transfer to a maintenance power supply, which is diesel backed and so inverter failure only represents a marginal loss of redundant supply to the associated loads but does not fail any equipment. This newly added 1E bus logic included failure of the 480V Bus E53, failure of components supporting 460V MCC E531, failure of the 125V DC switchgear, inverter common cause failure, failure of inverter EDE-I-1E and its bus, as well as similar logic for inverter EDE-I-1F. In Section 3.2.2 of the LAR dated October 3, 2019, the licensee described the following human performance actions:

1. Prior to the start and during each shift of the proposed AOT extension, a pre-job briefing will be conducted to reinforce expected human performance behaviors and bolster defense-in-depth barriers to human errors.
2. Operators and maintenance crews will be briefed on procedures for implementing and maintaining the equipment lineup necessary to perform the planned Vital Inverter 1E maintenance.
3. Operators will be additionally briefed on responding to unintended and unforeseen circumstances that may rely on Onsite Power Distribution system operability during the proposed AOT extension.

The licensee further stated in Section 3.2.4 of the LAR that:

During the planned maintenance of Vital Inverter 1E, no risk significant plant equipment will be removed from service and protective measures will be implemented to reduce the likelihood of challenges to risk significant equipment. As a result, the functional redundancy, independence and diversity currently described in the Seabrook Station Updated Final Safety Analysis Report (UFSAR) will be maintained throughout the proposed Completion Time extension.

As such, the likelihood of simultaneous maintenance actions is reduced. Maintenance that does occur will be evaluated and controlled by the licensee through its CRMP, and the human performance actions discussed above.

The licensee's analysis evaluated the delta CDF, ICCDP, delta LERF, and the ICLERP for the EDE-I-1E inverter that will be unavailable for the requested 7-day AOT extension. The NRC staff relied upon the results provided in the summary table below from the licensee's analysis described in the LAR submittal.

	ΔCDF	ΔLERF
	7.85-E-08	5.06E-09
	ICCDP	ICLERP
Single 7 day TS 3.8.3.1 Entry	1.51E-09	9.73E-11

The above results include the impacts from IEs, internal flood events, internal fire events, external hazards, and seismic events. As discussed above in Section 3.5.1.1 of this SE, the licensee provided a quantitative assessment of the change in risk using a PRA model, which is a fully integrated, full scope Level 1 and Level 2 model, which includes assessment of IEs; internal flood events; internal fire events; and external hazards, including seismic events.

Section 2.4 of RG 1.177, Revision 1, states that a one-time TS CT (or AOT) change of plant risk is acceptable when the ICCDP is less than 1.0×10^{-6} and the ICLERP is less than 1.0×10^{-7} . The values for ICCDP and ICLERP provided from the PRA analysis performed by the licensee are less than 1.0×10^{-6} and 1.0×10^{-7} , respectively.

The NRC staff concludes that the delta CDF, delta LERF, ICCDP, and ICLERP values of 7.85E-08, 5.06E-09, 1.51E-09, and 9.73E-11, respectively, for the increased representation of the EDE-I-1E vital inverter unavailable for the execution of maintenance and retest activities, are very small and meet the acceptance criteria provided in RG 1.174, Revision 3, and RG 1.177, Revision 1.

Based on its review of information provided in the LAR, as supplemented by letter dated October 30, 2019, the NRC staff concludes that the Seabrook IEPR (includes internal floods) is sufficient for this risk-informed application, and that the licensee has adequately identified the impact of the one-time AOT extension on plant risk. Therefore, the NRC staff finds that the licensee's Tier 1 evaluation is acceptable for this risk-informed application.

3.5.2 Tier 2: Avoidance of Risk-Significant Plant Configurations

RG 1.177, Revision 1, states that the licensee should provide reasonable assurance that risk-significant plant equipment outage configurations will not occur when specific plant equipment is OOS, consistent with the proposed TS change. The second tier evaluates the capability of the licensee to recognize and avoid risk-significant plant configurations that could result if equipment, in addition to that associated with the proposed change, is taken OOS simultaneously, or if other risk-significant operational factors, such as concurrent system or equipment testing, are also involved.

