December 14, 2017

10 CFR 50.90
Docket No. 50-443
SBK-L-17202

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Seabrook Station
Response to Seabrook Station, Unit No.1 – Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Amendment to Delete Operator Action and Request for Exemption

References:

1. NextEra Energy Seabrook, LLC letter SBK-L-17160, "License Amendment Request 17-05, Deletion of Operator Action and Request for Exemption from Section III.G.2.b of 10 CFR 50 Appendix R," October 10, 2017 (ML17283A398)
2. NRC letter, "Seabrook Station, Unit No. 1 – Supplemental Information Needed for Acceptance of Requested Licensing Action Re: Amendment to Delete Operator Action and Request for Exemption (EPID L-2017-LLA-0352 and EPID L-2017-LLE-0028)" November 29, 2017 (ML17332A341)

In Reference 1, NextEra Energy Seabrook, LLC (NextEra) submitted a license amendment request (LAR) to delete an operator action in the Seabrook Station current licensing basis and request exemption from the cable separation and automatic fire suppression requirements in Appendix R, Section III.G.2.b.

In Reference 2, the NRC identified that supplemental information would be required for acceptance of the request for processing.

The enclosure to this letter provides NextEra's response to the request for supplemental information. Attachment 1 to the enclosure provides a mark-up of the proposed change to the Operating License Condition 2.F for Seabrook Station. A final typed version of the page containing the revised license condition will be provided to the Project Manager upon request.

The changes to the LAR provided in this letter do not alter the conclusions in Reference 1 that the change does not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with this change.

No new or revised commitments are included in this letter.

Should you have any questions regarding this information, please contact Kenneth J. Browne, Licensing Manager, at (603) 773-7932.

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

Executed on December 14, 2017.

Sincerely,

NextEra Energy Seabrook, LLC

Eric McCartney
Regional Vice President – Northern Region
NextEra Energy Seabrook, LLC

cc

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ENCLOSURE TO SBK-L-17202

Background

By letter dated October 10, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17283A398), NextEra Energy Seabrook, LLC (NextEra) submitted a license amendment request (LAR) to delete an operator action in the Seabrook Station current licensing basis and request exemption from the cable separation and automatic fire suppression requirements in Appendix R, Section III.G.2.b.

By letter dated November 29, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17332A341), the NRC staff concluded that the following information is needed to complete the acceptance review.

REG1: Use of Appropriate Regulatory Process

Although Seabrook submitted a 10 CFR 50.12 exemption to 10 CFR 50, Appendix R, Section III.G.2, the correct request is a license amendment only per 10 CFR 50.90. An exemption in accordance with 10 CFR 50.12 only applies when there is a specific requirement to meet the regulation and the NRC staff did not identify this requirement for Seabrook. 10 CFR 50.48(b) states that Appendix R is required for plants licensed prior to January 1, 1979, and Seabrook's operating license is beyond this date. Please remove the request for an exemption from the submittal.

NextEra Response

Attachment 2, "Request for Exemption from Section III.G.2.b of 10 CFR 50, Appendix R" is deleted from the original submittal and respective locations in the cover letter and Enclosure 1, "NextEra Energy Seabrook's Evaluation of the Proposed Change," where an exemption request is referenced. Amend the title of the original submittal to "License Amendment Request 17-05, Deletion of Operator Action and Change to the Current Licensing Basis for Fire Protection."

REG2: Appropriate Application of Regulatory Process

The Seabrook Facility Operating License (ADAMS Accession No. ML053130320), Condition 2.F, states, "NextEra Energy Seabrook, LLC, may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain shutdown in the event of a fire." The staff identified that the request did not describe how the requested changes to the fire protection program would adversely impact Seabrook's ability to "achieve and maintain shutdown in the event of a fire." The request should also include information to support how the fire protection program, following the adverse change, provides confidence in the ability to achieve and maintain safe shutdown conditions in the event of a fire.

