



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

July 9, 2018

Mr. Mano Nazar  
President, Nuclear Division  
and Chief Nuclear Officer  
Florida Power & Light Co.  
Mail Stop EX/JB  
700 Universe Blvd.  
Juno Beach, FL 33408

**SUBJECT: ST. LUCIE PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENTS  
REGARDING TECHNICAL SPECIFICATION CHANGES RELATED TO THE  
AUXILIARY FEEDWATER SYSTEM (CAC NOS. MG0237 AND MG0238;  
EPID L-2017-LLA-0296)**

Dear Mr. Nazar:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment Nos. 245 and 196 to Renewed Facility Operating License Nos. DPR-67 and NPF-16 for the St. Lucie Plant, Unit Nos. 1 and 2, respectively. These amendments consist of changes to the Technical Specifications (TSs) in response to Florida Power & Light Company's application dated September 14, 2017, as supplemented by letter dated February 14, 2018.

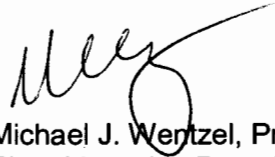
The amendments modify the St. Lucie Plant, Unit Nos. 1 and 2, TS 3.7.1.2, "Auxiliary Feedwater System," to add a new required action for an inoperable turbine-driven auxiliary feedwater (AFW) pump steam supply and add a new required action for an inoperable turbine-driven AFW pump steam supply concurrent with an inoperable motor-driven AFW pump.

M. Nazar

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

Sincerely,

A handwritten signature in black ink, appearing to read "Wentzel", with a long horizontal stroke extending to the right.

Michael J. Wentzel, 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. 245 to DPR-67
2. Amendment No. 196 to NPF-16
3. Safety Evaluation

cc: Listserv



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

FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-335

ST. LUCIE PLANT UNIT NO. 1

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 245  
Renewed License No. DPR-67

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Florida Power & Light Company (FPL, the licensee), dated September 14, 2017, as supplemented by letter dated February 14, 2018, 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, Renewed Facility Operating License No. DPR-67 is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and by amending paragraph 3.B to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 245, are hereby incorporated in the renewed license. FPL shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 90 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Booma Venkataraman, Acting Chief  
Plant Licensing Branch II-2  
Division of Operator Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Renewed Facility  
Operating License and  
Technical Specifications

Date of Issuance: July 9, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 245

ST. LUCIE PLANT UNIT NO. 1

RENEWED FACILITY OPERATING LICENSE NO. DPR-67

DOCKET NO. 50-335

Replace Page 3 of Renewed Facility Operating License No. DPR-67 with the attached revised Page 3.

Replace the following page of Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

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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. 245, are hereby incorporated in the renewed license. FPL shall operate the facility in accordance with the Technical Specifications.

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.

## **PLANT SYSTEMS**

### **AUXILIARY FEEDWATER SYSTEM**

#### **LIMITING CONDITION FOR OPERATION**

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- 3.7.1.2 At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:
- a. Two motor driven feedwater pumps, and
  - b. One feedwater pump capable of being powered from an OPERABLE steam supply system.

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

#### **ACTION:**

- a. With one auxiliary feedwater pump steam supply inoperable, restore the inoperable auxiliary feedwater pump steam supply 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.
- b. With one auxiliary feedwater pump inoperable, restore the auxiliary feedwater pump 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.
- c. With one auxiliary feedwater pump steam supply inoperable and one motor-driven auxiliary feedwater pump inoperable, either restore the inoperable auxiliary feedwater pump steam supply OR restore the inoperable motor-driven auxiliary feedwater pump 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.
- d. With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

#### **NOTE**

LCO 3.0.3 and all other LCO Actions requiring MODE changes are suspended until one AFW pump is restored to OPERABLE status.

- e. With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status.
- f. LCO 3.0.4.b is not applicable.

