



March 4, 2024

L-2024-033

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Seabrook Nuclear Station, Unit 1
Docket No: 50-443
Renewed Facility Operating License NPF-86

Subject: Request for Enforcement Discretion – Technical Specification (TS)
3/4.8.1.1 "A.C. Sources" Required Action Completion Time to Replace
"ED-X-3-B".

This letter formally requests approval for enforcement discretion to allow time for the replacement of the 3B Reserve Auxiliary Transformer.

Per TS 3/4.8.1.1 "A.C. Sources" it states the following for the LCO: "The AC sources are required to be OPERABLE in MODES 1, 2, 3, and 4 to ensure that: As a minimum, the following A.C. electrical power sources shall be OPERABLE: a. Two physically independent circuits between the offsite transmission network and the onsite Class 1E Distribution System, and b. Two separate and independent diesel generators."

There is a replacement strategy in place, however, it currently deviates from the Completion Time indicated in the TS.

This request is being made in accordance with NRC Enforcement Manual, Appendix F, "Notices of Enforcement Discretion." A description of the request for enforcement discretion is provided in Enclosure 1 of this letter.

This request for enforcement discretion is to minimize risk of an unnecessary shutdown of a reactor without a corresponding health and safety benefit. This enforcement discretion would allow continued power operation with ED-X-3-B (3B Reserve Auxiliary Transformer) inoperable for an additional five (5) days beyond the time limit specified in TS 3/4.8.1.1 that states that ED-X-3-B will be back to operable status in 72 hours. A follow-up one-time LAR will be issued to modify the requirement to 30 days to replace the equipment.

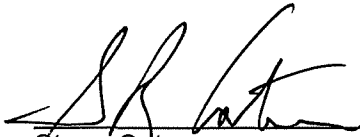
Approval of this enforcement discretion does not compromise the health and safety of plant personnel or the general public, nor does it involve irreversible environmental consequences.

This request has been reviewed by the Onsite Review Group.

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Should you have any questions regarding this submission, please contact Mr. Kenneth Mack, Fleet Licensing Manager, at 561-904-3635.

Sincerely,

A handwritten signature in black ink, appearing to read 'Steve Catron', written over a horizontal line.

Steve Catron
Licensing and Regulatory Compliance Director – Nuclear Fleet

Enclosure

cc: Administrator, Region I, USNRC
Project Manager, Seabrook, USNRC
Resident Inspector, Seabrook, USNRC

ENCLOSURE

REQUEST FOR ENFORCEMENT DISCRETION REGARDING TECHNICAL SPECIFICATION (TS) COMPLETION TIME TO FOR ED-X-3-B TO BE REPLACED [TS 3/4.8.1.1]

NextEra Energy Seabrook, LLC requests NRC enforcement discretion from Seabrook Technical Specification (TS) requirements related to the inoperability of the 3B Reserve Auxiliary Transformer. This request was discussed with the agency during a teleconference held on March 3, 2024. The following provides the information described in NRC Enforcement Manual, Part III, Appendix F, that must be considered in a request for enforcement discretion.

1. Did the licensee explain why a formal licensing process is not appropriate to address the issue and why the need for a NOED could not reasonably been avoided? If applicable, this explanation shall address previous instances of the issue and decisions to pursue licensing solutions in the past.

Current Event

On March 1st, 2024, at approximately 0542, the Seabrook Station control room received alarms associated with 345kV breakers 695 and 52 opening, de-energizing both the 3B Reserve Auxiliary Transformer and 3A Reserve Auxiliary Transformer. Initial troubleshooting identified that 3B Reserve Auxiliary Transformer had two local alarms present: sudden pressure relay actuated along with low oil level. A low SF6 gas alarm was identified at 0652. The OCC was immediately staffed with around-the-clock coverage. From the testing of the 3B Reserve Auxiliary Transformer, it was concluded that the maintenance activity would entail the replacement of the transformer.

The maintenance activity includes the replacement of the 3B Reserve Auxiliary Transformer with an onsite like-for-like spare. Replacement of the transformer is expected to take approximately 17 days. During this maintenance activity, the 3A Reserve Auxiliary Transformer will be available intermittently as permitted by the conditions during the replacement of the 3B Reserve Auxiliary Transformer.

