



June 12, 2018

L-2018-118

10 CFR 50.90

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

Turkey Point Nuclear Plant, Units 3 and 4  
Docket Nos. 50-250 and 50-251

Subject: Response to Sixth Request for Additional Information Regarding License Amendment Request 236, Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'

References:

1. Florida Power & Light Company letter L-2014-369, "License Amendment Request No. 236 Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4B'," December 23, 2014 (ML15029A297)
2. NRC E-mail "Request for Additional Information re. Turkey Point 3 & 4 LAR-236 (CACs MF5455 & MF5456)," April 14, 2016 (ML16105A459)
3. NRC E-mail "Request for Additional Information - Turkey Point 3 & 4 LAR-236 (CACs MF5455 & MF5456)," April 18, 2016 (ML16110A004)
4. NRC E-mail "Request for Additional Information re. Turkey Point 3 & 4 LAR-236 (CACs MF54555 & MF5456)," June 1, 2016 (ML16154A339)
5. Florida Power & Light Company letter L-2016-116, "Response to Request for Additional Information Regarding License Amendment Request 236, Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times- RITSTF Initiative 4b'," June 16, 2016 (ML16180A178)
6. Florida Power & Light Company letter L-2016-136, "Second Response to Request for Additional Information Regarding License Amendment Request 236, Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times - RITSTF Initiative 4b'," August 11, 2016 (ML16243A104)

*ADD  
NRR*

7. Florida Power & Light Company letter L-2017-006, "Supplement to License Amendment Request 236, Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," February 9, 2017 (ML17060A249)
8. NRC E-mail "Request for Additional Information Re. Turkey Point TSTF-505 LAR 236 (CACs MF5455 and MF5456)" March 30, 2017
9. Florida Power & Light Company letter L 2017-063, "Response to Third Request for Additional Information Regarding License Amendment Request 236, Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times –RITSTF Initiative 4b'," April 27, 2017 (ML17117A618)
10. NRC E-mail "Request for Additional Information - Turkey Point 3 & 4 LAR-236 (CACs MF5455 & MF5456)," August 10, 2017 (ML17223A061)
11. Florida Power & Light Company letter 2017-168 "Response to Fourth Request for Additional Information Regarding License Amendment Request 236, Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, "Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b," October 30, 2017 (ML17303A768)
12. Florida Power & Light Company letter 2018-001, "Supplement to Response to Fourth Request for Additional Information Regarding License Amendment Request 236, Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," February 15, 2018 (ML18046A597)
13. NRC E-mail "Turkey Point Nuclear Generating Unit Nos. 3 and 4, Request for Additional Information Regarding License Amendment Request 256 (CAC Nos. MF5455 and MF5456; EPID L-2014-0002)," March 1, 2018 (ML18061A017)
14. Florida Power & Light Company letter 2018-061, "Response to Fifth Request for Additional Information Regarding License Amendment Request 236, Revision to the Technical Specifications to Adopt Risk Informed Completion Times TSTF-505, Revision 1, 'Provide Risk-Informed Extended Completion Times – RITSTF Initiative 4b'," March 22, 2018 (ML18081A063)
15. NRC E-mail "Turkey Point Generating Unit Nos. 3 and 4, Request for Additional Information Regarding License Amendment Request 236 (CAC Nos. MF5455 and MF5456; EPID L-2014-0002)," May 17, 2018

In Reference 1, as supplemented by References 5, 6, 7, 9, 11, 12, and 14, Florida Power & Light Company (FPL) submitted license amendment request (LAR) 236 for Turkey Point Units 3 and 4. The proposed amendment would revise the Technical Specifications (TS) to implement TSTF-505, Revision 1, "Provide Risk-Informed Extended Completion Times RITSTF [Risk Informed TSTF] Initiative 4b."

In Reference 15, 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 (RAI).

