



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

March 27, 2019

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

SUBJECT: TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4 - ISSUANCE OF AMENDMENTS REGARDING TRANSITION LICENSE CONDITIONS FOR REACTOR COOLANT PUMP SEALS (EPID L-2018-LLA-0280)

Dear Mr. Nazar:

The U.S. Nuclear Regulatory Commission (NRC or the Commission) has issued the enclosed Amendment No. 286 to Renewed Facility Operating License (RFOL) No. DPR-31 and Amendment No. 280 to RFOL No. DPR-41 for Turkey Point Nuclear Generating Unit Nos. 3 and 4, respectively. The amendments change the RFOLs in response to the application from Florida Power & Light Company (FPL) dated October 17, 2018 as supplemented by letters dated October 24, 2018, December 3, 2018, and January 31, 2019.

The amendments modify the RFOLs by revising Paragraph 3.D, "Transition License Conditions," to eliminate Implementation Item 22. Eliminating Implementation Item 22 will remove FPL reliance on NRC approval of the Flowserve Reactor Coolant Pump (RCP) Seal Topical Report as a condition of Turkey Point's transition to National Fire Protection Association Standard 805, and instead will document in the RFOLs the application of the guidance outlined in NRC-approved Westinghouse Topical Report WCAP-16175-P-A, "Model for Failure of RCP Seals Given Loss of Seal Cooling in CE [Combustion Engineering] NSSS [Nuclear Steam Supply System] Plants." A copy of the related safety evaluation is also enclosed. A Notice of Issuance will be included in the Commission's biweekly *Federal Register* notice.

Sincerely,

A handwritten signature in black ink, appearing to read "Perry H. Buckberg", written over a horizontal line.

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

Docket Nos. 50-250 and 50-251

Enclosures:

1. Amendment No. 286 to DPR-31
2. Amendment No. 280 to DPR-41
3. Safety Evaluation

cc: Listserv



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

FLORIDA POWER & LIGHT COMPANY

DOCKET NO. 50-250

TURKEY POINT NUCLEAR GENERATING UNIT NO. 3

AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 286
Renewed License No. DPR-31

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Florida Power & Light Company (the licensee) dated October 17, 2018, as supplemented by letters dated October 24, 2018, December 3, 2018, and January 31, 2019, 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 Renewed Facility Operating License No. DPR-31 is amended as indicated in the attachment to this license amendment.
3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Undine Shoop, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed
Facility Operating License

Date of Issuance: March 27, 2019



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

FLORIDA POWER & LIGHT COMPANY

DOCKET NO. 50-251

TURKEY POINT NUCLEAR GENERATING UNIT NO. 4

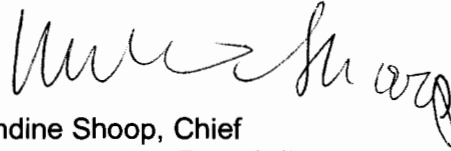
AMENDMENT TO RENEWED FACILITY OPERATING LICENSE

Amendment No. 280
Renewed License No. DPR-41

1. The U.S. Nuclear Regulatory Commission (the Commission) has found that:
 - A. The application for amendment by Florida Power & Light Company (the licensee) dated October 17, 2018, as supplemented by letters dated October 24, 2018, December 3, 2018, and January 31, 2019, 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 Renewed Facility Operating License No. DPR-41 is amended as indicated in the attachment to this license amendment.
3. This license amendment is effective as of its date of issuance and shall be implemented within 30 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION



Undine Shoop, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Renewed
Facility Operating License

Date of Issuance: March 27, 2019

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 286 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-31

AMENDMENT NO. 280 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-41

TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4

DOCKET NOS. 50-250 AND 50-251

Revise the Renewed Facility Operating License No. DPR-31 by removing the pages identified below and inserting the attached pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

Revise the Renewed Facility Operating License No. DPR-41 by removing the pages identified below and inserting the attached pages. The revised pages are identified by amendment number and contain marginal lines indicating the areas of change.

REMOVE

3
4
6

INSERT

3
4
6

- E. Pursuant to the Act and 10 CFR Parts 40 and 70 to receive, possess, and use at any time 100 milligrams each of any source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactively contaminated apparatus;
 - F. Pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of Turkey Point Units Nos. 3 and 4.
3. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations: 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Section 40.41 of 10 CFR Part 40, Sections 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

The applicant is authorized to operate the facility at reactor core power levels not in excess of 2644 megawatts (thermal).
 - B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 286, are hereby incorporated into this renewed license. The Environmental Protection Plan contained in Appendix B is hereby incorporated into this renewed license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.
 - C. Final Safety Analysis Report

The licensee's Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on November 1, 2001, describes certain future inspection activities to be completed before the period of extended operation. The licensee shall complete these activities no later than July 19, 2012.

The Final Safety Analysis Report supplement as revised on November 1, 2001, described above, shall be included in the next scheduled update to the Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following the issuance of this renewed license. Until that update is complete, the licensee may make changes to the programs described in such supplement without prior Commission approval, provided that the licensee 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. Fire Protection

FPL shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the licensee amendment requests dated June 28, 2012 and October 17, 2018, (and supplements dated September 19, 2012; March 18, April 16, and, May 15, 2013; January 7, April 4, June 6, July 18, September 12, November 5, and December 2, 2014; and February 18, 2015; October 24, and December 3, 2018; and January 31, 2019), and as approved in the safety evaluations dated May 28, 2015 and March, 27, 2019. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

Risk-Informed Changes that May Be Made Without Prior NRC Approval

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed fire PRA model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

- (a) Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.
- (b) Prior NRC review and approval is not required for individual changes that result in a risk increase less than 1×10^{-7} /year (yr) for CDF and less than 1×10^{-8} /yr for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by 2. and 3. below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in 2. above.
 2. The licensee shall implement the modifications to its facility, as described in Enclosure 1, Attachment S, Table S-2, "Plant Modifications Committed," of FPL letter L-2014-303, dated 11/05/2014, to complete the transition to full compliance with 10 CFR 50.48(c) by the end of the second refueling outage (for each unit) following issuance of the license amendment. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.
 3. The licensee shall implement the items listed in Enclosure 5, Attachment S, Table S-3, "Implementation Items," of FPL letter L-2018-219, dated 12/3/2018, with the exception of items 12, 18 and 19, no later than 12 months after issuance of the license amendment dated 5/28/2015. Items 12, 18 and 19 are associated with modifications in Table S-2 and will be completed in accordance with Transition License Condition 2 above.
- E. The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provision of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Florida Power and Light Turkey Point Nuclear Plant Physical Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program – Revision 15" submitted by letter dated August 3, 2012.

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The Turkey Point Nuclear Generating Station CSP was approved by License Amendment No. 245 as supplemented by a change approved by Amendment Nos. 256 and 266.