#### **SURVEILLANCE REQUIREMENTS**

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- 4.7.1.2 Each auxiliary feedwater pump shall be demonstrated OPERABLE:
- a. In accordance with the Surveillance Frequency Control Program by:



UNITED STATES  
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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. 196  
Renewed License No. NPF-16

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Florida Power & Light Company (FPL, the licensee), dated September 14, 2017, as supplemented by letter dated February 14, 2018, 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, Renewed Facility Operating License No. NPF-16 is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and by amending paragraph 3.B to read as follows:

B. Technical Specifications

The Technical Specifications contained in Appendices A and B, as revised through Amendment No. 196, are hereby incorporated in the renewed license. FPL shall operate the facility in accordance with the Technical Specifications.

3. This license amendment is effective as of its date of issuance and shall be implemented within 90 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Booma Venkataraman, Acting Chief  
Plant Licensing Branch II-2  
Division of Operator Reactor Licensing  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Renewed Facility  
Operating License and  
Technical Specifications

Date of Issuance: July 9, 2018

ATTACHMENT TO LICENSE AMENDMENT NO. 196

ST. LUCIE PLANT UNIT NO. 2

RENEWED FACILITY OPERATING LICENSE NO. NPF-16

DOCKET NO. 50-389

Replace Page 3 of Renewed Facility Operating License No. NPF-16 with the attached revised Page 3.

Replace the following page of Appendix A Technical Specifications with the attached revised page. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

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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. 196, are hereby incorporated in the renewed license. FPL shall operate the facility in accordance with the Technical Specifications.

## PLANT SYSTEMS

### AUXILIARY FEEDWATER SYSTEM

#### LIMITING CONDITION FOR OPERATION

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- 3.7.1.2 At least three independent steam generator auxiliary feedwater pumps and associated flow paths shall be OPERABLE with:
- Two feedwater pumps, each capable of being powered from separate OPERABLE emergency busses, and
  - One feedwater pump capable of being powered from an OPERABLE steam supply system.

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

#### **ACTION:**

- With one auxiliary feedwater pump steam supply inoperable, restore the inoperable auxiliary feedwater pump steam supply 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.
- With one auxiliary feedwater pump inoperable, restore the auxiliary feedwater pump 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.
- With one auxiliary feedwater pump steam supply inoperable and one motor-driven auxiliary feedwater pump inoperable, either restore the inoperable auxiliary feedwater pump steam supply OR restore the inoperable motor-driven auxiliary feedwater pump 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.
- With two auxiliary feedwater pumps inoperable, be in at least HOT STANDBY within 6 hours and in HOT SHUTDOWN within the following 6 hours.

#### **NOTE**

LCO 3.0.3 and all other LCO Actions requiring MODE changes are suspended until one AFW pump is restored to OPERABLE status.

- With three auxiliary feedwater pumps inoperable, immediately initiate corrective action to restore at least one auxiliary feedwater pump to OPERABLE status.
- LCO 3.0.4.b is not applicable.

#### **SURVEILLANCE REQUIREMENTS**

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- 4.7.1.2 Each auxiliary feedwater pump shall be demonstrated OPERABLE:
- In accordance with the Surveillance Frequency Control Program by:
    - Verifying that each valve (manual, power-operated, or automatic) in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct position.



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NOS. 245 AND 196

TO RENEWED FACILITY OPERATING LICENSE NOS. DPR-67 AND 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 letter dated September 14, 2017 (Reference 1), as supplemented by letter dated February 14, 2018 (Reference 2), Florida Power and Light Company (the licensee), submitted a license amendment request (LAR) to modify the St. Lucie Plant, Unit Nos. 1 and 2 (St. Lucie 1 and 2) Technical Specifications (TSs) for the auxiliary feedwater (AFW) system. Specifically, the licensee proposed to modify St. Lucie 1 and 2 TS 3.7.1.2, "Auxiliary Feedwater System," to add a new required action for an inoperable turbine-driven AFW pump steam supply and add a new required action for an inoperable turbine-driven AFW pump steam supply concurrent with an inoperable motor-driven AFW pump.

The supplement dated February 14, 2018, 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 as published in the *Federal Register* on November 7, 2017 (82 FR 51652).