NextEra reviewed NRC Enforcement Manual, Appendix F, "Notices of Enforcement Discretion," and determined that this request satisfies Section 1.3 -Applicability, as the time to process an Exigent or Emergent License Amendment Request (LAR) is not feasible due to the remaining time of under 36 hours within the associated 72 hour Allowed Outage Time (AOT) of this action statement. This NOED meets Enforcement Manual Appendix F, "Notices of Enforcement Discretion," Entry Criteria, Section 2, bullet point two, an "unnecessary down-power or the shutdown of a reactor without a corresponding health and safety benefit." The proposed maintenance activity to restore the SSC to operable status would be 17 days past the AOT, and a shutdown to accomplish the repair would introduce additional risk of a plant transient during shutdown and startup evolutions.

A follow-up one-time Emergency License Amendment Request (LAR) will be submitted to extend the LCO AOT; however, that submittal is estimated to take three more days to prepare and fully review. This request for Enforcement Discretion is intended to allow NextEra the time to prepare and submit an Emergency LAR.

This enforcement discretion is requested for the continued operation of the plant for an additional 5 days to allow the follow-up LAR to be prepared and submitted by NextEra and reviewed by the NRC.

Previous Occurrences

There have been no previous occurrences related to the current incident. There are no outstanding amendments or TS change requests related to this NOED request.

2. Did the licensee provide a description of the TSs or other license conditions that will be violated? This description shall include the time the condition was entered and when the completion time will expire.

At 0542 Operations entered TS 3.8.1.1, action a for AC power sources due to indications of a potential fault with the 3B Reserve Auxiliary Transformer (RAT). Both RATs were isolated by the automatic opening of Switchyard Breakers 695 and 52, which isolates Switchyard Bus 5 from the rest of the 345 Kv Switchyard.

TS 3.8.1.1 a, requires two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution System. If one of those offsite transmission circuits is not operable, then action a is applicable.

Action a states:

With an offsite circuit of the above required A.C. electrical power sources inoperable:

1. Perform Surveillance Requirement 4.8.1.1.a for the OPERABLE offsite circuit within 1 hour and at least once per 8 hours thereafter.
2. Within 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s), declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable; and
3. Restore at least two offsite circuits to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The 72 hours will expire on Monday, 3/4/24, at 0542. At this time plant shutdown will need to commence to Hot Standby (Mode 3) to be completed within 6 hours and then will need to continue to Cold Shutdown (Mode 5) within the next 30 hours.

3. Did the licensee provide sufficient information to demonstrate that the cause of the situation is well understood including extent of condition on other related SSCs (e.g., common cause)?

Cause

Based on the inspections and data collected, the most likely cause of this event is the failure of the bushing internal top and bottom seals which allowed a flow path of SF6 gas from the SF6 gas compartment through the bushing internals into the transformer tank. This was most likely caused by the loss of insulating oil in the bushing resulting in a fault and creating an overpressure condition and arcing inside the transformer. Since this failure resulted in contamination of the transformer, and the inability to conclusively test and inspect for winding damage, it is prudent to replace the transformer.

Extent of Condition

The 3B RAT experienced an internal pressure fault and requires a full replacement. The 3A RAT initial inspections indicate this is not a common mode failure, therefore there is no extent of condition. Inspections conducted on the remaining two bushings of RAT 3B indicated no signs of degradation and proper oil pressure. Inspections of the RAT 3A bushing oil pressure indicates satisfactory results.

The Fleet Transformer subject matter experts reviewed the overall health of the UAT and RAT transformers. The transformer oil physical properties for dielectric strength indicates no anomalies. Dissolved gases, including CO, were normal for all the UAT and RAT transformers with the exception of the 3B RAT. CO for this transformer was stable in the range of approximately 2 to 4 ppm until the November 2023 sample, which reached 44 ppm. While this is a trend to be noted, the overall magnitude of the increase was significantly below the IEEE criteria of 350 ppm and not a cause for immediate concern.

Review of Doble data for the UAT and RAT bushings were also performed. The test history and results were normal for the transformers except for the 3B RAT. Specifically, the April 2023 Doble test results indicated changes in Power Factor that were noted to be anomalies that warranted further investigation. At that time, this was not identified to require additional action. This apparent oversight is currently being investigated.