In the LAR dated October 3, 2019, the licensee stated, "Potentially risk significant plant configurations will not occur during the proposed one-time AOT extension due to online risk assessment tools and increased operational and managerial scrutiny of plant operations" and that "no risk significant plant equipment will be removed from service and protective measures will be implemented to reduce the likelihood of challenges to risk significant equipment." In its RAI, the NRC staff indicated, in part, that this reliance on the licensee's CRMP is more

appropriate for the Tier 3 evaluation, which ensures that adequate programs and procedures are in place for the identified risk-significant plant configurations and ensures that appropriate actions are taken to avoid such configurations.

Whereas the Tier 3 evaluation ensures that the CRMP is adequate when maintenance is about to commence, the Tier 2 evaluation is intended to be an early evaluation (i.e., completed prior to LAR submittal) to identify and preclude potentially high-risk plant configurations. One element described in Section 2.2.1 of RG 1.177, Revision 1, to assess whether the proposed TS change meets the defense-in-depth principle, includes consideration to preserve adequate capability of design features without over-reliance on programmatic activities as compensatory measures. To distinguish between Tier 2 and Tier 3 reliance on the CRMP, in its RAI, the NRC staff requested, in part, that the licensee describe (1) how the list of risk-significant functions/conditions considered in the PRA to be affected by the unavailability of EDE-I-1E was initially identified, (2) the criteria used to assess the risk significance, and (3) the process used to identify the testing and maintenance activities that could potentially cause a plant transient listed as compensatory action No. 1 in Section 3.2 of the LAR. In response, the licensee stated that the Seabrook model of record considers all the interfacing system functions and all potential plant configurations that can be impacted by the unavailability of inverter EDE-I-1E, and the licensee described the process used to review and modify the PRA model to include inverter EDE-I-1E. The licensee's process included evaluation of the following:

- Impact for the loss of inverter EDE-I-1E that included PRA model review and modification.
- Review of the applicable operating procedure to determine equipment failures that would result in the loss of 120V AC vital instrument bus (PP1E or PP1F). This included equipment failures and operator errors that could result in a loss of a mitigating function or an initiating event that could lead to core damage or large early release that were considered in the Seabrook PRA model.
- The addition of operator actions to the PRA model that were identified to be pertinent to the plant response required for event mitigation for the proposed AOT extension.
- Addition of logic to the PRA model to capture the potential run failure of the diesel, given a successful start due to the failure of components.
- Sensitivities performed to address the uncertainty associated with a structure, system, and component (SSC) failure or operator error.

The NRC staff confirmed that the applicable equipment failures identified by the licensee have been included and addressed using adequate compensatory actions that the licensee provided in Section 3.2 of its LAR dated October 3, 2019. Based on its review of the licensee's RAI response and the defense-in-depth measures described in Section 3.2 of this SE, the NRC staff concludes that the licensee has demonstrated the ability to identify and avoid risk-significant plant configurations. Therefore, the NRC staff finds that the licensee's Tier 2 evaluation is acceptable for this risk-informed application.

3.5.3 Tier 3: Risk-Informed Configuration Risk Management

Tier 3 assesses the licensee's program to ensure that the risk impact of OOS equipment is appropriately evaluated prior to performing any maintenance activity. The need for Tier 3 stems from the difficulty of identifying all possible risk-significant configurations under Tier 2.

As described in Section 3.5.2 of this SE and in Section 3.3 of the LAR dated October 3, 2019, the licensee stated that potentially risk-significant plant configurations will not occur and that procedure OS1247.02, "Loss of 120 V AC Vital Instrument Bus PP-1E or PP-1F," Revision 16, was reviewed to determine what potentially risk-significant functions would be impacted by the loss of bus PP-1E to provide a conservative assessment of potential impacts.

Section 2.3 of RG 1.177, Revision 1, states, in part, that "If the Tier 2 assessment demonstrates, with reasonable assurance, that there are no risk-significant configurations involving the subject equipment, the application of Tier 3 to the condition addressed by the proposed CT may not be necessary." In response to the NRC staff RAI, the licensee provided examples of where sensitivities and demonstrably conservative values and assumptions were applied in instances where uncertainty associated with an SSC failure or operator error impact on plant response existed. Furthermore, the licensee confirmed using sensitivities or qualitative discussion that the impact on CDF for the requested one-time AOT extension would be small and would be mitigated with the listed compensatory measures reviewed by the staff in Section 3.5.1.3 of this SE. Given the very low orders of magnitude for the delta CDF, delta LERF, ICCDP, and ICLERP that were quantified, the NRC staff finds that the licensee's process for addressing Tier 3, as described in RG 1.177, Revision 1, in addition to the human performance measures described in Section 3.2.2 of the LAR dated October 3, 2019, as supplemented by letter dated October 30, 2019, is acceptable for assessing and managing the OOS equipment in a timely manner during normal plant operations.