2.0 REGULATORY EVALUATION

2.1 Systems Descriptions

The St. Lucie Unit 1 AFW system is described in Section 10.5 of the St. Lucie Unit 1 Updated Final Safety Analysis Report (UFSAR) (ADAMS Accession No. ML17171A252), and the St. Lucie Unit 2 AFW system is described in Section 10.4.9 of the St. Lucie Unit 2 UFSAR (ADAMS Accession No. ML16225A425). Each unit has a dedicated AFW system consisting of one turbine-driven AFW pump, two motor-driven AFW pumps, and associated piping, valves, and instrumentation. The turbine-driven AFW pump normally delivers flow to both steam generators (SGs) in the respective unit. The motor-driven pumps are normally aligned such that each motor-driven pump delivers flow to its associated SG in the respective unit. However, normally closed cross-connect lines are available to allow manual redirection of flow to the opposite SG. The turbine-driven pump receives steam supplied via separate lines from the two main steam lines, and the motor-driven pumps receive electrical power from separate electrical divisions.

The AFW system assures a sufficient cooling water supply to the SGs when the normal main feedwater system is not available. This includes providing cooling water to either one or both SGs during normal shutdown and accident conditions in order to:

- Provide sufficient capability for the removal of sensible and decay heat from the reactor coolant system (RCS) during forced or natural circulation cooldown, assuming a single active failure concurrent with a loss of offsite power, and
- Provide sufficient capacity to reduce the RCS temperature to 325 degrees Fahrenheit (°F) (entry conditions for the Shutdown Cooling System under normal conditions), assuming a single active failure and loss of offsite power.

The AFW system is credited in accident analyses for a loss of offsite power, a loss of normal feedwater (including a feedwater line break accident), and cooldown following a loss of coolant accident through a small break, including a SG tube rupture. The turbine-driven AFW pump is independent of alternating current (AC) and is relied upon to deliver adequate feedwater to cool the primary system following a loss of all onsite and offsite AC electrical power.

## 2.2 Requested Changes

The licensee proposed to modify TS 3.7.1.2 for St. Lucie 1 and 2, to add a new required action for an inoperable turbine-driven AFW pump steam supply, and add a new required action for an inoperable turbine-driven AFW pump steam supply concurrent with an inoperable motor-driven AFW pump.

The proposed changes renumber the St. Lucie 1 and 2 TS 3.7.1.2 required ACTION(s) as follows:

- Renumber existing TS 3.7.1.2, ACTION a, to become TS 3.7.1.2, ACTION b;
- Renumber existing TS 3.7.1.2, ACTION b, to become TS 3.7.1.2, ACTION d;
- Renumber existing TS 3.7.1.2, ACTION c, to become TS 3.7.1.2, ACTION e;
- Renumber existing TS 3.7.1.2, ACTION d, to become TS 3.7.1.2, ACTION f;
- Add new TS 3.7.1.2, ACTION a, for an inoperable AFW pump steam supply;
- Add new TS 3.7.1.2, ACTION c, for an inoperable AFW pump steam supply concurrent with an inoperable motor-driven AFW pump.

## 2.3 Regulatory Review

The proposed license amendments involve a change to the content of the TSs. The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the proposed TS changes to verify their compliance with applicable regulations and conformance with associated regulatory guidance.

Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.36(b) states, in part: "The technical specifications will be derived from the analyses and evaluation included in the safety analysis report, and amendments thereto, submitted pursuant to §50.34." As stated in 10 CFR 50.34(a), "Contents of applications; technical information," the General Design Criteria (GDC) of Appendix A to 10 CFR Part 50 establish minimum requirements for the principal design criteria for water-cooled nuclear power plants similar in design to plants for which construction permits have previously been issued by the Commission. Pursuant to

10 CFR 50.34(a), the facility's preliminary safety analysis report must include a description of the relation of the design bases to the principal design criteria. Finally, 10 CFR 50.36(c)(2) states, in part: "Limiting conditions for operation are the lowest functional capability or performance levels of equipment required for safe operation of the facility. When a limiting condition for operation [LCO] of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the technical specifications until the condition can be met."

