UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

August 30, 2016

Mr. Mano Nazar
President and Chief Nuclear Officer
Nuclear Division
NextEra Energy
P.O. Box 14000
Juno Beach, FL 33408-0420

SUBJECT: ST. LUCIE PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENTS REGARDING CHANGES IN SELECTED TECHNICAL SPECIFICATIONS END STATES (CAC NOS. MF8106 AND MF8107; FORMERLY CAC NOS. MF6683 AND MF6684)

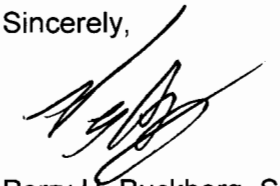
Dear Mr. Nazar:

The U.S. Nuclear Regulatory Commission (NRC or the Commission) has issued the enclosed Amendment Nos. 234 and 184 to Renewed Facility Operating License Nos. DPR-67 and NPF-16 for the St. Lucie Plant, Unit Nos. 1 and 2, respectively. These amendments change the Technical Specifications in response to the application (L-2015-182) from Florida Power & Light Company, et al., dated August 31, 2015, as supplemented by letters L-2016-084 and L-2016-132 dated April 20, and July 15, 2016, respectively.

The amendments modify selected Technical Specifications by changing the required action end states. The changes are consistent with Technical Specification Task Force (TSTF) Traveler 422 (TSTF-422), Revision 2, "Change in Technical Specifications End States (CE NPSD-1186)," with application of site-specific variations and deviations from TSTF-422.

The NRC staff's safety evaluation of the amendments is enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,



Perry H. Buckberg, Senior Project Manager
Plant Licensing Branch II-2
Division of Operator Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-335 and 50-389

Enclosures:
1. Amendment No. 234 to DPR-67
2. Amendment No. 184 to NPF-16
3. Safety Evaluation

cc w/enclosures: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
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FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-335

ST. LUCIE PLANT UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 234
Renewed License No. DPR-67

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Florida Power & Light Company (FPL, the licensee), dated August 31, 2015, as supplemented by letters dated April 20, and July 15, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Facility Operating License and Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Renewed Facility Operating License No. DPR-67 is hereby amended to read as follows:

   B. Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 234, are hereby incorporated in the renewed license. FPL shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance. In addition, the licensee shall incorporate Commitment Nos. 2 and 3 listed in Section 3.5 of the safety evaluation associated with this amendment in the next periodic update of the St. Lucie Unit 1 Updated Final Safety Analysis Report, in accordance with 10 CFR 50.71(e).

FOR THE NUCLEAR REGULATORY COMMISSION

Tracy J. Orf, Acting Chief
Plant Licensing Branch II-2
Division of Operator Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating License
and Technical Specifications

Date of Issuance: August 30, 2016

ATTACHMENT TO LICENSE AMENDMENT NO. 234

ST. LUCIE PLANT UNIT NO. 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-67

DOCKET NO. 50-335

Replace Page 3 of Renewed Operating License DPR-67 with the attached Page 3.

Replace the following pages of Appendix A, Technical Specifications, with the attached pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Page	Insert Page
3/4 3-13	3/4 3-13
3/4 3-23	3/4 3-23
3/4 4-1b	3/4 4-1b
3/4 6-10	3/4 6-10
3/4 6-12	3/4 6-12
3/4 6-13	3/4 6-13
3/4 6-18	3/4 6-18
3/4 6-30	3/4 6-30
3/4 7-14	3/4 7-14
3/4 7-16	3/4 7-16
3/4 7-20	3/4 7-20
3/4 7-20a	3/4 7-20a
3/4 7-24	3/4 7-24
3/4 8-1	3/4 8-1
3/4 8-2	3/4 8-2
3/4 8-3	3/4 8-3
3/4 8-10	3/4 8-10

applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified or incorporated below:

A. Maximum Power Level

FPL is authorized to operate the facility at steady state reactor core power levels not in excess of 3020 megawatts (thermal).

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 234 are hereby incorporated in the renewed license. FPL shall operate the facility in accordance with the Technical Specifications. I

Appendix B, the Environmental Protection Plan (Non-Radiological), contains environmental conditions of the renewed license. If significant detrimental effects or evidence of irreversible damage are detected by the monitoring programs required by Appendix B of this license, FPL will provide the Commission with an analysis of the problem and plan of action to be taken subject to Commission approval to eliminate or significantly reduce the detrimental effects or damage.

C. Updated Final Safety Analysis Report

The Updated Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on March 28, 2003, describes certain future activities to be completed before the period of extended operation. FPL shall complete these activities no later than March 1, 2016, and shall notify the NRC in writing when implementation of these activities is complete and can be verified by NRC inspection.

The Updated Final Safety Analysis Report supplement as revised on March 28, 2003, described above, shall be included in the next scheduled update to the Updated Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following issuance of this renewed license. Until that update is complete, FPL may make changes to the programs described in such supplement without prior Commission approval, provided that FPL evaluates each such change pursuant to the criteria set forth in 10 CFR 50.59 and otherwise complies with the requirements in that section.

D. Sustained Core Uncovery Actions

Procedural guidance shall be in place to instruct operators to implement actions that are designed to mitigate a small-break loss-of-coolant accident prior to a calculated time of sustained core uncovery.

TABLE 3.3-3 (continued)

TABLE NOTATION

ACTION 10 - With the number of OPERABLE channels one less than the Total Number of Channels, operation may proceed provided the following conditions are satisfied:

a. The inoperable channel is placed in the bypassed or tripped condition and the Minimum Channels OPERABLE requirement is demonstrated within 1 hour. If the inoperable channel can not be restored to OPERABLE status within 48 hours, then place the inoperable channel in the tripped condition.

b. Within 1 hour, all functional units receiving an input from the inoperable channel are also bypassed or tripped.

c. With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, operation may proceed provided one of the inoperable channels has been bypassed and the other inoperable channel has been placed in the tripped condition within 1 hour. Restore one of the inoperable channels to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

ACTION 11 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channels to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ACTION 12 - With the number of OPERABLE Channels one less than the Total Number of Channels, operation may proceed until performance of the next required CHANNEL FUNCTIONAL TEST provided the inoperable channel is placed in the tripped condition within 1 hour.

TABLE 3.3-6 (Continued)

TABLE NOTATION

ACTION 12 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.12.

ACTION 13 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

ACTION 14 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

ACTION 15 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within 72 hours, or:

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s),and

2) Prepare and submit a Special Report to the Commission pursuant to Specification6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

ACTION 16 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, comply with the ACTION requirements of Specification 3.9.9.

ACTION 17 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

REACTOR COOLANT SYSTEM

HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.1.3 At least two of the loops listed below shall be OPERABLE and at least one reactor coolant or shutdown cooling loop shall be in operation.*

a. Reactor Coolant Loop A and its associated steam generator and at least one associated reactor coolant pump,

b. Reactor Coolant Loop B and its associated steam generator and at least one associated reactor coolant pump,

c. Shutdown Cooling Loop A,

d. Shutdown Cooling Loop B.

APPLICABILITY: MODE 4.

ACTION:

a. With less than the above required reactor coolant or shutdown cooling loops OPERABLE, within one (1) hour initiate corrective action to return the required loops to OPERABLE status and immediately initiate action to make at least one steam generator available for decay heat removal via natural circulation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With no reactor coolant or shutdown cooling loop in operation, suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SHUTDOWN MARGIN of Technical Specification 3.1.1.1 and within one (1) hour initiate corrective action to return the required reactor coolant loop to operation.

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* All reactor coolant pumps and shutdown cooling pumps may be de-energized for up to 1 hour provided (1) no operations are permitted that would cause introduction into the RCS, coolant with boron concentration less than required to meet the SHUTDOWN MARGIN of Technical Specification 3.1.1.1 and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

CONTAINMENT SYSTEMS

CONTAINMENT AIR LOCKS

LIMITING CONDITION FOR OPERATION

3.6.1.3 Each containment air lock shall be OPERABLE with:

a. Both doors closed except when the air lock is being used for normal transit entry and exit through the containment, then at least one air lock door shall be closed, and

b. An overall air lock leakage rate in accordance with the Containment Leakage Rate Testing Program.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one containment air lock door inoperable*:

1. Maintain at least the OPERABLE air lock door closed and either restore the inoperable air lock door to OPERABLE status within 24 hours or lock the OPERABLE air lock door closed.

2. Operation may then continue until performance of the next required overall air lock leakage test provided that the OPERABLE air lock door is verified to be closed at least once per 31 days.

3. Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With the containment air lock inoperable, except as the result of an inoperable air lock door, maintain at least one air lock door closed; restore the inoperable air lock to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.1.3 Each containment air lock shall be demonstrated OPERABLE:

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* If the inner air lock door is inoperable, passage through the OPERABLE outer air lock door is permitted to effect repairs to the inoperable inner air lock door. No more than one airlock door shall be open at any time.

CONTAINMENT SYSTEMS

INTERNAL PRESSURE

LIMITING CONDITION FOR OPERATION

3.6.1.4 Primary containment internal pressure shall be maintained between –0.7 and +0.5 psig.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the containment internal pressure outside of the limits above, restore the internal pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.1.4 The primary containment internal pressure shall be determined to be within the limits in accordance with the Surveillance Frequency Control Program.

CONTAINMENT SYSTEMS

AIR TEMPERATURE

LIMITING CONDITION FOR OPERATION

3.6.1.5 Primary containment average air temperature shall not exceed 120°F.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With the containment average air temperature > 120°F, reduce the average air temperature to within the limit within 8 hours, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.1.5 The primary containment average air temperature shall be the arithmetical average of the temperatures at three of the following locations and shall be determined in accordance with the Surveillance Frequency Control Program:

Location

a. Containment fan cooler No. 1A air intake, elevation 45 feet.

b. Containment fan cooler No. 1B air intake, elevation 45 feet.

c. Containment fan cooler No. 1C air intake, elevation 62 feet.

d. Containment fan cooler No. 1D air intake, elevation 45 feet.

3/4.6.3 CONTAINMENT ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.6.3.1 The containment isolation valves shall be OPERABLE:

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more of the isolation valve(s) inoperable, either:

a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or

b. Isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position, or

c. Isolate each affected penetration within 4 hours by use of at least one closed manual valve or blind flange; or

d. Be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.3.1.1 The isolation valves shall be demonstrated OPERABLE prior to returning the valve to service after maintenance, repair or replacement work is performed on the valve or its associated actuator, control or power circuit by performance of the cycling test, and verification of isolation time.

CONTAINMENT SYSTEMS

SHIELD BUILDING INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.6.2 SHIELD BUILDING INTEGRITY shall be maintained.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

Without SHIELD BUILDING INTEGRITY, restore SHIELD BUILDING INTEGRITY within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.6.2 SHIELD BUILDING INTEGRITY shall be demonstrated in accordance with the Surveillance Frequency Control Program by verifying that the door in each access opening is closed except when the access opening is being used for normal transit entry and exit.

PLANT SYSTEMS

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3.1 At least two independent component cooling water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.3.1 At least two component cooling water loops shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed or otherwise secured in position, is in its correct position.

b. In accordance with the Surveillance Frequency Control Program during shutdown by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection Actuation Signal.

3/4.7.4 INTAKE COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4.1 At least two independent intake cooling water loops shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With only one intake cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.4.1 At least two intake cooling water loops shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that each valve (manual, power operated or automatic) servicing safety related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. In accordance with the Surveillance Frequency Control Program during shutdown by verifying that each automatic valve servicing safety related equipment actuates to its correct position on a Safety Injection Actuation signal.

PLANT SYSTEMS

3/4.7.7 CONTROL ROOM EMERGENCY VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.7.1 The control room emergency ventilation system shall be OPERABLE with:

a. Two booster fans,

b. Two isolation valves in each outside air intake duct,

c. Two isolation valves in the toilet area air exhaust duct,

d. One filter train,

e. At least two air conditioning units, and

f. Two isolation valves in the kitchen area exhaust duct.

NOTE

The control room envelope boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, 4, 5 and 6 or during movement of irradiated fuel assemblies.

ACTION:

MODES 1, 2, 3 and 4:

a. With one booster fan inoperable, restore the inoperable fan to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With one isolation valve per air duct inoperable, operation may continue provided the other isolation valve in the same duct is maintained closed; otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

c. With the filter train inoperable for reasons other than an inoperable Control Room Envelope boundary:

   1. Immediately initiate action to implement mitigating actions, and

   2. Within 1 hour, verify LCO 3.4.8, "Specific Activity," is met, and

   3. Within 24 hours restore the filter train to OPERABLE status.

   With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

d. With only one air conditioning unit OPERABLE, restore at least two air conditioning units to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ACTION: (continued)

MODES 1, 2, 3 and 4: (continued)

> **NOTE**
> Action not applicable when second booster fan intentionally made inoperable.

e. With two booster fans inoperable for reasons other than an inoperable Control Room Envelope boundary:

1. Immediately initiate action to implement mitigating actions, and
2. Within 1 hour, verify LCO 3.4.8, "Specific Activity," is met, and
3. Within 24 hours restore at least one booster fan to OPERABLE status.

