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

April 26, 2016

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

SUBJECT: TURKEY POINT NUCLEAR GENERATING UNIT NOS. 3 AND 4 - ISSUANCE OF AMENDMENTS REGARDING TECHNICAL SPECIFICATION FIGURE FOR THE BORIC ACID TANK MINIMUM VOLUME (CAC NOS. MF6148 AND MF6149)

Dear Mr. Nazar:

The U.S. Nuclear Regulatory Commission (NRC or the Commission) has issued the enclosed Amendment No. 270 to Renewed Facility Operating License (RFOL) No. DPR-31 and Amendment No. 265 to RFOL No. DPR-41 for the Turkey Point Nuclear Generating Unit Nos. 3 and 4, respectively. The amendments change the Technical Specifications in response to the application from Florida Power & Light Company dated April 16, 2015, as supplemented by letters dated December 7, 2015, and March 29, 2016.

The amendments revise TS Figure 3.1-2, "Boric Acid Tank Minimum Volume," to reflect corrections to an instrument uncertainty calculation.

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

Sincerely,

Audrey L. Klett, 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. 270 to DPR-31
2. Amendment No. 265 to DPR-41
3. Safety Evaluation

cc w/enclosures: Distribution via 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. 270
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 April 16, 2015, as supplemented by letters dated December 7, 2015, and March 29, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in Title 10 of the *Code of Federal Regulations* (10 CFR), Chapter I;

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

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

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

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

2. Accordingly, the license is amended by changes to the Operating License and Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B. of Renewed Facility Operating License No. DPR-31 is hereby amended to read as follows:

   B. Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 270 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.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Benjamin G. Beasley, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License and
Technical Specifications

Date of Issuance: April 26, 2016

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. 265
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 April 16, 2015, as supplemented by letters dated December 7, 2015, and March 29, 2016, complies with the standards and requirements of the Atomic Energy Act of 1954, as amended (the Act) and the Commission's rules and regulations set forth in Title 10 of the *Code of Federal Regulations* (10 CFR), Chapter I;

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

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

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

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

2. Accordingly, the license is amended by changes to the Operating License and Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B. of Renewed Facility Operating License No. DPR-41 is hereby amended to read as follows:

   B. Technical Specifications

   The Technical Specifications contained in Appendix A, as revised through Amendment No. 265 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.

3. This license amendment is effective as of its date of issuance and shall be implemented within 60 days of issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

Benjamin G. Beasley, Chief
Plant Licensing Branch II-2
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Attachment:
Changes to the Operating License and
Technical Specifications

Date of Issuance: April 26, 2016

ATTACHMENT TO LICENSE AMENDMENTS

AMENDMENT NO. 270 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-31

AMENDMENT NO. 265 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-41

DOCKET NOS. 50-250 AND 50-251

Replace page 3 of Renewed Facility Operating License No. DPR-31 with the attached page 3. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

Replace page 3 of Renewed Facility Operating License No. DPR-41 with the attached page 3. The revised page is identified by amendment number and contains marginal lines indicating the areas of change.

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

Remove	Insert
3/4 1-14	3/4 1-14

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. 270 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.