- E. Pursuant to the Act and 10 CFR Parts 40 and 70 to receive, possess, and use at any time 100 milligrams each of any source or special nuclear material without restriction to chemical or physical form, for sample analysis or instrument calibration or associated with radioactively contaminated apparatus;
 - F. Pursuant to the Act and 10 CFR Parts 30 and 70, to possess, but not separate, such byproduct and special nuclear materials as may be produced by the operation of Turkey Point Units Nos. 3 and 4.
3. This renewed operating license shall be deemed to contain and is subject to the conditions specified in the following Commission regulations: 10 CFR Part 20, Section 30.34 of 10 CFR Part 30, Section 40.41 of 10 CFR Part 40, Sections 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

The applicant is authorized to operate the facility at reactor core power levels not in excess of 2644 megawatts (thermal).
 - B. Technical Specifications

The Technical Specifications contained in Appendix A, as revised through Amendment No. 280, are hereby incorporated into this renewed license. The Environmental Protection Plan contained in Appendix B is hereby incorporated into this renewed license. The licensee shall operate the facility in accordance with the Technical Specifications and the Environmental Protection Plan.
 - C. Final Safety Analysis Report

The licensee's Final Safety Analysis Report supplement submitted pursuant to 10 CFR 54.21(d), as revised on November 1, 2001, describes certain future inspection activities to be completed before the period of extended operation. The licensee shall complete these activities no later than April 10, 2013.

The Final Safety Analysis Report supplement as revised on November 1, 2001, described above, shall be included in the next scheduled update to the Final Safety Analysis Report required by 10 CFR 50.71(e)(4), following the issuance of this renewed license. Until that update is complete, the licensee may make changes to the programs described in such supplement without prior Commission approval, provided that the licensee 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. Fire Protection

FPL shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the licensee amendment requests dated June 28, 2012 and October 17, 2018 (and supplements dated September 19, 2012; March 18, April 16, and May 15, 2013; January 7, April 4, June 6, July 18, September 12, November 5, and December 2, 2014; and February 18, 2015; October 24, and December 3, 2018; and January 31, 2019), and as approved in the safety evaluations dated May 28, 2015 and March 27, 2019. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

Risk-Informed Changes that May Be Made Without Prior NRC Approval

A risk assessment of the change must demonstrate that the acceptance criteria below are met. The risk assessment approach, methods, and data shall be acceptable to the NRC and shall be appropriate for the nature and scope of the change being evaluated; be based on the as-built, as-operated, and maintained plant; and reflect the operating experience at the plant. Acceptable methods to assess the risk of the change may include methods that have been used in the peer-reviewed fire PRA model, methods that have been approved by NRC through a plant-specific license amendment or NRC approval of generic methods specifically for use in NFPA 805 risk assessments, or methods that have been demonstrated to bound the risk impact.

- (a) Prior NRC review and approval is not required for changes that clearly result in a decrease in risk. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.
- (b) Prior NRC review and approval is not required for individual changes that result in a risk increase less than 1×10^{-7} /year (yr) for CDF and less than 1×10^{-8} /yr for LERF. The proposed change must also be consistent with the defense-in-depth philosophy and must maintain sufficient safety margins. The change may be implemented following completion of the plant change evaluation.

Transition License Conditions

1. Before achieving full compliance with 10 CFR 50.48(c), as specified by 2. and 3. below, risk-informed changes to the licensee's fire protection program may not be made without prior NRC review and approval unless the change has been demonstrated to have no more than a minimal risk impact, as described in 2. above.
 2. The licensee shall implement the modifications to its facility, as described in Enclosure 1, Attachment S, Table S-2, "Plant Modifications Committed," of FPL letter L-2014-303, dated 11/05/2014, to complete the transition to full compliance with 10 CFR 50.48(c) by the end of the second refueling outage (for each unit) following issuance of the license amendment. The licensee shall maintain appropriate compensatory measures in place until completion of these modifications.
 3. The licensee shall implement the items listed in Enclosure 5, Attachment S, Table S-3, "Implementation Items," of FPL letter L-2018-219, dated 12/3/2018, with the exception of items 12, 18 and 19, no later than 12 months after issuance of the license amendment dated 5/28/2015. Items 12, 18 and 19 are associated with modifications in Table S-2 and will be completed in accordance with Transition License Condition 2 above.
- E. The licensee shall fully implement and maintain in effect all provisions of the Commission-approved physical security, training and qualification, and safeguards contingency plans including amendments made pursuant to provision of the Miscellaneous Amendments and Search Requirements revisions to 10 CFR 73.55 (51 FR 27817 and 27822) and to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The combined set of plans, which contains Safeguards Information protected under 10 CFR 73.21, is entitled: "Florida Power and Light Turkey Point Nuclear Plant Physical Security Plan, Training and Qualification Plan, Safeguards Contingency Plan, and Independent Spent Fuel Storage Installation Security Program - Revision 15" submitted by letter dated August 3, 2012.

The licensee shall fully implement and maintain in effect all provisions of the Commission-approved cyber security plan (CSP), including changes made pursuant to the authority of 10 CFR 50.90 and 10 CFR 50.54(p). The Turkey Point Nuclear Generating Station CSP was approved by License Amendment No. 241 as supplemented by a change approved by Amendment Nos. 252 and 261.



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WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

AMENDMENT NO. 286 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-31

AMENDMENT NO. 280 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-41

FLORIDA POWER & LIGHT COMPANY

TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4

DOCKET NOS. 50-250 AND 50-251

1.0 INTRODUCTION

By letter dated October 17, 2018 (Reference 1), as supplemented by letters dated October 24, 2018 (Reference 2), December 3, 2018 (Reference 3), and January 31, 2019 (Reference 4), Florida Power & Light Company (FPL, the licensee), submitted a license amendment request (LAR) regarding the Turkey Point Nuclear Generating Station (Turkey Point), Units 3 and 4, requesting a change to its approved fire protection program (FPP). Specifically, the licensee requested to modify the Operating Licenses, Paragraph 3.D, "Transition License Conditions," Item 3, to eliminate Implementation Item 22, which required the licensee to review its probabilistic risk assessment (PRA) model upon U.S. Nuclear Regulatory Commission (the NRC or Commission) approval of the Flowserve Reactor Coolant Pump (RCP) Seal Topical Report (TR) (Flowserve TR). Eliminating Implementation Item 22 would remove the licensee's reliance on NRC approval of the Flowserve TR as a condition of transition to National Fire Protection Association Standard 805 (NFPA 805), and instead the licensee would use the guidance outlined in Westinghouse TR WCAP-16175-P-A, Revision 0, "Model for Failure of RCP Seals Given Loss of Seal Cooling in CE [Combustion Engineering] NSSS [Nuclear Steam Supply System] Plants," March 2007 (Reference 5), for modeling of RCP seal leakage in the PRA.