4. Did the licensee provide an evaluation of all safety and security concerns associated with operating outside of the TS or license conditions that demonstrates that the noncompliance will not create undue risk to the public health and safety or involve adverse consequences to the environment? This should include, as appropriate, a description of the condition and operational status of the plant, equipment that is out of service, inoperable, or degraded that may have risk significance, may increase the probability of a plant transient, may complicate the recovery from a transient, or may be used to mitigate the condition. This evaluation shall include potential challenges to offsite and onsite power sources and forecasted weather conditions.

The reserve auxiliary transformers 3A (1-ED-X-3A) and 3B (1-ED-X-3B), being out of service will not cause undue risk to the public health and safety or involve adverse consequences to the environment during the proposed period of enforcement discretion.

System Design and Operation

The facility is interconnected to offsite power via three 345 kilovolt lines of the transmission system for the New England states. The normal preferred source of power for the unit is its own main turbine output via two Unit Auxiliary Transformers. The redundant safety feature buses of the unit are powered by two unit auxiliary transformers. A highly reliable generator breaker is provided to isolate the generator from the unit auxiliary transformers in the event of a generator trip, thereby obviating the need for a bus transfer upon loss of turbine generator power. Auxiliary power may be taken from the 345-kV system by it being back-fed through the generator step-up transformers and unit auxiliary transformers when the generator circuit breaker is open.

In the event that the unit auxiliary transformers are not available, the redundant safety feature buses of the unit are powered by two reserve auxiliary transformers. Upon loss of offsite power, the unit is supplied with adequate power by either of two fast-starting, diesel-engine generators. Either diesel-engine generator and its associated safety feature bus is capable of providing adequate power for a safe shutdown under accident conditions with a concurrent loss of offsite power. A non-safety related supplemental emergency power system (SEPS) is available as a backup power source to either safety feature bus when one or both emergency diesel generators fail to start and load. SEPS is capable of providing adequate power for a safe shutdown under loss of offsite power condition. A constant supply of power to vital instruments and controls of each unit is assured through the redundant 125 volt direct current buses and their associated battery banks, battery chargers and inverters.

Basis of Current Design:

Two reserve auxiliary transformers (RATs) for each unit provide a second immediate access circuit from the preferred power supply (offsite source) to the onsite distribution system, providing power for all loads including all the engineered safety features loads. The transformers are three phase, three winding, outdoor type, oil filled, Class OA/FA/(FOA Future) transformers with wye connected 345 kV primary rated 27/36/(45 Future) MVA at 55°C and 30.24/40.32/(50.4 Future) MVA at 65°C; wye connected 13.8 kV secondary winding rated 18/24/(30 Future) MVA at 55°C and 20.16/26.88/(33.6 Future) MVA at 65°C, and delta connected 4300 volt tertiary rated 12/16/(20 Future) MVA at 55°C and 13.44/17.92/(22.4 Future) MVA at 65°C. Each transformer has the capacity to supply the power requirements of the connected load under all plant conditions.

The RATs are located on the north side of the Turbine Building heater bay. The pair of transformers is connected to the 345 kV switching station by SF6 gas insulated bus. High voltage bushings are used to connect the transformer terminals to the SF6 gas-insulated bus.

The secondary winding of each reserve auxiliary transformer is connected to a 13.8 kV switchgear bus, and the tertiary winding is connected to one train of 4160 volt emergency switchgear and to one 4160 volt nonessential switchgear lineup. By this arrangement, a separate RAT feeds each emergency bus. Connections to both the 13.8 kV and the 4160 volt switchgear are made with three phase nonsegregated phase bus ducts. There is a contingency alignment where emergency diesel generator EDG-1A may be aligned to provide power to the RAT-3A tertiary winding.

Weather Considerations

On Sunday, March 3rd, and Monday, March 4th, overcast conditions are to continue, with a marginal precipitation probability of intermittent rain showers. Ambient temperatures will exhibit a slight ascension to 54°F on Sunday before dipping to 48°F on the following day. Wind direction is expected to transition from northerly to east-northeast on Monday with maintained speeds of 5 to 10 mph.

