

CONTENT OF A REQUEST FOR ENFORCEMENT DISCRETION

1. Specifically address what type of NOED is being requested (Regular or Natural Event) [**Licensing**]

NextEra is requesting a regular notice of enforcement discretion (NOED) to avoid an unnecessary transient and plant shutdown that would result from complying with the Technical Specifications (TS). While vital inverter-1B is removed from service for corrective maintenance, the plant will be in Action b of TS 3.8.3.1, Onsite Power Distribution, which requires a plant shutdown if the inverter is not restored to operable status within 24 hours. The proposed NOED meets the criteria of NRC Inspection Manual Chapter (IMC) 0410, Sections 03.03a, 03.03b, and 06.02.a.1(a) for avoiding an unnecessary transient and plant shutdown, thereby minimizing potential safety consequences and operational risks as a result of compliance with TS 3.8.3.1, Action b.

2. A description of the Technical Specification (TS) or other license condition that will be violated for which enforcement discretion is requested. Include the time remaining before the plant would not be in compliance with the TS or license condition. When a regular NOED is requested, the licensee must show that granting the NOED request would avoid an unnecessary transient. [**Operations**]

Description of the Vital Instrumentation 120 volt AC Power Supply

The 120 volt AC vital instrumentation and control power system consists of the uninterruptible power supply (UPS) units and the associated 120 volt distribution panels. The six vital UPS units are normally powered from the 480 volt system and can also convert 125 volt DC power from station batteries to 120 volt AC power. These UPS units feed six electrically independent 120 volt AC vital instrument panels, which serve as instrument and control power supplies. Four of the vital UPS units (1A, 1B, 1C, and 1D) provide separate and independent power supplies to the four NSSS instrumentation channels (designated as channels I, II, III and IV). Manually operated maintenance feeds are provided to each of the four vital instrument panels associated with the NSSS instrumentation channels from 480/120-volt AC transformers connected to non-safety-related motor control centers.

Technical Specification Requirements

TS 3.8.3.1, Onsite Power Distribution, requires that in Modes 1 through 4 each 120 volt A.C. vital panel is energized from its associated inverter connected to its associated DC bus. Action b requires:

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.

The plant entered Action b when inverter 1B was removed from service at XXXX on February 19, 2014. Enforcement discretion is requested for a period of XX hours beginning at XXX on February 20, 2014 when the 24 hour completion time expires. The request for enforcement discretion will provide additional time to complete repair and restoration of the inverter and avoid the potential safety consequences and operational risks associated with complying with the Action.

3. The circumstances surrounding the situation including: likely causes, the need for prompt action, actions taken to avoid the need for an NOED, and identification of any relevant historical events; as a minimum, any other similar events at the plant, last maintenance performance on the equipment or similar equipment, any outstanding TS change requests related to the NOED, and the last NOED request from the plant. **[Engineering, Operations, Licensing]**

Vital Inverters 1A, 1B, 1C, and 1D supply uninterruptible 120 volt AC to their associated power panels, 1-EDE-PP-1A, B, C, D, respectively. To enhance reliability this is a non-grounded system designed to tolerate one ground on a given load and still provide uninterrupted power to each load. Ground detection is provided by a ground detector meter installed in the system. Ground fault current on the AC instrumentation bus is sensed by an ammeter and voltmeters (and relay) on each bus.

Computer alarm point D6025, PP1B Grounded, has been alarming repeatedly during the past two weeks, indicating a ground was occurring. The duration and frequency of the alarm increased to the point that monitoring equipment was installed to monitor the ground differential currents to each load. The results from the monitoring were inconclusive. Over the last two days, the alarm duration increased and stayed in long enough that voltage measurements could be taken at the output. Analysis of the voltage readings confirmed that the problem is actually not a load ground but an internal fault in the inverter, in the Ferro resonant

transformer. This transformer regulates the output voltage to the power panel and associated loads.

4. Information to show that the cause and proposed path to resolve the situation are understood by the licensee such that there is a high likelihood planned actions to resolve the situation can be completed within the proposed NOED time frame.
[Engineering, Maintenance, Work Management]

Independent concurrence of the condition was obtained by both peer evaluations within Engineering and by OEM (Westinghouse) of the initial assessment of the fault. Based on previous similar events with the Ferro resonant transformer, there is a high degree of confidence that the problem will be resolved by replacing the transformer and that the evolution can be performed in the required period of enforcement discretion. A similar previous event occurred in 2003 and replacing the transformer resolved the issue.