With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

> **NOTE**
> Action not applicable when third air conditioning unit intentionally made inoperable.

f. With three air conditioning units inoperable for reasons other than an inoperable Control Room Envelope boundary, restore at least one air conditioning unit to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

g. With the filter train inoperable due to an inoperable Control Room Envelope boundary:

1. Immediately initiate actions to implement mitigating actions, and
2. Within 24 hours, verify mitigating actions to ensure Control Room Envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits, and
3. Restore Control Room Envelope boundary to OPERABLE status within 90 days.

With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

PLANT SYSTEMS

3/4.7.8 ECCS AREA VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.8.1 Two independent ECCS area exhaust air filter trains shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one ECCS area exhaust air filter train inoperable, restore the inoperable train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.8.1 Each ECCS area exhaust air filter train shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by initiating, from the control room, flow through the HEPA filter and charcoal adsorber train and verifying that the train operates for at least 15 minutes.

b. By performing required ECCS area ventilation system filter testing in accordance with the Ventilation Filter Testing Program.

c. In accordance with the Surveillance Frequency Control Program:

1. Verifying that the air flow distribution is uniform within 20% across HEPA filters and charcoal adsorbers when tested in accordance with ASME N510-1989.

2. Verifying that the filter train starts on a Safety Injection Actuation Signal.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 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 generator sets each with:

1. Engine-mounted fuel tanks containing a minimum of 152 gallons of fuel,

2. A separate fuel storage system containing a minimum of 19,000 gallons of fuel, and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one offsite circuit of 3.8.1.1.a inoperable, except as provided in Action f. below, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With one diesel generator of 3.8.1.1.b inoperable, demonstrate the OPERABILITY of the A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours, unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*; restore the diesel generator to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

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* If the absence of any common-cause failure cannot be confirmed, this test shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

ACTION (continued)

c. With one offsite A.C. circuit and one diesel generator inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2.a.4 within 8 hours unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 ACTION Statement a or b, as appropriate, with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable A.C. power source. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

d. With two of the required offsite A.C. circuits inoperable, restore one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. Following restoration of one offsite source, follow ACTION Statement a. with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable offsite A.C. circuit.

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* If the absence of any common-cause failure cannot be confirmed, this test shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

ACTION (continued)

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in the at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Following restoration of one diesel generator unit, follow ACTION Statement b. with the time requirement of that ACTION Statement based on the time of initial loss of the remaining inoperable diesel generator.

f. With one Unit 1 startup transformer (1A or 1B) inoperable and with a Unit 2 startup transformer (2A or 2B) connected to the same A or B offsite power circuit and administratively available to both units, then should Unit 2 require the use of the startup transformer administratively available to both units, Unit 1 shall demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the inoperable startup transformer to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

g. LCO 3.0.4.b is not applicable to diesel generators.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments, indicated power availability; and

b. Demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring (manually and automatically) unit power supply from the auxiliary transformer to the startup transformer.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

1. Verifying fuel level in the engine-mounted fuel tank,

2. Verifying the fuel level in the fuel storage tank,

3. Verifying the fuel transfer pump can be started and transfers fuel from the storage system to the engine-mounted tank,

ELECTRICAL POWER SYSTEMS

D.C. DISTRIBUTION - OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.3 As a minimum the following D.C. electrical sources shall be OPERABLE:

a. 125-volt D.C. bus No. 1A, 125-volt Battery bank No. 1A and a full capacity charger.

b. 125-volt D.C. bus No. 1B, 125-volt Battery bank No. 1B and a full capacity charger.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

a. With one of the required battery banks or busses inoperable, restore the inoperable battery bank or bus to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.3.2.a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.3.1 Each D.C. bus train shall be determined OPERABLE and energized in accordance with the Surveillance Frequency Control Program by verifying indicated power availability.

4.8.2.3.2 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129-volts on float charge.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

FLORIDA POWER AND LIGHT COMPANY

ORLANDO UTILITIES COMMISSION OF THE CITY OF ORLANDO, FLORIDA

AND

FLORIDA MUNICIPAL POWER AGENCY

DOCKET NO. 50-389

ST. LUCIE PLANT, UNIT NO. 2

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 184
Renewed License No. NPF-16

1. The Nuclear Regulatory Commission (the Commission) has found that:

   A. The application for amendment by Florida Power & Light Company (FPL, the licensee), dated August 31, 2015, as supplemented by letters dated April 20, and July 15, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in 10 CFR Chapter I;

   B. The facility will operate in conformity with the application, the provisions of the Act, and the rules and regulations of the Commission;

   C. There is reasonable assurance (i) that the activities authorized by this amendment can be conducted without endangering the health and safety of the public, and (ii) that such activities will be conducted in compliance with the Commission's regulations;

   D. The issuance of this amendment will not be inimical to the common defense and security or to the health and safety of the public; and

   E. The issuance of this amendment is in accordance with 10 CFR Part 51 of the Commission's regulations and all applicable requirements have been satisfied.

2. Accordingly, the license is amended by changes to the Facility Operating License and Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Renewed Facility Operating License No. NPF-16 is hereby amended to read as follows:

   B. Technical Specifications

   The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 184, are hereby incorporated in the renewed license. FPL shall operate the facility in accordance with the Technical Specifications.

3. The license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance. In addition, the licensee shall incorporate Commitment Nos. 2 and 3 listed in Section 3.5 of the safety evaluation associated with this amendment in the next periodic update of the St. Lucie Unit 2 Updated Final Safety Analysis Report, in accordance with 10 CFR 50.71(e).

FOR THE NUCLEAR REGULATORY COMMISSION

Tracy J. Orf, Acting Chief
Plant Licensing Branch II-2
Division of Operator Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Facility Operating License
and Technical Specifications

Date of Issuance: August 30, 2016

ATTACHMENT TO LICENSE AMENDMENT NO. 184

ST. LUCIE PLANT, UNIT NO. 2

RENEWED FACILITY OPERATING LICENSE NO. NPF-16

DOCKET NO. 50-389

Replace Page 3 of Renewed Operating License NPF-16 with the attached Page 3.

Replace the following pages of Appendix A, Technical Specifications, with the attached pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Remove Page	Insert Page
3/4 3-16	3/4 3-16
3/4 3-27	3/4 3-27
3/4 4-3	3/4 4-3
3/4 6-9	3/4 6-9
3/4 6-11	3/4 6-11
3/4 6-12	3/4 6-12
3/4 6-19	3/4 6-19
3/4 6-30	3/4 6-30
3/4 7-13	3/4 7-13
3/4 7-14	3/4 7-14
3/4 7-17	3/4 7-17
3/4 7-20	3/4 7-20
3/4 8-1	3/4 8-1
3/4 8-2	3/4 8-2
3/4 8-3	3/4 8-3
3/4 8-10	3/4 8-10
3/4 8-15	3/4 8-15

neutron sources for reactor startup, sealed sources for reactor instrumentation and radiation monitoring equipment calibration, and as fission detectors in amounts as required.

D. Pursuant to the Act and 10 CFR Parts 30, 40, and 70, FPL to receive, possess, and use in amounts as required any byproduct, source, or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactive apparatus or components; and

E. Pursuant to the Act and 10 CFR Parts 30, 40, and 70, FPL to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of the facility.

3. This renewed license shall be deemed to contain and is subject to the conditions specified in the following Commission's regulations: 10 CFR Part 20, Section 30.34 of 10 FR Part 30, Section 40.41 of 10 CFR Part 40, Section 50.54 and 50.59 of 10 CFR Part 50, and Section 70.32 of 10 CFR Part 70; and is subject to all applicable provisions of the Act and to the rules, regulations, and orders of the Commission now or hereafter in effect; and is subject to the additional conditions specified below:

A. Maximum Power Level

FPL is authorized to operate the facility at steady state reactor core power levels not in excess of 3020 megawatts (thermal).

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 184 are hereby incorporated in the renewed license. FPL shall operate the facility in accordance with the Technical Specifications.

TABLE 3.3-3 (Continued)

TABLE NOTATION

ACTION 14 - With the number of channels OPERABLE one less than the Minimum Channels OPERABLE, STARTUP and/or POWER OPERATION may continue provided the following conditions are satisfied:

a. Verify that one of the inoperable channels has been bypassed and place the other inoperable channel in the tripped condition within 1 hour.

b. All functional units affected by the bypassed/tripped channel shall also be placed in the bypassed/tripped condition as listed below.

Process Measurement Circuit	Functional Unit Bypassed/Tripped
1. Containment Pressure -	Containment Pressure – High (SIAS, CIAS, CSAS) Containment Pressure – High (RPS)
2. Steam Generator Pressure -	Steam Generator Pressure – Low (MSIS) AFAS-1 and AFAS-2 (AFAS) Thermal Margin/Low Pressure (RPS) Steam Generator Pressure – Low (RPS)
3. Steam Generator Level -	Steam Generator Level – Low (RPS) If SG-2A, then AFAS-1 (AFAS) If SG-2B, then AFAS-2 (AFAS)
4. Pressurizer Pressure -	Pressurizer Pressure – High (RPS) Pressurizer Pressure – Low (SIAS) Thermal Margin/Low Pressure (RPS)

ACTION 15 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channels to OPERABLE status within 48 hours or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ACTION 16 - With the number of OPERABLE channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or declare the associated valve inoperable and take the ACTION required by Specification 3.7.1.5.

ACTION 17 - With the number of OPERABLE Channels one less than the Total Number of Channels, restore the inoperable channel to OPERABLE status within 48 hours or place the inoperable channel in the tripped condition and verify that the Minimum Channels OPERABLE requirement is demonstrated within 1 hour; one additional channel may be bypassed for up to 2 hours for surveillance testing per Specification 4.3.2.1.

TABLE 3.3-6 (Continued)

ACTION STATEMENTS

ACTION 22 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, perform area surveys of the monitored area with portable monitoring instrumentation at least once per 24 hours.

ACTION 23 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.4.6.1.

ACTION 24 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, suspend all operations involving movement of recently irradiated fuel within the spent fuel storage pool or crane operations with loads over recently irradiated fuel assemblies in the spent fuel storage pool.

ACTION 25 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirement, comply with the ACTION requirements of Specification 3.9.9.

ACTION 26 - With the number of channels OPERABLE less than required by the Minimum Channels OPERABLE requirements, within 1 hour initiate and maintain operation of the control room emergency ventilation system in the recirculation mode of operation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

ACTION 27 - With the number of OPERABLE Channels less than required by the Minimum Channels OPERABLE requirement, either restore the inoperable Channel(s) to OPERABLE status within 72 hours, or:

1) Initiate the preplanned alternate method of monitoring the appropriate parameter(s), and

2) Prepare and submit a Special Report to the Commission pursuant to Specification 6.9.2 within 14 days following the event outlining the action taken, the cause of the inoperability and the plans and schedule for restoring the system to OPERABLE status.

REACTOR COOLANT SYSTEM

HOT SHUTDOWN

LIMITING CONDITION FOR OPERATION

3.4.1.3 At least two of the loop(s)/train(s) listed below shall be OPERABLE and at least one Reactor Coolant and/or shutdown cooling loops shall be in operation.*

a. Reactor Coolant Loop 2A and its associated steam generator and at least one associated Reactor Coolant pump,**

b. Reactor Coolant Loop 2B and its associated steam generator and at least one associated Reactor Coolant pump,**

c. Shutdown Cooling Train 2A,

d. Shutdown Cooling Train 2B.

APPLICABILITY: MODE 4.

ACTION:

a. With less than the above required Reactor Coolant and/or shutdown cooling loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible and immediately initiate action to make at least one steam generator available for decay heat removal via natural circulation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With no Reactor Coolant or shutdown cooling loop in operation, suspend operations that would cause introduction into the RCS, coolant with boron concentration less than required to meet SHUTDOWN MARGIN of Technical Specifications 3.1.1.1 and immediately initiate corrective action to return the required coolant loop to operation.

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* All Reactor Coolant pumps and shutdown cooling pumps may be de-energized for up to 1 hour provided (1) no operations are permitted that would cause introduction into the RCS, coolant with boron concentration less than required to meet the SHUTDOWN MARGIN of Technical Specification 3.1.1.1 and (2) core outlet temperature is maintained at least 10°F below saturation temperature.

** A Reactor Coolant pump shall not be started with two idle loops and one or more of the Reactor Coolant System cold leg temperatures less than or equal to that specified in Table 3.4-3 unless the secondary water temperature of each steam generator is less than 40°F above each of the Reactor Coolant System cold leg temperatures.

CONTAINMENT AIR LOCKS

LIMITING CONDITION FOR OPERATION

3.6.1.3 Each containment air lock shall be OPERABLE with:

a. Both doors closed except when the air lock is being used for normal transit entry and exit through the containment, then at least one air lock door shall be closed, and

b. An overall air lock leakage rate in accordance with the Containment Leakage Rate Testing Program.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one containment air lock door inoperable*:

1. Maintain at least the OPERABLE air lock door closed and either restore the inoperable air lock door to OPERABLE status within 24 hours or lock the OPERABLE air lock door closed.