On Tuesday, March 5th, rain showers are forecasted with a 40% probability under persistent overcast conditions. The thermometric readings are envisaged to peak near 50°F, with east-northeast winds at speeds up to 10 mph. Rainfall probability escalates slightly to 50% on Wednesday, March 6th, with temperatures holding the mid-50s and a northeasterly wind flow.

Thursday, March 7th, anticipates a 60% rainfall probability under cloudy conditions. Ambient temperatures are projected to drop to around 45°F, with the wind veering to the northeast and increasing to speeds between 10 and 20 mph. By Friday, rain and snow showers manifest in the morning forecast, transitioning to a few rain showers in the afternoon. Projected highs are around 43°F, under the influence of north-northeast winds at speeds of up to 15 mph.

In summary, climatic conditions for the week project consistent overcast skies, intermittent rain showers with a slight chance of morning snow showers towards the end of the week, and an oscillating wind pattern majorly from the northeast quadrant. Ambient temperatures are expected to fluctuate primarily in the mid-40 to mid-50°F range. Section 5 of this document describes the potential impacts that weather could have when performing maintenance activities, regarding the replacement of the 3B RAT by the predicted replacement timeline.

Safety Margins

During the period of enforcement discretion both safety related busses 5 and 6 will remain powered from the offsite transmission network. The proposed period of enforcement discretion will not impact any assumptions or consequences specified in applicable safety analyses. Safety margins will be maintained in accordance with Seabrook safety analyses acceptance criteria and no changes are proposed that affect any assumptions or inputs to applicable safety analyses. Both Emergency EDGs 1A and 1B remain available as well as Unit Auxiliary Transformers 2A and 2B, providing defense-in-depth to a loss of offsite power. The Supplemental Emergency Power System is another backup power supply, normally aligned to bus 6.

Other Defense-in-Depth Considerations

Onsite Power System Description:

The onsite power system is comprised of the 4160V Emergency Distribution System, including the standby diesel generators and the 4160-volt connections from the unit and reserve auxiliary transformers, the 480V Emergency Distribution System, the 120V Vital Instrumentation and Control Power System and the 125V DC Distribution System including

the batteries and battery chargers. The Supplemental Emergency Power System (SEPS) also provides a non-safety related, diesel generator backed, power supply to one of the emergency buses when one or both emergency diesel generators fail to start and load.

Under normal operating conditions, the main generator supplies electrical power via isolated phase bus ducts to the utility grid through the generator step-up transformers and to the plant through the unit auxiliary transformers. The main generator is connected to the generator step-up and unit auxiliary transformers through a generator circuit breaker. During startup and shutdown, auxiliary power may be taken from the 345-kV system in one of two ways:

- a. Back-fed through the generator step-up transformers and unit auxiliary transformers when the generator circuit breaker is open
- b. From the reserve auxiliary transformers.

The principal feature of this system is the two redundant diesel generators which are connected to two groups of redundant emergency buses and loads when a loss of all offsite power sources occurs. Each redundant emergency bus and associated load group has sufficient redundancy, independence and testability to assure that the safety functions are performed. SEPS provides a non-safety related, diesel generator backed, power supply to the emergency buses if there is a loss of all offsite power and one or both emergency diesel generators fail to start and load.

Human Performance

Human Performance tool usage will be discussed and emphasized. During each shift of the proposed period of enforcement discretion, a pre-job briefing will be conducted to reinforce expected human performance behaviors and bolster defense-in-depth barriers to human errors for all impacted personnel. At the beginning of each shift, Operations crews will brief on guarded equipment associated with RAT 3B work. Once every shift an SRO will walk down all guarded equipment associated with RAT 3B work. Prior to performing work associated with RAT 3B, or activities that could impact plant electrical alignments, Maintenance and/or Operations involved personnel will be briefed with a focus on the risk of their activity.