The attachment to the enclosure provides markups of the operating licenses for Turkey Point Units 3 and 4 that add a license condition regarding implementation items and PRA methods used in the Risk Informed Completion Time Program. These markups supersede the markups of the operating licenses provided previously in Reference 12.

This response to the RAI does not alter the conclusions in Reference 1 that the change does not involve a significant hazards consideration pursuant to 10 CFR 50.92, and there are no significant environmental impacts associated with the change.

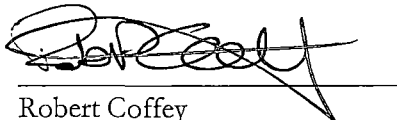
No new or revised commitments are included in this letter.

Should you have any questions regarding this submittal, please contact Robert Hess, Licensing Manager, at (305) 246-4112.

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

Executed on June 12, 2018

Sincerely,



Robert Coffey  
Regional Vice President - Southern Region  
Florida Power & Light Company

Enclosure

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**

APLA RAI-12.01 Remaining Unresolved F&Os

APLA RAI-12, dated August 10, 2017 (ADAMS Accession No. ML17223A061), noted that eleven facts and observations (F&Os) were identified in the LAR as unresolved and requested a resolution. In the February 15, 2018, supplemental response to APLA RAI-12, FPL stated that the eleven findings listed as unresolved in the LAR have been closed by an independent assessment (IA) team in accordance with the NRC approved F&O closeout process. FPL further stated that the F&O closeout identified 43 F&Os that were reported as resolved in the LAR but that the IA team concluded required additional documentation or justification. The RAI response included a table of these F&Os, the F&O IA team's comments, and FPL's disposition of the IA team comments for the risk-informed completion time (RICT) calculations. Many of the IA team's comments stated that no documentation confirming FPL's stated resolution was found and, therefore, the F&O could not be closed. In FPL's disposition for RICT responses, FPL generally states that "[d]ocumentation updates are needed" and that there is "[n]o impact on the RICT." The NRC staff has reviewed the information and concludes that when the IA team was unable to identify documentation to verify that the resolution proposed by FPL was implemented, FPL's stated resolution is assumed to have been implemented, but not documented, and therefore there is no impact on the RICT. For several F&Os discussed below, however, it appeared that the documentation available indicated that the resolution proposed by FPL may not have been implemented as summarized, and therefore, the conclusion that there is no impact on the RICT needs additional justification.

a. HR-A2-01

In Attachment 3 of the February 15, 2018, RAI response, the F&O IA team commented that the licensee was using an alternative approach to identify, screen, and quantify pre-initiators from the approach assumed in HR-A2 in the probabilistic risk assessment (PRA) standard. Based on the limited information provided in Table 1 of Enclosure 2 of the LAR, and Enclosure 3 of the February 15, 2018, RAI response, it appears all potential pre-initiator human errors are quantitatively screened based on using a relatively low screening value. The American Society of Mechanical Engineers (ASME) Standard does not address quantitative screening. Additionally, RICT calculations may include multiple structures, systems, and components that are inoperable, which can significantly alter PRA results and invalidate previous quantitative screening decisions. In addition to the use of an alternative approach, the IA team noted that some values seem to differ between the documentation and the PRA model.

1. Please summarize the new approach to identifying and including pre-initiator human errors in the PRA and justify its applicability for RICT calculations. For example, why are screening values of  $3E-03$  and  $3E-4$  expected to capture all pre-initiator

human errors that would become important under configurations for which a RICT may be calculated. Alternatively, implement or provide an implementation item in the response to APLA RAI 15.01 about implementing a method consistent with the ASME Standard.