5. A description of the proposed course of action to resolve the situation to eliminate the requirement for enforcement discretion. **[Engineering, Work Management]**

The proposed course of action is as follows:

- *Transfer power panel 1B loads to maintenance source*
- *De-energize the inverter and install the clearance*
- *Perform as-found testing*
- *Remove the existing faulted transformer*
- *Install new (pre-tested) transformer*
- *Restart inverter 1B and perform specified testing*
- *Verify no ground conditions and proper voltages with respect to ground*
- *Run for 1 hour to “heat up” transformer and repeat test measurements.*
- *Place inverter back on line and again verify proper voltages and no grounds exist.*
- *Transfer power panel 1B loads to the inverter*

6. A clear statement that the proposed resolution will not result in a different, unnecessary transient. **[Engineering, Operations]**

7. An explanation of why there is not sufficient time to process an emergency license amendment, or why a license amendment is not needed. **[Licensing]**

The events that led to this request for enforcement discretion were the result of an emergent equipment issue. Because the completion time for restoring the inverter to operable status is only 24 hours, insufficient time is available to prepare a license amendment request. This is a one-time request for extending the period of time that vital inverter B is allowed to be inoperable to allow corrective maintenance to restore the inverter to operable status following an equipment failure. As a result, a follow-up license amendment is not required.

8. The condition and operational status of the plant (including safety-related equipment out of service or otherwise inoperable). **[Operations]**

9. Justification for the duration of the noncompliance. **[Work Management, Risk Engineering]**

10. The status and potential challenges to off-site and on-site power sources. **[Operations]**

11. The basis for the licensee's conclusion that the noncompliance will not be of potential detriment to the public health and safety. **[Engineering, Licensing]**

The requested NOED does not does not involve a significant hazards consideration based on the three standards set forth in 10 CFR 50.92(c) as discussed below:

- A. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No

The requested NOED does not adversely affect any accident initiators; the vital inverters are not initiators of any accidents previously evaluated. Extending the completion time to restore an inoperable inverter to operable status does not alter design assumptions or the manner in which the plant is normally maintained and operated. The request does not affect the source term, containment isolation, or radiological release used in evaluating the radiological consequences of any accidents previously evaluated.

With the inverter out of service, an alternate power source is available to maintain the associated vital 120 VAC power panel energized. In the event of a loss of offsite power or loss of the alternate power source, the three remaining operable vital inverters would maintain their associated vital power panels energized to maintain capability of the reactor trip and engineered safety features actuation systems to perform their required functions.

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

- B. Does the proposed change create the possibility of a new or different kind of accident from any accident previously analyzed?

Response: No

The requested enforcement discretion does not create the possibility of a new or different accident from any previously evaluated. The inoperability of an inverter for a period longer than the current allowed outage time does not create a precursor for a new or different type of accident. The change makes no physical modifications to the plant and makes no changes to the method or procedures for plant operation. No new failure modes or modes of operation are introduced by the requested enforcement discretion.

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

- C. Does the proposed change result in a significant reduction in the margin of safety?

Response: No

The requested enforcement discretion does not result in a significant reduction in the margin of safety. Redundant inverters and an alternate

power supply remain available such that the vital instrumentation power sources can perform their required safety functions assuming no additional failures. The request does not change any instrument setpoints, and does not alter the acceptance criteria for any analyzed event or change any safety limit. The request does not alter the manner in which safety limits, limiting safety system settings, or limiting conditions for operation are determined.

Therefore, the proposed NOED does not result in a significant reduction in the margin of safety.

12. The safety basis for the request, including an evaluation of the safety significance and potential consequences of the proposed course of action. **[Risk Engineering]**

Safety Significance:

The function of inverter 1B is to supply reliable, stable power to 120 volt AC vital power panel 1-EDE-PP-1-B. The risk significant loads fed from power panel 1B include: (a) channel 2 of the solid state protection system (SSPS) and (b) train B of the emergency safeguards feature actuation system (ESFAS). Assuming power panel 1B is de-energized, the automatic actuation of ECCS train B would not function; however, manual control room action remains available to start and align systems.