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

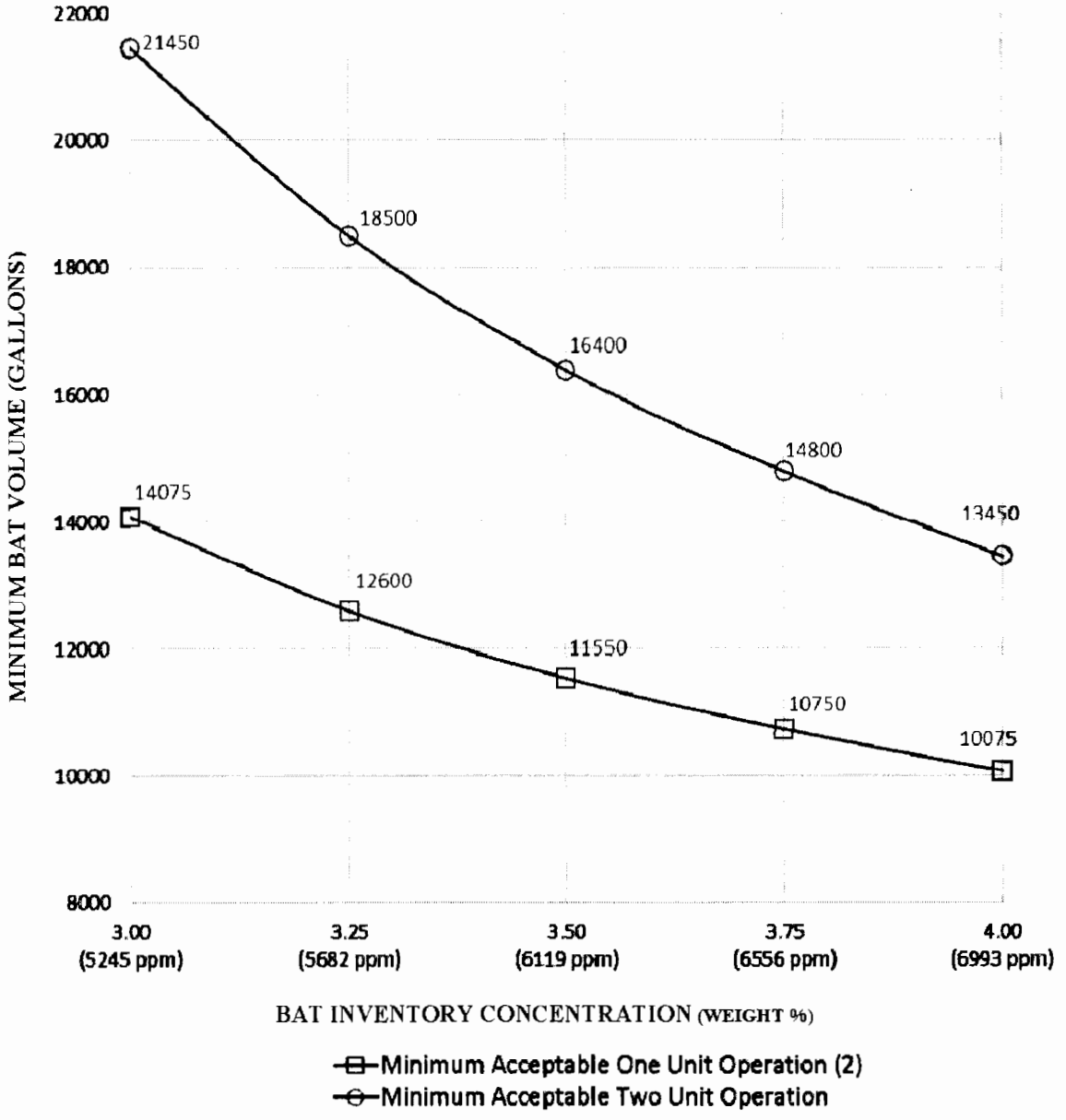
The Technical Specifications contained in Appendix A, as revised through Amendment No. 265 are hereby incorporated into this renewed license. The Environmental Protection Plan contained in Appendix B is hereby incorporated into this renewed license. The licensee shall operate the facility in accordance 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.

Figure 3.1-2
BORIC ACID TANK MINIMUM VOLUME (1)
Modes 1, 2, 3 and 4



Notes:

(1) Combined volume of all available boric acid tanks assuming RWST boron concentration between 2400 ppm and 2600 ppm.

(2) Includes 2900 gallons for the shutdown unit.

