March 25, 2016
L-2016-056
10 CFR 50.90

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

Re: Turkey Point Nuclear Plant, Units 3 and 4
Docket Nos. 50-250 and 50-251
Response to Request for Additional Information Regarding License Amendment Request 240, Conditional Exemption from End-of-Life Moderator Temperature Coefficient Measurement

References:

1. Florida Power & Light letter L-2015-189 "License Amendment Request 240, Conditional Exemption from End-of-Life Moderator Temperature Coefficient Measurement," October 6, 2015 (ML15301A261).

2. NRC E-mail from A. Klett to M. Guth "Request for Additional Information re. Turkey Point Unit 3 and 4 LAR 240 (CACs MF6783 and MF6784)," March 4, 2016.

In Reference 1, Florida Power & Light Company (FPL) submitted a license amendment request (LAR) to revise the technical specifications (TS) for Turkey Point Units 3 and 4. The proposed change revises the end-of-life moderator temperature coefficient (MTC) surveillance requirement by placing a set of conditions on reactor core operation, which if met, would allow exemption from the required MTC measurement.

In Reference 2, the NRC staff requested additional information to support its review of the LAR. The enclosure to this letter provides FPL's response to the request for additional information. Attachment 1 to the enclosure provides a markup of the TS showing proposed changes to TS 6.9.1.7, Core Operating Limits Report (COLR). Retyped pages containing the proposed changes are included in Attachment 2. Attachment 3 to the enclosure, which is provided for information only and supersedes Attachment 3 in Reference 1, shows changes to the COLR.

This response to the request for additional information does not alter the conclusions in Reference 1 that the proposed change does not involve a significant hazards consideration and there are no significant environmental impacts associated with the change.

In accordance with 10 CFR 50.91(b)(1), a copy of this letter is being forwarded to the designee of the State of Florida.

A001
NRR

No new or revised commitments are included in this submittal.

Should you have any questions regarding this submittal, please contact Mr. Mitch Guth, Licensing Manager, at 305-246-6698.

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

Executed on March 25, 2016

Sincerely,

Thomas Summers
Site Vice President
Turkey Point Nuclear Plant

Enclosure
Attachments

cc: NRC Regional Administrator, Region II
NRC Senior Resident Inspector
NRC Project Manager
Ms. Cindy Becker, Florida Department of Health

ENCLOSURE

Response to Request for Additional Information Regarding License Amendment Request 240, Conditional Exemption from End-of-Life Moderator Temperature Coefficient Measurement

Response to Request for Additional Information (RAI)

By application dated October 6, 2015 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML15301A261), Florida Power & Light Company (FPL, the licensee) submitted License Amendment Request (LAR) No. 240 for Turkey Point Nuclear Generating Unit Nos. 3 and 4 (Turkey Point). NRC's Reactor Systems Branch (SRXB) staff reviewed the application and identified areas where it needs additional information to support its review. The request for additional information (RAI) is provided below.

SRXB-RAI-1

In Section 4.2 of the LAR, it is stated that the request varies from the precedents in that it does not add a reference to WCAP-13749-P-A in Technical Specification (TS) 6.9.1.7, "Core Operating Limits Report [COLR]," and cites that the TS example changes provided in WCAP-13749-P-A do not include a revision to the TS requirements for the COLR. However, per the Note in Appendix B of WCAP-13749-P-A, and taking into consideration Section 2.3.3 of Appendix B, it is stated that WCAP-13749-P-A must be included in the TS COLR section. Additionally, the staff reviewed other recent similar precedents and found that in all those precedents, WCAP-13749-P-A was included in the TS COLR section. Please supplement the LAR to meet the requirements in WCAP-13749-P-A for inclusion of it in the TS COLR section and to be consistent with the precedents.

Response to SRXB-RAI-1

FPL is supplementing the LAR to include WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative Moderator Temperature Coefficient Measurement," March 1997, in TS 6.9.1.7, Core Operating Limits Report. Attachment 1 provides a markup of the TS showing the proposed change.

SRXB-RAI-2

In Section 3.0 of the LAR, the licensee stated that the PHOENIX-P code is currently used for Turkey Point and that the cross section generation may eventually transition to the PARAGON lattice code and NEXUS methodology. In the LAR, Attachment 5, response to Farley and Vogtle RAI Question 2, it is stated that Turkey Point does not propose to add PHOENIX-P, PARAGON, or NEXUS to the listed COLR references in the TSs and cites Vogtle as a precedent. However, the NRC staff has reviewed the Vogtle COLR references in its TSs and has found that Vogtle included PARAGON and NEXUS in the TS COLR references. Additionally, the staff reviewed other recent similar precedents and found that the neutronics methods are included in the TS COLR section. Therefore, the staff requests that the neutronics methods used to confirm moderator temperature coefficient (MTC) reload parameters be included in the TS COLR section to be consistent with the previous precedents and that future COLRs identify the neutronics methods used with WCAP-13749-P-A for the current cycle.

