April 4, 2017

10 CFR 50.90

Docket No. 50-443

SBK-L-17041

United States Nuclear Regulatory Commission
Attn.: Document Control Desk
Washington, D.C. 20555-0001

Seabrook Station

License Amendment Request 17-01

One-Time Exigent Change to the Seabrook Licensing Basis Regarding Service Water Cooling Tower Functionality

Pursuant to 10 CFR 50.90, NextEra Energy Seabrook, LLC (NextEra) is submitting an exigent license amendment request (LAR) for a one-time change to the licensing basis. The proposed change will allow NextEra to credit functionality of the service water (SW) system during the period that the SW cooling tower is unavailable while in Modes 5 and 6 during the current refueling outage. The allowance will satisfy the definition of operability for supported systems to permit necessary maintenance that will require removing both trains of the SW cooling tower from service.

The Enclosure to this letter provides NextEra's evaluation of the proposed amendment, including an explanation of the exigency.

NextEra requests approval of the proposed license amendment by April 14, 2017 with the change effective immediately for the period that Seabrook is in Modes 5 and 6 during the current refueling outage. The one-time change would expire when the plant enters Mode 4, which is currently scheduled for April 22, 2017.

This amendment request responds to a recently-stated NRC position, which NextEra is currently evaluating. In light of the near-term need to perform work affected by this position, NextEra seeks this one-time change to its licensing basis to provide clarity at this time, while postponing the need to achieve final resolution of the licensing issues involved.

In accordance with 10 CFR 50.91, NextEra is notifying the State of New Hampshire of this request by transmitting a copy of this letter and enclosure to the designated State Official.

As discussed in the Enclosure, the proposed change does not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with the change. The Seabrook Station Onsite Review Group has reviewed the proposed license amendment.

This letter contains no new or revised regulatory commitments.

If you have any questions or require additional information, please contact Ken Browne, Licensing Manager, at 603-773-7932.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on April 4, 2017

Eric McCartney
Regional Vice President - Northern Region
NextEra Energy

Enclosure: Evaluation of the Proposed Change

cc: NRC Region I Administrator
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# ENCLOSURE

## Evaluation of the Proposed Change

Subject: License Amendment Request 17-01: One-Time Exigent Change to the Seabrook Licensing Basis Regarding Service Water Cooling Tower Functionality

## 1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, NextEra Energy Seabrook, LLC (NextEra) is submitting an exigent license amendment request (LAR) for a one-time change to the licensing basis. The proposed change will allow NextEra to credit functionality of the service water (SW) system during the period that the SW cooling tower is unavailable while in Modes 5 and 6 during the current refueling outage. The allowance will satisfy the definition of operability for supported systems to permit necessary maintenance that will require removing both trains of the SW cooling tower from service.

## 2.0 DETAILED DESCRIPTION

### 2.1 Current Licensing Basis Requirements

Ultimate Heat Sink (UHS)

The Atlantic Ocean serves as the normal ultimate heat sink for Seabrook Station. However, in the unlikely event that the normal supply of cooling water from the Atlantic Ocean is unavailable, the atmosphere serves as the ultimate heat sink using a mechanical draft evaporative cooling tower.

The Atlantic Ocean portion of the ultimate heat sink includes two tunnels. One tunnel from the submerged intake structure offshore to the pump house at the plant site normally serves as an inlet; a second tunnel discharges cooling water to the ocean. The intake tunnel is designed to supply seawater from the Atlantic Ocean to the SW system during all normal operating and accident conditions. Provision is made to ensure a sufficient flow of cooling water via the intake tunnel from the ultimate heat sink to the SW pump house during a loss-of-coolant accident occurring simultaneously with a loss of offsite power and any single active failure.

The Atlantic Ocean portion of the ultimate heat sink is designed to perform all safety functions during and following the most severe natural phenomena anticipated, e.g., the safe shutdown earthquake (SSE), tornado, hurricane, flood, or low water level resulting from storm surges with the exception of the tunnels and transition structure, which were not specifically designed for the SSE. In the unlikely event that an earthquake of sufficient intensity occurs, which blocks over 95 percent of the available large flow area of the intake tunnel, the cooling tower would be used as the ultimate heat sink to cool and maintain the plant in a safe shutdown condition.

SW System

The function of the station SW system is to transfer the heat loads from various sources in both the primary and secondary portions of the plant to the ultimate heat sink. The system has been designed to supply sufficient cooling water to its heat loads under all possible operating conditions. The ultimate heat sink for all operating and accident heat loads is normally the Atlantic Ocean.