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION FOR AMENDMENT NO. 270 TO RENEWED FACILITY OPERATING LICENSE NO. DPR-31 AND AMENDMENT NO. 265 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 application dated April 16, 2015, as supplemented by letters dated December 7, 2015, and March 29, 2016,[1] Florida Power & Light Company (FPL, the licensee) requested changes to the Technical Specifications (TSs) for Turkey Point Nuclear Generating Unit Nos. 3 and 4 (Turkey Point), which are contained in Appendix A of Renewed Facility Operating Licenses DPR-31 and DPR-41. The licensee proposed to revise TS Figure 3.1-2, "Boric Acid Tank [BAT] Minimum Volume," to reflect corrections to an instrument uncertainty calculation and to correct nonconservative TS requirements.

By electronic mail (email) dated October 16, and November 30, 2015, and March 1, 2016,[2] the U.S. Nuclear Regulatory Commission (NRC) staff sent the licensee requests for additional information (RAIs). By supplements dated December 7, 2015, and March 29, 2016, the licensee responded to the RAIs. These supplements 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 (NSHC) determination as published in the *Federal Register* (FR) on September 1, 2015 (80 FR 52806).

2.0 REGULATORY EVALUATION

2.1. Description of the Boric Acid Tanks

Turkey Point's BATs are part of its Chemical and Volume Control System (CVCS). The CVCS provides a means for injection of boric acid, chemical additions for corrosion control, and reactor coolant cleanup and degasification. The CVCS also adds makeup water to the Reactor Coolant System (RCS), processes water let down from the RCS, and provides seal water injection to the reactor coolant pump seals. Makeup water to the RCS is provided by the CVCS in part from the

[1] Agencywide Documents Access and Management Systems (ADAMS) Accession Nos. ML15119A222, ML15351A406, and ML16109A112, respectively.
[2] ADAMS Accession Nos. ML15290A001, ML15335A003, and ML16062A005, respectively.

BATs, which supply concentrated boric acid solution when reactor coolant boron concentration is to be increased. The concentration of boric acid solution in storage is maintained between 3.0 and 4.0 percent by weight. Periodic manual sampling is performed, and corrective action is taken, if necessary, to ensure that these limits are maintained.

There are three shared BATs between both units that are cross-tied together effectively creating one common tank for both units and are sized to store sufficient boric acid solution to support a cooldown to cold shutdown conditions without letdown. Under these conditions, adequate boration can be achieved by providing makeup for coolant contraction from a BAT and the refueling water storage tank (RWST). The minimum volume maintained in the BATs is that volume necessary to increase the RCS boron concentration during the early phase of the cooldown of each unit, such that subsequent use of the RWST for contraction makeup will maintain the required shutdown margin throughout the remaining cooldown. In addition, the BATs have sufficient boric acid solution to achieve cold shutdown for each unit if the most reactive rod control cluster assembly (RCCA) is not inserted.

Turkey Point TS 3/4.1.2, "Reactivity Control systems, Boration Systems, Borated Water Sources – Operating," contains Limiting Conditions for Operation (LCO) 3.1.2.5.a, which states that a boric acid storage system with a minimum indicated borated water volume and a boron concentration in accordance with Figure 3.1-2 shall be operable. TS Figure 3.1-2 establishes the minimum BAT volume in gallons as a function of BAT inventory concentration in percent by weight for single-unit (or one-unit) and dual-unit (or two-unit) operation.

2.2 Licensee's Proposed Changes

The licensee proposed to revise TS Figure 3.1-2 to reflect corrections to an instrument uncertainty calculation and to correct nonconservative TS requirements. The curves in TS Figure 3.1-2 incorporate an instrument uncertainty of 600 gallons for one-unit operation and 1200 gallons for two-unit operation. These values were approved in Amendment Nos. 249 and 245, which the NRC issued for Unit 3 and 4, respectively, on June 15, 2012.[3] However, the licensee identified two issues in its calculation of the minimum acceptable BAT volume for a given boron concentration.