2. Operation may then continue until performance of the next required overall air lock leakage test provided that the OPERABLE air lock door is verified to be locked closed at least once per 31 days.

3. Otherwise, be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With the containment air lock inoperable, except as the result of an inoperable air lock door, maintain at least one air lock door closed; restore the inoperable air lock to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

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* If the inner air lock door is inoperable, passage through the OPERABLE outer air lock door is permitted to effect repairs to the inoperable inner air lock door. No more than one airlock door shall be open at any time.

CONTAINMENT SYSTEMS

INTERNAL PRESSURE

LIMITING CONDITION FOR OPERATION

3.6.1.4 Primary containment internal pressure shall be maintained between –0.368 and +0.400 psig.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With the containment internal pressure outside of the limits above, restore the internal pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.1.4 The primary containment internal pressure shall be determined to be within the limits in accordance with the Surveillance Frequency Control Program.

CONTAINMENT SYSTEMS

AIR TEMPERATURE

LIMITING CONDITION FOR OPERATION

3.6.1.5 Primary containment average air temperature shall not exceed 120°F.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With the containment average air temperature greater than 120°F, reduce the average air temperature to within the limit within 8 hours, or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.1.5 The primary containment average air temperature shall be the arithmetical average* of the temperatures at the following locations and shall be determined in accordance with the Surveillance Frequency Control Program:

Location

a. TE-07-3A NW RCB Elevation 70'

b. TE-07-3B SW RCB Elevation 70'

---

* With one temperature detector inoperable, use the air intake temperature detectors of the operating containment fan coolers.

3/4.6.3 CONTAINMENT ISOLATION VALVES

LIMITING CONDITION FOR OPERATION

3.6.3 The containment isolation valves shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3 and 4.

ACTION:

With one or more of containment isolation valve(s) inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and either:

a. Restore the inoperable valve(s) to OPERABLE status within 4 hours, or

b. Isolate each affected penetration within 4 hours by use of at least one deactivated automatic valve secured in the isolation position, or

c. Isolate each affected penetration within 4 hours by use of at least one closed manual valve or blind flange; or

d. Be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.3.1 The containment isolation valves shall be demonstrated OPERABLE prior to returning the valve to service after maintenance, repair or replacement work is performed on the valve or its associated actuator, control or power circuit by performance of a cycling test and verification of isolation time.

CONTAINMENT SYSTEMS

SHIELD BUILDING INTEGRITY

LIMITING CONDITION FOR OPERATION

3.6.6.2 SHIELD BUILDING INTEGRITY shall be maintained.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

Without SHIELD BUILDING INTEGRITY, restore SHIELD BUILDING INTEGRITY within 24 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.6.6.2 SHIELD BUILDING INTEGRITY shall be demonstrated in accordance with the Surveillance Frequency Control Program by verifying that the door in each access opening is closed except when the access opening is being used for normal transit entry and exit.

PLANT SYSTEMS

3/4.7.3 COMPONENT COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.3 At least two independent component cooling water loops shall be OPERABLE.*

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.3 At least two component cooling water loops shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that each valve (manual, power-operated or automatic) servicing safety-related equipment that is not locked, sealed, or otherwise secured in position, is in its correct position.

b. In accordance with the Surveillance Frequency Control Program during shutdown by verifying that each automatic valve servicing safety-related equipment actuates to its correct position on an SIAS test signal.

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* When CCW pump 2C is being used to satisfy the requirements of this specification, the alignment of the discharge valves shall be verified to be consistent with the appropriate power supply at least once per 24 hours. Upon receipt of annunciation for improper alignment of the pump 2C motor power in relation to any of its motor-operated discharge valves positions, restore proper system alignment within 2 hours.

PLANT SYSTEMS

3/4.7.4 INTAKE COOLING WATER SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.4 At least two independent intake cooling water loops shall be OPERABLE.*

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With only one intake cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.4 At least two intake cooling water loops shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that each valve (manual, power-operated, or automatic) servicing safety-related equipment that is not locked, sealed or otherwise secured in position, is in its correct position.

b. In accordance with the Surveillance Frequency Control Program during shutdown, by verifying that each automatic valve servicing safety-related equipment actuates to its correct position on a SIAS test signal.

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* When ICW pump 2C is being used to satisfy the requirements of this specification, the alignment of the discharge valves must be verified to be consistent with the appropriate power supply at least once per 24 hours.

PLANT SYSTEMS

3/4.7.7 CONTROL ROOM EMERGENCY AIR CLEANUP SYSTEM (CREACS)

LIMITING CONDITION FOR OPERATION

3.7.7 Two independent control room emergency air cleanup systems shall be OPERABLE with:

a. A filter train and its associated fan per system, and
b. At least one air conditioning unit per system, and
c. Two isolation valves in the kitchen area exhaust duct, and
d. Two isolation valves in the toilet area exhaust duct, and
e. Two isolation valves in each (North and South) air intake duct.

NOTE

The control room envelope boundary may be opened intermittently under administrative control.

APPLICABILITY: MODES 1, 2, 3, 4, 5 and 6 or during movement of irradiated fuel assemblies.

ACTION:

MODES 1, 2, 3, and 4:

a. With one control room emergency air cleanup system inoperable for reasons other than an inoperable Control Room Envelope boundary, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With one or more control room emergency air cleanup systems inoperable due to an inoperable Control Room Envelope boundary:

   1. Immediately initiate actions to implement mitigating actions, and
   2. Within 24 hours, verify mitigating actions to ensure Control Room Envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits, and
   3. Restore Control Room Envelope boundary to OPERABLE status within 90 days.

   With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

c. With an isolation valve in an air intake duct or air exhaust duct inoperable, operation may continue provided the other isolation valve in the same air intake or air exhaust duct is maintained closed; otherwise be in at least HOT STANDBY in the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

NOTE

Action not applicable when second CREACS train intentionally made inoperable.

d. With two control room emergency air cleanup systems inoperable for reasons other than an inoperable Control Room Envelope boundary:

   1. Immediately initiate action to implement mitigating actions, and
   2. Within 1 hour, verify LCO 3.4.8, "Specific Activity," is met, and
   3. Within 24 hours restore at least one CREACS train to OPERABLE status.

   With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

PLANT SYSTEMS

3/4.7.8 ECCS AREA VENTILATION SYSTEM

LIMITING CONDITION FOR OPERATION

3.7.8 Two independent ECCS area ventilation systems shall be OPERABLE.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

With one ECCS area ventilation system inoperable, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

SURVEILLANCE REQUIREMENTS

4.7.8 Each ECCS area ventilation system shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by initiating from the control room and verifying that the system operates for at least 15 minutes.

b. By performing required ECCS area ventilation system filter testing in accordance with the Ventilation Filter Testing Program.

c. In accordance with the Surveillance Frequency Control Program by verifying that the system starts on a safety injection actuation test signal.

3/4.8 ELECTRICAL POWER SYSTEMS

3/4.8.1 A.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.1.1 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, each with:

1. Two separate engine-mounted fuel tanks containing a minimum volume of 200 gallons of fuel each,

2. A separate fuel storage system containing a minimum volume of 42,500 gallons of fuel, and

3. A separate fuel transfer pump.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one offsite circuit of 3.8.1.1.a inoperable, except as provided in Action f. below, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With one diesel generator of 3.8.1.1.b inoperable, demonstrate the OPERABILITY of the A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2a.4 within 8 hours, unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*; restore the diesel generator to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

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* If the absence of any common-cause failure cannot be confirmed, this test shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

ACTION: (Continued)

c. With one offsite A.C. circuit and one diesel generator inoperable, demonstrate the OPERABILITY of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1.a within one hour and at least once per 8 hours thereafter; and if the EDG became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining OPERABLE EDG by performing Surveillance Requirement 4.8.1.1.2a.4 within 8 hours, unless it can be confirmed that the cause of the inoperable EDG does not exist on the remaining EDG*. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Restore the other A.C. power source (offsite circuit or diesel generator) to OPERABLE status in accordance with the provisions of Section 3.8.1.1 ACTION Statement a or b, as appropriate, with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable A.C. power source. Additionally, within 4 hours from the discovery of concurrent inoperability of required redundant feature(s) (including the steam driven auxiliary feed pump in MODE 1, 2, and 3), declare required feature(s) supported by the inoperable EDG inoperable if its redundant required feature(s) is inoperable.

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* If the absence of any common-cause failure cannot be confirmed, this test shall be completed regardless of when the inoperable EDG is restored to OPERABILITY.

ACTION: (Continued)

d. With two of the required offsite A.C. circuits inoperable, restore one of the inoperable offsite sources to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours. Following restoration of one offsite source, follow ACTION Statement a. with the time requirement of that ACTION Statement based on the time of the initial loss of the remaining inoperable offsite A.C. circuit.

e. With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two offsite A.C. circuits by performing Surveillance Requirement 4.8.1.1.1.a within 1 hour and at least once per 8 hours thereafter; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in the at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN. Following restoration of one diesel generator unit, follow ACTION Statement b. with the time requirement of that ACTION Statement based on the time of initial loss of the remaining inoperable diesel generator.

f. With one Unit 2 startup transformer (2A or 2B) inoperable and with a Unit 1 startup transformer (1A or 1B) connected to the same A or B offsite power circuit and administratively available to both units, then should Unit 1 require the use of the startup transformer administratively available to both units, Unit 2 shall demonstrate the operability of the remaining A.C. sources by performing Surveillance Requirement 4.8.1.1.1a. within 1 hour and at least once per 8 hours thereafter. Restore the inoperable startup transformer to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

g. LCO 3.0.4.b is not applicable to diesel generators.

SURVEILLANCE REQUIREMENTS

4.8.1.1.1 Each of the above required independent circuits between the offsite transmission network and the onsite Class 1E distribution system shall be:

a. Determined OPERABLE in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignments, indicated power availability; and

b. Demonstrated OPERABLE in accordance with the Surveillance Frequency Control Program by transferring (manually and automatically) unit power supply from the normal circuit to the alternate circuit.

4.8.1.1.2 Each diesel generator shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by:

ELECTRICAL POWER SYSTEMS

3/4.8.2 D.C. SOURCES

OPERATING

LIMITING CONDITION FOR OPERATION

3.8.2.1 As a minimum the following D.C. electrical sources shall be OPERABLE:

a. 125-volt Battery bank No. 2A and a full capacity charger.

b. 125-volt Battery bank No. 2B and a full capacity charger.

APPLICABILITY: MODES 1, 2, 3, and 4.

ACTION:

a. With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

b. With one of the required full capacity chargers inoperable, demonstrate the OPERABILITY of its associated battery banks by performing Surveillance Requirement 4.8.2.1a.1 within 1 hour, and at least once per 8 hours thereafter. If any Category A limit in Table 4.8-2 is not met, declare the battery inoperable.

SURVEILLANCE REQUIREMENTS

4.8.2.1 Each 125-volt battery bank and charger shall be demonstrated OPERABLE:

a. In accordance with the Surveillance Frequency Control Program by verifying that:

1. The parameters in Table 4.8-2 meet the Category A limits, and

2. The total battery terminal voltage is greater than or equal to 129-volts on float charge.

ACTION:

a. With one of the required trains of A.C. Emergency busses not fully energized, re-energize the train within 8 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

b. With one A.C. Instrument Bus either not energized from its associated inverter, or with the inverter not connected to its associated D.C. Bus: (1) re-energize the A.C. Instrument Bus 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) re-energize the A.C. Instrument Bus 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 HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.

c. With one D.C. Bus not energized from its associated Battery Bank, re-energize the D.C. Bus from its associated Battery Bank within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

SURVEILLANCE REQUIREMENTS

4.8.3.1 The specified busses shall be determined energized in the required manner in accordance with the Surveillance Frequency Control Program by verifying correct breaker alignment and indicated voltage on the busses.

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION FOR AMENDMENT NO. 234 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-67 AND AMENDMENT NO. 184 TO RENEWED FACILITY OPERATING LICENSE NO. NPF-16 FLORIDA POWER AND LIGHT COMPANY, ET AL. ST. LUCIE PLANT, UNIT NOS. 1 AND 2 DOCKET NOS. 50-335 AND 50-389

1.0 INTRODUCTION

By application dated August 31, 2015 (L-2015-182),[1] as supplemented by letters dated April 20 (L-2016-084),[2] and July 15, 2016 (L-2016-132),[3] Florida Power & Light Company (FPL, the licensee) requested changes to the Technical Specifications (TSs) for the St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2), which are contained in Appendix A of Renewed Facility Operating License Nos. DPR-67 and NPF-16. The licensee proposed to adopt (with variations and deviations) Technical Specification Task Force Traveler 422 (TSTF-422), Revision 2, "Change in Technical Specifications End States (CE [Combustion Engineering] NPSD-1186)," dated December 22, 2009.[4] The *Federal Register* (FR) notice published on April 7, 2011 (76 FR 19510), announced the availability of this TS improvement as part of the consolidated line item improvement process.