Response to SRXB-RAI-2

FPL is supplementing the LAR to include in TS 6.9.1.7, Core Operating Limits Report, the neutronics methods used with WCAP-13729-P-A. Attachment 1 provides a markup of the TS showing the proposed change.

The Core Operating Limits Report provided to the NRC in accordance with TS 6.9.1.7 will identify the neutronics methods used with WCAP-13749-P-A for the current cycle.

SRXB-RAI-3

In the LAR, Attachment 3, "Changes to COLR," the units used in the Revised Predicted MTC equation are inconsistent with those in the COLR, Section 2.6 (PCM/degree F vs. Δk/k/°F, respectively). In order for the comparison of the Revised Predicted MTC to the Surveillance Requirement (SR) 4.1.1.3.b surveillance limit to be valid, the staff requests the licensee to modify this inconsistency in the MTC units.

Response to SRXB-RAI-3

Section 2.6 of the COLR provides the MTC surveillance limit for SR 4.1.1.3.b. This value will be provided in units of PCM for consistency when comparing the limit to the revised predicted MTC, which is specified in units of PCM. Attachment 3, which is provided for information only, shows the proposed changes to the COLR.

Attachment 1

Markup of Technical Specification Page

3. WCAP-10054-P-A, Addendum 2, Revision 1 (proprietary), "Addendum to the Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code: Safety Injection into the Broken Loop and COSI Condensation Model," July 1997.

4. WCAP-16009-P-A, "Realistic Large-break LOCA Evaluation Methodology Using the Automated Statistical Treatment of Uncertainty Method (ASTRUM)", January 2005.

5. USNRC Safety Evaluation Report, Letter from R. C. Jones (USNRC) to N. J. Liparulo (W), "Acceptance for Referencing of the Topical Report WCAP-12945(P) 'Westinghouse Code Qualification Document for Best Estimate Loss of Coolant Analysis,' " June 28, 1996.**

6. Letter dated June 13, 1996, from N. J. Liparulo (W) to Frank R. Orr (USNRC), "Re-Analysis Work Plans Using Final Best Estimate Methodology."**

7. WCAP-12610-P-A, "VANTAGE+ Fuel Assembly Reference Core Report," S. L. Davidson and T. L. Ryan, April 1995.

8. WCAP-12610-P-A & CENPD-404-P-A, Addendum 1-A, "Optimized ZIRLO™," July 2006.

The analytical methods used to determine Overtemperature ΔT and Overpower ΔT shall be those previously reviewed and approved by the NRC in:

1. WCAP-8745-P-A, "Design Basis for the Thermal Overtemperature ΔT and Overpower ΔT Trip Functions, " September 1986

2. WCAP-9272-P-A, " Westinghouse Reload Safety Evaluation Methodology," July 1985

The analytical methods used to determine Safety Limits, Shutdown Margin - $T_{avg} > 200°F$, Shutdown Margin - $T_{avg} \leq 200°F$, Moderator Temperature Coefficient, DNB Parameters, Rod Bank Insertion Limits and the All Rods Out position shall be those previously reviewed and approved by the NRC in:

Insert

1. WCAP-9272-P-A, "Westinghouse Reload Safety Evaluation Methodology," July 1985.

The ability to calculate the COLR nuclear design parameters are demonstrated in:

1. Florida Power & Light Company Topical Report NF-TR-95-01, "Nuclear Physics Methodology for Reload Design of Turkey Point & St. Lucie Nuclear Plants."

Topical Report NF-TR-95-01 was approved by the NRC for use by Florida Power & Light Company in:

1. Safety Evaluation by the Office of Nuclear Reactor Regulations Related to Amendment No. 174 to Facility Operating License DPR-31 and Amendment No. 168 to Facility Operating License DPR-41, Florida Power & Light Company Turkey Point Units 3 and 4, Docket Nos. 50-250 and 50-251.