*Power panel (PP) 1B is supplied power via three power sources: (a) 480V AC source (MCC 612) through Inverter 1B, (b) 125V DC source (1-EDE-SWG-11B) through Inverter 1B, and (c) 120V AC maintenance-tie supply MCC 631. The inverter has a solid-state transfer switch that automatically transfers between the 480V AC source and the 125V DC source, based on the availability of these sources. Transfer to the maintenance-tie supply is a manual action that requires PP-1B to be briefly de-energized. **During the transfer to/from the maintenance –tie power supply, there could be a small increase in the risk of a plant trip.** However, this is judged not to be a significant core damage risk given all safety equipment is available.*

The AC sources (MCC 612 and 631) are powered from the emergency bus (E6), which would be supplied by the emergency diesel generator (DG-1B) or the supplemental emergency power supply diesel (SEPS), if offsite power becomes unavailable. The 125V DC source (SWG-11B) is powered from a battery (1-EDE-B-1-B) and battery charger (1-EDE-BC-1-B).

The increase in risk when inverter 1B is out of service during the period of enforcement discretion (24 hours) is determined in accordance with guidelines from Regulatory Guide 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk-Informed Decisions on Plant Specific Changes to the Licensing Basis" (Revision 2) and Regulatory Guide 1.177, "An Approach for Plant-Specific Risk Informed Decision Making: Technical Specifications" (Revision 1).

The Seabrook Station PRA model (SB2011) is an integrated, full scope, model and represents the current model-of-record for Seabrook Station. The risk significance of the proposed action is determined by quantifying the incremental core damage probability (ICCDP) and incremental large early release probability (ICLERP) for the associated plant configuration. Although PP-1B will be aligned to its maintenance-tie AC power source during the inverter 1B maintenance, the quantification conservatively assumes that the maintenance-tie is not used and the power panel remains de-energized during the period of enforcement discretion.

ICCDP

The Seabrook Station baseline CDF for full power operations assuming "zero maintenance" unavailability, model SB2011ZM is:

$$\text{CDF (full power, zero maintenance unavailability)} = 1.091\text{E-5 per yr.}$$

With the inverter 1B out of service and assuming no maintenance-tie power supply to energize PP-1B, the conditional CDF is:

$$\begin{aligned} \text{CCDF (full power | Inverter 1B OOS with no maintenance-tie power supply)} \\ = 1.925\text{E-5 per yr.} \end{aligned}$$

The incremental conditional core damage probability assuming 24 hours in this configuration (period of enforcement discretion) is:

$$\begin{aligned} \text{ICCDP (full power | Inverter 1B OOS with no maintenance-tie power} \\ \text{supply)} \\ = (1.925\text{E-5} - 1.091\text{E-5}) \text{ per yr} \times (24 \text{ hr} / 8760 \text{ hr per yr}) \\ = 2.284\text{E-8} < 1\text{E-6} \end{aligned}$$

ICLERP

The Seabrook Station baseline LERF for full power operations assuming "zero maintenance" unavailability, model SB2011ZM) is:

$$\text{LERF (full power, zero maintenance unavailability)} = 8.214\text{E-8 per yr.}$$

With the inverter 1B out of service and assuming no maintenance-tie power supply to energize panel 1B, the conditional LERF is:

$$\text{CLERF (full power | Inverter 1B OOS with no maintenance-tie power} \\ \text{supply)}$$

$$= 1.359\text{E-}7 \text{ per yr.}$$

The incremental conditional large early release probability assuming 24 hours in this configuration (period of enforcement discretion) is:

$$\begin{aligned} & \text{ICLERP (full power | Inverter 1B OOS with no maintenance-tie power supply)} \\ &= (1.359\text{E-}7 - 8.214\text{E-}8) \text{ per yr} \times (24 \text{ hr} / 8760 \text{ hr per yr}) \\ &= 1.473\text{E-}10 < 1\text{E-}7 \end{aligned}$$

The ICCDP of $2.284\text{E-}8$ and ICLERP of $1.473\text{E-}10$ are less than the $1.0\text{E-}06$ ICCDP and $1.0\text{E-}07$ ICLERP criteria established in Regulatory Guide 1.177 (Revision 1). As a result, the risk associated with the proposed single TS condition entry is very small. Note, that the ICCDP and ICLERP conservatively assume that Inverter 1B is out-of-service and associated PP-1B is not energized by the maintenance-tie AC power source. With PP-1B energized from the maintenance-tie source (MCC 631) the ICCDP and ICLERP values would be less. Based on these results, the proposed action has a very low impact on plant risk.