Current Plant Status

The 1B 125-volt battery is currently out of service. Placing the 1B battery bank in service would require the site to enter a two-hour technical specification shutdown action statement concurrent with inoperability of the train B emergency diesel generator for the duration a vital battery is disconnected from its associated DC bus. Based on the increased risk of the restoration activity combined with the impacted operability of the emergency diesel generator, the 1B battery bank will remain out of service for the duration of this work. The impact of this battery out of service is negligible. Seabrook has two 100% capacity 125-volt DC batteries per train (for a total of four 100% capacity batteries). This configuration is discussed in detail in License Amendment number 157.

The RAT 3A will be available intermittently while the replacement strategy for RAT 3B is in progress.

There is no other equipment out of service, inoperable, or degraded with notable risk significance that could potentially increase the probability of a plant transient, complicate the recovery from a transient, or be used to mitigate the condition. No other operational challenges are currently being experienced. NextEra will have a daily touch point with ISO New England to ensure current grid stability status is understood.

- 5. Did the licensee provide a description and timeline of the proposed course of action to resolve the situation (e.g., likely success of the repairs) and explain how the resolution will not result in a different or unnecessary transient? This shall include the time period for the requested discretion and demonstrate a high likelihood of completion within the requested period of enforcement discretion. If the proposed course of action necessitates enforcement discretion greater than 5 days, the licensee shall justify why a longer-term solution (e.g., emergency amendment) should not be processed within the duration of a 5 days NOED.**

The approximate timeline for the course of action is as follows:

1. (2 Days) Perform testing of spare 3B Transformer and complete preparations for the replacement.
2. (10 Days) Replace 3B Transformer with spare
3. (3 Days) Recharge SF6
4. (2 Days) Transformer Testing and Exit LCO

During the repair activity redundant offsite and onsite power supplies will be guarded as specified below. The repair plan for the 3B Auxiliary transformer is not expected to impact any other systems or structures that could potentially cause a different or unnecessary transient. However, due to potential unwanted weather conditions, it could cause delays in maintenance activities, further warranting the proposed timeline of the replacement to ensure efficient and safe working conditions. An Emergency LAR will be submitted in concert with this NOED.

- 6. Did the licensee detail and explain compensatory actions the plant has both taken and will take to reduce risk(s), focusing on both event mitigation and initiating event likelihood? This shall include how each compensatory measure achieves one or more of the following:**
- a. Reduces the likelihood of initiating events;
 - b. Reduces the likelihood of the unavailability of redundant trains, during the period of enforcement discretion; and
 - c. Increases the likelihood of successful operator actions in response to initiating events.

Compensatory actions are actions that have been taken to reduce risk and other potential initiating events.

Compensatory Actions:

- Guarding of the following equipment
 - Both Emergency Diesel Generators
 - The Supplemental Emergency Power System (SEPS)
 - The 345 Kv Switchyard, including the Breaker Enclosure building
 - Generator Step Up Transformers
 - Unit Auxiliary Transformers
 - Reserve Auxiliary Transformer 3A
 - Relay Room
 - B and D Battery Chargers
 - B and D Battery Room

Note: Guarding of these areas will ensure that no unapproved work occurs in those areas that could threaten any of the electrical power supplies and subsequently reduce the current allowed outage time to a lesser allowed outage time. Operations will perform SRO walkdown of the guarded equipment per shift.

- Current scheduled work is being reviewed to ensure no work is performed that could threaten offsite and onsite power sources.
- Any scheduled work that is a threat to generation is being moved. For example, the A condensate pump motor replacement was scheduled for next week is being moved outside the window of the RAT 3B transformer maintenance.
- Any online scheduled work is being reviewed to ensure no impact to AC power sources.
- ISO will provide daily updates to validate future grid work that could put the station under further ISO contingency actions.
- Hourly fire patrols will be performed in high fire risk areas as specified in section 7 of this NOED.
- Just In Time Training (JITT) will be performed with licensed Operations prior to placing reserve auxiliary transformers in service and will include potential faults to aid in operator response and overall proficiency. In addition, Licensed Operators will perform a review of the following procedures at the beginning of each shift rotation period (day shift; peak shift; mid shift): OS1246.02, Degraded Vital AC Power; E-0, Reactor Trip or Safety Injection; and ECA-0.0, Loss of All AC Power.

Note: Validation of the current work schedule for the next several weeks will ensure availability of equipment for operators to respond to any initiating events, as well as eliminate the possibility of an initiating event occurring due to work in areas that are currently guarded or protected.

