

August 8, 2001

Mr. J. A. Stall  
Senior Vice President, Nuclear and  
Chief Nuclear Officer  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, Florida 33408-0420

SUBJECT: TURKEY POINT UNITS 3 AND 4 — ISSUANCE OF AMENDMENTS  
REGARDING TECHNICAL SPECIFICATION CHANGES TO INCREASE THE  
ALLOWED OUTAGE TIME FOR THE EMERGENCY DIESEL GENERATORS  
AND TO RELOCATE A TECHNICAL SPECIFICATION SURVEILLANCE  
REQUIREMENT (TAC NOS. MB1408 AND MB1409)

Dear Mr. Stall:

The U.S. Nuclear Regulatory Commission has issued the enclosed Amendment No. 215 to Facility Operating License No. DPR-31 and Amendment No. 209 to Facility Operating License No. DPR-41 for the Turkey Point Plant, Units Nos. 3 and 4, respectively. The amendments consist of changes to the Technical Specifications (TSs) in response to your application dated March 12, 2001, as supplemented June 26, 2001.

The amendments to the Turkey Point Units 3 and 4 TS emergency diesel generators (EDGs) TSs revised the allowed outage time specified in TS 3.8.1.1, Actions b and f, and TSs 3.4.3 and 3.5.2, from 72 hours to 14 days, to restore an inoperable EDG to operable status. In addition, the amendments would allow the relocation of TS Surveillance Requirement 4.8.1.1.2.g.1 to a licensee-controlled maintenance program that will be incorporated by reference in the Updated Final Safety Analysis Report.

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

Sincerely,

**/RA/**

Kahtan N. Jabbour, Senior Project Manager, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket Nos. 50-250 and 50-251

Enclosures:

1. Amendment No. 215 to DPR-31
2. Amendment No. 209 to DPR-41
3. Safety Evaluation

cc w/enclosures: See next page

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FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-250

TURKEY POINT PLANT UNIT NO. 3

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 215  
License No. DPR-31

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Florida Power and Light Company (the licensee) dated March 12, 2001, as supplemented June 26, 2001, 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 license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-31 is hereby amended to read as follows:

(B) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 215, are hereby incorporated in the license. The Environmental Protection Plan contained in Appendix B is hereby incorporated into the 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 within issuance.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Ronald W. Hernan, Acting Chief, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: August 8, 2001

FLORIDA POWER AND LIGHT COMPANY

DOCKET NO. 50-251

TURKEY POINT PLANT UNIT NO. 4

AMENDMENT TO FACILITY OPERATING LICENSE

Amendment No. 209  
License No. DPR-41

1. The Nuclear Regulatory Commission (the Commission) has found that:
  - A. The application for amendment by Florida Power and Light Company (the licensee) dated March 12, 2001, as supplemented June 26, 2001, 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 license is amended by changes to the Technical Specifications as indicated in the attachment to this license amendment, and paragraph 3.B of Facility Operating License No. DPR-41 is hereby amended to read as follows:

(B) Technical Specifications and Environmental Protection Plan

The Technical Specifications contained in Appendix A, as revised through Amendment No. 209, are hereby incorporated in the license. The Environmental Protection Plan contained in Appendix B is hereby incorporated into the 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.

FOR THE NUCLEAR REGULATORY COMMISSION

*/RA/*

Ronald W. Hernan, Acting Chief, Section 2  
Project Directorate II  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Attachment:  
Changes to the Technical  
Specifications

Date of Issuance: August 8, 2001

ATTACHMENT TO LICENSE AMENDMENT

AMENDMENT NO. 215 FACILITY OPERATING LICENSE NO. DPR-31

AMENDMENT NO. 209 FACILITY OPERATING LICENSE NO. DPR-41

DOCKET NOS. 50-250 AND 50-251

Replace the following pages of the Appendix A Technical Specifications with the attached pages. The revised pages are identified by amendment number and contain marginal lines indicating the area of change.