In its application dated April 16, 2015, the licensee stated that the instrument uncertainty of 600 gallons was erroneously doubled to 1200 gallons and included in the BAT minimum volume curve for two-unit operation. The licensee stated that the BATs are common equipment that serves both units and, therefore, the instrument uncertainty for two-unit operation should not have been counted twice when establishing the minimum acceptable BAT volume curve.

In its application dated April 16, 2015, the licensee also indicated that when calculating the total loop uncertainty (TLU) for the BAT instrumentation that monitors BAT level, the conversion of the TLU into equivalent tank volume uncertainty (in gallons) was incorrectly calculated based on the volume of a single BAT. The calculation should have considered the volume of a common tank comprised of three BATs cross-tied together. Therefore, the calculated TLU was underestimated, which resulted in the instrumentation uncertainty increasing from 600 gallons to

[3] ADAMS Accession No. ML11293A365.

900 gallons. This issue impacts both the one-unit operation curve and the two-unit operation curve in TS Figure 3.1-2.

In summary, both curves in TS Figure 3.1-2 should reflect an instrument uncertainty of 900 gallons. The licensee proposed to revise Figure 3.1-2 by shifting the one-unit operation curve up by 300 gallons, which would correct a nonconservative TS, and the two-unit operation curve down by 300 gallons in order to reflect the correct instrument uncertainty values for both curves.

2.3 Regulatory Review

The NRC staff reviewed the licensee's application to ensure that (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) activities proposed will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendments will not be inimical to the common defense and security or the health and safety of the public. The NRC staff considered the following regulatory requirements, guidance, and licensing and design-basis information during its review of the proposed changes.

The regulations in Title 10 of the *Code of Federal Regulations* (10 CFR), Part 50, "Domestic Licensing of Production and Utilization Facilities," provide the regulatory requirements for the licensing of production and utilization facilities.

Paragraph 50.92(a) of 10 CFR states that in determining whether an amendment to a license will be issued to the applicant, the Commission will be guided by the considerations that govern the issuance of initial licenses to the extent applicable and appropriate.

The regulatory requirements related to the content of the TSs are contained in 10 CFR 50.36, "Technical specifications." Paragraph 50.36(a)(1) of 10 CFR states that each applicant for a license authorizing operation of a utilization facility shall include proposed TSs in the application in accordance with the requirements of this section (i.e., 10 CFR 50.36). Paragraph 50.36(b) of 10 CFR states that the TSs will be derived from the analyses and evaluation included in the safety analysis report.

Paragraph 50.36(c) of 10 CFR requires TSs to include the following categories related to station operation: (1) safety limits, limiting safety systems settings, and control settings; (2) LCOs; (3) surveillance requirements; (4) design features; (5) administrative controls; (6) decommissioning; (7) initial notification; and (8) written reports. Paragraph 50.36(c)(2) of 10 CFR states that LCOs are the lowest functional capability or performance levels of equipment required for safe operation of the facility, and when LCOs are not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the LCO can be met. LCOs must be established for a structure, system, or component that is part of the primary success path and which functions to mitigate a design basis accident or transient that presents a challenge to the integrity of a fission product barrier.

The Turkey Point design approval for its construction phase was based on the proposed general design criteria (GDC) published by the Atomic Energy Commission in the FR on July 11, 1967 (32 FR 10213). Section 1.3, "General Design Criteria," of the Turkey Point

Updated Final Safety Analysis Report (UFSAR) describes the Turkey Point GDC and lists other sections of the UFSAR that describe the GDC in more detail.

The staff considered Turkey Point GDC 12, "Instrumentation and Control Systems," which is described in Section 7.1 of the UFSAR and states that instrumentation and controls shall be provided, as required, to monitor and maintain within prescribed operating ranges essential reactor facility operating variables.