The licensee is proposing this change because the Flowserve TR has not yet been submitted to the NRC, and removal of the Flowserve TR license condition will allow the licensee to fully implement the requirements of its NFPA 805 FPP and remain within its licensing basis for future RCP seal replacements without reliance on the Flowserve TR. In addition, replacing the Flowserve TR reliance with NRC approved industry consensus guidance provided in WCAP-16175-P-A will result in the introduction of additional conservatism in the licensee's PRA.

The supplement dated January 31, 2019, provided additional information that clarified the application, did not expand the scope of the application as originally noticed, and did not change the NRC staff's original proposed no significant hazards consideration determination as published in the *Federal Register* on December 26, 2018 (83 FR 66318).

1.1 Background

On June 28, 2012 (Reference 6), FPL requested to revise the Turkey Point FPP in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.48(c). On May 28, 2015 (Reference 7), the NRC issued Amendment No. 262 to Renewed Facility Operating License (RFOL) No. DPR-33, and Amendment No. 257 to RFOL No. DPR-41 (NFWA 805 Safety Evaluation). The amendments consisted of changes to the operating licenses to transition the Turkey Point FPP to a risk-informed (RI), performance-based (PB) program based on NFWA 805, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants" (2001 Edition) (NFWA 805), (Reference 8), in accordance with 10 CFR 50.48(c). NFWA 805 allows the use of PB methods such as fire modeling and RI methods such as fire PRA to demonstrate compliance with the nuclear safety performance criteria (NSPC).

The transition license conditions issued as part of Amendment Nos. 262 and 257 require the licensee to complete certain plant modifications and implementation items within a certain time period. Implementation Item 22 as discussed in Transition License Condition 3, is to be completed within 6 months of the NRC approval of the Flowserve TR. Since the NRC has not yet approved the Flowserve TR, Implementation Item 22 is not yet completed.

2.0 REGULATORY EVALUATION

2.1 System Description

A RCP seal prevents nuclear reactor coolant from exiting the RCP body along the pump's impeller shaft. Turkey Point installed the three-stage Flowserve RCP seals for Unit 3 and Unit 4 during the fall 2015 and spring 2016 refueling outages, respectively. These seal installations included a passive back-up sealing device, referred to as the Abeyance Seal, which activates upon the complete failure of the three primary seal stages. The proposed WCAP-16175-P-A seal design allows for three-stage and four-stage seal models, but does not include a back-up seal.

2.2 Regulations and Guidance

The following regulations address fire protection:

- Section 50.48, "Fire protection," of 10 CFR, provides the NRC requirements for nuclear power plant fire protection. The NRC regulations include specific requirements for requesting approval for an RI/PB FPP based on the provisions of NFWA 805.
- Section 50.48(a)(1) requires each holder of an operating license, and holders of a combined license issued under part 52 to have a fire protection plan that satisfies GDC 3 of Appendix A to 10 CFR part 50 and states that the fire protection plan must describe the overall fire protection program; identify the positions responsible for the program and the authority delegated to those positions; and outline the plans for fire protection, fire detection and suppression capability, and limitation of fire damage. Section 50.48(a)(2) states that the fire protection plan must describe the specific features necessary to implement the program described in paragraph (a)(1) including administrative controls and personnel requirements for fire prevention and manual suppression activities; automatic and manual fire detection and suppression systems; and the means to limit fire damage to structures, systems, and components to ensure the capability to safely

shut down the plant. Section 50.48(a)(3) requires that the licensee retain the fire protection plan and each change to the plan as a record until the Commission terminates the license and that the licensee retain each superseded revision of the procedures for 3 years.

- Appendix A to 10 CFR part 50, GDC 3, states that:

Structures, systems, and components important to safety shall be designed and located to minimize, consistent with other safety requirements, the probability and effect of fires and explosions. Noncombustible and heat resistant materials shall be used wherever practical throughout the unit, particularly in locations such as the containment and control room. Fire detection and fighting systems of appropriate capacity and capability shall be provided and designed to minimize the adverse effects of fires on structures, systems, and components important to safety. Firefighting systems shall be designed to assure that their rupture or inadvertent operation does not significantly impair the safety capability of these structures, systems, and components.

- Paragraph 50.48(c)(3)(i) of 10 CFR states, in part, that:

A licensee may maintain a fire protection program that complies with NFPA 805 as an alternative to complying with [10 CFR 50.48(b)] for plants licensed to operate before January 1, 1979, or the fire protection license conditions for plants licensed to operate after January 1, 1979. The licensee shall submit a request to comply with NFPA 805 in the form of an application for license amendment under §50.90. The application must identify any orders and license conditions that must be revised or superseded, and contain any necessary revisions to the plant's technical specifications and the bases thereof.

- 10 CFR 50.48(c)(3)(ii) states that:

The licensee shall complete its implementation of the methodology in Chapter 2 of NFPA 805 (including all required evaluations and analyses) and, upon completion, modify the fire protection plan required by paragraph (a) of this section to reflect the licensee's decision to comply with NFPA 805, before changing its fire protection program or nuclear power plant as permitted by NFPA 805.

The purpose of 10 CFR 50.48(c)(3)(ii) is explained in the statement of considerations for the Final Rule, "Voluntary Fire Protection Requirements for Light Water Reactors; Adoption of NFPA 805 as a Risk-Informed, Performance-Based Alternative" (69 FR 33536 through 69 FR 33548; June 16, 2004), which states, in part, that:

This paragraph requires licensees to complete all of the Chapter 2 methodology (including evaluations and analyses) and to modify their fire protection plan before making changes to the fire protection program or to the plant configuration. This process ensures that the transition to an NFPA 805 configuration is conducted in a complete, controlled, integrated, and organized manner. This requirement also precludes licensees from implementing

NFPA 805 on a partial or selective basis (e.g., in some fire areas and not others, or truncating the methodology within a given fire area).

Pursuant to 10 CFR 50.90, whenever a holder of a license desires to amend the license or permit, an application for an amendment must be filed with the Commission describing the changes desired, and following, as far as applicable, the form prescribed for original applications. Accordingly, a licensee who seeks to amend its NFPA 805 authorizations must file an amendment stating, as applicable, the desired changes to orders, license conditions, and technical specifications.