NextEra Response

The NRC-approved fire protection program includes compliance with Branch Technical Position (BTP) CMEB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants." The staff reviewed the fire protection program for conformance with Standard Review Plan 9.5.1 (NUREG-0800), which contains, in BTP CMEB 9.5.1, the technical requirements of Appendix A to BTP ASB 9.5-1 and Appendix R to 10 CFR 50. The staff concluded systems utilized for safe shutdown and the methodology used to ensure adequate protection of safe shutdown systems is in accordance with the technical requirements of Section III.G of Appendix R to 10 CFR 50 (BTP CMEB 9.5-1, Section C.5.b). Deviating from the requirements of BTP CMEB 9.5-1, specifically Section C.5.b.2.b, is adverse to the Fire Protection Program and therefore, NRC approval is necessary. This is similar to the precedent set by a Watts Bar LAR and subsequent NRC issued amendment (ML16307A013). Additionally, deletion of the operator action to trip the station offsite power breakers for a fire in the train A essential switchgear room is adverse to the fire protection program (FPP) in that a manual action that utilizes a circuit protected from damage is being replaced with credit for operation of a circuit that may be subject to fire damage.

The fire protection program, as revised by the deletion of the manual operator action and deviation from the separation requirements in BTP CMEB 9.5.1, continues to provide confidence in the ability to achieve and maintain safe shutdown conditions in the event of a fire. This justification can be found in the original LAR submittal beginning in Section 3.0, Technical Evaluation, and the information in this supplement. The analysis shows that there are no credible fires that could prevent the reactor trip breakers from tripping. In order to prevent a reactor trip breaker from tripping, a fire would need to cause physical damage to the breaker. This is unlikely to occur due to the limited permanent and transient combustibles in the vicinity of the reactor trip switchgear. Initiation of a reactor trip is the first step in procedure OS1200.01, "Safe Shutdown and Cooldown from the Main Control Room," and is considered an expeditious action in the Appendix R Report. Therefore, a reactor trip would occur per procedure prior to sufficient breaker damage to prevent reactor trip breaker operation. The capability to trip the reactor trip breakers from outside the train A switchgear room prior to fire damage that prevents the reactor trip breakers from tripping satisfies that safe shutdown requirements. Therefore, removal of the operator action to trip the station offsite power breakers and the deviation from BTP CMEB 9.5.1 separation requirements are justified and do not adversely affect the ability to achieve and maintain safe shutdown conditions in the event of a fire. Additional modifications would not enhance plant safety.

Additionally, Section 2.4, Description of Proposed Change, is revised to include a change to the operating license fire protection condition as follows:

"NextEra Energy Seabrook, LLC, shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report, the Fire Protection Program Report, and the Fire Protection of Safe Shutdown Capability report for the facility, as supplemented and amended, and as approved in the Safety Evaluation Report, dated

March 1983; Supplement 4, dated May 1986; Supplement 5, dated July 1986; Supplement 6, dated October 1986; Supplement 7, dated October 1987; ~~and~~ Supplement 8, dated May 1989 **and in Amendment No. ZZZ** subject to the following provisions: NextEra Energy Seabrook, LLC, may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain shutdown in the event of a fire."

TECH1: Ignition Sources and Combustibles

The staff noted that the submittal lacks a discussion of where the shunt trip cables may be subjected to fire damage and which ignition sources and combustibles could result in a fire that could damage those cables.