Remove pages

3/4 4-9

3/4 5-4

3/4 8-2

3/4 8-4

3/4 8-6

Insert pages

3/4 4-9

3/4 5-4

3/4 8-2

3/4 8-4

3/4 8-6

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO AMENDMENT NO. 215 TO FACILITY OPERATING LICENSE NO. DPR-31  
AND AMENDMENT NO. 209 TO FACILITY OPERATING LICENSE NO. DPR-41

FLORIDA POWER AND LIGHT COMPANY

TURKEY POINT UNIT NOS. 3 AND 4

DOCKET NOS. 50-250 AND 50-251

1.0 INTRODUCTION

By letter dated March 12, 2001, as supplemented June 26, 2001, Florida Power & Light Company (FPL, the licensee) proposed amendments to the Turkey Point Units 3 and 4 Technical Specifications (TSs) related to the emergency diesel generators (EDGs). The proposed amendments would revise the current 72-hour allowed outage time (AOT) specified in TS 3.8.1.1, Actions b and f, and TSs 3.4.3 and 3.5.2 to allow 14 days to restore an inoperable EDG to operable status. In addition, the proposed amendments would relocate TS Surveillance Requirement (SR) 4.8.1.1.2.g.1 to a licensee-controlled maintenance program that will be incorporated by reference into the Updated Final Safety Analysis Report (UFSAR).

The purpose of the proposed extension of the EDG AOT is to provide the licensee more latitude to perform maintenance during power operation. This proposed change is based on the findings of a deterministic evaluation and a probabilistic risk assessment (PRA). The proposed relocation of the TS SR will reduce the complexity of activities performed during refueling outage, thereby reducing the potential for human performance errors and the duration of refueling outages. The supplemental submittal of June 26, 2001, provided clarifying information that did not change the scope of the original request or change the initial proposed no significant hazards consideration.

The staff has reviewed the proposed changes to Turkey Point Unit 3 and 4 TSs 3.8.1.1 and 4.8.1.1.2.g.1 and finds them acceptable, as discussed in the following evaluation.

2.0 BACKGROUND

In the original configuration of Turkey Point Units 3 and 4, two EDGs, currently labeled 3A and 3B, were shared by the two units. In 1990-1991, as part of an upgrade of the emergency power system, two additional EDGs, labeled 4A and 4B, were added to the plant.

The onsite emergency AC power source consists of four EDGs and their associated auxiliary systems comprising the fuel oil, lube oil, cooling water, air starting, and air intake and exhaust systems, and the automatic control circuitry. Each EDG consists of a turbo-charged, two-cycle engine directly coupled to a generator. The generator is a 4160 volt, 3 phase, 60 Hz, AC synchronous machine. The 2000-hour rating is 2850 KW for the Unit 3 EDGs and 3095 KW for the Unit 4 EDGs. The continuous rating is 2500 KW for the Unit 3 EDGs and 2874 KW for the Unit 4 EDGs.

The EDGs are seismically qualified, safety related, and located in a separate room inside two separate structures located east (Unit 3) and northeast (Unit 4) of the turbine area. They are connected to separate power trains, two per unit. The EDGs supply onsite emergency AC power to electrical loads needed to achieve safe shutdown of the plant or to mitigate the consequences of safety injection event coincident with the loss of the normal AC power supply. With any credible single failure, the EDGs are capable of assuring a safe shutdown of both units during a loss of offsite power (LOOP) concurrent with a loss-of-coolant accident (LOCA) on one unit.

Each EDG can supply power to its respective 4.16 kV bus. Under specific circumstances, each EDG can supply either of the opposite unit's vital 4.16 kV buses through the station blackout (SBO) tie line. The 4.16 kV system can connect via the crosstie and the swing switchgear to any EDG with either the A or B switchgear of the opposite unit. The design provides the capability to perform this function from within the control room. Turkey Point Units 3 and 4 can both successfully withstand and recover from a loss of all offsite and onsite AC power in compliance with the SBO rule, Section 50.63 Title 10 of the *Code of Federal Regulations* (10 CFR 50.63).

### 3.0 PROPOSED CHANGES

The current Turkey Point Units 3 and 4 TS 3.8.1.1, Action b, requires that three separate and independent EDGs be operable in Modes 1, 2, 3, and 4. In the event that one of the required EDGs becomes inoperable, the limiting condition for operation (LCO) requires the inoperable EDG to be returned to operable status within 72 hours, or the plant must transition to hot standby (Mode 3) within 6 hours and be placed in cold shutdown (Mode 5) within the following 30 hours.

If two of the required EDGs become inoperable, TS 3.8.1.1, Action f, requires that at least one of the inoperable EDGs be returned to operable status within 2 hours or the plant must be brought to hot standby conditions within the next 6 hours and to cold shutdown conditions within the following 30 hours. Both inoperable EDGs must be returned to operable status within 72 hours or the unit must be in at least hot standby conditions within the next 6 hours and cold shutdown within the following 30 hours.