Pursuant to 10 CFR 50.92(a), in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations, which govern the issuance of initial licenses to the extent applicable and appropriate. Under 10 CFR 50.40, common standards for issuance of licenses include considerations of safety and satisfaction of the requirements of the National Environmental Policy Act of 1969 as implemented in 10 CFR Part 51, "Environmental Protection Regulations for Domestic Licensing and Related Regulatory Functions." Under 10 CFR 50.57(a), to issue an operating license, the Commission must find, among other things, that (1) there is reasonable assurance that the activities authorized by the operating license can be conducted without endangering the health and safety of the public; (2) there is reasonable assurance that such activities will be conducted in compliance with the regulations in this chapter; and (3) the issuance of the license will not be inimical to the common defense and security or to the health and safety of the public. Additional findings required to issue amendments related to fire protection are provided in 10 CFR 50.48, as discussed below.

The regulations also allow for flexibility that was not included in the NFPA 805 standard. Licensees who choose to adopt 10 CFR 50.48(c) but wish to use the PB methods permitted elsewhere in the standard to meet the fire protection requirements of NFPA 805, Chapter 3, "Fundamental Fire Protection Program and Design Elements," may do so by submitting an LAR in accordance with 10 CFR 50.48(c)(2)(vii). This regulation further provides that:

The Director of the Office of Nuclear Reactor Regulation, or a designee of the Director, may approve the application if the Director or designee determines that the performance based approach:

- (A) Satisfies the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release;
- (B) Maintains safety margins; and
- (C) Maintains fire protection defense in depth (DID) (fire prevention, fire detection, fire suppression, mitigation, and post fire safe shutdown capability).

Alternatively, licensees may choose to use RI or PB alternatives to comply with NFPA 805 by submitting a LAR in accordance with 10 CFR 50.48(c)(4), which states, in part, that:

The Director of the Office of Nuclear Reactor Regulation, or designee of the Director, may approve the application if the Director or designee determines that the proposed alternatives:

- (i) Satisfy the performance goals, performance objectives, and performance criteria specified in NFPA 805 related to nuclear safety and radiological release;

- (ii) Maintain safety margins; and
- (iii) Maintain fire protection DID (fire prevention, fire detection, fire suppression, mitigation, and post fire safe shutdown capability).

In addition to the conditions outlined by the rule that require licensees to submit an LAR for NRC review and approval in order to adopt an RI/PB FPP, a licensee may submit additional elements of its FPP for which it wishes to receive specific NRC review and approval, as set forth in Regulatory Position C.2.2.1 of Regulatory Guide (RG) 1.205, Revision 1, "Risk Informed, Performance Based Fire Protection for Existing Light Water Nuclear Power Plants" (Reference 9). Inclusion of these elements in a NFPA 805 LAR is meant to alleviate uncertainty in portions of the current FPP licensing bases as a result of the lack of specific NRC approval of these elements. Regulatory guides are not substitutes for regulations, and compliance with them is not required. Methods and solutions that differ from those set forth in regulatory guides will be deemed acceptable if they provide a basis for the findings required for the issuance or continuance of a permit or license by the Commission. Accordingly, any submittal addressing these additional FPP elements needs to include sufficient detail to allow the NRC staff to assess whether the licensee's treatment of these elements meets the 10 CFR 50.48(c) requirements.

The purpose of the FPP established by NFPA 805, is to provide assurance through a DID philosophy, that the NRC's fire protection objectives are satisfied.

Section 1.2, "Defense in Depth," of NFPA 805 states that:

Protecting the safety of the public, the environment, and plant personnel from a plant fire and its potential effect on safe reactor operations is paramount to this standard. The fire protection standard shall be based on the concept of defense in depth. Defense in depth shall be achieved when an adequate balance of each of the following elements is provided:

- (1) Preventing fires from starting;
- (2) Rapidly detecting fires and controlling and extinguishing promptly those fires that do occur, thereby limiting fire damage; and
- (3) Providing an adequate level of fire protection for structures, systems and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions from being performed.

In accordance with 10 CFR part 50, Appendix A, GDC 3, fire detection and fighting systems must be designed such that their rupture or inadvertent operation does not significantly impair the ability of the structures, systems, and components important to safety to perform their intended safety functions.

In addition, 10 CFR 50.32, "Elimination of repetition," states, in part, that "the applicant may incorporate by reference information contained in previous applications, statements or reports filed with the Commission: Provided, that such references are clear and specific."

The NRC staff review of this LAR also relied on the following additional codes, regulatory guides, and standards:

- Revision 1 of RG 1.205, "Risk Informed, Performance Based Fire Protection for Existing Light Water Nuclear Power Plants," December 2009 (Reference 9), provides guidance for use in complying with the requirements that the NRC has promulgated for RI/PB FPPs that comply with 10 CFR 50.48 and the referenced 2001 Edition of the NFPA standard. Revision 1 of RG 1.205 sets forth regulatory positions; emphasizes certain issues, clarifies the requirements of 10 CFR 50.48(c) and NFPA 805, clarifies the guidance in Nuclear Energy Institute (NEI) 04-02, Revision 2, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," April 2008 (Reference 10) and provides exceptions to the NEI 04-02 guidance where required. Should a conflict occur between NEI 04-02 and RG 1.205, the regulatory positions in RG 1.205 govern.
- RG 1.174, "An Approach for Using Probabilistic Risk Assessment in Risk Informed Decisions on Plant-Specific Changes to the Licensing Basis," Revision 3, issued January 2018 (Reference 11), provides the NRC staff's recommendations for using risk information in support of licensee-initiated licensing basis changes to a nuclear power plant that requires such review and approval.
- NUREG/CR 6850, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities," Volumes 1 and 2 and Supplement 1, September 2005 and September 2010, respectively (Reference 12), (Reference 13), and (Reference 14), presents a compendium of methods, data, and tools to perform a fire PRA and develop associated insights.
- NEI 04-02, Revision 2, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c), (Reference 10), provides guidance for implementing the requirements of 10 CFR 50.48(c), and represents methods for implementing in whole or in part a RI/PB FPP. This implementing guidance for NFPA 805 has two primary purposes: (1) provide direction and clarification for adopting NFPA 805 as an acceptable approach to fire protection, consistent with 10 CFR 50.48(c); and (2) provide additional supplemental technical guidance and methods for using NFPA 805 and its appendices to demonstrate compliance with fire protection requirements. Although there is a significant amount of detail in NFPA 805 and its appendices, clarification and additional guidance for select issues help ensure consistency and effective utilization of the standard. The NEI 04-02 guidance focuses attention on the RI/ PB FPP fire protection goals, objectives, and performance criteria contained in NFPA 805 and the RI/PB tools considered acceptable for demonstrating compliance. Revision 2 of NEI 04-02 incorporates guidance from RG 1.205 and approved Frequently Asked Questions (FAQs).

2.3 Licensee's Proposed Changes

To document the proposed RCP seal change, in its LAR dated October 17, 2018, the licensee proposed to modify the Operating Licenses, Paragraph 3.D, "Transition License Conditions," Item 3), to eliminate Implementation Item 22 to remove reliance on NRC approval of the Flowserve TR as a condition of transition to NFPA 805, and instead use the guidance outlined in WCAP-16175-P-A, Revision 0, for modeling of RCP seal leakage in the PRA.