NextEra Response

The reactor trip switchgear is located in the southeast corner of the train A switchgear room. The station Evaluation and Comparison to BTP APCSB 9.5-1 Appendix A, states the combustible loading contributing to a design basis fire to be 1 gallon of oil in a circuit breaker remote racking tool and 88 pounds of plastics (ladders). The oil and ladders are kept along the west wall of the train A switchgear room more than 100 ft. from the reactor trip switchgear and the closest point to the train B shunt trip cables, and more than 50 ft. from the closest point to the train A shunt trip cables. Therefore, these combustibles could not result in a fire that would damage both trains of shunt trip cables. The train A and train B shunt trip cables are only routed in close proximity (approximately 18 inches apart) in separate conduits for approximately 4 ft. directly above the reactor trip switchgear. The train A shunt trip cable is subsequently routed in a cable tray. The train B shunt trip cables are routed entirely in conduit once the cable exits the reactor trip switchgear. The cable is routed in this conduit approximately 20 ft. vertical out of the reactor trip switchgear cabinet, and then south approximately 6 ft. and west approximately 3 ft. into the train B switchgear room. Thus, the fire damage to both trains of shunt trip capability could only occur in the immediate vicinity of the reactor trip switchgear. The train A cable tray is not routed directly over any 480V or 4.16 kV cabinets in this area.

In the vicinity of both trains of shunt trip cables, there is a 480V motor control center, 2 transformers, and 4 panels along a nearby wall approximately 5 ft. to the west of the reactor trip switchgear cabinets. These transformers are dry type rated 480/120V 25 kVA, and 150/120V 5 kVA. These panels are a 120V rod control fuse cabinet, 125 VDC fuse panel, 125 VDC power panel, and a 125 VDC auxiliary relay panel. The reactor trip switchgear cabinets are shielded from theses transformers and panels by the motor control center. An Appendix R emergency light battery pack is mounted on the wall directly across from train A reactor trip switchgear. These type battery packs are metal enclosed and are judged to have no fire potential. The rod drive control cabinet is located directly north of the reactor trip switchgear, and four 120 VAC panels are located along the wall to the east. The rod power supply cabinets are attached to the train B reactor trip switchgear cabinet directly to the south. There are no other cable trays located in the southeast corner of the room. All cables to and from the panels and transformers

are routed in conduit up into the cable tray system above. There are no permanent combustibles located in this area. All cables in the train A switchgear room have thermoset insulation and are qualified to IEEE 383.

The train A switchgear room contains the train A 4.16 kV switchgear along the northwest wall, and the train A 125 VDC switchgear along the northeast wall. In addition, there are train A 480V unit substations, 480V motor control centers, battery chargers, inverters, low voltage transformers, lighting equipment, and electrical panels located in the room.

TECH2: Exclusion of Institute of Electrical and Electronics Engineers (IEEE) 383 Cables as Combustibles

The staff noted that the submittal does not consider IEEE 383 cables as combustibles. This lack of consideration of IEEE 383 cables as combustibles is not a common assumption; therefore the licensee should provide a discussion of the basis for acceptance of this assumption. The staff understands that a technical argument could be made that IEEE 383 cables may not have to be considered ignition sources, but in the presence of other ignition sources these cables are combustible and usually considered as part of a combustible loading calculation.

NextEra Response

Per Section 3.1 of the Seabrook Station Fire Protection of Safe Shutdown Capability (10CFR50, Appendix R) Report, cables used at Seabrook Station are of thermoset material. They maintain shape and performance when subjected to high temperature, ultimately burning before melting. At a minimum, they meet the requirements of IEEE 383-1974; they are self-extinguishing and non-flame propagating. The average ignition temperature of the cable was calculated from the data available in the individual cable specifications and is >750°F. The assumption made in the Seabrook Station fire loading calculations is that cables (power & control) are assumed to burn when subjected to external flame or high temperature greater than 750°F for a duration greater than 5 minutes. If a design basis fire is determined to be hot enough and burn long enough, cabling in the immediate vicinity is assumed to burn, incapacitating the system the cabling serves and forming another heat source that is analyzed for additional fire possibilities. Therefore, the additional heat source is considered as part of the original postulated design basis fire only if the fire lasts more than 5 minutes with a high temperature greater than 750°F. The design basis fire description for the A essential switchgear room (fire area CB-F-1A-A), contained in the Fire Hazards Analysis of Seabrook Station's Evaluation and Comparison to BTP APCSB 9.5-1, Appendix A Report, is less than 750°F and 5 minutes and therefore, does not have to be considered as part of the combustible loading calculation.