2. Please confirm that the PRA model and the documentation are aligned.

***FPL Response***

1. As an implementation item, FPL will use a systematic process to review calibration procedures and practices to identify activities, that if performed incorrectly, can have an adverse impact on the automatic initiation of standby safety equipment, consistent with the ASME standard. (See RAI 15.01b)
2. The PRA model and documentation will be aligned as part of response 12.01a.1.

b. QU-3

Table 1 of Enclosure 2 of the LAR states that changes to the mutually exclusive event combinations, flag file, circular logic breaks, and recovery rule file are documented in the change database and the model updates. However, the F&O team found no evidence of documentation of the recovery or the mutually exclusive files. Improper modeling of these issues can affect the RICT calculations. In its February 15, 2018, disposition of the F&O team's finding, the licensee states that the finding will have no impact on the RICT calculation; however, the basis for that disposition is not clear without a well-documented evaluation. Please summarize how recovery and the mutually exclusive events are identified, evaluated, modeled, and documented.

***FPL Response***

The recovery rules are modeled in a recovery rule file. The identification and evaluation of the recovery rules are documented in the HRA calculations supporting the model updates.

Mutually exclusive basic events are explicitly modeled in the CAFTA fault tree for each accident sequence. Typically, this applies to maintenance alignments where multiple trains are not intentionally taken out-of-service at the same time, or "non-sense" basic event combinations. Changes to the mutually exclusive modelling are evaluated and discussed in the Turkey Point (PTN) PRA Model Update Document for the current model of record. This is reviewed and approved through the model maintenance process.

An enhancement to the quantification notebook to cross-reference the location of the sources for the evaluation of the recovery rules and mutually exclusive rules is in progress but has no impact on quantification of a RICT.

c. IFSN-A2-01, IFSN-A4-01

Table 1 of Enclosure 2 of the LAR for IFSN-A2-01 states that no credit for floor drains or operator actions to mitigate a flood was taken, and therefore, there was no need to credit flood alarms. Table 1 of Enclosure 2 of the LAR for IFSN-A4-01 states that calculations for flood volumes and subsequent flooding heights had been documented. The F&O team comments identified a PRA document that stated that a reasonable time for the flood to be terminated was based on alarms. In general, timing considerations for operators to terminate the flood is logical, otherwise unreasonable flood damage would have to be assumed. The F&O team also identified at least one drain that appeared to have been assessed. The F&O team could not identify specific calculations on room equipment floods and propagation, nor the input to those calculations (such as time to termination and floor drains).

Please summarize how flooding alarms, human actions, and floor drains have been included in the PRA to determine flood volumes and flood heights. If additional changes are needed to the PRA to resolve these F&Os, provide an implementation item in the response to APLA RAI 15.01 summarizing the changes.

***FPL Response***

The PTN internal flooding document states “In reality, the duration of a release of floodwater will be determined by when the operators are alerted to the problem, the steps that must be taken to terminate the release and whether these are taken expeditiously. In this analysis, however, no action by the operators that might curtail a flood scenario was considered: floods were allowed to persist for long periods of time (~ 12 to 24 hours) unless the flood source is finite...Since no credit is taken for operator actions that would mitigate any leak, spray, or rupture, no human reliability analysis was necessary.”

Flood alarms and human actions are not included in the PRA, as documented in the PTN internal flood analysis. As stated in the internal flooding analysis, “Credit was always taken for installed floor drains of 24-in. diameter or greater. However, the functioning of smaller drains (typically of 4-in. diameter) cannot be assumed particularly if pumps that may themselves be submerged are relied upon to empty sumps. Therefore, in general, the consequences of flooding were normally calculated allowing for the possibility that the drains and sump pumps do not function unless their functioning exacerbates the situation.”

Documentation enhancements to clarify the presence of flood alarms, dikes, curbs, sumps, drains, sump pumps, spray shields, water tight doors, etc. will be added to the internal flooding analysis.