The operability of a Unit 4 EDG is required for Unit 3, and vice versa, in Modes 1, 2, 3, and 4, to satisfy the single active failure criterion for high head safety injection pumps, and other shared equipment required during a LOCA coincident with LOOP. A footnote to TS 3.8.1.1 requires that compliance with TS 3.5.2, "ECCS Subsystem- $T_{avg}$  Greater than or Equal to 350 °F," and TS 3.8.2.1, "D.C. Source Operating," be maintained whenever one or more of the four EDGs are removed from service.

TS SR 4.8.1.1.2.g.1 states that at least once per 18 months during shutdown (applicable only to the two diesel generators associated with the unit) the EDG will be inspected in accordance with procedures prepared in conjunction with its manufacturer's recommendations. This inspection requirement is primarily associated with maintaining EDG reliability.

The following changes to TS Action Statement 3.8.1.1, Actions b and f, and TS SR 4.8.1.1.2.g.1 are requested:

a) Change "72 hours" to "14 days" in Action Statement 3.8.1.1.b and revise the associated footnote as follows:

With one of the required diesel generators inoperable, demonstrate the OPERABILITY of the above required startup transformers and their associated circuits by performing Surveillance Requirement 4.8.1.1.a within 1 hour and at least once per 8 hours thereafter. If the diesel generator became inoperable due to any cause other than an inoperable support system, an independently testable component, or preplanned preventative maintenance or testing, demonstrate the OPERABILITY of the remaining required diesel generators by performing Surveillance Requirement 4.8.1.1.2.a.4 within 24 hours, unless the absence of any potential common mode failure for the remaining diesel generators is determined. If testing of remaining required diesel generators is required, this testing must be performed regardless of when the inoperable diesel generator is restored to OPERABILITY. Restore the inoperable diesel generator to OPERABLE status within 14 days \*\* or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

\*\* 72 hours if inoperability is associated with Action Statement 3.8.1.1.c

b) Change “72 hours\*\*” to “14 days” in Action Statement 3.8.1.1.f and delete the associated footnote to read as follows:

With two of the above required diesel generators inoperable, demonstrate the OPERABILITY of two startup transformers and their associated circuits by performing the requirements of Specification 4.8.1.1.a within 1 hour and at least once per 8 hours thereafter; restore at least one of the inoperable diesel generators to OPERABLE status within 2 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours. Restore all required diesel generators to OPERABLE status within 14 days from time of initial loss or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours.

c) Replace current SR 4.8.1.1.2.g.1 with the word “Deleted.” The requirement will be relocated to a licensee-controlled maintenance program incorporated by reference into the next revision of the UFSAR.

The following statement will be added to the UFSAR at the next update.

The diesels will be inspected in accordance with a licensee controlled maintenance program. The maintenance program will require inspections in accordance with procedures prepared in conjunction with the manufacturer’s recommendations for this class of standby service. Changes to the maintenance program will be controlled under 10 CFR 50.59.

In addition to the above changes, the amendments include administrative changes that consist of deleting footnotes on pages 3/4 4-9, 3/4 5-4, 3/4 8-2, and 3/4 8-4 that are no longer applicable, and adding appropriate footnotes on pages 3/4 4-9 and 3/4 8-2 that are consistent with the requested EDG AOT TS changes.

#### 4.0 EVALUATION

The staff has evaluated the licensee's proposed revision to the TSs using both deterministic analysis and PRA methods, as discussed below. Also, the evaluation of the administrative changes is provided below.

#### 4.1 Deterministic Evaluation

The purpose of the proposed change to TS 3.8.1.1, Actions b and f, is to extend the EDG AOT from the current 72 hours to 14 days to allow the licensee to perform preventive maintenance work on-line. Currently the work can only be performed during shutdown. In addition, the longer AOT will help the licensee avert unplanned shutdowns by providing margin for the performance of corrective maintenance. The extra margin may be needed to resolve EDG deficiencies that are discovered during scheduled preventive maintenance activities.

The staff evaluated the licensee's request to extend the AOT for EDGs to determine whether the implementation of the SBO requirement in 10 CFR 50.63 would be eroded by the proposed changes, and whether the overall availability of the EDGs would be reduced significantly as a result of increased on-line preventive maintenance activities. It has been the staff's position that the availability of an alternate AC (AAC) power source is a condition for approval of the extended EDG AOT. To qualify as an AAC source, an EDG must have excess capacity to mitigate an SBO in one unit and achieve safe shutdown in the other unit. The excess capacity of the EDG should not include the capacity made available by shedding loads or the normally available capacity for powering safe shutdown LOOP loads in the non-SBO unit.