Section 3.1.34 of the St. Lucie Unit 1 UFSAR includes the following discussion addressing GDC 34, "Residual Heat Removal" and its relationship to the AFW system design basis:

#### 3.1.34 CRITERION 34 - RESIDUAL HEAT REMOVAL

A system to remove residual heat shall be provided. The system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

Suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities shall be provided to assure that for onsite electrical power system operation (assuming offsite power is not available) and for offsite electrical power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure.

#### DISCUSSION

Residual heat removal capability is provided by the shutdown cooling system (Section 9.3-5) for reactor coolant temperatures less than 325°F. For temperatures greater than 325°F, this function is provided by the steam generators and the auxiliary feedwater system. Sufficient redundancy, interconnections, leak detection, and isolation capabilities exist in each of these systems to assure that the residual heat removal function can be accomplished, assuming a single failure. Within appropriate design limits, either system can remove fission product decay heat at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

If onsite power is lost, there will be a "fast-dead" automatic transfer of power to the startup transformers. If offsite power is lost, the electrical equipment required for safe shutdown is loaded on the emergency diesel generators....

Section 3.1.34 of the St. Lucie Unit 2 UFSAR includes the following discussion addressing GDC 34, "Residual Heat Removal" and its relationship to the AFW system design basis:

#### 3.1.34 CRITERION 34 - RESIDUAL HEAT REMOVAL

A system to remove residual heat shall be provided. The system safety function shall be to transfer fission product decay heat and other residual heat from the reactor core at a rate such that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

Suitable redundancy in components and features, and suitable interconnections, leak detection, and isolation capabilities shall be provided to assure that for onsite electric power system operation (assuming offsite power is not available) and for offsite electric power system operation (assuming onsite power is not available) the system safety function can be accomplished, assuming a single failure.

## DISCUSSION

The transfer of fission product decay heat and other residual heat from the reactor core is accomplished by the steam generators and the shutdown cooling system at such a rate that specified acceptable fuel design limits and the design conditions of the reactor coolant pressure boundary are not exceeded.

Residual heat removal capacity is provided with sufficient redundancies in design that in the event of a single active failure or a single limited leakage passive failure the system can still perform its function. The steam generator auxiliaries and the Shutdown Cooling System are designed to operate from either offsite or onsite electric power sources....

Guidance for NRC staff review of TSs is contained in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," Section 16.0, "Technical Specifications." The staff has prepared standard technical specifications (STSs) for each of the light-water reactor nuclear steam supply systems and associated balance-of-plant equipment systems. The guidance specifies that the staff should review whether the content and format of proposed TSs are consistent with the applicable STSs. Where TS provisions depart from the reference TSs, the staff determines whether the proposed differences are justified by uniqueness in plant design or other considerations. The applicable current STSs for St. Lucie 1 and 2 are contained in NUREG-1432, "Standard Technical Specifications – Combustion Engineering Plants," Revision 4.0 (Reference 3).

### 3.0 TECHNICAL EVALUATION

#### 3.1 Technical Review

The model STS 3.7.5 included in NUREG-1432, Revision 4, incorporated previously approved Technical Specification Task Force (TSTF) Traveler 412, Revision 3, "Provide Actions for One Steam Supply to Turbine Driven AFW/EFW [emergency feedwater] Pump Inoperable." Approved TSTF Travelers are generic changes to the Improved Standard Technical Specifications that may be adopted by facilities meeting the conditions associated with the change.

The model STS 3.7.5 in NUREG-1432 is configured for a Combustion Engineering plant with a three-train AFW system consisting of one turbine-driven AFW pump and two motor-driven pumps. Plant AFW systems often consist of three pumps, typically two motor-driven pumps and one turbine-driven pump configured into three trains. The capacity of the AFW pumps varies by plant, but typically the turbine-driven pumps have the capacity to remove necessary heat for any design-basis accident or event requiring feedwater flow to the SGs and the motor-driven pumps have between half the capacity and the full capacity of the turbine-driven pump. Motor-driven



AFW pumps are typically powered from an independent Class 1E power supply, and each pump feeds one or more SGs. Turbine-driven AFW pumps receive all necessary steam flow from either or both connected steam generators and provide the required AFW flow to all SGs. The model safety evaluation for TSTF 412, Revision 3, published in the *Federal Register* on July 17, 2007 (72 FR 39089), was based on the most common AFW system configuration consisting of two motor-driven pumps and one turbine-driven pump.