Except for the event that seawater flow to the SW pump house is restricted (>95 percent blockage) due to seismically induced damage to the large seawater intake and discharge tunnels, the SW system using the Atlantic Ocean heat sink is fully capable of performing all safety functions during and following all other severe natural phenomena.

The ocean supplied SW system consists of two completely independent and redundant flow trains, each of which supplies cooling water to a primary component cooling water (PCCW) heat exchanger, a diesel generator jacket water cooler, the secondary component cooling water heat exchangers, the auxiliary secondary component cooling water heat exchangers, the condenser water box priming pump seal water heat exchangers, and, except during a LOCA, to the fire protection (FP) system during a fire. Flow in each redundant train is supplied by two redundant pumps with each pump capable of supplying 100 percent of the flow to dissipate plant heat loads during normal full power operation. Thus, for full power operation one pump per train is required. The four SW pumps take suction from a common bay in the SW pump house, which is supplied from the Atlantic Ocean via the intake tunnel due to the static head of the ocean.

Cooling Tower

In the unlikely event that the main circulating water tunnel is unavailable, a mechanical draft evaporative cooling tower serves as the ultimate heat sink. The cooling tower is designed to supply cooling water to the primary component cooling water and diesel heat exchangers while sustaining a loss of offsite power and any single active failure. The cooling tower and all its associated components are designed for the safe shutdown earthquake loads. Considering the ultimate heat sink in total as the Atlantic Ocean and the cooling tower, the heat sink safety function is assured following the most severe natural phenomena including the safe shutdown earthquake, tornado, hurricane, flood, or loss of water level.

Technical Specifications (TS)

TS 3.7.4, Service Water System / Ultimate Heat Sink, requires an operable SW system in Modes 1 through 4. The proposed one-time license amendment would only apply in Modes 5 and 6, which is outside the Mode of Applicability of TS 3.7.4.

## 2.2 Reason for the Proposed Change

NextEra intends to perform cleaning of the cooling tower basin during the current refueling outage, which started on April 1, 2017. During this activity, the pump in each cooling tower loop will be de-energized for personnel protection during diving operations in the cooling tower basin, rendering the cooling tower unavailable.

Although it is not required to be operable in Modes 5 and 6, the SW system must be functional to support operability of the emergency diesel generator (EDG) and residual heat removal (RHR) system, which are required to be operable in Modes 5

and 6. However, with the cooling tower portion of the ultimate heat sink unavailable, the SW system might become unavailable in the event of an earthquake with sufficient intensity to block over 95 percent of the flow area of the SW intake tunnel. We understand the NRC holds the position that a system that supports operability of TS equipment must meet all its design requirements, including conformance to General Design Criterion (GDC) 2 for natural phenomenon, to be credited as a functional support system. Therefore, removing the cooling tower from service would render the SW system non-functional, which in turn would render the required EDG and RHR system inoperable. Voluntarily rendering the EDG and RHR system inoperable would not be appropriate because the TS required actions for these systems require immediate initiation of corrective actions to restore compliance with the limiting condition for operation. As a result, NextEra is requesting a one-time change to allow maintaining the SW system functional during the period that the cooling tower is unavailable.

Requiring the cooling tower to be available to credit functionality of the SW system appears contrary to the NRC's approval of TS 3.7.4 in Amendment No. 32 [Reference 1] and the guidance in section C.10 of Inspection Manual Chapter (IMC) 0326 [Reference 2]. Amendment 32 evaluated and approved removing the entire cooling tower from service during Modes 1 through 4 with an approved allowed outage time, and IMC 0326 acknowledges that plant-specific TS may contain specific requirements or allowances regarding support systems, such as Seabrook TS 3.7.4, that would govern in such a case.

Additionally, Amendment No. 32 evaluated the impact of SW TS allowed out of service time for both single and dual train unavailability of the cooling tower. As part of Amendment No. 32, the impact to reactor core damage frequency was assessed. The safety evaluation in the amendment stated that the staff agreed with the methodology used and that the change in SW system unavailability due to the proposed TS amendment and the resulting increase in the total reactor core damage frequency are insignificantly small. The amendment concluded that the proposed changes to the TS accurately reflected the SW system and UHS design basis and provide an adequate level of safety while providing considerable flexibility.

In light of the near-term need to perform the cooling tower work, NextEra is requesting this one-time change to its licensing basis to provide clarity at this time, while postponing the need to achieve final resolution of the licensing issues involved.