TECH3: Fire Detection

The staff noted that the submittal lacks specific information regarding the detection system, code compliance, spacing, and any deviations that exist for the detection system. It is common for detection systems for large fire areas to have some deviations from the code of record. If there

are deviations – a description of those deviations should be included along with an explanation of any impacts those deviations have on the proposed change.

NextEra Response

The train A essential switchgear room, fire area CB-F-1A-A, is monitored by fire protection control panel FP-CP-558. The detection system includes 51 ionization smoke detectors installed to the requirements of NFPA 72E (1982). Each detector protects approximately 48 square feet (total floor area / 51 detectors). The detectors are spaced approximately 15 – 20 ft. with some exceptions that are within the code of record required maximum of 30 ft. spacing. Detectors are located in the immediate vicinity of the reactor trip switchgear, as well as several along the cable routing path. There are no deviations for the fire detection system in the train A essential switchgear room.

TECH4: Location Description of Shunt Trip Cables

The staff noted that the submittal lacks a discussion of the routing of the shunt trip cables. A better understanding of the room layout, a description of the types of electrical cabinets, and their relationship to the target cabinets and cables is needed for the staff to make a safety determination regarding the lack of 20 feet of separation with intervening combustibles. The staff noted that the submittal also lacks information regarding the relationship between the two trains, and how close the cables are together both vertically and horizontally.

NextEra Response

The train A and train B reactor trip breakers are located in adjacent cubicles in the train A switchgear room with the train A breakers north of the train B breakers. The train B switchgear room is located directly south of the train A switchgear room, separated by a 3-hour fire barrier.

The train A shunt trip cables are routed in conduit into a train A cable tray above the reactor trip switchgear train A cabinet about 4 ft. vertical and then 6 ft. west. The cables are routed north in the tray approximately 15 ft. before turning west approximately 10 ft. and over the train A vital battery rooms. The cables continue in the train A cable tray system vertical into the cable spreading room on the control building 50 ft. elevation. The train B shunt trip cables are routed in conduit vertical out of the top of the reactor trip switchgear train B cabinet approximately 20 ft. and then turn south approximately 6 ft. to the wall. The cables then turn west approximately 3 ft. into the train B switchgear room.