Calculations for the capacities of drains, and the amount of water retained by sumps, berms, dikes, etc. and how these factors are accounted for in flood volumes and SSC impacts from flooding will be added to the internal flooding analysis as addendums to provide supporting information.

d. IGN-A7

Table 1 of Enclosure 2 of the LAR for IGN-A7 states that supplemental walkdowns were performed to identify any missing ignition sources and the analysis was updated accordingly. The F&O team commented that not all ignition sources that have been identified have been included in the fire PRA. FPL responded that any effect of and missing sources is bounded by the NUREG-2180, "Determining the Effectiveness, Limitations, and Operator Response for Very Early Warning Fire Detection Systems in Nuclear Facilities (DELORES-VEWFIRE)" sensitivity study. The referenced sensitivity study for NUREG-2180 measures the impact of using a PRA model of fire detection that has since been retired and replaced with a new model. It has no relationship to missing ignition sources. Therefore, the impact of the missing ignition sources is unknown.

Further, FPL states that, "[a] model change is required to add the new ignition sources in the cable spreading room." Please confirm that all relevant ignition sources are included in the fire PRA or provide an implementation item in the response to APLA RAI 15.01 summarizing changes to the PRA that will resolve this F&O.

***FPL Response***

As an implementation item, ignition sources identified in finding 1-18 and subsequent extent of condition walkdowns will be included in the fire PRA. (See RAI 15.01b)

APLA RAI-15.01 Implementation Item

In APLA RAI-15, dated August 10, 2017, the NRC staff requested that several issues (very early warning fire detection system (VEWFDS), human error probability (HEP) floor, and unresolved F&Os) critical to the acceptance of the RICT program be considered for inclusion in a table of implementation items to be completed before implementation of the RICT program. Although FPL states in its February 15, 2018, RAI response that, "[t]he methodology in NUREG-2180 will be incorporated into the Turkey Point Fire PRA model," modeling VEWFDS with NUREG-2180 was not one of the items that FPL proposed as an implementation item in its response to APLA RAI-15. FPL proposed one implementation item for using the HEP floor, and one other implementation item that all F&O "findings will be closed." This general statement does not provide sufficient clarity to support issuing a license amendment.

- a. Provide an implementation item confirming that the VEWFDS modeling in accordance with NUREG-2180 will be used
- b. Provide other implementation item(s), as appropriate, summarizing how the PRA model will be changed for F&Os whose resolution requires changes to the PRA model (i.e., not including any that only need additional documentation) prior to RICT implementation.

***FPL Response***

Table of implementation items:

Item	Implementation Date
1. The VEWFDs modeling in accordance with NUREG-2180 will be incorporated into the Turkey Point PRA model.	Prior to implementation of the Risk Informed Completion Time Program
2. FPL will use a systematic process to review calibration procedures and practices to identify activities, that if performed incorrectly, can have an adverse impact on the automatic initiation of standby safety equipment. (See RAI 12.01a)	
3. Ignition sources identified in finding 1-18 and subsequent extent of condition walkdowns will be included in the fire PRA. (See RAI 12.01d).	
4. New scenarios identified as part of finding 10-20 to address Turbine Generator fires will be included in the fire PRA.	
5. Confirm that the all hazards CDF and LERF estimates achieved using NRC accepted methods will be less than 1E- 04 per year and 1E-05 per year, respectively.	
6. Implement a joint HEP floor of 1E-06 in the internal events model. For future model updates, once the HFE combinations have been analyzed and the HEP floor of 1E-06 applied, individual HFE combination probabilities may be set below 1E-06 if a detailed analysis is performed and technical justification is provided.	



**ATTACHMENT**

Markup of the Unit 3 and Unit 4 Operating Licenses

INSERT OL

- I. FPL is authorized to implement the Risk Informed Completion Time Program as approved in License Amendment No. XXXX subject to the following conditions:
  1. FPL will complete the items listed in the table of implementation items in the enclosure to FPL letter L-2018-118 dated June 12, 2018 prior to implementation of the Risk Informed Completion Time Program.
  2. The risk assessment approach and methods, shall be acceptable to the NRC, be based on the as-built, as-operated, and maintained plant, and reflect the operating experience of the plant as specified in RG 1.200. Methods to assess the risk from extending the completion times must be PRA methods accepted as part of this license amendment, or other methods approved by the NRC for generic use. If the licensee wishes to change its methods, and the change is outside the bounds of this license condition, the licensee will seek prior NRC approval via a license amendment.