3.6 Key Principle 5: Impact of the Proposed Change Is Monitored

RG 1.174, Revision 3, and RG 1.177, Revision 1, establish the need for an implementation and monitoring program to ensure that extensions to TS CTs (or AOTs) do not degrade operational safety over time and that no adverse degradation occurs due to unanticipated degradation or common cause mechanisms. An implementation and monitoring program is intended to ensure that the impact of the proposed TS change continues to reflect the reliability and availability of SSCs impacted by the change. RG 1.174, Revision 3, states that monitoring performed under the Maintenance Rule, 10 CFR 50.65, can be used when the monitoring performed is sufficient for the SSCs affected by the risk-informed application.

In Section 4.1 of the LAR dated October 3, 2019, the licensee stated that the vital inverter 1E is currently in the 10 CFR 50.65(a)(2) Maintenance Rule category (i.e., vital inverter EDE-I-1E is meeting established performance criteria).

Furthermore, the licensee stated that the Seabrook Maintenance Rule program is consistent with 10 CFR 50.65(a)(4) and is managed to ensure that risk-significant plant configurations will not be entered for planned maintenance activities and that appropriate actions will be taken, should unforeseen events place the plant in a risk-significant configuration during the proposed one-time AOT extension.

The NRC staff finds that the implementation and monitoring program for the proposed TS change described by the licensee is consistent with Key Principle 5 of RG 1.177, Revision 1, and, therefore, is acceptable.

3.7 Technical Conclusion

The NRC staff reviewed the information provided by the licensee and the technical basis used to establish the proposed one-time 7-day AOT for the UPS EDE-I-1E vital instrument bus inverter. The licensee is requesting the one-time extension in order to perform vital bus UPS repair activities during power operation. Past operating experience supports the proposed change to a 7-day AOT for an inoperable BOP vital instrument bus UPS. Therefore, the 7-day AOT reflects a reasonable time to complete corrective and preventative maintenance and post-maintenance testing.

In addition, the NRC staff found that there is reasonable assurance that the AC instrument bus will remain energized by its alternate power supply when an instrument bus UPS is removed from service because there are two independent sources of power, and the licensee will perform compensatory actions to further protect the vital bus system during repairs. Based on these considerations, the NRC staff concludes that a one-time AOT extension for the BOP vital instrument bus UPS, EDE-I-1E, from 24 hours to 7 days is acceptable, in accordance with 10 CFR 50.36(c)(2)(i), because there is minimal risk that vital bus loads will lose power, and the LCO will be met.

As discussed in Section 3.1 of this SE, an acceptable approach for making risk-informed decisions about proposed TS changes, including both permanent and temporary changes, is to show that the proposed changes meet the five key principles stated in RG 1.174, Revision 3, Section C, and RG 1.177, Revision 1, Section B. The NRC staff determined in Sections 3.2 through 3.6 of this SE that the licensee's proposed one-time extension of the AOT for the EDE-I-1E vital inverter from 24 hours to 7 days meets the five key principles. Therefore, the NRC staff concludes that the proposed changes to the TS LCO 3.8.3.1 for the AOT extension are acceptable.

4.0 FINAL NO SIGNIFICANT HAZARDS CONSIDERATION

The NRC's regulation in 10 CFR 50.92(c) states that the NRC may make a final determination under the procedures in 10 CFR 50.91 that a proposed license amendment involves no significant hazards consideration if operation of the facility, in accordance with the proposed amendment, would not (1) involve a significant increase in the probability or consequences of an accident previously evaluated; or (2) create the possibility of a new or different kind of accident from any accident previously evaluated; or (3) involve a significant reduction in a margin of safety.