Dominant Risk Contributors/Insights:

There are no significant risk impacts as a result of the proposed plant configuration. During performance of inverter 1B maintenance, the power supply to PP-1B will be aligned to the maintenance-tie, MCC-631. As demonstrated above, failure of this power supply to PP-1B is not significant from a risk perspective. PP-1B loads have been reviewed to ensure that there are no adverse interactions associated with de-energizing the panel. As mentioned earlier, the risk significant loads include: (a) channel 2 of the solid state protection system (SSPS) and (b) train B of the emergency safeguards feature actuation system (ESFAS). Assuming that the PP-1B is de-energized, the automatic actuation of ECCS train B would not function; however back-up manual control of ECCS-B equipment remains available.

Compensatory Measures:

There are no specific compensatory measures credited to reduce quantitative risk during the period of enforcement discretion. However, non-quantifiable risk-reduction compensatory measures to be implemented during the maintenance include the following:

Protected Train/Guarded Equipment – The alternate train (train A) of safety equipment will be protected via plant procedure OP-AA-102-1003, Guarded Equipment. This will maximize the availability of train A safety equipment for mitigation of an event occurring during the maintenance period.

Others....

Extent of Condition:

The inverter degradation is limited to inverter I-1B. There has been no similar degradation observed at the opposite train inverter (1A). As a result, no changes to PRA common-cause factor modeling are warranted.

External Event Risk:

The Seabrook PRA is a fully integrated risk model of both internal and external events. Therefore, the likelihood and/or consequence of an external event are included in the quantified results.

Weather Forecast:

The weather forecast for the duration of the proposed enforcement discretion period is normal weather conditions. No severe weather conditions are forecast for the next several days.

Conclusion:

This evaluation supports a 24 hour period of enforcement discretion for inverter 1B:

- The incremental conditional core damage probability (ICCDP) for 24 hours of Inverter 1B unavailability is $2.28\text{E-}8$. The incremental conditional large early release probability (ICLERP) is $1.47\text{E-}10$. The ICCDP and ICLEFP are less than the $1.0\text{E-}6$ and $1\text{E-}07$ criteria (respectively) established in Regulatory Guide 1.177 (Revision 1). These risk impacts conservatively assume no alternate power source is aligned to PP-1B.
- During the repair of Inverter 1B, appropriate compensatory measures will be employed (e.g., protection of alternate train equipment) to manage risk. These measures will tend to reduce plant risk however they are not credited in the quantified results.

13. The basis for the conclusion that the noncompliance will not involve adverse consequences to the environment. **[Licensing, Engineering]**

This request for enforcement discretion does not result in any significant changes in the types or any significant increase in the amounts of any effluents that may be released offsite. In addition, no significant increase in individual or cumulative occupational radiation exposures is involved as a result of the request. Therefore, NextEra concludes that this request for enforcement discretion does not involve any adverse consequences to the environment.

14. A statement that the request has been approved by the facility organization that normally reviews safety issues (Plant On-site Review Committee, or its equivalent). **[Licensing]**

The Station Operation Review Committee (SORC) reviewed and recommended approval of the requested NOED on February 19, 2014 (SORC meeting number XXXX).

15. Verbal commitment to submit the written NOED request within two working days. Unless otherwise agreed as discussed in Section 06.03 j. of "NRC Inspection Manual Chapter 0410," a follow-up amendment will be submitted within 4 working days of verbal granting the NOED. **[Licensing]**

This written NOED request is being submitted within two working days of the NRC verbally granting enforcement discretion. As discussed with the NRC staff on February 19, 2014 this is a one-time request for extending the period of time that vital inverter 1B is allowed to be inoperable to allow corrective maintenance to restore the inverter to operable status. No follow-up license amendment will be submitted.