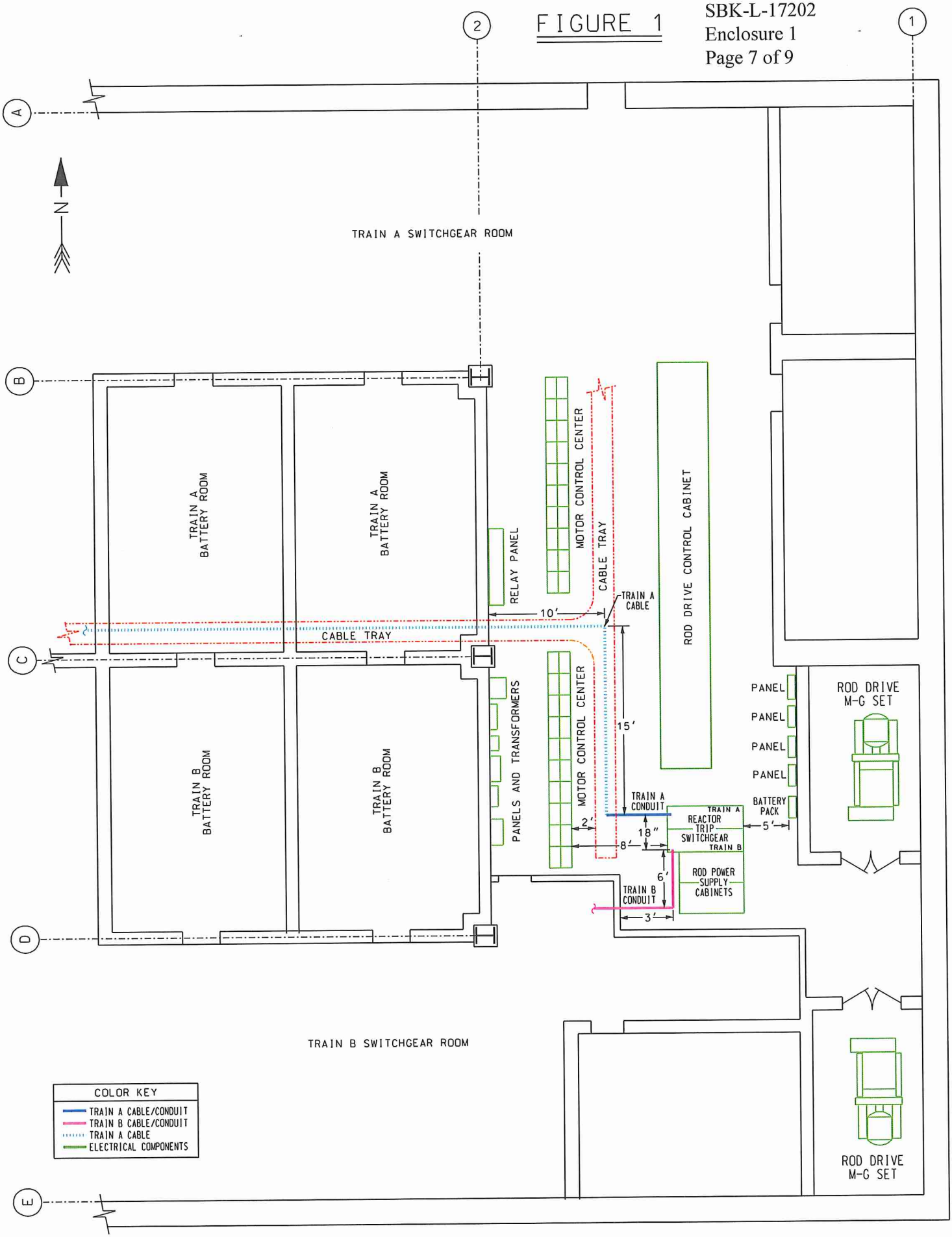
The minimum separation distance between the train A and train B cables is approximately 18 inches out of the reactor trip switchgear cabinets for approximately 4 ft. At that point, the train A cables are routed west into the cable tray, and the train B cables continue vertical. There is an Appendix R light battery pack and motor control center, as well as, the transformers and panels described in the TECH1 response in the vicinity of the train A and train B shunt trip cables. The motor control center is approximately 8 ft. from the reactor trip switchgear cabinets. The train B

conduit is approximately 6 ft. horizontal from the train A cable tray out of the top of the reactor trip switchgear cabinet. There are no intervening combustibles between the train A and train B conduits. The train B reactor trip switchgear is located very close to the train B switchgear room (Fire Area CB-F-1B-A), and the train B cable is routed only a short distance in the train A switchgear room as described in the previous paragraph.

The train A cables routed in cable tray in this area are not routed directly above any 480V or 4.16 kV electrical cabinets, and are maintained approximately 4 ft. vertical and 2 ft. horizontal from the nearby motor control center. The train B cables are in a dedicated conduit not routed over any high energy cabinets other than the reactor trip switchgear.

See Figure 1 on the following page for cable routing and equipment layout diagram.

