

From: [Poole, Justin](#)
To: [Mack, Jarrett](#); [Levander, Matthew](#)
Cc: [Danna, James](#)
Subject: Request for Additional Information RE: 120V Inverter LAR
Date: Tuesday, May 31, 2022 4:07:00 PM
Attachments: [L-2021-LLA-0131 STSB RAIs final.pdf](#)

Jarrett,

By letter dated July 21, 2021, as supplemented by letters dated September 22, 2021, and March 7, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML21202A238, ML21278A309, and ML22066B007, respectively), NextEra Energy Seabrook, LLC (NextEra, the licensee) requested changes to the Technical Specifications (TSs) for Renewed Facility Operating License NPF-86 for Seabrook Station, Unit No. 1 (Seabrook). The proposed changes would revise TS 3/4.8.3, "Onsite Power Distribution – Operating," by increasing the Allowed Outage Time (AOT) for the 120-volt (V) alternating current (AC) vital instrument panel inverters, establishing a new required action for two inoperable 120 VAC vital instrument panel inverters of the same electrical train and related administrative changes. In reviewing the submitted information, the U.S. Nuclear Regulatory Commission (NRC) staff has determined that additional information is necessary to complete its review.

On May 20, 2022, the NRC staff sent the licensee DRAFT RAIs to ensure that the questions are understandable, the regulatory basis is clear, there is no proprietary information contained in the RAIs, and to determine if the information was previously docketed. On May 31, 2022, the NRC and the licensee held a public meeting to discuss the DRAFT RAIs. During the meeting, the licensee requested a response date of 30 days from the date of this email. The NRC staff informed the licensee that this timeframe is acceptable. The attached is the final version of the RAIs. These RAIs will be put in ADAMS as a publicly available document.

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REQUESTS FOR ADDITIONAL INFORMATION (RAIs) REGARDING THE LICENSE
AMENDMENT REQUEST TO REVISE TECHNICAL SPECIFICATION 3/4.8.3, “ONSITE
POWER DISTRIBUTION – OPERATING”
SEABROOK STATION, UNIT NO. 1
DOCKET NO. 50-443

By application dated July 21, 2021, and as supplemented by letters dated September 22, 2021, and March 7, 2022 (Agencywide Documents Access and Management System (ADAMS) Accession Numbers ML21202A238, ML21278A309, and ML22066B007, respectively), NextEra Energy Seabrook, LLC (NextEra, the licensee) requested changes to the Technical Specifications (TSs) for Renewed Facility Operating License NPF-86 for Seabrook Station, Unit No. 1 (Seabrook). The proposed changes would revise TS 3/4.8.3, “Onsite Power Distribution – Operating,” by increasing the Allowed Outage Time (AOT) for the 120-volt (V) alternating current (AC) vital instrument panel inverters, establishing a new required action for two inoperable 120 VAC vital instrument panel inverters of the same electrical train and related administrative changes. The Supplement dated September 22, 2021 superseded the July 21, 2021, application.

The NRC staff has determined that the following additional information is needed to complete the review of the Seabrook license amendment request.

Regulatory Requirements and Guidance

The NRC staff used the following regulatory requirements to review the LAR:

Title 10 of the *Code of Federal Regulations*, Part 50 (10 CFR 50), Section 36, “Technical specifications,” requires, in part, that the applicants for a license authorizing operation of a production or utilization facility must include in their application proposed TSs. 10 CFR 50.36(c) requires that TS include items in five specific categories related to station operation. These categories are (1) Safety limits, limiting safety system settings, and limiting control settings, (2) Limiting conditions for operation (LCOs), (3) Surveillance requirements (SRs), (4) Design features, and (5) Administrative controls. The proposed change to the Seabrook TS relates to the LCO category.

10 CFR 50.36(c)(2)(i), in part, stated that LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met.

NRC Staff RAIs

EEEE RAI-5

In the licensee’s response to EEEB RAI-2(b), the licensee stated the following:

Specifically, in the event of two or more vital panel/inverter failures on the same electrical train due to the inoperability of the DC links to their associated inverters, the most likely scenario for the application of proposed ACTION d, the instrument panels would either remain energized from their normal inverter-powered Class 1 E qualified 480-volt MCCs or 125 VDC bus, or if power to the instrument panels were disrupted, their associated static transfer switches would shift power to their backup (aka maintenance) MCC power supplies, just as the case for a single inverter failure, and operating procedures direct manual transfer to the backup AC power supplies if required.