The staff also considered Turkey Point GDC 30, "Reactivity Holddown Capability," which is described in Sections 3.1 and 9.2 of the Turkey Point UFSAR, insofar as it requires one of the reactivity control systems be capable of making and holding the core subcritical under any conditions with appropriate margin for contingencies. Turkey Point GDC 30 states that the reactivity control systems provided shall be capable of making the core subcritical under credible accident conditions with appropriate margins for contingencies and limiting any subsequent return to power such that there will be no undue risk to the health and safety of the public.

The staff considered the Standard Review Plan (SRP), Section 9.3.4, "Chemical and Volume Control System (PWR [Pressurized Water Reactor]) (Including Boron Recovery System)," Revision 3,[4] insofar as it provides guidance for performing safety reviews for amendments relating to the CVCS.

The staff considered NRC Regulatory Guide (RG) 1.105, "Setpoints for Safety-Related Instrumentation," Revision 3,[5] which describes a method acceptable to the NRC staff for complying with the NRC's regulations for ensuring the setpoints for safety-related instrumentation are initially within, and remain within, the TS limits. This RG endorses Part 1 of International Society of Automation Standard S67.04.01-2006.

NRC Administrative Letter (AL) 98-10, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety," dated December 29, 1998,[6] provides the NRC's staff expectations regarding the correction of facility TSs when they are found to contain nonconservative values or specify incorrect actions. NRC AL 98-10 states that the discovery of an improper or inadequate TS value or required action is considered a degraded or nonconforming condition. Additional guidance is in NRC Regulatory Issue Summary 2005-20, dated April 16, 2008.[7] The NRC considers imposing administrative controls in response to the improper or inadequate TSs as an acceptable short term corrective action. The NRC staff expects licensees to submit an amendment request in a timely fashion following the imposition of such administrative controls.

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[4] ADAMS Accession No. ML070160660.
[5] ADAMS Accession No. ML993560062.
[6] ADAMS Legacy Library Accession No. 9812280273. The document is also available from the NRC's public Web site at: http://www.nrc.gov/reading-rm/doc-collections/gen-comm/admin-letters/1998/al98010.html.
[7] ADAMS Accession No. ML073531473.

3.0 TECHNICAL EVALUATION

The staff evaluated the licensee's proposed changes to TS Figure 3.1-2, "Boric Acid Tank Minimum Volume," associated with TS LCO 3.1.2.5 that reflect a correction to the associated instrument uncertainty calculation for both one-unit and two-unit operation. The staff reviewed the proposed changes for compliance with 10 CFR 50.36. The staff also reviewed the licensee's calculation methodology to determine if the proposed changes are consistent with safety analysis assumptions and NRC guidance.

3.1 Review of Reactivity Control Capability

The staff used SRP Section 9.3.4, Revision 3, as guidance in its review. Section 9.3.4 of the SRP, Revision 3, states that the NRC review should verify the adequacy of the CVCS system for reactivity control by ensuring that the amount of boric acid stored in the CVCS exceeds the amount required to borate the RCS to cold shutdown concentration, assuming that the control rod assembly with the highest reactivity worth is held in the fully withdrawn position. Because the proposed TS changes are limited to the BATs' volumes, the NRC staff's review focused primarily on ensuring that the minimum amount of boric acid stored in the BATs exceeds the amount required to borate the RCS to cold shutdown concentration. As discussed in Section 9.2.1 of the Turkey Point UFSAR, the BATs have a minimum volume of boric acid to support cooldown to cold shutdown conditions, with appropriate shutdown margin, without letdown and can achieve cold shutdown conditions even if the most reactive RCCA is not inserted.