As revised, the first paragraph of the Turkey Point, Units 3 and 4, License Conditions 3.D will read as follows (changes in bold):

FPL shall implement and maintain in effect all provisions of the approved fire protection program that comply with 10 CFR 50.48(a) and 10 CFR 50.48(c), as specified in the licensee amendment requests dated June 28, 2012 **and October 17, 2018** (and supplements dated September 19, 2012; March 18, April 16, and May 5, 2013; January 7, April 4, June 6, July 18, September 12, November 5, and December 2, 2014; February 18, 2015; **October 24, and December 3, 2018; and January 31, 2019**), and as approved in the safety evaluations dated May 28, 2015 **and March 27, 2019**. Except where NRC approval for changes or deviations is required by 10 CFR 50.48(c), and provided no other regulation, technical specification, license condition or requirement would require prior NRC approval, the licensee may make changes to the fire protection program without prior approval of the Commission if those changes satisfy the provisions set forth in 10 CFR 50.48(a) and 10 CFR 50.48(c), the change does not require a change to a technical specification or a license condition, and the criteria listed below are satisfied.

The licensee is also proposing a revision to its FPP Transition License Condition 3 of 3.D, which will read as follows (changes in bold):

The licensee shall implement the items listed in Enclosure 5, Attachment S, Table S-3, "Implementation Items," of FPL letter **L-2018-219, dated 12/3/2018**, with the exception of items 12, 18, **and 19**, no later than 12 months after issuance of the license amendment **dated 5/28/2015**. Items 12, 18 and 19 are associated with modifications in Table S-2 and will be completed in accordance with Transition License Condition 2 above.

3.0 TECHNICAL EVALUATION

3.1 Maintaining Defense-in-Depth and Safety Margins

NFPA 805, Section 4.2.4.2, requires that the "use of fire risk evaluation for the PB approach shall consist of an integrated assessment of the acceptability of risk, defense-in-depth, and safety margins."

3.1.1 Defense-in-Depth

As a supplement to the definition of DID provided in NFPA 805, Section 1.2, the NRC-endorsed guidance in NEI 04-02, Section 5.3.5.2, states that:

In general, the defense-in-depth requirement is satisfied if the proposed change does not result in a substantial imbalance in:

- Preventing fires from starting;
- Detecting fires quickly and extinguishing those that do occur, thereby limiting fire damage; and
- Providing adequate level of fire protection for structures, systems and components important to safety, so that a fire that is not promptly extinguished will not prevent essential plant safety functions [from] being performed.

3.1.2 Safety Margins

Although not a part of the requirements of NFPA 805, and thus not required under 10 CFR 50.48(c), NFPA 805, Appendix A, Section A.2.4.4.3, provides the following background related to the meaning of the term "safety margins":

An example of maintaining sufficient safety margins occurs when the existing calculated margin between the analysis and the performance criteria compensates for the uncertainties associated with the analysis and data. Another way that safety margins are maintained is through the application of codes and standards. Consensus codes and standards are typically designed to ensure such margins exist.

NEI 04-02, Section 5.3.5.3, "Safety Margins," lists two specific criteria that should be addressed when considering the impact of plant changes on safety margins:

- Codes and standards or their alternatives accepted for use by the NRC are met; and,
- Safety analysis acceptance criteria in the licensing basis (e.g., FSAR [Final Safety Analysis Report], supporting analyses, etc.) are met, or provides sufficient margin to account for analysis and data uncertainty.

3.2 Discussion

3.2.1 The Requested Change and the Licensee's Technical Basis

The licensee stated that its proposed change removes the Flowserve TR review requirement from the NFPA 805 Transition License Condition and removes Implementation Item 22 from Attachment S, Table S-3. The licensee further stated that the PRA treatment for the RCP seal leakage will be revised to use the guidance from the NRC approved WCAP-16175-P-A instead of the guidance from the Flowserve TR, and consequently, the fire PRA requires updates to selected data, specifically, the Human Error Probability (HEP) values associated with reduced time to trip the RCPs on loss of seal cooling are changed. The licensee further stated that the new time to trip the RCPs following a loss of seal cooling will be established as 20 minutes from WCAP-16175-P-A versus 60 minutes as assumed in the Flowserve TR, and that the RCP seal failure probabilities in the PRA model were adjusted to be consistent with those presented in WCAP-16175-P-A for Flowserve RCP seals.

The licensee stated that the change to Transition License Condition 3 includes the deletion of Table S-3, Implementation Item 22 which eliminates reliance on the Flowserve TR. The licensee further stated that NRC approval of the Flowserve TR is a precursor for the Table S-3 implementation item and that the Flowserve TR has not yet been submitted to the NRC for review. The licensee further stated that removal of the Flowserve TR license condition will allow it to fully implement the requirements of the NFPA 805 license amendment and remain within its licensing basis for future RCP seal replacements without reliance on the Flowserve TR.

The licensee stated that the WCAP-16175-P-A RCP seal leakage PRA model has been evaluated for use in the Turkey Point configuration and that it includes a three-stage

RCP seal model and a four-stage RCP seal model, neither of which has the Abeyance Seal. The licensee further stated that it installed the three-stage Flowserve RCP seal with the Abeyance Seal for Unit 3 and Unit 4 during the fall 2015 and spring 2016 refueling outages, respectively and that the modifications correspond to Item 33 in LAR Attachment S, Table S-2. The licensee further stated that since WCAP-16175-P-A does not include an Abeyance Seal model, this feature was conservatively not credited in the Turkey Point fire PRA model.

3.2.1.1. Use of WCAP-16175-P-A for Turkey Point RCP Seal PRA Model

The licensee stated that, as described in Section 4 of the Safety Evaluation for WCAP-16175-P-A, there are three issues that must be addressed for non-Combustion Engineering (CE) plants that wish to apply the failure models for Flowserve RCP seals to the site specific PRA models, and the issues include:

1. Justify that failure modes observed during early operation of Flowserve RCP seals on CE plants are appropriately considered in the PRA models.
2. Justify that stable RCP seal operation has been observed before applying the RCP seal model to the PRA.
3. Justify that the plant and operator responses included in plant procedures reflect the conditions and timing assumed in the WCAP.