By electronic mail dated March 8, 2016,[5] the U.S. Nuclear Regulatory Commission (NRC or the Commission) staff sent the licensee a request for additional information (RAI). By letter dated April 20, 2016, the licensee responded to the RAI. The licensee's letters dated April 20, and July 15, 2016, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the staff's original proposed no significant hazards consideration determination, which was published in the FR on November 24, 2015 (80 FR 73237).

[1] Agencywide Documents Access and Management System (ADAMS) Accession No. ML15254A180.
[2] ADAMS Accession No. ML16118A272.
[3] ADAMS Accession No. ML16201A236.
[4] ADAMS Accession No. ML093570241.
[5] ADAMS Accession No. ML16068A261.

2.0 REGULATORY EVALUATION

2.1 Description of TSTF-422, Revision 2

TSTF-422 incorporates the Combustion Engineering Owners Group (CEOG) Topical Report (TR) CE NPSD-1186-A, Revision 0, "Technical Justification for the Risk Informed Modification to Selected Required Action End States for CEOG Member PWRs [Pressurized-Water Reactors]," dated October 2001.[6] The staff approved this TR for use in a safety evaluation (SE) dated July 17, 2001.[7] TSTF-422 is a commercial nuclear power industry initiative developed under the Risk Management Technical Specifications program. The intent of risk-informed TS changes is to maintain or improve safety while reducing unnecessary burden and to make TS requirements consistent with the Commission's other risk-informed regulatory requirements.

When a TS limiting condition for operation (LCO) of a nuclear power plant is not met, the licensee is required to shut down the reactor or follow remedial actions permitted by the TS until the condition can be met. A TS typically provides a completion time (CT), or allowed outage time (AOT), for completing the required action. If the remedial action cannot be met within the CT, then the licensee is required to shut down the reactor. The TSs typically require the shutdown condition, or "end state," to be the cold shutdown mode of operation (i.e., Mode 5). An end state is a condition – usually an operational mode, as discussed below – that the reactor must be placed in if the TS required actions cannot be met. The end states are currently defined based on placing the reactor into a mode or condition in which the LCO is not applicable. The St. Lucie 1 and 2 TSs contain the following modes of operation:

Operational Mode	Reactivity Condition, K_{eff}	Percent of Rated Thermal Power*	Average Coolant Temperature (T_{avg})***
1. Power Operation	≥ 0.99	> 5 percent	≥ 325 °F
2. Startup	≥ 0.99	≤ 5 percent	≥ 325 °F
3. Hot Standby	< 0.99	0	≥ 325 °F
4. Hot Shutdown	< 0.99	0	325 °F > T_{avg} > 200 °F
5. Cold Shutdown	< 0.99	0	≤ 200 °F
6. Refueling**	≤ 0.95	0	≤ 140 °F

* Excluding decay heat.
** Fuel in the reactor vessel with the vessel head closure bolts less than fully tensioned or with the head removed.
*** Degrees Fahrenheit (°F).

The adoption of TSTF-422 would allow an end state of Mode 4 (Hot Shutdown) rather than Mode 5 (Cold Shutdown) for selected TSs in order for the licensee to perform repairs of short duration (i.e., typically 2 to 3 days) that necessitate exiting the original mode of operation. CE NPSD-1186 provides the basis for changing certain required end states using a risk-informed approach. Mode 5 is the current end state for LCOs that are applicable in Modes 1 through 4. For specific TS conditions, CE NPSD-1186 justifies Mode 4 (rather than Mode 5) as an acceptable alternate end state. The risk of the transition from Mode 1 to

[6] ADAMS Accession No. ML110410539.
[7] ADAMS Accession No. ML011980047.

Modes 4 or 5 primarily depends on the availability of alternating current (AC) sources. During the transition from Mode 4 to Mode 5, there is an increased potential for losses of shutdown cooling or inventory events. Decay heat removal following a loss of offsite power event in Mode 5 is dependent on AC power for shutdown cooling. However, in Mode 4, the turbine driven auxiliary feedwater pump will be available. Therefore, transitioning to Mode 5 is not always the preferred end state from a risk-informed perspective.

The proposed change to the St. Lucie TSs will allow time to perform short duration repairs, which currently necessitate exiting the original mode of applicability. The licensee would be required to assess and manage risk in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants" (i.e., the Maintenance Rule). Modified end states are limited to conditions where: (1) entry into the shutdown mode is for a short interval, (2) entry is initiated by inoperability of a single train of equipment or a restriction on a plant operational parameter, unless otherwise stated in the applicable TS, and (3) the primary purpose is to correct the initiating condition and return to power operation as soon as is practical.

Revision 2 of TSTF-422 modified the TS required actions with a note prohibiting the use of LCO 3.0.4.a when entering the preferred end state (i.e., Mode 3) on startup.

2.2 Requested Changes

Section 3 of this SE describes in detail the licensee's proposed changes, which are summarized as follows. The licensee proposed to adopt TSTF-422, Revision 2 (i.e., to require an end state of Mode 4 instead of Mode 5 and to add a note stating that LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN) for the following Unit 1 and 2 TSs (with differences between the Units specified).

- ACTION a of LCO 3.4.1.3 of TS 3/4.4.1.3, "Reactor Coolant System – Hot Shutdown."
- ACTIONS a.3 and b of LCO 3.6.1.3 of TS 3/4.6.1.3, "Containment Systems – Containment Air Locks."
- The ACTION of LCO 3.6.1.4 of TS 3/4.6.1.4, "Containment Systems – Internal Pressure."
- The ACTION of LCO 3.6.1.5 of TS 3/4.6.1.5, "Containment Systems – Air Temperature."
- ACTION d of LCO 3.6.3.1 (Unit 1) and LCO 3.6.3 (Unit 2) of TS 3/4.6.3, "Containment Systems – Containment Isolation Valves."
- The ACTION of LCO 3.6.6.2 of TS 3/4.6.6.2, "Containment Systems – Shield Building Integrity."
- The ACTION of LCO 3.7.3.1 (Unit 1) and LCO 3.7.3 (Unit 2) of TS 3/4.7.3, "Plant Systems – Component Cooling Water System."
- The ACTION of LCO 3.7.4.1 (Unit 1) and LCO 3.7.4 (Unit 2) of TS 3/4.7.4, "Plant Systems – Intake Cooling Water System."
- ACTIONS a, b, d, and g (MODES 1, 2, 3 and 4) of LCO 3.7.7.1 of Unit 1 TS 3/4.7.7, "Plant Systems – Control Room Emergency Ventilation System."
- ACTIONS a, b, and c (MODES 1, 2, 3, and 4) of Unit 2 TS 3/4.7.7, "Plant Systems – Control Room Emergency Air Cleanup System (CREACS)."

- The ACTION of LCO 3.7.8.1 (Unit 1) and LCO 3.7.8 (Unit 2) of TS 3/4.7.8, "Plant Systems – ECCS [Emergency Core Cooling System] Area Ventilation System."
- ACTIONS a, b, c, and e of LCO 3.8.1.1 of TS 3/4.8.1, "Electrical Power Systems – A.C. Sources."
- ACTION a of LCO 3.8.2.3 of Unit 1 TS 3/4.8.2.3, "Electrical Power Systems – D.C. [Direct Current] Distribution – Operating," and Action a of LCO 3.8.2.1 of Unit 2 TS 3/4.8.2, "Electrical Power Sources – D.C. Sources – Operating."
- ACTION b(2) of LCO 3.8.3.1 of Unit 2 TS 3/4.8.3, "Electrical Power Systems – Onsite Power Distribution – Operating."

By letters dated April 20, and July 15, 2016, the licensee reduced the scope of its application by removing its request to adopt TSTF-422 for the following TSs.

- ACTION 11 (Unit 1) and ACTION 15 (Unit 2) in Table 3.3-3 of TS 3/4.3.2 "Engineered Safety Feature Actuation System Instrumentation."
- ACTION 17 (Unit 1) and ACTION 26 (Unit 2) in Table 3.3-6 of TS 3/4.3.3 "Monitoring Instrumentation."
- ACTION c (MODES 1, 2, 3 and 4) of LCO 3.7.7.1 of Unit 1 TS 3/4.7.7.
- ACTION b(1) of LCO 3.8.3.1 of Unit 2 TS 3/4.8.3.

In its letter dated August 31, 2015, the licensee also proposed several variations and deviations from the TSTF because of differences between the guidance quoted in the TR and that applicable to St. Lucie and differences between the St. Lucie TSs and the Standard Technical Specifications (STSs). These changes are described further in Section 3.4 of this SE.

2.3 Regulatory Review

The NRC staff considered the following regulatory requirements, guidance, and licensing and design-basis information during its review of the proposed changes.

Section 50.36, "Technical specifications," of 10 CFR prescribes the regulatory requirements related to the content of TSs. Pursuant to 10 CFR 50.36(c), TSs are required to include items in the following five specific categories related to station operation: (1) safety limits, limiting safety system settings, and limiting control settings; (2) LCOs; (3) surveillance requirements (SRs); (4) design features; and (5) administrative controls.

Paragraph 50.36(c)(2)(i) of 10 CFR, states in part, that LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility, and when an LCO is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.

Section 50.46, "Acceptance criteria for emergency core cooling systems for light water nuclear power reactors," of 10 CFR requires that the reactor be provided with an ECCS designed so that its calculated cooling performance following postulated loss-of-coolant accidents (LOCAs) conforms to the criteria set forth in 10 CFR 50.46(b).

NUREG-1432, "Standard Technical Specifications – Combustion Engineering Plants," Revisions 2 and 3[8] describe the STSs for CE plants.

NRC Regulatory Guide (RG) 1.174, "An Approach for Using Probabilistic Risk Assessment [PRA] in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," dated July 1998,[9] describes a risk-informed approach acceptable to the NRC for assessing the nature and impact of proposed permanent licensing basis changes by considering engineering issues and applying risk insights. This RG also provides risk acceptance guidelines for evaluating the results of such evaluations.

RG 1.177, "An Approach for Plant-Specific, Risk-Informed Decisionmaking: Technical Specifications," dated August 1998,[10] describes an acceptable risk-informed approach specifically for assessing proposed permanent AOT and SR interval changes. This RG also provides risk acceptance guidelines for evaluating the results of such assessments. RG 1.177 identifies a three-tiered approach for the licensee's evaluation of the risk associated with a proposed CT or AOT TS change. The risk assessment provided in CE NPSD-1186 was done in accordance with RG 1.174 and RG 1.177.

CE NPSD-1186 states, in part, that

> ...preventing plant challenges during shutdown conditions has been, and continues to be, an important aspect of ensuring safe operation of the plant. Past events demonstrate that risk of core damage associated with entry into, and operation in, shutdown cooling [SDC] is not negligible and should be considered when a plant is required to shutdown [*sic*]. Therefore, the TS should encourage plant operation in the steam generator heat removal mode whenever practical, and require SDC entry only when it is a risk beneficial alternative to other actions.

TSs and design basis analyses were typically developed under the perception that placing a plant in cold shutdown would result in the safest condition and the design basis analyses would bound credible shutdown accidents. In the late 1980s and early 1990s, the NRC and licensees recognized that this perception was incorrect and took corrective actions to improve shutdown operation. During this time, the STSs were also developed, and many licensees converted their TSs to the STSs. Because enactment of a shutdown rule was expected, industry postponed almost all TS changes involving power operation, including a revised end state requirement. However, in the mid-1990s, the Commission decided a shutdown rule was not necessary because of industry improvements.

Controlling shutdown risk encompasses control of conditions that can cause potential initiating events and responses to those initiating events that do occur. Initiating events are a function of equipment malfunctions and human error. Responses to events are a function of plant sensitivity, ongoing activities, human error, defense in depth, and additional equipment malfunctions.

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[8] ADAMS Accession Nos. ML011930335 and ML041830597, respectively.
[9] ADAMS Accession No. ML003740133.
[10] ADAMS Accession No. ML003740176.

Licensees often address the risk during shutdown operations via voluntary actions and application of 10 CFR 50.65. Paragraph 50.65(a)(4) of 10 CFR states, in part:

> Before performing maintenance activities...the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. The scope of the assessment may be limited to structures, systems, and components that a risk informed evaluation process has shown to be significant to public health and safety.

RG 1.182, "Assessing and Managing Risk before Maintenance Activities at Nuclear Power Plants," dated May 2000,[11] provides guidance on implementing the provisions of 10 CFR 50.65(a)(4) by endorsing the revised Section 11 (which was published separately on February 22, 2000[12]) of Nuclear Management and Resources Council (NUMARC) 93-01, Revision 2, "Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," April 1996. That section was subsequently incorporated into Revision 3 of NUMARC 93-01, dated July 2000.[13]

RG 1.182 was withdrawn because the NRC determined that it was redundant to Revision 3 of RG 1.160, "Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," dated May 2012.[14] Withdrawal of RG 1.182 was published in the FR on November 27, 2012 (77 FR 70846). The FR notice also stated that withdrawal of RG 1.182 neither altered any prior or existing licensing commitments based on its use, nor constituted backfitting as defined in 10 CFR 50.109 (i.e., the Backfit Rule) and was not otherwise inconsistent with the issue finality provisions in 10 CFR Part 52.