Turkey Point's design satisfies the SBO rule by providing a unit crosstie at the 4.16 kV level. Specifically, the design uses an alternate safety-related, Class 1E, power source that can be aligned to the SBO unit within 10 minutes of confirmation of an SBO condition. The ability to align the source to the SBO unit in 10 minutes is provided by the crosstie, which allows the 4.16 kV switchgear D of each unit to be connected. The crosstie is sized to carry 500 amperes. The 4.16 kV system has the capacity via the crosstie and the swing switchgear to connect any EDG with either the A or B switchgear of the opposite unit. The connection can be done from the control room. Thus, the power source from one unit EDG can be made available to compensate for an out-of-service EDG in the other unit, if needed.

Each EDG is sized to maintain both units in hot standby for the postulated SBO scenario. Tables 8.2-5a and 8.2-5b of the UFSAR demonstrate that all of the auto-connect loads and required manual loads associated with an EDG and its respective unit for a LOOP condition, plus the additional loads required on the opposite SBO unit, can be supplied by any one EDG. The maximum loading applied to the Unit 3 EDG if Unit 4 is in SBO and only one Unit 3 EDG operable is 2453 KW (the total LOOP loads for Unit 3 are 1338 KW and the total anticipated SBO loads for Unit 4 are 1115 KW). This is 397 KW less than the Unit 3 EDG 2000-hours rating of 2850 KW. The loading is also less than the Unit 3 EDG continuous rating of 2500 KW. The maximum load applied to the Unit 4 EDG if Unit 3 is in SBO and only one Unit 4 EDG is operable is 2546 KW (the total LOOP loads for Unit 4 are 1453 KW and the total anticipated SBO loads for Unit 3 are 1093 KW). This is 549 KW less than the Unit 4 EDG 2000-hour rating of 3095 KW. The loading is also less than the Unit 4 EDG continuous rating of 2874 KW. This analysis demonstrates that each EDG has the required excess capacity to power its dedicated division of safety loads required to respond to LOOP at one unit and an SBO at the other unit and maintain both units in hot standby.

In the event of a LOOP at one unit during an EDG extended outage, the offsite power from the other unit can be made available through the SBO cross-tie.

Further, in the event that an EDG is inoperable in Modes 1-4, existing TS 3.8.1.1 requires that within 2 hours all required systems, subsystems, trains, components, and devices that depend on the remaining operable EDG as a source of emergency power be verified to be operable. This required action provides assurance that a LOOP event will not result in a complete loss of safety function of critical systems while one of the EDGs is inoperable.

In order to restrict entering into the extended LCO if a unit EDG, the blackout crosstie or the startup transformer, is unavailable, the licensee has made the following restrictions:

If an EDG is unavailable, an EDG on the opposite unit will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.

If the blackout crosstie is unavailable, an EDG will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.

If an EDG is unavailable, the blackout crosstie will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.

If a condition is entered in which both an EDG and the blackout crosstie are unavailable at the same time, restore the EDG or blackout crosstie to service as soon as possible.

If an EDG is unavailable, the startup transformer will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.

If the startup transformer is unavailable, an EDG will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.

In addition, positive measures in the form of administrative controls and guidelines do not allow maintenance to be planned on EDGs when adverse weather conditions (hurricanes and tornadoes) are expected.

The relocated inspection requirement of TS 4.8.1.1.2.g is primarily associated with maintaining EDG reliability. Reliability-centered inspection and maintenance, while important, do not meet the requirements set forth in 10 CFR 50.36(c)(3) for incorporation in the TSs, and are not activities that are generally used to demonstrate component operability. Maintaining reliable EDGs is necessary to reduce the risk contribution from LOOP and SBO scenarios. The licensee-controlled maintenance program will require inspection in accordance with procedures prepared in conjunction with its manufacturer's recommendations for this class of standby service. The subject inspection is not included in the *Standard Technical Specifications for Westinghouse Plants*, NUREG-1431.

## 4.2 Deterministic Summary

Based on the above discussion, the staff finds that the licensee's request to extend the EDG AOT to 14 days is acceptable. This finding is based on the following: (1) the longer AOT would reduce entries into the LCO and reduce the number of EDG starts for major EDG maintenance activities, (2) the unit EDG would be capable of powering the components of the other unit's selected loads necessary to maintain both units in hot standby in the event of an SBO, and (3) postponing preplanned maintenance when adverse weather is expected will minimize the potential for SBOs during the longer AOT. Also, the staff finds that the licensee's request to relocate TS SR 4.8.1.1.2.g.1 is acceptable.