The licensee stated that these concerns are addressed as follows:

1. The Flowserve N-Seals have proven to be reliable in RCP installations throughout the industry since the 1980s. Since 2016, Turkey Point has operated with Flowserve RCP seals and has maintained communication with the seal vendor and industry groups regarding the seal design, failure mechanisms, maintenance, operational controls, and industry operating experience. These considerations, along with any differences between the Turkey Point RCP seals and the seal design discussed in WCAP 16175-PA, were evaluated and judged not to affect the seal probability model. Thereby, the Turkey Point RCP seal design is appropriate for application of the 3-stage seal model evaluated in WCAP 16175-P-A.
2. Operation of the Flowserve RCP seals since 2016 has yielded sufficient evidence of stable operation to justify application of the WCAP 16175-P-A seal model to the Turkey Point PRA. During operation with new Flowserve RCP seals, performance parameters including pressure distribution between stages, Controlled Bleed Off (CBO) flow, and outlet temperature have remained within expected ranges. In cases where seals have experienced a degraded or failed stage, performance parameters have been within the vendor's pre-defined ranges for operating limits.
3. Plant procedures for installation and operation of the Flowserve RCP seals reflect industry knowledge and operating experience. Operating procedures and operator training will be reviewed for consistency with the conditions and timing evaluated in WCAP-16175-P-A, and will be revised as necessary to support implementation of this license amendment.

3.2.1.2 Changes to PRA model

The licensee stated that the WCAP-16175-P-A RCP seal leakage model has been reviewed and approved by the NRC, and that the PRA approach used in the WCAP has been referenced in approved NFPA 805 amendments, including those of a Westinghouse design, and has been evaluated for use in the Turkey Point configuration.

The licensee stated that Flowserve TR reliance will be replaced with the NRC-approved industry consensus guidance provided in WCAP-16175-P-A. The licensee further stated that the time available to trip the RCPs following a loss of seal cooling is 20 minutes, whereas the time available assumed in the Flowserve TR is 60 minutes, and that assuming a shorter time for operators to recognize the need and trip the RCPs results in increases in the calculated failure probability, which in turn increases the calculated core damage frequency (CDF) and large early release frequency (LERF) values. The licensee further stated that the RCP seal failure probabilities were adjusted to be consistent with those provided in WCAP-16175-P-A.

The licensee stated that the change from the guidance in the Flowserve TR to WCAP-16175-P-A does not change the PRA model logic; only changes to selected model inputs are made, and the PRA uses the same RCP seal leakage model. The licensee stated, however, that several HEPs and RCP seal failure probabilities that are inputs to the model are changed to remove credit for the fourth RCP seal stage and apply WCAP-16175-P-A values to the other RCP seal stages, that these HEPs are increased based on the reduced time credited to trip the RCPs, and the RCP seal failure probabilities are increased to be consistent with those provided in WCAP-16175-P-A.

The licensee also modified the PRA model to correct an identified over-conservatism in the application of several pre-initiator human error events in the PRA that are unrelated to the RCP seal performance.

In PRA Request for Additional Information (RAI) 01 (Reference 15), the NRC staff requested that the licensee clarify if the change in method from the Flowserve TR to WCAP-16175-P-A is considered a PRA upgrade. In its response to PRA RAI 01 (Reference 4), the licensee stated that use of WCAP-16175-P-A does not constitute a new methodology as the current model is simply an expansion of the earlier model via a change of failure probabilities and associated human actions. The licensee further stated that the change to the PRA is only a change in the expected leakages associated with the seals and the timing for operator actions to trip the RCPs, that the framework of the model remains essentially the same, and the High-Level Requirements and Supporting Requirements in the PRA Standard for the associated Technical Elements continue to be addressed regardless of this change. The licensee further stated that the significant sequences were not changed, there is no change in the model scope since equipment, dependencies, and the types of accident sequences remain the same. Finally, the licensee stated that there is no change in PRA modeling capability as the PRA model still evaluates the risk associated with station blackout (SBO) and total loss of cooling events related to RCP seal failures.

The LAR expands further upon the effect of WCAP-16175-P-A on the PRA model. The licensee stated that there are no changes to any of the methods used in the fire PRA model as a result of using the WCAP-16175-P-A guidance related to the time limit to trip the RCPs on a loss of seal cooling and the changes in seal failure probabilities. The licensee further stated that there were no changes in event tree or fault tree models, meaning that no changes in any accident sequence modeling occurred and that the PRA model's basic events pertaining to probability of

RCP seal failure upon loss of seal cooling were adjusted to be consistent with WCAP-16175-P-A values. The licensee further stated that the reduced time available to trip the RCPs also resulted in increased HEPs being calculated for individual basic events associated with failures to trip the RCPs and that these probability changes were also reflected in the human error dependency analysis to ensure that the increased failure probabilities were considered in the dependent failure combinations. The licensee further stated that the methods used to calculate the increased HEPs remain unchanged and there were no changes made to the PRA model quantification methods.

3.2.1.3. Process for Change in Risk Determination

Since Turkey Point is still completing its transition to NFPA 805, the fire PRA is used to assess the risk significance of the variance from deterministic requirements (VFDRs) to determine if the risk is acceptable to allow transition. Thus, the change in risk supporting the LAR is the change in risk due to the use of the post-transition risk model minus the risk of the compliant model. To evaluate this change in risk, the licensee utilized the compliant risk described in its letter dated September 12, 2014 (Reference 16) in support of its original NFPA 805 application. In its response to PRA RAI 02 (Reference 4), the licensee indicated that the change to the pre-initiator human error events did not affect the compliant risk cited from this source. The post-transition risk is characterized by a PRA model consisting of both WCAP-16175-P-A and the refinement to pre-initiator human error event risk. As was done for the NFPA 805 LAR, Turkey Point applied the risk reduction credit from Fire Area CC to adjust the change in risk; however, the risk reduction credit for this LAR was modified as required for the use of the WCAP model. The licensee indicated in its response to PRA RAI 02 that the Safety Injection Systems to which the pre-initiator human errors refer are not credited for Fire Area CC and incorporation of the pre-initiator human error events in the risk reduction credit would only increase the risk reduction.

3.2.1.4. Risk Results

The licensee indicated that the initial change in CDF for application of WCAP-16175-P-A utilizing the removal of the conservatism in the pre-initiator human events is $1.95E-05$ /reactor-year (rx-yr) and $2.97E-05$ /rx-yr for Units 3 and 4, respectively; the change in LERF is $1.55E-06$ /rx-yr and $1.58E-06$ /rx-yr for Units 3 and 4, respectively. However, additional risk reduction credit is available to bear upon these initial calculated changes in risk values. The risk reduction credit for CDF from Fire Area CC is $2.05E-04$ /rx-yr and $1.86E-04$ /rx-yr for Units 3 and 4, respectively; the risk reduction credit for LERF from Fire Area CC is $7.26E-06$ /rx-yr and $4.52E-06$ /rx-yr for Units 3 and 4, respectively. Thus, due to the magnitude of the risk reduction credit, the licensee concludes that the overall change in risk for the NFPA 805 transition considering the analysis changes in this LAR is negative for both LERF and CDF.