The issues found by the licensee in the instrument uncertainty impacts both the uncertainty for one-unit and two-unit operation. The uncertainty included in the current TS Figure 3.1-2 is 600 gallons for one-unit operation and 1200 gallons for two-unit operation. The corrected uncertainty is 900 gallons for both one- and two-unit operation. This is an increase in uncertainty for one-unit operation and a decrease for two-unit operation. These issues could potentially challenge the ability to achieve cold shutdown conditions without letdown with the most reactive RCCA not inserted, particularly for one-unit operation. This is because the actual minimum volume in the BAT (i.e., the instrument indicated volume minus the uncertainty) could be less than previously assumed, which is nonconservative. As discussed in the licensee's application dated April 16, 2015, the licensee established administrative controls to assure that the minimum acceptable BAT volume for one-unit operation is within the corrected values until these amendments are granted and implemented.

The licensee incorporated the corrected uncertainty values by adjusting the nominal curves on TS Figure 3.1-2. The nominal curves show the requirements for the values observed from the tanks' level gauges. While both the proposed nominal curves and uncertainty values have changed from those values currently in the TSs, the difference between the nominal curves and uncertainty values is the same for both the proposed and current TSs. These amendments do not change the minimum volume needed to satisfy design basis accident analyses.

In its RAI dated October 16, 2015, the staff asked the licensee if the evaluations crediting the boric acid from the BAT to achieve cold shutdown used nominal volume minus uncertainty in the calculations or a different volume assumption. In its response dated December 7, 2015, the licensee stated that all the calculations were performed using nominal BAT volume minus the

volume uncertainty. Therefore, the results from those evaluations will be unchanged with the incorporation of the proposed TS Figure 3.1-2, which includes corrections for the instrument uncertainty.

Because the nominal minus uncertainty values assumed in the evaluations to achieve cold shutdown are unchanged in the proposed amendment, Turkey Point GDC 30, which requires the reactivity control system be capable of making and holding the core subcritical under any conditions with appropriate margin for contingencies, and the 10 CFR 50.36 requirement to have limiting conditions of operation that are the lowest functional capability of equipment to perform their safety operation, continue to be met with the proposed amendments.

3.2 Review of TLU Calculation and its Methodology

The staff reviewed the licensee's TLU calculation and its methodology to verify that the proposed changes to increase the BAT minimum acceptable volume curve by 300 gallons for one-unit operation and to decrease the BAT minimum acceptable volume curve by 300 gallons for two-unit operation are adequate and consistent with safety analysis assumptions and NRC guidance.

Uncertainty is the amount to which an instrument channel's output is in doubt (or the allowance made for such doubt) caused by possible errors, either random or systematic. Uncertainty is generally identified within a probability and confidence level. Random error is described as a variable whose value at a particular future instant cannot be predicted exactly but can only be estimated by a probability distribution function. Bias is an uncertainty component that consistently has the same algebraic sign and is expressed as an estimated limit of error.

In its application dated April 16, 2015, the licensee stated that it calculated the TLU for the three instrument loops using the square-root-sum-of-the-squares (SRSS) methodology, which accounts for random errors. The instrument loops monitor the level in each of the three BATs. However, the licensee identified issues in the TLU calculation that converted the TLU into equivalent tank volume uncertainty (in gallons), which resulted in the curves in TS Figure 3.1-2 being incorrect and nonconservative. The staff determined that it needed to review the licensee's TLU calculation to verify which errors the licensee considered, how the licensee combined the errors (e.g., random, nonrandom, and bias), and how it calculated the TLU. Therefore, in its RAIs dated October 16, 2015, and March 1, 2016, the staff requested the licensee to provide its TLU calculation, or information from the calculation, and a description of the methodology and assumptions it used in the TLU calculation.

TLU Calculation Methodology

The staff reviewed the licensee's TLU calculation methodology for measuring BAT level to determine if the tank interconnection affects the accuracy and bias of the level measurement system. This determination included confirmation that the BATs were identical in height and internal diameter and installed at the same elevation in their interconnected design. In its RAIs dated October 16, 2015, and March 1, 2016, the staff requested the licensee to clarify whether the three BATs are identical in height and internal diameter and installed at the same elevation. The staff also requested the licensee to describe the measures taken to assure consistency of the specific gravity between the three BATs.