The configuration of the AFW systems at St. Lucie 1 and 2 is consistent with the configuration considered for the model TS 3.7.5 in NUREG-1432, Revision 4, and the configuration considered for the model safety evaluation for TSTF 412, Revision 3. Therefore, the NRC staff has concluded that the bases included in NUREG-1432, Revision 4, and the model safety evaluation prepared for TSTF 412 are generally applicable to the proposed new TS information, which is contained in proposed ACTION a and ACTION c.

The staff developed the following evaluation of each proposed change to TS 3.7.1.2 for St. Lucie 1 and 2, as delineated in Attachment 1 to the supplement to the license amendment request:

#### LCO 3.7.1.2 ACTIONS

The licensee proposed to revise the "ACTION" section of LCO 3.7.1.2 as follows:

#### ACTION a

The licensee proposed adding a new ACTION a, which states:

With one auxiliary feedwater pump steam supply inoperable, restore the inoperable auxiliary feedwater pump steam supply 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.

The effect of new ACTION a is consistent with the corresponding portions of Condition A and the associated Required Action and Completion Time for STS 3.7.5 in NUREG-1432, Revision 4. The bases for STS 3.7.5 provides the following justifications for accepting the relevant portions of Condition A of STS 3.7.5:

- For the inoperability of the turbine driven AFW pump due to one inoperable steam supply, the 7-day Completion Time is reasonable since there is a redundant steam supply line for the turbine driven pump and the turbine driven train is still capable of performing its specified function for most postulated events.
- For the inoperability of the turbine driven pump due to one inoperable steam supply, the 7 day-Completion Time is reasonable due to the availability of redundant OPERABLE motor driven AFW pumps; and due to the low probability of an event requiring the use of the turbine driven AFW pump.

The staff reviewed these justifications and determined that the bases of these statements are generic and applicable to the St. Lucie 1 and 2 AFW systems. Therefore, the proposed 7-day time to restore an AFW pump steam supply to operable status of ACTION a is acceptable.

The proposed ACTION a also includes additional actions if the steam supply is not restored to operable status within 7 days. These actions include being in at least Hot Standby within the next 6 hours and in Hot Shutdown within the following 6 hours. These actions are more conservative than the corresponding Required Actions and Completion times specified in Condition D of STS 3.7.5 because the time to reach Mode 3 [Hot Standby] for proposed Action a is equal to the Completion Time to be in Mode 3 for Condition D of STS 3.7.5, and Condition D includes provisions for a total of 18 hours to reach the end state of Mode 4 [Hot Shutdown]. Therefore, the remaining proposed actions if the steam supply is not returned to operable status within 7 days are acceptable.

#### ACTION b

The licensee proposed to relabel the existing ACTION a, which addresses the condition of one inoperable AFW pump, as ACTION b. This change is editorial in nature and does not affect the meaning of the action. Therefore, the change is acceptable.

#### ACTION c

The licensee proposed a new ACTION c applicable when one AFW steam supply is inoperable and one motor-driven AFW pump is inoperable. The licensee initially proposed the following text for ACTION c:

With one auxiliary feedwater pump steam supply inoperable and one motor-driven auxiliary feedwater pump inoperable, either restore the inoperable auxiliary feedwater pump steam supply OR restore the inoperable motor-driven auxiliary feedwater pump to OPERABLE status within 48 hours or be in at least HOT STANDBY within the next 6 hours and in HOT SHUTDOWN within the following 6 hours.

As discussed in the model safety evaluation for TSTF 412, Revision 3, a 24-hour Completion Time is applicable to plants that may provide insufficient flow to the SGs to satisfy accident analyses assumptions if a main steam line break or feedwater line break were to occur that renders the remaining steam supply to the turbine-driven AFW pump inoperable (a concurrent single failure is not assumed). Insufficient feedwater flow could result at plants with three AFW pumps if, for example, the single remaining operable AFW train does not have sufficient capacity to satisfy accident analyses assumptions or the operable AFW train only feeds the faulted SG (i.e., the SG that is aligned to the operable steam supply for the turbine-driven AFW pump). In accordance with TSTF 412, a 48-hour Completion Time would be applicable when the remaining operable motor-driven AFW train is capable of providing sufficient feedwater flow in accordance with accident analyses assumptions.