Additionally, the licensee performed a supplemental analysis to evaluate the risk from the addition of WCAP-16175-P-A above the accepted post-transition risk from NFPA 805 (each incorporating the refinement to the pre-initiator human error events) and found the increase to be small.

3.2.1.5 Nuclear Safety Capability Analysis Review Insights

The licensee stated that the nuclear safety capability analysis (NSCA) was reviewed for any changes in compliance strategies or recovery actions and that in the event of a complete loss of

RCP seal cooling due to a fire in certain fire areas, the existing compliance strategies remain valid and the previously identified recovery actions for DID are being retained. The licensee further stated that no new compliance strategies or recovery actions were identified.

The licensee stated that the NSCA was reviewed for any changes in VFDRs and compliance strategies (including recovery actions and activities occurring at the primary control station(s)), and that in the event of a complete loss of RCP seal cooling due to a fire in certain fire areas, the previously identified recovery actions for DID are being retained. The licensee further stated that these DID recovery actions do not have specific time requirements that require updating and that no new VFDRs or recovery actions were identified, therefore, no changes are required to the lists of VFDRs or recovery actions.

3.2.2 Safety Margins

The licensee stated that a review of the DID and safety margin evaluations associated with the original NFPA 805 LAR have been completed based on the proposed application of the guidance from WCAP-16175-P-A instead of the guidance from the Flowserve TR in the fire PRA model.

The licensee stated that consistent with the use of fire risk evaluations and change evaluations for the NFPA 805 performance-based approach, implementation of the following guidelines ensures the bases for maintaining safety margin:

- The risk-informed, performance-based processes utilized are based upon NFPA 805, 2001 Edition, endorsed by the NRC in 10 CFR 50.48(c).
- The fire risk evaluation process is in accordance with NEI 04-02, Revision 2, which is endorsed by the NRC in Regulatory Guide 1.205, Revision 1.
- The fire PRA is developed with guidance from NUREG/CR-6850, which was developed jointly between the NRC and the Electric Power Research Institute (EPRI).
- The baseline fire PRA (and the internal events PRA upon which it is based) have undergone formal industry peer reviews conducted by a diverse group of PRA practitioners from other PWR [pressurized-water reactor] plants and industry.
- Fire protection systems and features determined to be required by NFPA 805 Chapter 4 have been confirmed to meet the requirements of NFPA 805 Chapter 3 and their associated referenced codes and listings or provided with acceptable alternatives using processes accepted for use by the NRC (e.g., FAQs).

The licensee stated that it concluded that using the guidance in WCAP-16175-P-A instead of the guidance from the Flowserve TR in the fire PRA maintains adequate safety margin.

3.2.3 Defense-in-Depth

The licensee stated that the update to the fire PRA does not impact the ability to prevent fires from starting, nor does it impact the ability to rapidly detect, control, and promptly extinguish fires that do occur. The licensee stated that the only aspect of the DID approach that is altered is the timing associated with actions to stop RCPs to mitigate seal damage. The LAR indicates in the event of a complete loss of RCP seal cooling due to a fire, the previously identified recovery actions for DID were verified sufficient and are being retained. No new recovery actions for DID or for risk were determined necessary.

The licensee stated that it concluded that using the guidance in WCAP-16175-P-A instead of the guidance from the Flowserve TR in the fire PRA model has no impact on any of the DID echelons relative to fire protection described by NFPA 805.

3.3 NRC Staff Evaluation

In accordance with 10 CFR 50.48(c)(3)(i), the licensee submitted a LAR to revise its NFPA 805 License Condition 3.D. The NRC staff reviewed the information provided by the licensee in its LAR that included discussions of the impact of the proposed change on risk, DID, and safety margins as required by NFPA 805, Section 4.2.4.2.

The NRC staff finds that the licensee has justified that failure modes observed during early operation of Flowserve RCP seals on CE plants are appropriately considered in the PRA models. The licensee has communicated with Flowserve and industry groups concerning the seal design, failure mechanisms maintenance, operational controls, and industry operating experience. The licensee has evaluated the information, and determined that it does not affect their seal probability model.

The NRC staff finds that the licensee observed stable RCP seal operation before applying the RCP seal model to the PRA. The licensee stated that the seal performance parameters have remained in their expected ranges for normal operation and for degraded and failed seal stages.

The NRC staff finds that the licensee has justified that the plant and operator responses included in plant procedures reflect the conditions and timing assumed in WCAP-16175-P-A. The licensee stated that operating procedures and operator training will be reviewed for consistency with the conditions and timing evaluated in WCAP-16175-P-A, and will be revised as necessary to support implementation of this license amendment.

In regard to risk, the NRC staff confirmed that the proposed change does not challenge the RG 1.174 acceptance guidelines because the proposed change results in a negative change in fire CDF and fire LERF. Since the change in risk is negative for both fire CDF and fire LERF, the total risk and additional risk of recovery actions do not impair the licensee's proposed change.

In regard to DID, the NRC staff confirmed that the proposed change has no impact on any of the DID echelons because the change is not considered a method for preventing fires from starting, nor detecting or extinguishing fires, and because the risk evaluation concludes that an adequate level of fire protection will be provided so that a fire will not prevent essential safety functions from being performed.

In regard to safety margins, the NRC staff confirmed that the proposed changes continue to maintain adequate safety margins, in part, because the changes do not impact any codes and standards or their alternatives accepted for use by the NRC, and the changes do not impact any safety analysis acceptance criteria used in the licensing basis.

3.4 Technical Conclusion

Based on the above, the NRC staff concludes that the effect on the FPP of removing reliance on the Flowserve TR and replacing it with the guidance provided in WCAP-16175-P-A can be assessed using the methods and approaches accepted previously by the NRC staff. Further, the NRC staff finds the proposed change acceptable because the licensee assessed the acceptability of WCAP-16175-P-A and its associated risk, DID, and safety margin in accordance with NFPA 805, Section 4.2.4.2., because the licensee demonstrated that the change analysis produces a negative risk and does not challenge the RG 1.174 risk acceptance guidelines, and because the licensee demonstrated that DID and safety margins, as developed in the original LAR, are maintained.

In addition, the NRC staff concludes that the licensee has identified the appropriate license condition that must be revised as a result of the proposed change and that the proposed revision is adequate; therefore, it satisfies the requirements of 10 CFR 50.48(c)(3)(i).

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, 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) on March 4, 2019 (ADAMS Accession No. ML19064A209), of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change requirements with respect to installation or the use of facility components 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 has previously issued a proposed finding, which was published in the *Federal Register* on December 26, 2018 (83 FR 66318), that the amendments involve no significant hazards consideration, and there has been no public comment on such finding. 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.