In addition, RG 1.160 endorses Revision 4A of NUMARC 93-01, dated April 2011.[15] NUMARC 93-01, Revision 4A provides methods that are acceptable to the NRC staff for complying with the provisions of 10 CFR 50.65. The NRC's model SE[16] for TSTF-422, Revision 2 currently refers to the guidance in NUMARC 93-01, Revision 2.

The licensee's application states that FPL reviewed Section 11 of NUMARC 93-01, Revision 4A, as well as the supporting TR WCAP-16364-NP, Revision 2, "Implementation Guidance for Risk Informed Modification to Selected Required Action End States at Combustion Engineering NSSS Plants (TSTF-422)," dated May 2010,[17] and its fleet procedure EN-AA-100-2002, "Maintenance Rule Program Administration," which references RG 1.160 and NUMARC 93-01 as the governing guidance for determination of the risk significance of structures, systems and components within the scope of the Maintenance Rule. Per the application, the licensee's review found no inconsistencies with the intent of CE NPSD-1186-A; WCAP-16364-NP, Revision 2; TSTF-422, Revision 2; and the model SE for TSTF-422. The staff finds that the licensee's commitment to RG 1.160 guidance acceptable for application of TSTF-422.

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[11] ADAMS Accession No. ML003740117.
[12] ADAMS Accession No. ML003704489.
[13] ADAMS Accession No. ML031500684.
[14] ADAMS Accession No. ML113610098.
[15] ADAMS Accession No. ML11116A198.
[16] ADAMS Accession No. ML103270197.
[17] ADAMS Accession No. ML102500295.

3.0 TECHNICAL EVALUATION

The NRC staff reviewed the licensee's application to ensure that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) activities proposed will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or the health and safety of the public. The staff compared the licensee's proposal against the regulatory criteria in Section 2 of this SE.

3.1 Risk Assessment

The objective of the risk assessment in CE NPSD-1186 was to show that the changes in risk from changes in TS end states are either negative (i.e., a net decrease in risk) or neutral (i.e., no risk change). The TR documents a risk-informed analysis of the proposed TS changes. PRA results and insights are used in combination with results of deterministic assessments to identify and propose changes in end states for all CE plants. This is consistent with guidance provided in RG 1.174 and RG 1.177. The three-tiered approach documented in RG 1.177 was followed. The first tier includes the assessment of the risk impact of the proposed change for comparison to acceptance guidelines consistent with RG 1.174 and the Commission's Policy Statement on "Safety Goals for the Operation of Nuclear Power Plants," published in the FR on August 21, 1986 (51 FR 30028). In addition, the first tier aims at ensuring that there are no time intervals associated with the implementation of the proposed TS end state changes during which there is an increase in the probability of core damage or large early release with respect to the current end states. The second tier addresses the need to preclude potentially high risk configurations that could result if equipment is taken out of service during implementation of the proposed TS change. The third tier addresses the application of 10 CFR 50.65(a)(4) for identifying risk-significant configurations resulting from maintenance or other operational activities and taking appropriate compensatory measures to avoid such configurations.

The scope of the TR and the associated NRC SE were limited to identifying changes in end state conditions that excluded continued power operation as an acceptable end state, regardless of the risk. The CEOG's risk assessment approach was found by the NRC to be comprehensive and acceptable. In addition, the analyses show that the criteria of the three tiered approach for allowing TS changes are met as explained as follows.

- Risk Impact of the Proposed Change (Tier 1): The risk changes associated with the proposed TS changes, in terms of mean yearly increases in core damage frequency (CDF) and large early release frequency (LERF), are risk neutral or risk beneficial. In addition, there are no time intervals associated with the implementation of the proposed TS end state changes during which there is an increase in the probability of core damage or large early release with respect to the current end states.

- Avoidance of Risk Significant Configurations (Tier 2): The need for some restrictions and enhanced guidance was determined by the specific TS assessments documented in WCAP 16364-NP, Revision 2. These restrictions and guidance are intended to (1) preclude preventive maintenance and operational activities on risk-significant equipment combinations, and (2) identify actions to exit expeditiously a risk-significant

configuration should it occur. Licensees are expected to commit to following the implementation guidance in WCAP 16364-NP, Revision 2. In Attachment 2 of its application, the licensee provided a commitment to follow the guidance in WCAP 16364-NP, as discussed further in Section 3.5 of this SE. Based on the information provided by the licensee and the licensee's commitment to follow WCAP 16364-NP, the NRC staff concludes that the proposed restrictions and guidance are adequate for preventing risk-significant plant configurations.

- Configuration Risk Management (Tier 3): There are programs in place to comply with 10 CFR 50.65(a)(4) to assess and manage the risk from proposed maintenance activities. These programs can support licensee decision making regarding the appropriate actions to control risk whenever a risk-informed TS is entered.

3.2 Addition of a Note Regarding Non-Applicability of LCO 3.0.4.a

LCO 3.0.4 states, in part, "When an LCO is not met, entry into a MODE or other specified condition in the Applicability shall only be made ... [w]hen the associated ACTIONS to be entered permit continued operation in the MODE or other specified condition in the Applicability for an unlimited period of time[.]"

Changing the end states allows continued operation with the LCO not met by removing the TS requirement to exit the LCO mode(s) of applicability. In this case, the requirements of LCO 3.0.4.a would apply unless otherwise stated. LCO 3.0.4.a allows entry into a mode or other specified condition in the applicability with the LCO not met when the associated actions to be entered permit continued operation in the mode or other specified condition in the applicability for an unlimited period of time. Compliance with required actions that permit continued operation of the unit for an unlimited period of time in a mode or other specified condition provides an acceptable level of safety for continued operation. This is without regard to the status of the unit before or after the mode change. Therefore, in such cases, entry into a mode or other specified condition in the applicability may be made in accordance with the provisions of the required actions.

Thus, implementing modified end states requires adding a Note to the affected actions to prevent using the allowance of LCO 3.0.4.a when entering hot shutdown (Mode 4) from cold shutdown (Mode 5). This is done to avoid unit operation in a condition that should be prohibited by TSs because LCO 3.0.4.a allows entry into a mode or other specified condition in the applicability when the associated actions to be entered permit continued operation in the mode or other specified condition in the applicability for an unlimited period of time. Applying the allowance of LCO 3.0.4.a to modified end states was not analyzed in CE NPSD-1186; therefore, the NRC staff concludes that an appropriate limitation is applied by the addition of a note to the affected required actions that states, "LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN."

3.3 Evaluation of Proposed TS Changes

3.3.1 ACTION a of LCO 3.4.1.3 of TS 3/4.4.1.3

ACTION a of Unit 1 LCO 3.4.1.3 states:

> With less than the above required reactor coolant or shutdown cooling loops OPERABLE, within one (1) hour initiate corrective action to return the required loops to OPERABLE status. If the remaining OPERABLE loop is a shutdown cooling loop, be in COLD SHUTDOWN within 30 hours.

The licensee proposed the following changes shown in bolded text:

> With less than the above required reactor coolant or shutdown cooling loops OPERABLE, within one (1) hour initiate corrective action to return the required loops to OPERABLE status **and immediately initiate action to make at least one steam generator available for decay heat removal via natural circulation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION a of Unit 2 LCO 3.4.1.3 states:

> With less than the above required Reactor Coolant and/or shutdown cooling loops OPERABLE, immediately initiate corrective action to return the required loops to OPERABLE status as soon as possible. If the remaining OPERABLE loop is a shutdown cooling loop, be in COLD SHUTDOWN within 30 hours.

The licensee proposed the following changes shown in bolded text:

> With less than the above required reactor coolant or shutdown cooling loops OPERABLE, within one (1) hour initiate corrective action to return the required loops to OPERABLE status **and immediately initiate action to make at least one steam generator available for decay heat removal via natural circulation. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

Unit 1 LCO 3.4.1.3 states that at least two of the loops listed in the LCO shall be operable and at least one reactor coolant or shutdown cooling loop shall be in operation while in Mode 4. Unit 2 LCO 3.4.1.3 states that at least two of the loops/trains listed in the LCO shall be operable and at least one Reactor Coolant and/or shutdown cooling loop shall be in operation while in Mode 4. The Reactor Coolant System loops consist of the reactor vessel; two parallel heat transfer loops, each containing one steam generator and two reactor coolant pumps; a pressurizer connected to one of the reactor vessel outlet pipes; and associated piping. Water flows from the reactor vessel into a hot leg, either into a steam generator or a shutdown cooling system where it is cooled, and is returned to the reactor vessel via one or more of the cold legs. The flow rate must be sufficient to both cool the core and to ensure good boron mixing.

This TS requires that two loops or trains consisting of any combination of reactor coolant system cooling loops or shutdown cooling trains shall be operable and at least one loop or train shall be in operation to provide forced flow in the reactor coolant system for decay heat removal and to

mix boron. ACTION b addresses the condition when the two shutdown cooling trains are inoperable. In that condition, the TS recognizes that in Cold Shutdown (Mode 5), shutdown cooling operation is not possible and continued Hot Shutdown (Mode 4) operation is allowed until the condition may be exited.

Condition B of STSs, Revision 2 and Required Action A.2 of STSs, Revision 3 are concerned with the unavailability of forced circulation in two reactor coolant system loops and the inoperability of one train of shutdown cooling. Upon failure to satisfy the LCO, the current STSs would have the plant placed in Mode 5. St. Lucie TSs have a similar requirement.

The requested change reflects the risk of Mode 5 operation with one shutdown cooling system train inoperable and two reactor coolant system loops not in operation. The change will allow heat removal to be achieved in Mode 4 using either shutdown cooling or, if available, the steam generators with reactor coolant system/core heat removal driven by natural convection flows. Reactivity concerns are addressed by requiring natural circulation prior to reactor coolant pump restart. Furthermore, if unavailability of reactor coolant system loops is caused by the unavailability of a single shutdown cooling train, staying in a state with minimal reliance on shutdown cooling (i.e., Mode 4) is preferred because of the diversity in reactor coolant system heat removal modes during Mode 4 operation.

3.3.2 ACTIONS a.3 and b of LCO 3.6.1.3 of TS 3/4.6.1.3

ACTION a.3 of Units 1 and 2 LCO 3.6.1.3 states:

> Otherwise, be in at least HOT STANDBY within the next six hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> Otherwise, be in at least HOT STANDBY within the next six hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION b of Units 1 and 2 LCO 3.6.1.3 states:

> With the containment airlock inoperable, except as the result of an inoperable air lock door, maintain at least one air lock door closed; restore the inoperable air lock to OPERABLE status 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 licensee proposed to the following changes shown in bolded text:

> With the containment airlock inoperable, except as the result of an inoperable air lock door, maintain at least one air lock door closed; restore the inoperable air lock to OPERABLE status within 24 hours or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

Containment air locks provide a controlled personnel passage between outside and inside the containment building with inner and outer doors and door seals with a small compartment between the inner and outer doors. In its letter dated April 20, 2016, the licensee states:

> Two personnel air locks are provided. These are welded steel assemblies with two double gasketed doors in series. Provision is made to pressurize the space between the gaskets for leak testing. The doors are mechanically interlocked to ensure that one door cannot be opened until the second door is sealed.

The LCO states that each containment air lock shall be OPERABLE with certain conditions in Modes 1, 2, 3, and 4. The operability of the containment air locks is defined to ensure that leakage rates, as defined in TS 3/4.6.1.2, "Containment Systems – Containment Leakage," will not exceed permissible values in accordance with the Containment Leakage Rate Testing Program in TS 6.8.4.h. These TSs are entered when containment leakage is within limits but some portion of the containment isolation function is impaired. The staff evaluated the proposed changes to TS 3/4.6.1.3 for the appropriate action end state for extended repair of an inoperable air lock when air lock doors are not functional. Changes to the TSs are only requested for conditions when containment leakage is not expected to exceed that allowed in TS 3/4.6.1.2. This means that the containment air locks must still be functional under expected conditions during Mode 4 operation.

The NRC staff addressed Mode 4 versus Mode 5 operation in Sections 3 and 4 of the model SE for TSTF-422, Revision 2, and concludes that there is essentially no benefit in moving to Mode 5 under many conditions, including this condition. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the transition to the shutdown cooling system.

3.3.3 The ACTION of LCO 3.6.1.4 of TS 3/4.6.1.4

The ACTION for Units 1 and 2 LCO 3.6.1.4 states:

> With the containment internal pressure outside the limits above, restore the internal pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With the containment internal pressure outside the limits above, restore the internal pressure to within the limits within 1 hour or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The LCO states that primary containment internal pressure shall be maintained between specified limits during Modes 1, 2, 3, and 4. These limits ensure that the containment structure does not exceed its design negative pressure differential with respect to the annulus

atmosphere of 0.70 pounds per square inch and that containment peak pressure does not exceed the design pressure of 44 pounds per square inch gauge during LOCA conditions.