H. PAD TCD Safety Analyses

1. PAD 4.0 TCD has been specifically approved for use for the Turkey Point licensing basis analyses. Upon NRC's approval of a revised generic version of PAD that accounts for Thermal Conductivity Degradation (TCD), FPL will within six months:
  - a. Demonstrate that PAD 4.0 TCD remains conservatively bounding in licensing basis analyses when compared to the new generically approved version of PAD w/TCD, or
  - b. Provide a schedule for the re-analysis using the new generically approved version of PAD w/TCD for any of the affected licensing basis analyses.

INSERT OL ↘

4. This renewed license is effective as of the date of issuance, and shall expire at midnight July 19, 2032.

FOR THE NUCLEAR REGULATORY COMMISSION

Signed by  
Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Attachments:  
Appendix A – Technical Specifications for Unit 3  
Appendix B – Environmental Protection Plan

Date of Issuance: June 6, 2002

H. PAD TCD Safety Analyses

1. PAD 4.0 TCD has been specifically approved for use for the Turkey Point licensing basis analyses. Upon NRC's approval of a revised generic version of PAD that accounts for Thermal Conductivity Degradation (TCD), FPL will within six months:
  - a. Demonstrate that PAD 4.0 TCD remains conservatively bounding in licensing basis analyses when compared to the new generically approved version of PAD w/TCD, or
  - b. Provide a schedule for the re-analysis using the new generically approved version of PAD w/TCD for any of the affected licensing basis analyses.

INSERT OL

4. This renewed license is effective as of the date of issuance, and shall expire at midnight April 10, 2033.

FOR THE NUCLEAR REGULATORY COMMISSION

Signed by  
Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Attachments:  
Appendix A – Technical Specifications for Unit 4  
Appendix B – Environmental Protection Plan

Date of Issuance: June 6, 2002

H. PAD TCD Safety Analyses

1. PAD 4.0 TCD has been specifically approved for use for the Turkey Point licensing basis analyses. Upon NRC's approval of a revised generic version of PAD that accounts for Thermal Conductivity Degradation (TCD), FPL will within six months:
  - a. Demonstrate that PAD 4.0 TCD remains conservatively bounding in licensing basis analyses when compared to the new generically approved version of PAD w/TCD, or
  - b. Provide a schedule for the re-analysis using the new generically approved version of PAD w/TCD for any of the affected licensing basis analyses.

INSERT OL ↘

4. This renewed license is effective as of the date of issuance, and shall expire at midnight July 19, 2032.

FOR THE NUCLEAR REGULATORY COMMISSION

Signed by  
Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Attachments:  
Appendix A – Technical Specifications for Unit 3  
Appendix B – Environmental Protection Plan

Date of Issuance: June 6, 2002

H. PAD TCD Safety Analyses

1. PAD 4.0 TCD has been specifically approved for use for the Turkey Point licensing basis analyses. Upon NRC's approval of a revised generic version of PAD that accounts for Thermal Conductivity Degradation (TCD), FPL will within six months:
  - a. Demonstrate that PAD 4.0 TCD remains conservatively bounding in licensing basis analyses when compared to the new generically approved version of PAD w/TCD, or
  - b. Provide a schedule for the re-analysis using the new generically approved version of PAD w/TCD for any of the affected licensing basis analyses.

INSERT OL



4. This renewed license is effective as of the date of issuance, and shall expire at midnight April 10, 2033.

FOR THE NUCLEAR REGULATORY COMMISSION

Signed by  
Samuel J. Collins, Director  
Office of Nuclear Reactor Regulation

Attachments:  
Appendix A – Technical Specifications for Unit 4  
Appendix B – Environmental Protection Plan

Date of Issuance: June 6, 2002