## 4.3 Probabilistic Risk Assessment Evaluation

In Regulatory Guide (RG) 1.177, the staff identified a three-tier approach for licensees and the staff to evaluate the risk associated with proposed TS AOT changes. Tier 1 is an evaluation of the impact on plant risk of the proposed TS change as expressed by the change in core damage frequency (CDF), the incremental conditional core damage probability (ICCDP<sup>1</sup>), and, where appropriate, the change in large early release frequency (LERF) and the incremental conditional large early release probability (ICLERP<sup>2</sup>). Tier 2 is an evaluation of the process used to address potentially high-risk configurations that could exist if equipment in addition to that associated with the change were to be taken out of service simultaneously, or other risk significant operational factors, such as concurrent system or equipment testing, were also involved. Tier 3 is an evaluation of the overall configuration risk management program (CRMP) to ensure that adequate programs and procedures are in place to identify and compensate for other potentially lower probability, but nonetheless risk significant, configurations resulting from maintenance and other operational activities.

FPL used the three-tiered approach to evaluate the risk associated with the proposed EDG AOT extension from 3 to 14 days. The approach is generally consistent with RG 1.174 and RG 1.177, and the staff evaluated whether FPL's application has met the intent of these RGs.

### Tier 1: PRA Capability and Insights

#### Evaluation of PRA Model and Application to the Proposed Change

The staff's review focused on the capability of the FPL's PRA model to analyze the risk stemming from the extended AOT for EDGs. This activity, however, did not involve an in-depth review of the licensee's PRA to the extent necessary to validate the overall quantitative estimates. The purpose was to confirm that the licensee's risk analysis used to support the proposal was of sufficient quality, detail and scope for the proposed application.

#### (1) Internal initiating events

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<sup>1</sup>ICCDP=[(conditional CDF with the subject equipment out of service) - (baseline CDF with nominal equipment unavailabilities)] x (duration of single AOT under consideration)

<sup>2</sup>ICLERP = [(conditional LERF with the subject equipment out of service) - (baseline LERF with nominal equipment unavailabilities)] x (duration of single AOT under consideration)

In response to Generic Letter (GL) 88-20, FPL submitted its Individual Plant Examination (IPE) for internal initiating events to the U.S. Nuclear Regulatory Commission (NRC) in June 1991. The submittal consisted of a Level 1 PRA with a limited-scope Level 2 containment performance. The submittal also included the results of some external events; however, the external events portion was not reviewed as part of the staff's evaluation of the licensee's IPE for internal initiating events. The staff's review of the submittal included a "Step 2" review to perform a more detailed evaluation of the licensee's IPE. The Step 2 review consisted of audits involving a site visit, system walkdowns, and interviews with the plant personnel and analysts. During the review, the licensee revised certain sections of the original IPE when responding to the staff's request for additional information (RAI). The staff's safety evaluation report of the IPE concluded that the licensee met the intent of GL 88-20. Since the IPE, FPL made a number of changes to their PRA model. The licensee stated that the revision and applications of the PRA models and associated databases are handled as "Quality Related" under the 10 CFR Part 50, Appendix B, Quality Assurance (QA) program. In addition, the licensee indicated that the models have been maintained to represent the current plant configurations. Revisions of the models follow written procedures and an independent review is internally performed.

FPL has also participated in the Westinghouse Owners Group (WOG) peer review activities. The Turkey Point PRA is scheduled to be reviewed by WOG peer review group in early 2002. In preparation for the peer review, a couple of external PRA experts reviewed the licensee's PRA model used for this particular application and did not identify any findings that would change the licensee's conclusions.

Based on the significant reduction in the baseline CDF from  $1E-4$ /yr in the IPE to  $9E-6$ /yr in the current PRA, the staff requested additional information on major model changes and their risk impact. According to the licensee's response, several major model changes are listed below:

- High Head Safety Injection from the opposite unit as a backup for recirculation was credited for small loss of coolant accidents (LOCAs).
- The LOCA initiating event frequencies were updated.
- The Reactor Coolant Pump seal LOCA model was revised.
- The Component Cooling Water system of the opposite unit was credited.