In the supplement dated September 22, 2021, the licensee had stated the following:

The UPS units consist of a rectifier section which converts three-phase 460V AC power to a nominal 125 VDC power and an inverter section which inverts the DC power to single phase 120 VAC power. The inverters (two per train) assure an uninterrupted supply of AC electrical power to the AC vital buses even if the 4.16 kV safety buses are de-energized. The common DC bus which connects the rectifier output, the battery bank, and the input of the inverter, is called the DC link. Blocking circuitry installed in each UPS unit connect the battery source to the internal DC bus and prevents the 125 VDC batteries from supplying the inverter section when ac power is available and is capable of supplying the required output. Should AC power become unavailable or degrade below the allowable voltage, the diode instantly conducts, linking the internal DC bus to the battery supply providing power to the inverter section..

The NRC staff understands that based on the description of the UPSs in the September 22, 2021, supplement, either the Class 1E 480 VAC MCC through the rectifier or the 125 VDC power source supplies DC power to the inverter/panel via the DC link. Once the DC link is not available, the Class 1E 480 VAC MCC or the 125 VDC power source can no longer supply power to the inverter/panel. This staff's understanding is not consistent with the above underlined statement in response to EEEB RAI-2(b). Please clarify this inconsistency between the September 22, 2021, supplement and the response to EEEB RAI-2(b).

EEEB RAI-6

In the supplement dated September 22, 2021, the licensee stated the following:

During the proposed AOT extensions, power to the affected vital instrument panel will be maintained such that the assumptions and inputs associated with plant safety analyses are unaffected. Thereby, the balance of prevention and mitigation strategies remains preserved.

It appears that, based on the above statement, the assumptions and inputs associated with Seabrook's safety analyses would be affected if power to the affected 120 VAC vital instrument panel was not maintained using a maintenance supply from a non-Class 1 E 480-volt AC motor control center during the proposed 7-day AOT. However, the NRC staff notes that the maintenance power supply is not required by the Seabrook TS LCO 3.8.3.1 and/or for the operability of the 120 VAC vital instrument panel.

Clarify what power supply is credited such that the assumptions and inputs associated with plant safety analyses are unaffected. Clarify whether the inoperability of one 120 VAC vital instrument panel and the proposed associated AOT extension in the proposed revised

TS 3.8.3.1 Action b will adversely affect any assumptions or inputs associated with Seabrook's safety analyses. If such assumptions or inputs will be affected, provide justification to ensure sufficient safety margin will continue to exist during the proposed AOT extension.

STSB RAI-1

In response to EEEB RAI-2(a), the licensee stated the following (in part):

The proposed TS Bases will also clarify that upon exiting ACTION d and entering ACTION b for the remaining inoperable inverter, the proposed 7-day AOT of ACTION b begins at the time of initial inoperability (rather upon exiting ACTION d).

The purpose of the TS bases is to provide an explanation for the TS requirements. According to 10 CFR 50.36(a)(1), while TS bases should be included in an application, they are not to become a part of the TS. NRC staff noted that the proposed TS bases for TS 3.8.3.1 Action d appear to introduce a requirement to enter Action b. This requirement is only in the TS bases, not the proposed TS, which increases the possibility for misinterpretation. Please describe the location of this requirement in the TS or update the proposed TS to clarify the requirement.

STSB RAI-2

The licensee's response to RAI 2(c) states, in part, "For the reasons discussed in the response to EEEB RAI-1, operating experience has shown that the restoration of at least one inverter within the 8-hour AOT of proposed ACTION d is unlikely." NRC staff noted that this statement is in contradiction to proposed Action d.2 of TS 3.8.3.1 which requires, in part, that at least two AC vital panels be energized from their associated inverters and DC buses within eight hours when two or more AC vital panels of the same train are inoperable. In light of this information, please explain how the actions in proposed Action d.2 would meet the intent of 10 CFR 50.36(c)(2)(i) which states, in part, "When a limiting condition for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met."