6.0 CONCLUSION

The Commission has concluded, based on the aforementioned considerations, 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 Coffey, Robert, Florida Power & Light Company, letter to U.S. Nuclear Regulatory Commission, "Turkey Point Nuclear Generating Station, Units 3 and 4, Docket Nos. 50-250 and 50-251, Renewed Facility Operating Licenses DPR-31 and DPR-41, License Amendment Request 265, Revise NFPA 805 License Condition for Reactor Coolant Pump Seals," October 17, 2018 (ADAMS Accession No. ML18292A842).
- 2 Hess, Robert, Florida Power & Light Company, letter to U.S. Nuclear Regulatory Commission, "Turkey Point Nuclear Plant, Unit 3 and 4, Docket Nos. 50-250 and 50-251, Renewed Facility Operating Licenses DPR-31 and DPR-41, Requested Approval for License Amendment Request 265, Revise NFPA 805 License Condition for Reactor Coolant Pump Seals," October 24, 2018 (ADAMS Accession No. ML18297A032).
- 3 Coffey, Robert, Florida Power & Light Company, letter to U.S. Nuclear Regulatory Commission, "Turkey Point Nuclear Plant, Unit 3 and 4, Docket Nos. 50-250 and 50-251, Renewed Facility Operating Licenses DPR-31 and DPR-41, Supplement to License Amendment Request 265, Revise NFPA 805 License Condition for Reactor Coolant Pump Seals," December 3, 2018 (ADAMS Accession No. ML18338A053).
- 4 Coffey, Robert, Florida Power & Light Company, letter to U.S. Nuclear Regulatory Commission, "Turkey Point Nuclear Plant, Unit 3 and 4, Docket Nos. 50-250 and 50-251, Renewed Facility Operating Licenses DPR-31 and DPR-41, Response to RAI Regarding License Amendment Request 265, Revise NFPA 805 License Condition for Reactor Coolant Pump Seals," January 31, 2019 (ADAMS Accession No. ML19031C866).
- 5 Westinghouse Electric Company, LLC, "Model for Failure of RCP Seals Given Loss of Seal Cooling in CE NSSS Plants," WCAP-16175-NP-A, Revision 0, March 2007 (ADAMS Accession No. ML071130383).
- 6 Kiley, Michael, Florida Power & Light Company, letter to U.S. Nuclear Regulatory Commission, "Turkey Point Nuclear Generating Station Units 3 and 4, Docket Nos. 50-250 and 50-251, License Amendment Request No. 216, Transition to 10 CFR 50.48(c) – NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants," June 28, 2012 (ADAMS Accession No. ML12191A048).
- 7 Klett, Audrey, L., U.S. Nuclear Regulatory Commission, letter to Nazar, Mano, Nextera Energy, "Turkey Point Nuclear Generation Station, Unit Nos. 3 and 4 - Issuance of Amendments Regarding Transition to a Risk-Informed, Performance-Based Fire Protection Program In Accordance with 10 CFR 50.48(c) (TAC Nos. ME8990 and ME8991)," May 28, 2015 (ADAMS Accession No. ML15061A237).
- 8 National Fire Protection Association, "Performance-Based Standard for Fire Protection for Light Water Reactor Electric Generating Plants," Standard 805 (NFPA 805), 2001 Edition, Quincy, Massachusetts.
- 9 U.S. Nuclear Regulatory Commission, "Risk-Informed, Performance-Based Fire Protection for Existing Light-Water Nuclear Power Plants," Regulatory Guide 1.205, Revision 1, December 2009 (ADAMS Accession No. ML092730314).
- 10 Nuclear Energy Institute, "Guidance for Implementing a Risk-Informed, Performance-Based Fire Protection Program Under 10 CFR 50.48(c)," Washington, DC, NEI 04-02, Revision 2, April 2008 (ADAMS Accession No. ML081130188).
- 11 U.S. Nuclear Regulatory Commission, "An Approach for Using Probabilistic Risk

- Assessment in Risk-Informed Decisions on Plant-Specific Changes to the Licensing Basis," Regulatory Guide 1.174, Revision 3, January 2018 (ADAMS Accession No. ML17317A256).
- 12 U.S. Nuclear Regulatory Commission, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities, Volume 1: Summary and Overview," NUREG/CR-6850, September 2005 (ADAMS Accession No. ML052580075).
 - 13 U.S. Nuclear Regulatory Commission, "EPRI/NRC-RES Fire PRA Methodology for Nuclear Power Facilities, Volume 2: Detailed Methodology," NUREG/CR-6850, September 2005 (ADAMS Accession No. ML052580118).
 - 14 U.S. Nuclear Regulatory Commission, "Fire Probabilistic Risk Assessment Methods Enhancements," NUREG/CR-6850, Supplement 1, September 2010 (ADAMS Accession No. ML103090242).
 - 15 Buckberg, Perry, U.S. Nuclear Regulatory Commission, E-mail to Hanek, Olga, Florida Power & Light Company, "Request for Additional Information - Turkey Point LAR 265 PRA - NFPA RCP Seals - EPID L-2018-LLA-0280," January 16, 2019 (ADAMS Accession No. ML19016A233).
 - 16 Kiley, Michael, Florida Power & Light Company, letter to U.S. Nuclear Regulatory Commission, "Turkey Point Nuclear Generating Station Units 3 & 4, Docket Nos. 50-250 & 50-251, Response to RAI Regarding LAR No. 216 - Transition to 10CFR50.48(c) - NFPA 805 Performance-Based Standard for Fire Protection for Light Water Reactor Generating Plants," September 12, 2014 (ADAMS Accession No. ML14279A093).

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Date: March 27, 2019

SUBJECT: TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4 - ISSUANCE OF AMENDMENTS REGARDING TRANSITION LICENSE CONDITIONS FOR REACTOR COOLANT PUMP SEALS (EPID L-2018-LLA-0280) DATED MARCH 27, 2019

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RidsNrrPMTurkeyPoint Resource

RidsNrrLABClayton Resource

RidsRgn2MailCenter Resource

RidsNrrDorLpl2-2 Resource

RidsNrrDeEmib Resource

RidsNrrDraAplb Resource

JRobinson, NRR

JHyslop, NRR

BWolfgang, NRR

ADAMS Accession No.: ML19064A903

*by memorandum

**by e-mail

OFFICE	NRR/DORL/LPL2-2/PM	NRR/DORL/LPL2-2/LA	NRR/DE/EMIB/BC**
NAME	PBuckberg	BClayton	SBailey
DATE	03/07/19	03/06/19	02/28/19
OFFICE	NRR/DRA/APLB/BC*	OGC (NLO)**	NRR/DORL/LPL2-2/BC
NAME	GCasto	STurk	UShoop
DATE	03/04/19	03/22/19	03/27/19
OFFICE	NRR/DORL/LPL2-2/PM		
NAME	PBuckberg		
DATE	03/27/19		

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