The staff finds that the licensee's internal initiating events PRA used to support this proposed change has been subjected to internal and external peer reviews. Additionally, changes to and applications of the PRA model have been subjected to the licensee's administrative controls for QA. The significant reduction in the baseline CDF from the IPE was found to be reasonable based on the information provided by FPL. Most importantly, the modified reactor coolant pump (RCP) seal LOCA model, which is based on the draft Westinghouse Commercial Atomic Power (WCAP) report titled RCP Seal LOCA modeling Guidelines, had the most significant impact on reducing the risk associated with this particular application. The draft WCAP is based on the RCP seal leakage model described in WCAP-15603, WOG2000 Reactor Coolant Pump Seal Leakage Model for Westinghouse PWRs, Revision 0, December 2000. The licensee's RCP seals are the new high-temperature seals. This increased the performance of the RCP seals during a loss of seal injection and cooling. There are also other design features contributing to a further risk reduction. For example, the EDGs at Turkey Point Units 3 and 4 can be easily cross-tied between units. A single

EDG can provide sufficient power to mitigate a loss of offsite power affecting both units. There is also a diesel-driven standby steam generator feedwater pump which is not dependent on any 4KV power supply. This pump as well as another motor-driven standby steam generator feedwater pump is a backup to the normal feedwater pumps and the auxiliary feedwater pumps. Another enhancement made to reduce the dependence on offsite power and onsite power sources was the addition of a diesel-driven service water pump. Among the functions of the service water system is to provide backup cooling to the charging pumps. The staff finds that these design features and their capabilities could significantly reduce the risk stemming from a potential loss of offsite power at Turkey Point Units 3 and 4.

FPL performed additional sensitivity studies to assess the sensitivity of the risk impact of an extended EDG AOT to changes in extension of the Residual Heat Removal AOT from 3 to 7 days, and offsite power non-recovery probabilities. The licensee examined the cumulated risk impact of both the EDG and RHR AOT extensions. The studies did not produce any unexpected results that could change the staff conclusions in this risk evaluation.

In its submittal, FPL provided the staff with the top ten cutsets calculated for both the baseline and conditional cases relevant to this application. For conditional cases where an EDG was taken out of service due to preventive or corrective maintenance, the behavior of the dominant cutsets was generally consistent with the staff's expectation as the cutsets associated with the loss of offsite power sequences gained their significance. The staff also evaluated the basic event data and the initiating event frequency for loss of offsite power used in the cutsets, and found them to be reasonable. Specifically, the basic events for EDG test and maintenance outage, EDG failure to start, EDG failure to run, operator failure to crosstie the EDGs, and offsite power recovery were separately modeled. The staff finds that the requisite elements of a PRA required in modeling the loss of offsite power sequences were included in the licensee's PRA. The staff considers the level of detail of the licensee's PRA for internal initiating events used for this application appropriate.

In summary, FPL's current PRA used to assess the risk due to internal initiating events has been updated from the original IPE. The risk assessments performed to estimate the impact on plant risk used the updated PRA. The staff did not identify any significant shortcomings in the licensee's internal events PRA that could have a significant impact on the overall results of this application. The staff finds that the licensee's risk analysis of internal initiating events performed to assess the risk impact of the proposed change is generally of sufficient detail and quality for the proposed application.

## (2) External initiating events

The staff evaluated the potential impact on plant risk due to the proposed change stemming from external initiating events. FPL personnel and an industry expert performed the following tasks in order to investigate the fire risk associated with the proposed EDG AOT extension:

- A plant walkdown of the Control Room and Cable Spreading Room was performed.
- A review of previous fire risk evaluation information and conservatisms.

- The Control Room and Cable Spreading Room fire risk in the individual plant examination of external events (IPEEE) was revised.

The licensee also stated that the required actions in response to external initiating events including fire, tornados, earthquakes and hurricanes are well proceduralized. Based on this information, the licensee concluded that the risk impact due to external initiating events would be very small.

The staff's evaluation of the licensee's risk submittal on the risk due to external initiating events included both the licensee's Tier 1 analysis and the Tier 2 restrictions (discussed in Tier 2). The Tier 1 analysis itself was not sufficient for this application regarding its quality and detail. However, when the Tier 2 restrictions are considered concurrently with the Tier 1 analysis, the staff finds that the risk impact due to external initiating events is significantly reduced although no specific quantitative assessment of these Tier 2 restrictions is performed. These restrictions are partially based on risk insights gained from FPL's previous EDG AOT application for St. Lucie Units 1 and 2. The staff finds that the licensee's approach to include these compensatory measures to address the risk impact due to external initiating events is reasonable for this particular application.

The staff's evaluation of the FPL's IPEEE found that the licensee's IPEEE process was capable of identifying severe accident vulnerabilities. The staff concluded that the IPEEE met the intent of Supplement 4 to GL 88-20. No severe accident vulnerabilities from external initiating events were identified.