The staff noted that each motor-driven AFW pump at St. Lucie 1 and 2 was normally aligned to deliver flow to a single SG, and, therefore, the AFW system was not normally configured for a single motor-driven AFW pump to provide sufficient flow to satisfy accident analysis assumptions for all initiating events. This condition was inconsistent with the basis for the 48-hour completion time evaluated for TSTF 412. To determine whether the 48-hour completion time would be appropriate for the proposed ACTION a, the staff requested additional information related to whether a single motor-driven AFW pump could be realigned to the alternate SG in order to provide adequate flow for events that render the normally aligned SG inoperable (Reference 4). In the supplement dated February 14, 2018, the licensee stated that the St. Lucie accident analyses do not explicitly credit AFW flow to the non-faulted SG via the

cross-connection flowpath. Accordingly, FPL revised the proposed ACTION c to specify a 24-hour completion time rather than the originally proposed 48-hour completion time. The licensee proposed the following revised text for ACTION c:

With one auxiliary feedwater pump steam supply inoperable and one motor-driven auxiliary feedwater pump inoperable, either restore the inoperable auxiliary feedwater pump steam supply OR restore the inoperable motor-driven auxiliary feedwater pump 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.

The STS typically allows a 72-hour or longer Completion Time for Conditions where the remaining operable equipment is able to mitigate postulated accidents without assuming a concurrent single active failure. For TSTF 412, the 24-hour Completion Time applies to the situation where the turbine-driven AFW train would be able to deliver adequate flow for most postulated events, and would only be challenged by a main steam line break or feedwater line break that renders the remaining operable steam supply to the turbine-driven EFW pump inoperable. The selection of 24 hours for the Completion Time is based on the remaining operable steam supply to the turbine-driven AFW pump and the continued functionality of the turbine-driven AFW train, the remaining operable motor-driven AFW train, and the low likelihood of an event occurring during this 24-hour period that would challenge the capability of the AFW system to provide adequate feedwater to the SGs. The proposed Completion Time for this particular situation is consistent with what was approved for Waterford Steam Electric Station, Unit 3 (Reference 5) for a similar Condition, and it is consistent with the STS in that the proposed Completion Time is much less than the 72 hours that is allowed for the situation where full accident mitigation capability is maintained.

When proposed ACTION c would be entered at either St. Lucie Unit 1 or Unit 2, the turbine-driven AFW pump train with one inoperable steam supply would be capable of delivering adequate AFW flow to satisfy accident analysis assumptions for the full spectrum of design basis accidents other than the few low-probability events that would render the remaining steam supply inoperable. The proposed required action to restore either the inoperable steam supply or the inoperable motor-driven AFW pump to operable status would restore the capability to deliver adequate AFW flow for the full spectrum of design basis accidents and events. As addressed in the model safety evaluation for TSTF 412, the proposed 24-hour completion time for implementing either required action is commensurate with the remaining capability to deliver adequate AFW flow for all but a small subset of events that would render the remaining operable steam supply inoperable. In addition, the proposed ACTION c is consistent with the intent of STS 3.7.5, Condition C, presented in NUREG-1432, Revision 4. Therefore, the proposed 24-hour time to restore full AFW flow capability for all design-basis initiating events as specified in ACTION c is acceptable.

The proposed ACTION c also includes additional actions if neither the inoperable steam supply nor the inoperable motor-driven AFW pump is restored to operable status within 24 hours. These actions consist of being in at least Hot Standby within the next 6 hours and in Hot Shutdown within the following 6 hours. These actions are more conservative than STS 3.7.5, because the time to reach Mode 3 [Hot Standby] is equal to the Completion Time to be in Mode 3 for Condition D of STS 3.7.5, and Condition D includes provisions for a total of 18 hours to reach the end state of Mode 4 [Hot Shutdown]. Therefore, the completion times and required actions if none of the affected equipment is restored to operable status within 24 hours are acceptable.