In its letters dated December 7, 2015, and March 29, 2016, the licensee responded to the RAIs and confirmed that the three BATs – T205A, T205B, and T205C – are identical in height and internal diameter. The licensee also stated that it uses bubbler tubes in its level instrumentation. The licensee measures the BAT levels using Level Transmitters LT-106 for T205A, LT-108 for T205B, and LT-102 for T205C. The licensee confirmed that the three BATs are located at the same elevation and that the BATs are interconnected with 3-inch pipes at the bottom of each tank. The bubbler tubes are 4 inches below the top of the vortex level. The bubbler tube outlet is about 9 inches above the BAT interconnection. Therefore, the elevation of the tank interconnections is at an elevation that does not affect the accuracy of the level measurement system.

In its letter dated March 29, 2016, the licensee stated that its chemistry personnel sample the BATs for boron concentration weekly and verify the BAT level, boron concentration (i.e., boric acid concentration wt%), and temperature parameters are satisfactory. The BAT boric acid concentration can vary from 3.0 wt% to 4.0 wt%; however, the licensee administratively controls it between 3.25 wt% (5,682 ppm) and 4.0 wt% (6,993 ppm). The licensee also stated, "Analytical results falling outside of the specified limits are confirmed by grab sample and associated on-line monitor. Corrective actions are taken in accordance with plant procedures for restoring water quality to within the specified limits, as required." The NRC staff determined that the indicated measures assure that the specific gravity of the three BATs is satisfactory.

In its responses to these RAIs, the licensee described the methodology used in its calculation. The licensee's methodology was based on the FPL Nuclear Engineering Department Discipline Standard IC-3.17, which specifies that each parameter in the calculation be addressed and assumptions be identified and used. The licensee calculated the TLU using random and nonrandom terms, as shown in the following formula:

$$\pm TLU = \pm(PC^2 + PU^2 + DU_1^2 + DU_2^2 + DU_3^2 + \ldots.. + DU_n^2)^{1/2} \pm B$$

The random terms in this formula are the process considerations (PC), primary element uncertainties (PU), and device uncertainties for n devices (DU_n). The DU is the SRSS of the errors, which incorporates the reference accuracies, drifts, temperature effects, radiation effects, seismic effects, humidity effects, setting tolerances, static pressure effects, power supply effects, and measurement and test equipment. There were no rack errors associated with the calculation. The terms within the square root are considered random and independent of each other. The appropriate biases term (B) is nonrandom and, therefore, added algebraically to the SRSS value. The NRC staff determined that the licensee's TLU calculation and its methodology are consistent with the methodology in RG 1.105 and is, therefore, acceptable.

TLU Calculation

The licensee based its BAT indication TLU (TLU_{IND}) calculation on all of the errors or uncertainties associated with the level transmitter and the level indicator and combined these errors or uncertainties using the SRSS methodology.

The licensee's TLU_{IND} calculation is summarized as follows:

$$TLU_{IND} = \pm(DU_{LT}^2 + DU_{LI}^2)^{1/2} + B(PC_2) + B(PC_3) - (B(PC_1))$$

In this calculation, DU_{LT} is the device uncertainties for the level transmitter; DU_{LI} is the device uncertainties for the level indicator; $B(PC_1)$ is the boric acid concentration error (the only negative component of error is addressed for conservatism); $B(PC_2)$ is the BAT construction error; and $B(PC_3)$ is the bubbler construction errors. In the $B(PC_2)$ term, the tank construction tolerances are conservatively considered using a bias error of 0.03 percent smaller than the nominal tank diameter.

Per the licensee's letter dated March 29, 2016, the standard 0.5-inch bubbler tube is inserted 0.5 inches farther down into the tanks than nominal, thus causing a greater pressure reading that indicates an actual higher useable boric acid solution volume in the tank. The bubbler construction errors (i.e., $B(PC_3)$) is calculated as 0.38 percent and considered as a conservative bias and algebraically added to the TLU_{IND}.