## 2.3 Basis for the Exigency

NextEra had originally planned to remove the cooling tower from service to clean the basin during operation in Mode 1 prior to the April 2017 refueling outage. The planned activity would have complied with TS 3.7.4, which provides a 72-hour completion time for the condition that two cooling tower loops or the cooling tower itself are inoperable. However, because the NRC recently communicated to the Seabrook staff the position that a TS support system must meet GDC 2 for natural phenomenon for the supported system to be considered operable, the activity could

not be performed in Modes 1 through 4. (Both trains of the supported systems, PCCW and EDG, would have been declared inoperable, requiring an immediate plant shutdown.) As a result, NextEra re-scheduled performance of the activity to the upcoming refueling outage, outside the Mode of Applicability of TS 3.7.4. Because the activity was rescheduled for a plant condition in which the system is not required to be operable, no need for a license amendment was apparent. However, as explained in Section 2.2, now the activity cannot be performed with the plant shutdown because, based on the NRC position, removing the cooling tower from service renders the SW system incapable of fully meeting GDC 2. Therefore, in the current situation, the cooling tower cannot be removed from service in any plant mode.

NextEra needs to perform maintenance on the cooling tower during the current refueling outage to ensure its continued reliability. The activity includes removing accumulated sediment from the cooling tower basin and removal of a previously installed Code Relief weldolet on the cooling tower pump discharge piping. NextEra expected to be able to perform the work with the plant in a Mode where the TS requirements for the SW cooling tower are not applicable. However, the exigent situation, which could not have been foreseen, only became apparent when the NRC recently communicated its stance that without the cooling tower, the SW system could not be considered functional. This change is requested on an exigent basis because a failure to obtain the requested amendment will prevent performing the cooling tower maintenance in any plant mode of operation.

### 2.4 Description of the Proposed Change

NextEra is requesting a one-time change to the licensing basis such that the SW system remains functional to support operability of the EDG and RHR system while the cooling tower is out of service for maintenance. The effective duration of the change would be the period that Seabrook is in Modes 5 and 6 during the April 2017 refueling outage.

## 3.0 TECHNICAL EVALUATION

The SW system employs two independent and redundant cooling loops. Each loop can be supplied by either of two full-capacity SW pumps drawing water from the Atlantic Ocean, or alternatively, each loop can be supplied by a full-capacity cooling tower SW pump drawing water from a mechanical draft cooling tower basin. Each of the six pumps is a 100% capacity pump capable of handling all of the necessary heat loads for its respective train for all normal and design basis events.

Because the tunnels between the Atlantic Ocean and the pump house are not specifically designed to seismic Category I requirements, a seismic Category I cooling tower is provided to protect against their failure due to a seismic event. Therefore, to meet the design basis for the SW system, each loop must have an operable SW pump and an operable cooling tower SW pump during operation in Modes 1 through 4.

Seabrook License Amendment 32 revised TS 3.7.4 with changes to take advantage of the extra redundancy in the SW system and UHS designs to provide enhanced flexibility during station operation. Among other changes, the amendment extended the allowed outage time for one inoperable cooling tower SW loop from 72 hours to seven days and added an allowed outage time of 72 hours for two inoperable cooling tower SW pumps. The safety evaluation for the amendment discussed the consequences of a loss of SW. For transients and loss of coolant accidents, loss of SW would fail primary component cooling leading to loss of cooling to the reactor coolant pump seals and to the emergency core cooling system pumps. For a loss-of-offsite-power event, loss of SW would fail the diesel generators leading to station blackout. In its safety evaluation, the NRC staff concluded that the proposed changes to TS 3/4.7.4 accurately reflect the SW system and UHS design bases and provide an adequate level of safety while providing considerable flexibility.

The changes approved in Amendment 32 allow continued operation for up to 72 hours in Modes 1 through 4 with both cooling tower loops or the cooling tower inoperable. In this condition, which the NRC concluded provides an adequate level of safety, the SW system does not meet GDC 2 for natural phenomenon (earthquakes). The proposed change to the licensing basis, however, would only be applicable in Modes 5 and 6, when the reactor coolant system is in a much lower energy state than in Modes 1 through 4, and the consequences of a loss of SW would be less severe.

Numerous automatic actuations, such as starting of engineered safeguards equipment (ECCS pumps), starting of EDGs, and cooling tower actuation, that are required in Modes 1 through 4 are not required in Modes 5 and 6. Consequently, more time would be available in Modes 5 and 6 to manually restore a cooling tower loop to operation in the event of an earthquake that significantly obstructs the ocean water supply to the SW system.