The upper limit on containment pressure in this LCO results from containment designed to respond to Mode 1 design basis accidents while remaining well within the structural material elastic response capabilities. This effectively maintains the containment design pressure about a factor of two or more below the minimum containment failure pressure. Consequently, small containment pressure challenges at the design basis pressure have a negligible potential of threatening containment integrity.

The vacuum lower limit on containment pressure is typically set in the plant design basis and ensures the ability of the containment to withstand an inadvertent actuation of the containment spray system. The model SE states that the lower limit is of particular concern to plants with steel shell containment designs. Plants with steel containment control the impact of inadvertent containment spray system actuation via the use of vacuum breakers. The containment is comprised of a steel containment vessel surrounded by a reinforced concrete shield building. The model SE for TSTF-422, Revision 2, as well as WCAP 16364-NP, state that all plants should secure one containment spray system pump when entering this action statement for violation of the low containment pressure limit for a period projected to exceed 1 day. The licensee provided a regulatory commitment in its application to follow the guidance in WCAP 16364-NP upon approval and implementation of these amendments. Section 3.5 of this SE has more information on the licensee's regulatory commitments.

The NRC staff has addressed Mode 4 versus Mode 5 operation in the model SE for TSTF-422, Revision 2 and concludes that there is essentially no benefit in moving to Mode 5 under many conditions, including this condition. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the transition to the shutdown cooling system.

3.3.4 The ACTION of LCO 3.6.1.5 of TS 3/4.6.1.5

The ACTION for Unit 1 LCO 3.6.1.5 states:

> With the containment average air temperature > 120°F, reduce the average air temperature to within the limit within 8 hours, or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With the containment average air temperature > 120°F, reduce the average air temperature to within the limit within 8 hours, or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The ACTION for Unit 2 LCO 3.6.1.5 states:

> With the containment average air temperature greater than 120°F, reduce the average air temperature to within the limit within 8 hours, or be in at least HOT

STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

With the containment average air temperature greater than 120°F, reduce the average air temperature to within the limit within 8 hours, or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The LCO states that primary containment average air temperature shall not exceed 120 °F in Modes 1, 2, 3, and 4. The containment air temperature systems ensure that the peak containment vessel temperature does not exceed the containment vessel design temperature during steam line break and LOCA conditions.

The upper limit on containment temperature is based on Mode 1 design basis analyses for containment structures and equipment qualification. The Mode 4 energy release is less than the maximum that could occur in Mode 1 and, consequently, initial Mode 4 post-accident containment temperature will be below the containment temperature limit employed in the plant design basis. Thus, temporary operation outside the limits specified in the LCO would not be expected to challenge containment integrity.

The NRC staff addressed Mode 4 versus Mode 5 operation in the model SE for TSTF-422, Revision 2, and concluded there is essentially no benefit in moving to Mode 5 under many conditions, including this condition. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the alignment of the shutdown cooling system.

3.3.5 ACTION d of LCO 3.6.3.1 (Unit 1) and LCO 3.6.3 (Unit 2) of TS 3/4.6.3

The ACTION of Unit 1 LCO 3.6.3.1 states:

With one or more isolation valve(s) inoperable, either: [...]
d. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

With one or more isolation valve(s) inoperable, either: [...]
d. Be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The ACTION of Unit 2 LCO 3.5.3 states:

> With one or more containment isolation valve(s) inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and either: ...
> d. Be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With one or more containment isolation valve(s) inoperable, maintain at least one isolation valve OPERABLE in each affected penetration that is open and either: ...
> d. Be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The LCO states that the containment isolation valves shall be operable in Modes 1, 2, 3, and 4. St. Lucie containment isolation valves ensure that the containment atmosphere will be isolated from the outside environment in the event of a release of radioactive material to the containment atmosphere or pressurization of the containment. Containment isolation within the time limits specified ensures that the release of radioactive material to the environment will be consistent with the assumptions used in the analyses for a LOCA. In its letter dated April 20, 2016, the licensee states:

> Lines which connect directly to the containment atmosphere and are not used to mitigate the effects of a LOCA are provided with two valves in series. Except for the shutdown cooling lines, each line that penetrates the reactor containment and is neither part of the reactor coolant pressure boundary nor connected directly to the containment atmosphere has at least one containment isolation valve located outside the containment as close to the containment as practical.

Operability of the containment isolation valves ensures that leakage rates will not exceed permissible values. The ACTION statement for this LCO is entered when containment leakage is within limits but some portion of the containment isolation function is impaired (e.g., one valve in a two valve path is inoperable, or containment purge valves have leakage in excess of TS limits). The staff evaluated the proposed changes to this TS for the appropriate ACTION/end state for extended repair of an inoperable containment isolation valve when one containment isolation valve in a single line is inoperable.

The NRC staff addressed Mode 4 versus Mode 5 operation in the model SE for TSTF-422, Revision 2 and concluded there is essentially no benefit in moving to Mode 5 under many conditions, including this condition. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the alignment of the shutdown cooling system.

3.3.6 The ACTION of LCO 3.6.6.2 of TS 3/4.6.6.2

The ACTION for Units 1 and 2 LCO 3.6.6.2 states:

> Without SHIELD BUILDING INTEGRITY, restore SHIELD BUILDING INTEGRITY 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 licensee proposed the following changes shown in bolded text:

> Without SHIELD BUILDING INTEGRITY, restore SHIELD BUILDING INTEGRITY within 24 hours or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The shield building is a reinforced concrete structure of right cylinder configuration with a shallow dome roof surrounding the containment vessel. An annular space of approximately 4 feet is provided between the containment vessel and the interior face of the concrete shield building. The design of the shield building provides for biological shielding, controlled release of the annulus atmosphere under accident conditions, and environmental protection of the containment vessel. The shield building ventilation system maintains a slight negative pressure in the shield building annulus following a LOCA, and mixes shield building inleakage with the air in the annulus and with any leakage from the containment and discharges it through a filter train, which includes charcoal adsorbers.

The LCO states that shield building integrity shall be maintained in Modes 1, 2, 3, and 4. The LCO considers the limited leakage design of the containment and the probability of an accident occurring during the transition from Mode 1 to Mode 5. The purpose of maintaining shield building operability is to ensure that the release of radioactive material from the primary containment atmosphere is restricted to those leakage paths and associated leakage rates assumed in the accident analysis. The shield building functions as a fission product barrier. The TSs place restrictions on containment air locks and containment isolation valves. The integrated effect of these TSs is intended to ensure that containment leakage is controlled to meet 10 CFR Part 100 limits following a maximum hypothetical event initiated from full power.

Shield building leakage at or near containment design basis levels is not explicitly modeled in the PRA. The PRA implicitly assumes that containment gross integrity must be available. In the Level 2 model, containment leakage is not considered to contribute to LERF even without a shield building. If accidents occurred in Mode 4, the resulting initial containment pressures would be less than the design basis analysis conditions, and the shield building would be available to further limit releases. When the action statement of this TS can no longer be met, the plant must be shut down and transitioned to Mode 5.

Inoperability of the shield building during Mode 4 implies leakage rates in excess of permissible values. Containment conditions following a LOCA in Mode 4 may result in containment pressures somewhat higher than in Mode 5, but since containment leakage is controlled by the Containment Leakage Rate Testing Program in TS 6.8.4, and major leak paths should be isolable, there should be no contribution to an increased LERF.

Accidents initiated from Mode 4 are initially less challenging to the containment than those initiating from Mode 1. Furthermore, by having the plant in a shutdown condition in advance, fission product releases should be reduced. Thus, while leakage restrictions should be maintained in Mode 4, a condition in excess of that allowed in Mode 1 is anticipated to meet overall release requirements and, therefore, Mode 4 should be allowed to effect repair of the leak and then return the plant to power operation.

The NRC staff addressed Mode 4 versus Mode 5 operation in the model SE for TSTF-422, Revision 2 and concluded there is essentially no benefit in moving to Mode 5 under many conditions, including this condition. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the alignment of the shutdown cooling system.

3.3.7 The ACTION of LCO 3.7.3.1 (Unit 1) and LCO 3.7.3 (Unit 2) of TS 3/4.7.3

The ACTION for Unit 1 LCO 3.7.3.1 and Unit 2 LCO 3.7.3 states:

> With only one component cooling water loop OPERABLE, restore at least two loops 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 licensee proposed the following changes shown in bolded text:

> With only one component cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The component cooling water systems are designed to provide a heat sink for auxiliary systems under normal operating and shutdown conditions and provide a heat sink for safety related components associated with reactor decay heat removal for safe shutdown or LOCA conditions. Component cooling water is one of the support systems that is required to be operable or to function to secure and maintain the reactor in a hot shutdown condition and bring it to cold shutdown. The LCO states that at least two independent component cooling water loops shall be operable in Modes 1, 2, 3, and 4. Operability of the component cooling water system would ensure that sufficient cooling capacity is available for continued operation of safety-related equipment during normal and accident conditions.

The redundant cooling capacity of this system, assuming a single failure, is consistent with the assumptions used in the safety analyses. In the event of a design basis accident, one train of component cooling water is required to provide the minimum heat removal capability assumed in the safety analysis for systems to which it supplies cooling water. The component cooling water system provides heat removal capability to the containment fan coolers, containment spray, and shutdown cooling. In addition, component cooling water provides cooling to the reactor coolant pumps seals. Other safety components may be cooled via component cooling water component flow paths. From an end state perspective, upon loss of part of the

component cooling water, the plant should normally transition to a state where reliance on the component cooling water system is least significant.

For conditions where component cooling water flow is lost to the reactor coolant pump seals, reactor shutdown is required, and the actions for operating reactor coolant system loops are entered. Limited duration natural circulation operation is acceptable, but extended plant operation in the higher Mode 4 temperatures may degrade reactor coolant pump seal elastomers. Mode 5 operation ensures adequately low reactor coolant system temperatures so that reactor coolant pump seal challenges would be avoided. Therefore, use of the modified Mode 4 end state may not always be appropriate. Prior to entry into Mode 5 from a loss of component cooling water to reactor coolant pump seals, the redundant component cooling water train should be confirmed operable, and backup cooling water systems should be confirmed for emergency use. Steam generator inventory is retained to assure a diverse and redundant heat removal source if component cooling water should fail. As discussed in Section 3.5 of this SE, the licensee committed to an implementation guide that describes compensatory actions.

3.3.8 The ACTION of LCO 3.7.4.1 (Unit 1) and LCO 3.7.4 (Unit 2) of TS 3/4.7.4

The ACTION for Unit 1 LCO 3.7.4.1 and Unit 2 LCO 3.7.4 states:

> With only one intake cooling water loop OPERABLE, restore at least two loops 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 licensee proposed the following changes shown in bolded text:

> With only one intake cooling water loop OPERABLE, restore at least two loops to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The LCO states that at least two independent intake cooling water loops shall be operable in Modes 1, 2, 3, and 4. The intake cooling water system provides a heat sink for the component cooling, turbine cooling, and steam generator open blowdown systems under normal operating and shutdown conditions and a heat sink for the component cooling system under accident conditions. The intake cooling water system also supports the shutdown cooling system. The intake cooling water system provides emergency makeup to the component cooling water system. A loss of one intake cooling water system train will degrade the plant's capability to remove heat via the affected shutdown cooling heat exchanger. In this case, a Mode 4 end state with the reactor coolant system on steam generator heat removal is preferred to Mode 5 with the reactor coolant system on shutdown cooling heat removal.

One intake cooling water pump and one essential header are required to remove the post-accident heat load from one component cooling water heat exchanger. Each component cooling water heat exchanger is capable of post-accident heat removal duty. Two redundant full capacity essential headers and three full-capacity pumps are provided, and one pump and

one header for each component cooling water heat exchanger is provided to assure adequate cooling capability if one system fails.

The intake cooling water system is required to support shutdown cooling when the plant is in Mode 4 or in Mode 5. Therefore, in conditions in which the other intake cooling water system train is inoperable, the one operable intake cooling water system train must continue to function. The intake cooling water system is one of the support systems that is required to be operable or to function to secure and maintain the reactor in a hot shutdown condition and bring it to cold shutdown.

Operation in Mode 4 with the steam generators available provides a decay heat removal path that is not directly dependent on the intake cooling water system, although there are some long term concerns such as reactor coolant pump seal cooling. The proposed Mode 4 end state generally results in plant conditions where reliance on the intake cooling water system is least significant. As discussed in Section 3.5 of this SE, the licensee committed to an implementation guide in which compensatory actions will be contained.