7. Did the licensee demonstrate that the NOED condition, including compensatory measures will not result in more than a minimal increase in radiological risk, either in quantitative assessment that the risk will be within the normal work control levels (ICCDP less than or equal to 5E-7 and/or ICLERP less than or equal to 5E-8) or in a defensible qualitative manner?

Risk Insights

The PRA model was evaluated assuming that both RATs (3A and 3B) were unavailable to conservatively bound the risk increase for the equipment out of service for 5 days. The results of the assessment show that risk with no quantitative credit for compensatory actions is minimal, and well within the guidance of the NRC Enforcement Manual of 5E-07 for ICCDP and 5E-08 for ICCLERP.

PRA Metric	Freq (/yr)	Delta (/yr)	5 Day Incremental Probability
CDF - Zero T&M	1.84E-06		
CDF - Operating Condition	1.91E-06	7.00E-08	9.58E-10
LERF - Zero T&M	3.65E-08		
LERF - Operating Condition	3.67E-08	2.00E-10	2.81E-12

Risk insights regarding the dominant risk contributors are obtained via a review of initiating event frequencies, component, and operator action importance measures.

When examining the delete-term cutsets (i.e., the cutsets comprising the difference between the plant-specific configuration and the zero-maintenance configuration), initiating events for Loss of Vital 4.16KV Bus E6 (Train B) dominate.

Regarding individual components, the risk achievement worth (RAW) of the delete-termed cutsets were reviewed. Several components have high RAW values with the dominant contributors being:

1-ED-X-1-A, 1-ED-X-1-B, 1-ED-X-1-C (GSU Phase A/B/C Faults)

1-SY-MOD-G106 (SY Motor Operated Disconnect G106)

1-ED-X-2-A & 1-ED-X-2-B (UAT A/B Faults)

Operator actions with the most risk significance (RAW values) consists of:

HH.MISPOUVAB.LT - MISPO - Failure to properly restore Buses E5 AND E6 controls

HH.MISPOUVA.LT - MISPO - Failure to properly restore BUS E5 controls

Discussion on External Events Risk

As the Internal Events' change in risk due to ED-X-3-B OOS, the change in risk due to external flooding, high winds, and tornado with ED-X-3-B out of service is also deemed negligible given this condition does not increase the frequency of these external hazards.

Seismic

The change in seismic risk is deemed negligible. The seismic risk is typically governed by the initiating event frequency, as a “cliff-edge” effect occurs in that all offsite power transformers would tend to be highly reliable up to a certain ground motion, and then all offsite power would fail past this point. Given the seismic event frequency is not changing, the change in seismic risk is less likely than the change in risk due to internal events.

Fire

The fire PRA model was reviewed to identify any potential risk insights with the ED-X-3-B unavailable. The dominant fire scenarios include:

Fire Compartment Description	Scenario	Scenario Description
SY Transformers	PLT_FC_3_0	FCB: SY Transformers
	PLT_FC_3_0_FS1	1-ED-X-1-A:GSU Phase A
	PLT_FC_3_0_FS2-0	1-ED-X-1-B:GSU Phase B
	PLT_FC_3_0_FS3-0	1-ED-X-1-C:GSU Phase C
DG Building - Engine Room - Train A	DG_FC_2A_A	Oil Scenario Damaging all targets in DG_FC_2A_A
DG Building - Engine Room - Train B	DG_FC_2B_A	Oil Scenario Damaging all targets in DG_FC_2B_A

Hourly fire patrols shall be established for the duration of the time requested.

8. Did the licensee confirm that the facility organization that normally reviews safety issues has reviewed and approved this request and that a written NOED request will be submitted within 2 days of the NRC staff’s decision regarding the NOED?

This request for the enforcement discretion was reviewed and approved by NextEra Seabrook’s Onsite Review Group on 3/1/2024. This letter satisfies the requirement that a written Notice of Enforcement Discretion request be submitted 2 working days after the NRC’s verbal decision.

9. Was there agreement on the need for a follow-up LAR?

A follow-up LAR is required for this NOED. The LAR will consist of a one-time TS change that modifies the time allowed from 72 hours to 30 days.