The AFD, $F_Q(Z)$, $F_{\Delta}H$, K(Z), Safety Limits, Overtemperature ΔT, Overpower ΔT, Shutdown Margin - $T_{avg} > 200°F$, Shutdown Margin -$T_{avg} \leq 200°F$, Moderator Temperature Coefficient, DNB Parameters, and Rod Bank Insertion Limits shall be determined such that all applicable limits of the safety analyses are met. The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements thereto, shall be provided upon issuance, for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector, unless otherwise approved by the Commission.

**As evaluated in NRC Safety Evaluation dated December 20, 1997.

INSERT

The analytical methods used to support the suspension of the measurement of the Moderator Temperature Coefficient in accordance with Surveillance Requirement 4.1.1.3.b shall be those previously reviewed and approved by the NRC in:

1. WCAP-13749-P-A, "Safety Evaluation Supporting the Conditional Exemption of the Most Negative EOL Moderator Temperature Coefficient Measurement," March 1997.
2. WCAP-11596-P-A, "Qualification of the Phoenix-P/ANC Nuclear Design System for Pressurized Water Reactor Cores," June 1988.
3. WCAP-16045-P-A, "Qualification of the Two-Dimensional Transport Code PARAGON," August 2004.
4. WCAP-16045-P-A, Addendum 1-A, "Qualification of the NEXUS Nuclear Data Methodology," August 2007.

Attachment 2

Clean Revised Technical Specification Page

3. WCAP-10054-P-A, Addendum 2, Revision 1 (proprietary), "Addendum to the Westinghouse Small Break ECCS Evaluation Model Using the NOTRUMP Code: Safety Injection into the Broken Loop and COSI Condensation Model," July 1997.

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The AFD, $F_Q(Z)$, $F_\Delta H$, K(Z), Safety Limits, Overtemperature ΔT, Overpower ΔT, Shutdown Margin - $T_{avg} > 200°F$, Shutdown Margin -$T_{avg} \leq 200°F$, Moderator Temperature Coefficient, DNB Parameters, and Rod Bank Insertion Limits shall be determined such that all applicable limits of the safety analyses are met. The CORE OPERATING LIMITS REPORT, including any mid-cycle revisions or supplements thereto, shall be provided upon issuance, for each reload cycle, to the NRC Document Control Desk with copies to the Regional Administrator and Resident Inspector, unless otherwise approved by the Commission.

Attachment 3

Change to Core Operating Limits Report
(Information Only)

2.5 Moderator temperature coefficient (MTC) (TS 3.1.1.3)

- **$\leq$ + 5.0 x 10^{-5} Δk/k/°F** — BOL, HZP, ARO and, from HZP to 70% Rated Thermal Power (RTP)

- **From 70% RTP to 100% RTP the MTC decreasing linearly from $\leq$ + 5.0 x 10^{-5} Δk/k/°F to $\leq$ 0.0 x 10^{-5} Δk/k/°F**

- **Less negative than - 41.0 x 10^{-5} Δk/k/°F** — EOL, RTP, ARO

2.6 Moderator temperature coefficient (MTC) Surveillance at 300 ppm (TS 4.1.1.3)

- **Less negative than - 35.0 x 10^{-5} Δk/k/°F** — Within 7 EFPD of reaching equilibrium boron concentration of 300 ppm.

Insert 1

(-35 PCM/°F)

2.7 Analog Rod Position Indication System (TS 3.1.3.2)

- **Figure A3** (page 14A-A9) — The All Rods Out (ARO) position for all shutdown Banks and Control Banks is defined to be 230 steps withdrawn.

2.8 Control Rod Insertion Limits (TS 3.1.3.6)

- **Figure A3** (page 14A-A9) — The control rod banks shall be limited in physical insertion as specified in Figure A3 for ARO = 230 steps withdrawn.

2.9 Axial Flux Difference (TS 3.2.1)

- **Figure A4** (page 14A-A10)

2.10 Heat Flux Hot Channel Factor $F_Q(Z)$ (TS 3.2.2)

- **$[F_Q]^L$ = 2.30**

- **K(z) = 1.0** — For 0' $\leq$ z $\leq$ 12' where z is core height in ft

Insert 1

The Revised Predicted near – EOL 300 ppm MTC shall be calculated using the algorithm contained in WCAP-13749-P-A:

Revised Predicted MTC = Predicted MTC + AFD Correction - 3 PCM/degree F

If the Revised Predicted MTC is less negative than the SR 4.1.1.3.b 300 ppm surveillance limit and all the benchmark data contained in the surveillance procedure are met, then an MTC measurement in accordance with SR 4.1.1.3.b is not required to be performed.