FIGURE 1


2
1
A
B
C
D
E
N
TRAIN A SWITCHGEAR ROOM
TRAIN A BATTERY ROOM
TRAIN A BATTERY ROOM
TRAIN B BATTERY ROOM
TRAIN B BATTERY ROOM
RELAY PANEL
PANELS AND TRANSFORMERS
MOTOR CONTROL CENTER
MOTOR CONTROL CENTER
CABLE TRAY
CABLE TRAY
TRAIN A CABLE
10'
15'
2'
8'
18"
6'
3'
5'
TRAIN A CONDUIT
TRAIN B CONDUIT
ROD DRIVE CONTROL CABINET
TRAIN A
REACTOR TRIP SWITCHGEAR
TRAIN B
ROD POWER SUPPLY CABINETS
PANEL
PANEL
PANEL
PANEL
BATTERY PACK
ROD DRIVE M-G SET
ROD DRIVE M-G SET
TRAIN B SWITCHGEAR ROOM
COLOR KEY
TRAIN A CABLE/CONDUIT
TRAIN B CABLE/CONDUIT
TRAIN A CABLE
ELECTRICAL COMPONENTS

TECH5: Possible Cable Damage in Main Control Room and Cable Spreading Room

The staff noted that the submittal only addresses fires in the switchgear room (the room the reactor trip breakers are in). The submittal does not address the Main Control Room or the Cable Spreading Room, both of which contain the same cables that can cause the failure to trip. The staff recognizes that the likelihood of an anticipated transient without scram, is low due to the redundancy and diversity of the reactor trip system, but the staff noted that this request only addresses one fire area out of three that could cause the event.

NextEra Response

The station licensing basis does not credit operator action to trip offsite power from the main control room in the event of a fire in the main control room or cable spreading room. For these areas, manual reactor trip is credited to occur by operator action from the main control room before operators leave to man the remote safe shutdown control stations. Both the main control room and cable spreading room are Alternative Shutdown fire areas. The action to trip the reactor from the control room for a fire in these areas is part of the station original licensing basis and was reviewed by the NRC in the Seabrook Safety Evaluation Report (SER). This action is justifiable because the main control room evacuation would be expected to be deliberate and planned with sufficient time for the operator to trip the reactor. In addition, the Seabrook Appendix R Report credits the action to trip the reactor to occur expeditiously, as described in Section 3.3 of the Enclosure to the original LAR. Therefore, Seabrook does not propose to change the existing analysis and operator action regarding reactor trip capability for a fire in the main control room or cable spreading room.

TECH6: Other Unaffected Shutdown Capability

The staff noted that the submittal lacks a discussion of other trip capabilities (automatic or manual) to either insert the control rods or otherwise stop the reaction (boric acid injection). The staff also noted that there is no discussion if these other means – either automatic or manual, are susceptible to the same fire damage as the shunt trip cables. In addition, there is no discussion of whether this scenario defeats other anticipated transient without scram countermeasures.

NextEra Response

Insertion of the control rods into the reactor is the credited means for reactivity control in order to achieve and maintain hot standby. The reactor trip system monitors several system variables. The reactor trip breakers will open automatically whenever a condition monitored by the reactor trip system reaches a preset value. These conditions would de-energize the undervoltage coils located within the reactor trip switchgear. In addition, operators can manually open the reactor trip breakers using a control switch on the main control board. When this switch is actuated, it de-energizes the undervoltage coils and energizes the shunt trip coils located in the reactor trip switchgear to open the reactor trip breakers.

If the reactor trip breakers cannot be opened remotely, operators could be dispatched to the train A switchgear room to open the breakers manually. However, in the event of a fire in the train A switchgear room, this may not be possible.

The rod drive motor generator sets could be de-energized from the non-essential switchgear room by tripping power to the 480V unit substations supplying them.

Seabrook has rapid boration capability, which is not credited for fire safe shutdown. Boric acid injection is credited only in order to achieve and maintain cold shutdown within four hours into the event. Rapid boration would provide reactivity control over time, however the Seabrook time critical operator action response times require immediate shutdown of the reactor.