3.3.9 ACTIONS a, b, d, and g (MODES 1, 2, 3 and 4) of LCO 3.7.7.1 of Unit 1 TS 3/4.7.7 and ACTIONS a, b, and c (MODES 1, 2, 3, and 4) of Unit 2 TS 3/4.7.7

ACTION a (Modes 1, 2, 3, and 4) of Unit 1 LCO 3.7.7.1 states:

> With one booster fan inoperable, restore the inoperable fan to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With one booster fan inoperable, restore the inoperable fan to OPERABLE status within 7 days or be in at least-HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION b (Modes 1, 2, 3, and 4) of Unit 1 LCO 3.7.7.1 states:

> With one isolation valve per air duct inoperable, operation may continue provided the other isolation valve in the same duct is maintained closed; otherwise, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With one isolation valve per air duct inoperable, operation may continue provided the other isolation valve in the same duct-is maintained closed; otherwise, be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION d (Modes 1, 2, 3, and 4) of Unit 1 LCO 3.7.7.1 states:

> With only one air conditioning unit OPERABLE, restore at least two air conditioning units to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With only one air conditioning unit OPERABLE, restore at least two air conditioning units to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION g (Modes 1, 2, 3, and 4) of Unit 1 LCO 3.7.7.1 states:

> With the filter train inoperable due to an inoperable Control Room Envelop boundary:
> 1. Immediately initiate actions to implement mitigating actions, and
> 2. Within 24 hours, verify mitigating actions to ensure Control Room Envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits, and
> 3. Restore Control Room Envelope boundary to OPERABLE status within 90 days.
>
> With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> [...] With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION a (Modes 1, 2, 3, and 4) of Unit 2 LCO 3.7.7 states:

> With one control room emergency air cleanup system inoperable for reasons other than an inoperable Control Room Envelope boundary, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With one control room emergency air cleanup system inoperable for reasons other than an inoperable Control Room Envelope boundary, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT

STANDBY within 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION b (Modes 1, 2, 3, and 4) of Unit 2 LCO 3.7.7 states:

With one or more control room emergency air cleanup systems inoperable due to an inoperable Control Room Envelop boundary:
1. Immediately initiate actions to implement mitigating actions, and
2. Within 24 hours, verify mitigating actions to ensure Control Room Envelope occupant exposures to radiological, chemical, and smoke hazards will not exceed limits, and
3. Restore Control Room Envelope boundary to OPERABLE status within 90 days.

With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

[...] With the above requirements not met, be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION c (Modes 1, 2, 3, and 4) of Unit 2 LCO 3.7.7 states:

With an isolation valve in an air intake duct or air exhaust duct inoperable, operation may continue provided the other isolation valve in the same air intake or air exhaust duct is maintained closed; otherwise be in at least HOT STANDBY in the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

With an isolation valve in an air intake duct or air exhaust duct inoperable, operation may continue provided the other isolation valve in the same air intake or air exhaust duct is maintained closed; otherwise be in at least HOT STANDBY in the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

In its letter dated April 20, 2016, the licensee states:

St. Lucie 1: The control room ventilation system consists of split system air conditioners (i.e., an indoor and outdoor section), a ducted air intake and air distribution system, and a filter train with HEPA [High Efficiency Particulate Air] filters and charcoal absorbers with two redundant booster centrifugal fans. The Control Room Ventilation System removes potentially radioactive particulates and iodine from the Control Room during the Post-LOCA operating mode using a HEPA filter, charcoal adsorber, and control room emergency ventilation booster fans.

> St. Lucie 2: The Control Room Emergency Cleanup System removes potentially radioactive particulates and iodine from the control room air during the post-LOCA operating mode. Each unit consists of a roughing filter, HEPA prefilter, charcoal adsorber, HEPA after filter and fan. The system operates along with the [Control Room Air Conditioning] system post-LOCA to maintain a positive control room pressure. The systems contain three redundant air conditioning and two redundant air cleaning trains, with separate power supplied for each train.
>
> CONCLUSION: The St. Lucie control room emergency ventilation systems are similar to the CREACUS [Control Room Emergency Air Cleanup System] considered in the SE for CE NPSD-1186. [The St. Lucie Unit 1 system contains a single filter train.] As noted in the SE, this TS is applicable to all plants.

The LCOs state that control room emergency ventilation systems (for Unit 1) or two independent CREACSs (for Unit 2) shall be operable in all Modes of operation or during movement of irradiated fuel assemblies. The control room emergency ventilation systems provide a protected environment from which operators can control the plant following an uncontrolled release of radioactivity, chemicals, or toxic gas. The TSs require operability of the systems from Mode 1 through 4 to support operator response to a design basis accident. Operability in Mode 5 and 6 is also required during movement of fuel assemblies. The systems are needed to protect the control room in a wide variety of circumstances. Plant operation in the presence of degraded control room emergency ventilation systems should be based on placing the plant in a state that poses the lowest plant risk.

Outage planning should ensure that the plant staff is aware of the system inoperability, that respiratory units and control room pressurization systems are available, that operational and leakage pathways are properly controlled, and that alternate shutdown panels and local shutdown stations are available. As discussed in Section 3.5 of this SE, the licensee committed to an implementation guide in which compensatory actions will be described.

The NRC staff addressed Mode 4 versus Mode 5 operation in its model SE for TSTF-422, Revision 2 and concluded there is essentially no benefit in moving to Mode 5 under many conditions, including this condition. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the alignment of the shutdown cooling system.

3.3.10 The ACTION of LCO 3.7.8.1 (Unit 1) and LCO 3.7.8 (Unit 2) of TS 3/4.7.8

The ACTION of Unit 1 LCO 3.7.8.1 states:

> With one ECCS area exhaust air filter train inoperable, restore the inoperable train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With one ECCS area exhaust air filter train inoperable, restore the inoperable train to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The ACTION of Unit 2 LCO 3.7.8 states:

> With one ECCS area ventilation system inoperable, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With one ECCS area ventilation system inoperable, restore the inoperable system to OPERABLE status within 7 days or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

The LCOs state that two independent ECCS area exhaust air filter trains (for Unit 1), or area ventilation systems (for Unit 2), shall be operable in Modes 1, 2, 3, and 4. The ECCS area ventilation system is designed to provide post-LOCA filtration and adsorption of fission products in the exhaust air from certain areas of the reactor auxiliary building.

The Staff's model SE for CE NPSD-1186 contains justification for STS LCO 3.7.13, "ECCS pump room exhaust air cleanup system (ECCS PREACS) and the ESF [Engineered Safety Feature] pump room exhaust air cleanup system (ESF PREACS)." In its letter dated April 20, 2016, the licensee states:

> The St. Lucie ECCS area ventilation system is equivalent to that considered in the SE for CE NPSD-1186. As specifically noted in the SE, this TS is applicable to St. Lucie 1 & 2.

According to the staff's SE for CE NPSD-118, the CEOG bounded the short term need for the PREACS by assuming: (1) the frequency of Mode 4 LOCAs requiring recirculation is bounded by 0.0001 per year, (2) the probability of a significant leak into the ECCS pump room is about 0.1, and (3) the probability that the backup system is unavailable is 0.1. The probability that the system will be needed over a given repair interval assumed at 7 days (or 0.0192 years) becomes 0.0001 times 0.10 times 0.10 times 0.0192, which equals 1.92 times 10^{-8}. According to the staff's SE for CE NPSD-1186, the CEOG failed to address potential operator errors in arriving at this estimate. However, the bounding nature of the CEOG estimate and its sensitivity study appear to be sufficient to demonstrate that this failure will not significantly influence the conclusion. Consequently, the NRC staff concludes that this is a reasonable assessment.

The ECCS area ventilation system is a post-accident mitigation system that is expected to have little or no impact on CDF. The NRC staff addressed Mode 4 versus Mode 5 operation in its

model SE for TSTF-422, Revision 2 and concluded there is essentially no benefit in moving to Mode 5 under many conditions. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the alignment of the shutdown cooling system.

3.3.11 ACTIONS a, b, c, and e of LCO 3.8.1.1 of TS 3/4.8.1

ACTION a of Units 1 and 2 LCO 3.8.1.1 states:

> With one offsite circuit of 3.8.1.1.a inoperable [...]. Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> [...] Restore the offsite circuit to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION b of Units 1 and 2 LCO 3.8.1.1 states:

> With one diesel generator of 3.8.1.1.b inoperable [...]; restore the diesel generator to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours [...].

The licensee proposed the following changes shown in bolded text:

> With one diesel generator of 3.8.1.1.b inoperable [...]; restore the diesel generator to OPERABLE status within 14 days or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN** [...].

ACTION c of Units 1 and 2 LCO 3.8.1.1 states:

> With one offsite A.C. circuit and one diesel generator inoperable [...]. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours [...].

The licensee proposed the following changes shown in bolded text:

> With one offsite A.C. circuit and one diesel generator inoperable [...]. Restore at least one of the inoperable sources to OPERABLE status within 12 hours or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN** [...].

ACTION e of Units 1 and 2 LCO 3.8.1.1 states:

> With two of the above required diesel generators inoperable [...]; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in the [*sic*] at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours [...].

The licensee proposed the following changes shown in bolded text:

> With two of the above required diesel generators inoperable [...]; restore one of the inoperable diesel generators to OPERABLE status within 2 hours or be in the [*sic*] at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN** [...].

In its letter dated April 20, 2016, the licensee states:

> The normal source of auxiliary ac power for plant start-up or shutdown is from the incoming off-site transmission lines through the plant switchyard and start-up transformers. In the event of a complete loss of the normal offsite ac power sources, station on-site emergency ac power system will be supplied by the on-site emergency diesel generators (EDGs) and station batteries. In the event that all offsite and onsite power sources fail, except for one Unit 2 EDG, power will be transferred from the only operating Unit 2 EDG to one of the Unit 1 4.16 KV [kilovolt] Class 1E distribution buses via the station blackout cross-tie. In the event of a total loss of AC power, and a loss of one EDG on St. Lucie Unit 1, power can be provided to one of the Unit 2 Class 1E redundant divisions from the only available site EDG set. The power will be transferred via a cross-tie connecting the safety-related swing switchgear of the two units.
>
> CONCLUSION: The St. Lucie AC sources are equivalent to those considered in the SE for CE NPSD-1186. As noted in the SE, this TS is applicable to all plants.

The LCO states, in part, that as a minimum, the following A.C. electrical power sources shall be OPERABLE in Modes 1, 2, 3, and 4: (1) two physically independent circuits between the offsite transmission network and the onsite Class 1E distribution system, and (2) two separate and independent diesel generators each with engine-mounted fuel tanks, a separate fuel storage system, and a separate fuel transfer pump.

During Mode 4 with the steam generators available, plant risk is dominated by a loss of offsite power (LOOP) initiating event. If a LOOP were to occur during degraded AC power system conditions, the number of redundant and diverse means available for removing heat from the reactor coolant system may vary, depending upon the cause of the degradation. If entry into the LCO action statements resulted from inoperability of both onsite AC sources (i.e., EDGs) followed by LOOP, a station blackout event will occur. For this event, the steam generator inventory may be sufficient for several hours of reactor coolant system cooling without

feedwater, and the turbine driven auxiliary feedwater pump, which does not rely on the AC power sources to operate, should be available if needed. There should also be time to start any available alternate AC power supplies, such as blackout diesels.

Table 2, "Good Practice/Considerations for Remaining in Mode 4," of WCAP-16364-NP provides the following guidance for a Mode 4 end state associated with LCO 3.8.1.1: (1) switchyard activities, other than those necessary to restore power, should be prohibited while AC power sources are degraded, and (2) in order to properly utilize the turbine driven auxiliary feedwater pumps, the steam generator pressure should be maintained above the minimum recommended pressure required to operate the turbine driven auxiliary feedwater system. As discussed in Section 3.5 of this SE, the licensee provided a regulatory commitment to follow the guidance of WCAP-16364 upon approval and implementation of these amendments.

The NRC staff addressed Mode 4 versus Mode 5 operation in its model SE for TSTF-422, Revision 2 and concluded there is essentially no benefit in moving to Mode 5 under many conditions. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the transition to the shutdown cooling system. In the case of a degraded AC power capability, the likelihood of losing shutdown cooling is increased, and the NRC staff concludes that the plant should be placed in a condition (generally, Mode 4 with steam generator cooling) that maximizes the likelihood of avoiding a further plant upset of loss of reactor coolant system cooling.

3.3.12 ACTION a of LCO 3.8.2.3 of Unit 1 TS 3/4.8.2.3 and LCO 3.8.2.1 of Unit 2 TS 3/4.8.2

ACTION a of Unit 1 LCO 3.8.2.3 states:

> With one of the required battery banks or busses inoperable, restore the inoperable battery bank or bus to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With one of the required battery banks or busses inoperable, restore the inoperable battery bank or bus to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

ACTION a of Unit 2 LCO 3.8.2.1 states:

> With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

The licensee proposed the following changes shown in bolded text:

> With one of the required battery banks inoperable, restore the inoperable battery bank to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN.**

In its letter dated April 20, 2016, the licensee states:

> St. Lucie 1 & 2: Power is provided at 125 volts dc (ungrounded) for plant control and instrumentation and for operation of dc motor operated equipment such as valve operators and emergency lube oil pumps. As for the 4.16 kV and 480 volt ac emergency systems, the 125 volt dc system is arranged into two main redundant load groups A and B and a third service or swing load group AB. Load groups A and B are each capable of supplying the minimum dc power requirements to safely shut down the plant and/or mitigate the consequences of a LOCA.
>
> Redundant 120 volt ac single phase instrument buses provide power to essential instrumentation. Each bus is supplied separately from an inverter connected to one of the two Class 1E 125 volt dc buses.