To calculate the boric acid density, which corresponds to the $B(PC_1)$ term, the licensee assumed that the combination of pure acid and pure water only gives additional mass to the solution. The licensee calculated the specific gravity of the borated water in the BATs assuming it is used at 55 degrees Fahrenheit (°F) and 104 °F with concentrations of 3.0 wt% and 4.0 wt% boric acid. Based on pure water at 60 °F and 1 atmosphere, the specific gravity of 4.0 wt% at 55 °F is 1.042 (i.e., the maximum specific gravity) and the specific gravity of 3.0 wt% at 104 °F is 1.024 (i.e., the minimum specific gravity). The most limiting specific gravity error (i.e., B(PC1)) is based on the maximum specific gravity of 1.042 and is calculated to be a bias error of -172 gallons.

The three BATs are interconnected together to form one large tank. To determine the required TS level, the licensee calculated the indicated level of these three tanks as follows:

$$TLU_{IND} = \pm 725.5 \text{ gallons} - (B(PC_1))$$

The licensee calculated the maximum error in total loop level, including the boric acid concentration, to be 897.5 gallons. However, the licensee conservatively rounded this value to a total loop level indicated error of 900 gallons. The licensee uses the negative error of 900 gallons in its final calculation of the TS volume, which is conservative. The NRC staff verified that the proposed minimum BAT volume values in TS Figure 3.1-2, "Boric Acid Tank Minimum Volume," are 300 gallons more than the previous values in the figure for one-unit operation and 300 gallons less than the previous values in the figure for two-unit operation to reflect a correction to the associated instrument uncertainty calculation for both one-unit and two-unit operation. The staff determined that the licensee's calculation methodology was acceptable and that the TLU calculation results were adequate for use in the TS Figure 3.1-2 values.

3.3 Technical Evaluation Conclusions

Because the current BAT volume requirements in TS Figure 3.1-2 for one-unit operation assumes a TLU value of 600 gallons, the licensee proposed adding 300 gallons to those values to reflect the 900-gallon TLU value. Because the current BAT volume requirements in TS Figure 3.1-2 for two-unit operation assumes a TLU value of 1200 gallons, the licensee proposed subtracting 300 gallons from those values to reflect the 900-gallon TLU value.

Because the nominal minus uncertainty values assumed in the evaluations to achieve cold shutdown are unchanged in the proposed amendment, Turkey Point GDC 30, which requires the reactivity control system be capable of making and holding the core subcritical under any conditions with appropriate margin for contingencies, and the 10 CFR 50.36 requirement to have LCOs that are the lowest functional capability of equipment to perform their safety operation, continue to be met with the proposed amendments. The staff also determined that the licensee's calculation methodology and results are adequate and consistent with safety analysis assumptions and NRC guidance. Thus, the staff finds that the proposed TS change will not adversely affect plant operation, impact the performance of safety-related equipment, or otherwise compromise the public health and safety. The staff concludes that the proposed changes to TS Figure 3.1-2 are acceptable.

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 December 28, 2015, and again on April 6, 2016,[8] of the proposed issuance of the amendments. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATION

The amendments change a requirement with respect to the installation or 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 that the amendments involve NSHC, and there has been no public comment on such finding published in the FR on September 1, 2015 (80 FR 52806). 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.

[8] The NRC staff notified the State official by telephone and by email. The emails are in ADAMS under Accession Nos. ML15362A537 and ML16098A017, respectively.

6.0 CONCLUSION

Based on the aforementioned considerations, the NRC staff concluded 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.

Principal Contributors: Joshua M. Borromeo
Hang Vu
Gursharan Singh

Date: April 26, 2016

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

Sincerely,

/RA/

Audrey L. Klett, 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. 270 to DPR-31
2. Amendment No. 265 to DPR-41
3. Safety Evaluation

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