An evaluation of the issue of no significant hazards consideration is presented below:

1. The proposed changes do not involve a significant increase in the probability or consequences of an accident previously evaluated.

The proposed change extends the AOT for the vital inverter 1-E from 24 hours to 7 days. Vital inverter 1-E does not solely support any risk-significant functions. The failure of an inverter is not an initiator of any analyzed event and does not increase the frequency of an initiating

event. Consequently, extending the AOT will not have an impact on the frequency of occurrence of any event previously analyzed. The proposed change does not alter the design, configuration, operation, or function of any plant system, structure, or component. As a result, the outcomes of previously evaluated accidents are unaffected.

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

2. The proposed changes do not create the possibility of a new or different kind of accident from any accident previously evaluated.

No new accident scenarios, failure mechanisms, or limiting single failures are introduced as a result of the proposed change. The proposed change does not challenge the performance or integrity of any safety-related system. The proposed change neither installs nor removes any plant equipment, nor alters the design, physical configuration, or mode of operation of any plant structure, system, or component. Installed equipment will not be operated in a new or different manner. No physical changes are being made to the plant, so no new accident causal mechanisms are being introduced. Procedures that ensure the unit operates within analyzed limits and procedures that respond to off-normal and emergency conditions are not altered with this proposed change.

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

3. The proposed changes do not involve a significant reduction in a margin of safety.

The margin of safety associated with the acceptance criteria of any accident is unchanged. The proposed change does not alter the design, configuration, operation, or function of any plant system, structure, or component. The ability of any operable structure, system, or component to perform its designated safety function is unaffected by this change. Operation with one instrument bus inverter inoperable and the associated instrument bus aligned to its maintenance supply does not result in a significant reduction in the margin of safety. Surveillance testing of the emergency diesel generators (EDGs) and the electrical distribution system provides confidence that the EDGs will energize the emergency AC buses following a loss of power.

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

Based on the above evaluation, the NRC staff concludes that the three standards of 10 CFR 50.92(c) are satisfied. Therefore, the NRC staff has made a final determination that no significant hazards consideration is involved for the proposed amendment and that the amendment should be issued as allowed by the criteria contained in 10 CFR 50.91.

5.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Commonwealth of Massachusetts official was notified of the proposed issuance of the amendment on November 8, 2019 and the New Hampshire State official was notified of the proposed issuance of the amendment on November 19, 2019. The officials had no comments.

6.0 ENVIRONMENTAL CONSIDERATION

The amendment changes a requirement with respect to the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration, and there has been no public comment on such finding published in the *Federal Register* on October 28, 2019 (84 FR 57781). As discussed in Section 4.0 of this SE, the Commission has made a final determination that no significant hazards consideration is involved for the amendment. Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) there is reasonable assurance that such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributors: Keith Tetter
Steve Wyman

Date: December 5, 2019

SUBJECT: SEABROOK STATION, UNIT NO. 1 - ISSUANCE OF AMENDMENT NO. 163
 RE: ONE-TIME CHANGE TO THE ONSITE POWER DISTRIBUTION
 REQUIREMENTS (EPID L-2019-LLA-0216) DATED DECEMBER 5, 2019

DISTRIBUTION:

Public	RidsNrrLALRonewicz Resource
PM File Copy	RidsACRS_MailCTR Resource
RidsNrrDssStsb Resource	RidsNrrDorlLpl1 Resource
RidsRgn1MailCenter Resource	RidsNrrDexEeob Resource
RidsNrrPMSeabrook Resource	RidsNrrDraApic Resource
KTetter, NRR	SWyman, NRR

ADAMS Accession No.: ML19326C480

*by memorandum **by e-mail

OFFICE	NRR/DORL/LPL1/PM	NRR/DORL/LPL1/LA	NRR/DEX/EEOB/BC*	NRR/DRA/APLC/BC*
NAME	JPoole	LRonewicz	BTitus	SRosenberg
DATE	11/26/2019	11/25/2019	11/15/2019	11/08/2019
OFFICE	NRR/DSS/STSB/BC**	OGC - NLO**	NRR/DORL/LPL1/BC	NRR/DORL/LPL1/PM
NAME	VCusumano	JWachutka	JDanna (JKim for)	JPoole
DATE	11/26/2019	12/05/2019	12/05/2019	12/05/2019

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