In summary, the staff finds that the licensee's PRA and additional risk assessments performed in support of the proposed change are of sufficient detail and quality for the application. The scope and detail of the PRA are found to be compatible with the risk implications of the change being requested. For external events, the licensee's approach to include several important compensatory measures to address the potential risk impact is concluded to be reasonable for this particular application.

#### Evaluation of PRA Results and Insights Associated with the Proposed Change

##### (1) Internal initiating events

FPL evaluated the impact on plant risk of the proposed change as expressed by the change in CDF ( $\Delta$ CDF), the ICCDP for a single outage, the change in LERF ( $\Delta$ LERF), and the ICLERP for a single outage. These risk measures are consistent with those used in RGs 1.174 and 1.177. The following sections summarize the licensee's calculated results.

##### (a) $\Delta$ CDF and $\Delta$ LERF

The new proposed CDFs were based on the expected outage frequency and duration given the 14-day AOT for EDGs. These results are provided by FPL, and the staff's evaluation of this application did not attempt to validate the accuracy of these quantitative estimates. These estimates are entirely based on internal initiating events.

Current CDF	$9.01 \times 10^{-6}/\text{yr}$
Proposed CDF	$9.15 \times 10^{-6}/\text{yr}$
$\Delta$ CDF	$1.41 \times 10^{-7}/\text{yr}$

Current LERF	$3.79 \times 10^{-8}/\text{yr}$
Proposed LERF	$3.80 \times 10^{-8}/\text{yr}$
$\Delta$ LERF	$1.17 \times 10^{-10}/\text{yr}$

(b) ICCDP and ICLERP for a single outage

FPL provided the calculated ICCDPs and ICLERPs for both a preventive maintenance outage and a corrective maintenance outage. The ICLERPs are based on the conditional containment failure probability of 0.01 instead of the best estimate value of 0.00076. In addition, these estimates are based on the full 14-day duration of an EDG outage.

ICCDP (Corrective Maintenance)	$4.44 \times 10^{-7}$
(Preventive Maintenance)	$3.23 \times 10^{-7}$
ICLERP (Corrective Maintenance)	$4.44 \times 10^{-9}$
(Preventive Maintenance)	$3.23 \times 10^{-9}$

The staff finds that FPL used appropriate risk measures consistent with the applicable RGs to assess the risk of the proposed change due to internal initiating events. The calculated risk impact of the change was estimated to be small.

(2) External initiating events

The absence of a PRA for external initiating events can pose a significant limitation on gaining accurate quantitative risk results and insights necessary to evaluate the risk impact of the proposed licensing changes. In order to meet the intent of Supplement 4 to GL 88-20, many licensees opted to use non-PRA methodologies. For example, many licensees used the Seismic Margin Method for earthquakes and the FIVE [fire-induced vulnerability evaluation] Methodology to identify plant-specific vulnerabilities to severe accidents. Although most licensees succeeded in meeting the intent of the IPEEE program, the use of their IPEEE for other purposes would generally be inappropriate. These non-PRA methodologies either make obtaining the baseline CDF very difficult or produce unrealistically conservative results. On the other hand, the overall risk impact of the changes in licensing applications could be underestimated without including the contribution stemming from external initiating events.

Based on the review of the licensee's IPEEE and insights gained from the review of previous EDG AOT extension requests, the staff finds that earthquakes would be a small risk contributor at Turkey Point Units 3 and 4 for the proposed change in EDG AOT extension. For fires, the staff's evaluation took into account the licensee's proposed compensatory measures that reduce the fire risk contribution. The staff judges the potential risk increase due to fires to be small given the compensatory measures. For other external initiating events, e.g., hurricanes and tornados, the licensee proposed additional Tier 2 restrictions in their submittal to avoid potential high risk conditions. These restrictions are considered for the review of the potential risk of the proposed change. Based on the above, the staff finds that the potential risk impact due to external initiating events would be small.

In summary, the staff did not combine the CDF and LERF contributions stemming from external initiating events with those from internal initiating events. The staff did not do so due to several factors including the absence of the external initiating events PRA and the role of significant compensatory measures. Nonetheless, the staff finds that, with the compensatory measures

properly in place, the risk impact of the proposed change due to external initiating events would meet the acceptable guidelines of the Tier 1 requirements prescribed in the applicable RGs 1.177 and 1.174.