During the period that both cooling tower loops are unavailable to support cleaning of the basin, the cooling tower pumps will be de-energized under administrative controls to provide protection for the divers in the cooling tower basin. However, in the event of a loss of the ocean supplied service water loops, the cooling tower could be restored to service after removing the divers from the cooling tower basin and restoring power to the cooling tower pumps. The work plan for removing the cooling tower from service will contain provisions for restoring the cooling tower to service.

The likelihood of a seismic-induced failure of the circulating water tunnels and associated transition structures is very low. Although these tunnels and structures were not specifically designed to Seismic Category 1 criteria, they are assessed as having considerable seismic capacity in the plant's seismic risk analysis of record. Nonetheless, NextEra will remove the cooling tower from service in accordance with a station procedure that that will include strict administrative controls that provide for timely restoration of the cooling tower following a loss of the ocean-supplied SW system.

- The procedure will assign specific responsibilities to designated operators, maintenance personnel, and the divers
- The procedure will provide briefings to the personnel involved regarding their roles and responsibilities

- Planned maintenance will not occur on protected train equipment for SW, EDGs and associated vital buses, RHR, PCCW, and the supplemental emergency power system while the cooling tower is out of service.
- The cooling tower will be restored to service in the event of a severe weather warning
- NextEra will perform a risk evaluation prior to removing the cooling tower from service with the reactor coolant system (RCS) in reduced inventory, with RCS time to boil less than six hours, or spent fuel pool time to reach 200 degrees F less than six hours.

## 4.0 REGULATORY EVALUATION

### 4.1 Applicable Regulatory Requirements/Criteria

- Appendix A to Part 50—General Design Criteria for Nuclear Power Plants:
  - *Criterion 2—Design bases for protection against natural phenomena* requires structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena.
  - *Criterion 34—Residual heat removal* requires a system to remove residual heat shall be provided.
  - *Criterion 44—Cooling water* - requires a system to transfer heat from structures, systems, and components important to safety, to an ultimate heat sink shall be provided.

- 10 CFR 50.91, Notice for public comment; State consultation - includes provisions for requesting exigent and emergency amendments.

### 4.2 No Significant Hazards Consideration Determination Analysis

The proposed change will allow NextEra to credit service water (SW) system functionality during the period that the SW cooling tower is unavailable while in Modes 5 and 6 during the current refueling outage. The change is needed to permit necessary maintenance that will require removing both trains of the SW cooling tower from service.

NextEra has evaluated whether a significant hazards consideration is involved with the proposed amendment by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

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

   Response: No.

The proposed change neither involves any physical changes to plant equipment or systems nor does it alter the assumptions of any accident analyses. The proposed change does not adversely affect accident initiators or precursors, and it does not alter design assumptions, plant configuration, or the manner in which the plant is operated and maintained. The proposed change does not adversely affect the ability of structures, systems, or components (SSCs) to perform their intended safety functions in mitigating the consequences of an initiating event within the assumed acceptance limits.

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

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

Response: No.

No new accident scenarios, failure mechanisms, or limiting single failures are introduced because of the proposed change. The change does not challenge the integrity or performance of any safety-related systems. No plant equipment is installed or removed, and the change does not alter the design, physical configuration, or method of operation of any plant SSC. No physical changes are made to the plant, so no new causal mechanisms are introduced.

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

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

Response: No.

Margin of safety is associated with the ability of the fission product barriers (i.e., fuel cladding, reactor coolant system pressure boundary, and containment structure) to limit the level of radiation dose to the public. The proposed change does not affect operation of the plant and no accident analyses are affected by the proposed changes. The proposed change does not adversely affect systems that maintain the plant in a safe shutdown condition.

The proposed change would allow the service water (SW) system to remain functional in Modes 5 and 6 to support operability of the required emergency diesel generator and residual heat removal system while the SW cooling tower is unavailable. Administrative controls will provide for restoration of the cooling tower in the event of a loss of the ocean supplied SW system.

Therefore, the proposed changes do not involve a significant reduction in the margin of safety.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) 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.

## 5.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or a significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the proposed amendment.

## 6.0 REFERENCES

1. NRC letter "Amendment No. 32 to Facility Operating License NPF-86: Primary Component Cooling Water System Operability Requirements - License Amendment Request 93-01 and Service Water System/Ultimate Heat Sinks Operability Requirements - License Amendment Request 93-02 (TAC M85491 and M85750)," October 5, 1994
2. NRC Inspection Manual Chapter 0326, "Operability Determinations & Functionality Assessments for Conditions Adverse to Quality or Safety," December 3, 2015