Unit 1 LCO 3.8.2.3 and Unit 2 LCO 3.8.2.1 state that as a minimum the following D.C. electrical sources shall be OPERABLE in Modes 1, 2, 3, and 4: (a) 125-volt D.C. bus No. 1A (Unit 1), or 2A (Unit 2), 125-volt Battery bank No. 1A (Unit 1 only), and a full capacity charger; and (b) 125-volt D.C. bus No. 1B (Unit 1), or 2B (Unit 2), 125-volt Battery bank No. 1B (Unit 1 only), and a full capacity charger.

DC power sources have sufficient capacity for steady state operation of connected loads during Modes 1, 2, 3, and 4, while at the same time maintaining the battery banks fully charged. Each battery charger has sufficient capacity to restore the battery to its fully charged state within a specified time period while supplying power to connected loads. The DC sources are required to be operable during Modes 1, 2, 3, and 4 and connected to the associated DC buses. Mode 5 is the current end state for not restoring an inoperable DC electrical subsystem to operable status within 2 hours.

If a DC electrical power subsystem is inoperable during Mode 4, plant risk is dominated by LOOP events. Such an event with concurrent failure of the unaffected EDG can progress to a station blackout. These events challenge the capability of the engineered safeguards systems to remove heat from the reactor coolant system. Entry into Mode 4 as the end state when an inoperable DC electrical power subsystem cannot be restored to operability within 2 hours provides the plant staff with several resources. For station blackout cases with one DC power source continuing to operate, the turbine driven auxiliary feedwater pump is available for reactor coolant system heat removal when steam pressure is adequate. If this pump becomes unavailable, such as if the other DC sources were lost and the turbine-driven auxiliary feedwater pump could not be satisfactorily operated locally, the lack of reactor coolant system heat removal initiates a boil down of the steam generator inventory. Boil off of steam generator inventory and a certain amount of reactor coolant system inventory must both occur in order to

uncover the core. Under this condition, the plant operators have significant time to accomplish repair and/or recovery of offsite or onsite power. According to the St. Lucie Updated Final Safety Analysis Reports (UFSARs), the units can successfully withstand a Station Blackout event for at least 4 hours. After 4 hours, either offsite power is restored or one or both EDGs are started, thus terminating the event. Per the UFSAR, the results of the analysis show that after Station Blackout, the plant is in a condition from which recovery from the Station Blackout is achievable.

The NRC staff has addressed Mode 4 versus Mode 5 operation in its model SE for TSTF-422, Revision 2 and concludes that there is essentially no benefit in moving to Mode 5 under many conditions, including those applicable here. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because additional risk benefits are realized by averting the risks associated with the transition to the shutdown cooling system. As described in Section 3.5 of this SE, the licensee provided a regulatory commitment to follow the guidance of WCAP-16364 upon approval and implementation of these amendments. WCAP-16364 is an implementation guide for TSTF-422, Revision 2, and contains compensatory actions and considerations for remaining in Mode 4.

3.3.13 ACTION b(2) of LCO 3.8.3.1 of Unit 2 TS 3/4.8.3

ACTION b of Unit 2 LCO 3.8.3.1 states:

> With one A.C. Instrument Bus either not energized from its associated inverter, or with the inverter not connected to its associated D.C. Bus: [...] (2) re-energize the A.C. Instrument Bus 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 licensee proposed the following changes shown in bolded text:

> With one A.C. Instrument Bus either not energized from its associated inverter, or with the inverter not connected to its associated D.C. Bus: [...] (2) re-energize the A.C. Instrument Bus 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 **HOT SHUTDOWN within the following 6 hours. LCO 3.0.4.a is not applicable when entering HOT SHUTDOWN**.

The LCO states that the electrical busses listed in the LCO shall be energized in the specified manner with both tie breakers open between redundant busses and between St. Lucie Unit 1 and Unit 2 during Modes 1, 2, 3, and 4. Per the St. Lucie Unit 2 UFSAR, the Onsite Power Distribution System receives power from either the preferred (offsite) power system (Section 8.2) or from the standby power system (safety related), which consists of two EDGs, 2A and 2B. Each EDG set is rated at 3685 kilowatts, 0.8 power factor, 4.16 kV and is complete with its own air starting system, fuel supply system, and automatic control circuitry.

The Unit 2 UFSAR states that four pairs of redundant 120 volt ac single phase ungrounded instrument buses (i.e., 2MA, 2MA-1, 2MB, 2MB-1, 2MC, 2MC-1, 2MD, and 2MD-1) provide uninterruptible power to Engineered Safety Features Actuation System (ESFAS) and Reactor

Protective System (RPS) instrumentation. Each bus is supplied separately from an inverter connected to one of the two safety related 125 volt dc panels. An operable inverter requires the associated vital bus to be powered by the inverter and have output voltage and frequency within the acceptable range. In order to be operable, the inverter must also be powered from the associated station battery. Per the UFSAR, to permit maintenance of any inverter without disabling the corresponding instrument bus, maintenance bypass transformers and voltage regulators are provided for each inverter system. This design feature ensures that the redundancy incorporated in the design of the RPS and ESFAS is maintained.

The inverters provide an uninterruptible source of power – provided that the station batteries are operable – to the vital buses even if the 4.16 kV ESFAS buses are not energized. Per the UFSAR, upon a loss of the preferred power source, the tie breakers between the nonsafety and safety buses automatically open, and the emergency diesel generators automatically start, are brought to speed and begin supplying power directly to the emergency buses. Furthermore, entry into the LCO required action statement implies that the redundancy of the inverters has been degraded.

The inoperability of a single inverter during Mode 4 operation will have little or no impact on plant risk. The inoperable inverter causes a loss of power to the associated bistable channel of the RPS. Since reactor trip will have been accomplished as part of the shutdown prior to reaching Mode 4, loss of one inverter will not impact reactor trip. An inoperable inverter also causes a loss of power to one of the four ESFAS trip paths. This single condition should not impact the ability of the ESFAS to perform its function.

The NRC staff addressed Mode 4 versus Mode 5 operation in its model SE for TSTF-422, Revision 2 and concluded there is essentially no benefit in moving to Mode 5 under many conditions. There is also a potential benefit to remaining in Mode 4 on steam generator heat removal because addition risk benefits are realized by averting the risks associated with the alignment of the shutdown cooling system.

3.4 Assessment of Proposed Variations and Deviations from TSTF-422

The licensee proposed variations and deviations from TSTF-422, Revision 2. These variations and deviations stem from plant-specific differences from the STSs on which TSTF-422, Revision 2 is based. In addition, the licensee stated that it was also deviating from the TSTF-422 model SE in that it was using RG 1.160 and NUMARC 93-01 instead of RG 1.182. Section 2 of this SE addresses this deviation and found it acceptable. The licensee also described some plant-specific design and system differences from the STSs.

The licensee stated that because the St. Lucie TSs have not been converted to the STSs of NUREG-1432, on which TSTF-422, Revision 2 is based, the layout of the TSs when compared to TSTF-422, Revision 2 differ significantly in format; however, the technical differences are minor. In addition, St. Lucie 1 and 2 are "analog" plants; therefore, only "analog" instrumentation STSs are applicable.

The licensee stated that the STSs use terms such as "Required ACTION" and "Completion Time" where the St. Lucie TSs use equivalent terms of "ACTION" and "Allowed Outage Time." While the St. Lucie 1 and 2 terms are maintained in the TSs for

consistency, the STSs and equivalent St. Lucie TS terms may be used interchangeably. The licensee stated these differences do not invalidate the applicability of TSTF-422, Revision 2 and the model SE to the St. Lucie TSs.

The licensee stated that changes may have required the movement of information from one TS page to another and that this difference does not invalidate the applicability of TSTF-422, Revision 2 and the model SE to the St. Lucie TSs.

The licensee stated that in general, the St. Lucie TSs use the MODE noun names (i.e., "HOT SHUTDOWN" in lieu of "MODE 4") and that the use of noun names does not invalidate the applicability of TSTF-422, Revision 2 and the model SE to the St. Lucie TSs.

The NRC staff concludes that these deviations and variations did not invalidate the applicability of TSTF-422, Revision 2 and the model SE to the St. Lucie TSs and do not affect the technical requirements and, therefore, are acceptable.

3.5 Regulatory Commitments

In its application dated August 31, 2015, the licensee provided the following regulatory commitments regarding the implementation of TSTF-422, Revision 2:

1. Upon implementation of the approved TS amendments, the licensee will modify the Technical Specification Bases for the revised specifications as adopted with the applicable license amendment.

2. On an ongoing basis, the licensee will follow the guidance established in Section 11 of NUMARC 93-01, Nuclear Management and Resource Council, Revision 4A, April 2011.

3. Upon implementation of the approved TS amendments, when TS required ACTION end state remains within the applicability of the TS, the licensee will follow the guidance established in WCAP-16364-NP, Revision 2, dated May 2010, with the exception that Section 11 of NUMARC 93-01, Revision 4A, will be utilized to meet 10 CFR 50.65(a)(4) requirements in lieu of NUMARC 93-01, Revision 3.

As stated in the NRC's Office of Nuclear Reactor Regulation Office Instruction, LIC-105, "Managing Commitments Made by Licensees to the NRC," Revision 6,[18] commitments made by a licensee in support of a license amendment are not legally binding; therefore, the NRC staff's SE should not rely on commitments as a basis for any part of the NRC staff's approval of a proposed amendment. However, the staff may rely on a commitment if it is escalated into an obligation (e.g., license condition) or subsequently incorporated into a mandated licensing basis document (e.g., UFSAR).

As discussed in this SE, the NRC staff has relied, in part, on the second and third commitment listed above as part of the NRC staff's acceptance of the proposed amendments. Consistent with the guidance in NRR Office Instruction LIC-105, and in LIC-101, "License Amendment

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[18] ADAMS Accession No. ML16119A302.

Review Procedures," Revision 4,[19] these actions, originally proposed as regulatory commitments, have been elevated to amendment implementation requirements for incorporation into the St. Lucie 1 and 2 UFSARs. As such, the NRC staff has added the following implementation requirements in the amendment issuance authority page to ensure that the UFSAR is revised as part of the amendment implementation:

> The license amendment is effective as of its date of issuance and shall be implemented within 60 days from the date of issuance. In addition, the licensee shall incorporate Commitment Nos. 2 and 3 listed in Section 3.5 of the safety evaluation associated with this amendment in the next periodic update of the St. Lucie Unit 1 [and Unit 2] Updated Final Safety Analysis Report, in accordance with 10 CFR 50.71(e).

The NRC staff notes that following incorporation of the commitments listed above into the St. Lucie 1 and 2 UFSARs, future UFSAR changes will be subject to the provisions of 10 CFR 50.59.

3.6 Summary

The NRC staff has reviewed the licensee's proposed adoption, with variations and deviations, of TSTF-422, Revision 2 to modify certain TS requirements to permit an end state of Mode 4 with the implementation of CE NPSD-1186-A, and concludes that the proposed changes are consistent with the approved TR and, therefore, are acceptable.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, on July 20, 2016, the NRC staff notified the State of Florida official (Ms. Cynthia Becker, M.P.H., Chief of the Bureau of Radiation Control, Florida Department of Health) of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

These amendments change inspection or surveillance requirements or requirements with respect to installation or use of facility components located within the restricted area as defined in 10 CFR Part 20. The NRC staff determined that the amendments involve no significant change in the types, or significant increase in, the amounts of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. By FR notice dated November 24, 2015 (80 FR 73237), the Commission previously issued a proposed finding that the amendments involve no significant hazards consideration, and there has been no public comment on these findings. Accordingly, the amendments meet the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendments.

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[19] ADAMS Accession No. ML113200053.

6.0 CONCLUSION

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

Principal Contributors: Ravinder Grover
Perry Buckberg
Audrey Klett

Date: August 30, 2016

The NRC staff's safety evaluation of the amendments is enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

/RA/

Perry H. Buckberg, Senior Project Manager
Plant Licensing Branch II-2
Division of Operator Reactor Licensing
Office of Nuclear Reactor Regulation

Docket Nos. 50-335 and 50-389

Enclosures:
1. Amendment No. 234 to DPR-67
2. Amendment No. 184 to NPF-16
3. Safety Evaluation

cc w/enclosures: Distribution via Listserv

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DATE	08/05/16	08/05/16	07/19/16	08/16/16
OFFICE	DORL/LPL2-2/BC (A)	DORL/LPL2-2/PM		
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DATE	08/30/16	08/30/16		

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