The station licensing basis and safe shutdown timing calculations credit reactor trip to occur expeditiously once operators determine safe shutdown is necessary in response to a fire. For the train A switchgear room fire area, operations procedure OS 1200.01 provides for early trip of the reactor from the Control Room. Loss of all diverse reactor trip capabilities in the early stages of the fire is not expected.

TECH7: Procedure Response

The submittal states that in response to a fire in the train A switchgear room, the operators would implement procedure OS1200.01, "Safe Shutdown and Cooldown from the Main Control Room", and that initiating a manual reactor trip is the first step in the procedure. The staff noted that the submittal lacks a discussion of what represents a fire (detector activation, confirmation of a fire, confirmation of a fire that damages safe shutdown equipment, etc.). An understanding of the entry conditions into OS 1200.01 is important for the staff to evaluate if the procedure will be entered in time before credible fire damage could prevent a plant trip using the shunt trip.

NextEra Response

Following receipt of a fire alarm, operators would enter procedure OS1200.00, "Response to Fire or Fire Alarm Actuation." This procedure directs operators to determine if there is a valid fire condition. If a valid fire condition is confirmed in the train A switchgear room, operators would perform prompt actions to place two atmospheric steam dump valve mode selector switches to close, place both power operated relief valves (PORV) control switches to close, close a PORV block valve, and stop all but 1 centrifugal charging pump. These actions can be accomplished quickly from the main control board. In parallel with the steps taken in OS1200.00, the fire brigade leader would be dispatched to the field in order to determine if the fire has the potential to damage components in the train A switchgear room. If that potential exists, operators would enter OS1200.01. Reactor trip would occur as the first step in the procedure.

Attachment 1

Proposed Change to Operating License Condition 2.F (Mark-Up)

(For the following mark-up, deletions are shown as strike through bold text and the additions are shown as bold text.)

E. Physical Security

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provision of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans[1], submitted by letter dated September 23, 2004, and supplemented by letters dated October 15, October 22, and October 29, 2004, and May 18, 2006, is entitled: "Florida Power and Light & FPL Energy Seabrook Physical Security Plan, Training and Qualification Plan and Safeguards Contingency Plan." The set contains Safeguards Information protected under 10 CFR 73.21. NextEra Energy Seabrook, LLC shall fully implement and maintain in effect all provisions of the Commission-approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The NextEra Energy Seabrook, LLC CSP was approved by License Amendment No. 127 (as supplemented by clarifications approved by License Amendment No. 132 and License Amendment No. 146).

F. Fire Protection

NextEra Energy Seabrook, LLC, shall implement and maintain in effect all provisions of the approved fire protection program as described in the Final Safety Analysis Report, the Fire Protection Program Report, and the Fire Protection of Safe Shutdown Capability report for the facility, as supplemented and amended, and as approved in the Safety Evaluation Report, dated March 1983; Supplement 4, dated May 1986; Supplement 5, dated July 1986; Supplement 6, dated October 1986; Supplement 7, dated October 1987; ~~and~~ Supplement 8, dated May 1989 **and in Amendment No. ZZZ** subject to the following provisions: NextEra Energy Seabrook, LLC, may make changes to the approved fire protection program without prior approval of the Commission, only if those changes would not adversely affect the ability to achieve and maintain shutdown in the event of a fire.

G. Fixed Incore Detector Analysis

If the methodology described in Appendix B of ANP-3243P, Revision 1, "Seabrook Station, Unit 1 Fixed Incore Detector System Analysis Supplement to YAEC-1855PA," is utilized in any plant surveillance then NextEra must notify the NRC by letter of the plant's conditions and results of that surveillance.

H. Financial Protection

The licensees shall have and maintain financial protection of such type and in such amounts as the Commission shall require in accordance with Section 170 of the Atomic Energy Act of 1954, as amended, to cover public liability claims.

I. DELETED

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[1]The Training and Qualification Plan and Safeguards Contingency Plan are Appendices to the Security Plan.