### ACTIONS d, e, and f

The licensee proposed to relabel the existing ACTION b, ACTION c, and ACTION d as ACTION d, ACTION e, and ACTION f, respectively. This change is editorial in nature and does not affect the meaning of any of the actions. Therefore, the change is acceptable.

### 3.2 Technical Conclusion

The proposed changes are consistent with NRC practices and policies as generally reflected in the STSs and as reflected by applicable precedents that have been approved. The NRC staff concludes that the requirements of 10 CFR 50.36(c)(2) continue to be met, because the minimum performance level of equipment needed for safe operation of the facility, as specified in St. Lucie 1 and 2 TS LCO 3.7.1.2, remains unchanged and appropriate remedial measures are specified if the LCO is not met. The changes to St. Lucie 1 and 2 TS LCO 3.7.1.2 Actions are consistent with the guidance of Section 16.0 of NUREG-0800, in that the proposed changes are generally consistent with the STS incorporated in NUREG-1432, with allowances for design differences present at St. Lucie 1 and 2. Therefore, the NRC staff has determined that the proposed changes to St. Lucie 1 and 2 TSs are acceptable.

### 4.0 STATE CONSULTATION

In accordance with the Commission's regulations, on May 8, 2018, 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 a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20. The NRC staff has determined that the amendments involve no significant increase in the amounts, and no significant change in the types, of any effluents that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission previously issued a proposed finding that the amendments involve no significant hazards consideration (NSHC), published in the *Federal Register* on November 7, 2017 (82 FR 51652), and there has been no public comment on this finding. Accordingly, the amendment meets 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 amendment.

### 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 amendments will not be inimical to the common defense and security or to the health and safety of the public.

## 7.0 REFERENCES

1. DeBoer, Dan, Florida Power & Light Company, letter to U.S. Nuclear Regulatory Commission, "St. Lucie Units 1 and 2, Docket Nos. 50-335 and 50-389, Renewed Facility Operating Licenses DPR-67 and NPF-16, License Amendment Request to Add New Required Actions for an Inoperable Auxiliary Feedwater Pump Steam Supply," September 14, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17257A300).
2. DeBoer, Dan, Florida Power & Light Company, letter to U.S. Nuclear Regulatory Commission, "St. Lucie Units 1 and 2, Docket Nos. 50-335 and 50-389, Renewed Facility Operating Licenses DPR-67 and NPF-16, Response to Request for Additional Information Regarding License Amendment Request to Add New Required Actions for an Inoperable Auxiliary Feedwater Pump Steam Supply," February 14, 2018 (ADAMS Accession No. ML18045A007).
3. NRC, NUREG-1432, Vol. 1, Revision 4.0, "Standard Technical Specifications, Combustion Engineering Plants"; NUREG-1432, Vol. 2, Bases (ADAMS Accession Nos. ML12102A165 and ML12102A169).
4. Buckberg, Perry, NRC, E-mail to Frehafer, Ken, Florida Power & Light Company, "Request for Additional Information - St. Lucie Inop AFW Steam Supply LAR (L-2017-LLA-0296)" January 18, 2018 (ADAMS Accession No. ML18019A071).
5. Kalyanam, N., NRC, letter to Herron, John T., Entergy Operations, Inc., "Waterford Steam Electric Station, Unit 3 – Issuance of Amendment Re: Emergency Feedwater System (TAC No. MB2010)," October 4, 2001 (ADAMS Accession No. ML012840538).

Principal Contributor: Steve Jones

Date: July 9, 2018

SUBJECT: ST. LUCIE PLANT, UNIT NOS. 1 AND 2 - ISSUANCE OF AMENDMENTS REGARDING TECHNICAL SPECIFICATION CHANGES RELATED TO THE AUXILIARY FEEDWATER SYSTEM (CAC NOS. MG0237 AND MG0238; EPID L-2017-LLA-0296) DATED JULY 9, 2018

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