## Tier 2: Avoidance of Risk Significant Plant Configurations

The licensee is expected to provide reasonable assurance that risk significant plant equipment outage configurations will not occur when specific plant equipment is out of service, consistent with the proposed TS change. FPL evaluated several potential configurations in which an additional equipment unavailability concurrent with an EDG outage was assumed. The equipment evaluated included the Startup Transformers, Blackout Crosstie, and offsite grid. Based on the evaluation, the following restrictions were proposed:

### Startup Transformer

- If an EDG is unavailable, the startup transformer will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.
- If the Startup Transformer is unavailable, an EDG will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.

### Blackout Crosstie

- If an EDG is unavailable, an EDG on the opposite unit will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.
- If the Blackout Crosstie is unavailable, an EDG will be removed from service only for corrective maintenance, i.e., maintenance required to ensure or restore operability.
- If an EDG is unavailable, the Blackout Crosstie will be removed from service only for corrective maintenance i.e., maintenance required to ensure or restore operability.
- If a condition is entered in which both an EDG and the Blackout Crosstie are unavailable at the same time, restore the EDG or Blackout Crosstie to service as soon as possible.

### Grid

- If a hurricane warning has been issued in an area which may impact the FPL grid, i.e., within the FPL service area, an EDG or the Blackout Crosstie should be removed from service only for corrective maintenance, e.g., maintenance required to ensure or restore operability.
- If an EDG or the Blackout crosstie is unavailable when a hurricane warning in an area that may impact the FPL grid is issued, the unavailable component(s) will be restored to service as soon as possible.

- If a tornado watch has been issued for an area which includes the Turkey Point Pant site, and/or the substations and transmission lines serving Turkey Point Plant switchyard, restore the unavailable component(s) to service as soon as possible.

To address the potential fire risk implications, FPL proposed the following fire protection Tier 2 restrictions.

During Modes 1, 2, and 3, if an EDG is to be removed from service for maintenance for a period scheduled to exceed 72 hours, the following actions will be completed:

- A plant fire protection walkdown of the areas that could impact EDG availability, offsite power availability or the ability to use the SBO crosstie prior to entering the extended AOT;
- A thermographic examination of high risk potential ignition sources in the cable spreading room and the control room;
- Restriction of planned hot work in the cable spreading room and control room during the extended AOT; and
- Establishment of a continuous fire watch in the cable spreading room when in the extended AOT.

The licensee stated that in addition to the pre-determined restrictions above, assessments performed in accordance with the provisions of the Maintenance Rule (a)(4) will ensure that any other risk significant configurations are identified before removing an EDG from service for pre-planned maintenance.

The staff finds that the FPL's Tier 2 analysis was reasonable in identifying and evaluating potential risk significant configurations. The licensee committed to implement a number of significant compensatory measures to avoid potential risk significant configurations. These Tier 2 restrictions compensate for the shortcomings of the Tier 1 assessment which roughly measures the expected risk stemming from the proposed change. The Tier 3 assessment, in turn, complements the analyses of Tiers 1 and 2.

### Tier 3: Risk-Informed Plant Configuration Management

RG 1.177 states that the licensee should develop a program that ensures the risk impact of out-of-service equipment is appropriately evaluated prior to performing any maintenance activity. A Tier 3 CRMP has been established at Turkey Point Units 3 and 4 via the implementation of the Maintenance Rule (a)(4). At Turkey Point, the Equipment Out of Service (EOOS) software distributed by Electric Power Research Institute is used as the on-line PRA tool used for implementing the Maintenance Rule (a)(4). There is an EOOS model for each unit, and any shared systems or dependencies are modeled in each.

The staff finds that the licensee's configuration risk management program, which implements the Maintenance Rule (a)(4), meets the Tier 3 guidelines prescribed in RG 1.177.

## Implementation and Monitoring

The staff expects the licensee to implement this TS change in accordance with the three-tiered approach described above. To ensure that extension of this EDG AOT does not degrade operational safety over time, FPL should ensure that when an EDG does not meet its performance criteria, the evaluation required under the Maintenance Rule includes this EDG AOT TS change in its scope. If the licensee concludes that the performance or condition of a TS system or component affected by a TS change does not meet established performance criteria, appropriate corrective action should be taken, in accordance with the Maintenance Rule. Such corrective action could include consideration of another TS change to shorten the revised AOT, or imposition of a more restrictive administrative limit, if the licensee determines this is an important factor in reversing the negative trend.

### 4.4 Probabilistic Summary

The PRA provided by the licensee for the proposed changes in the EDG AOT supports the proposed changes in the EDG AOT. In addition, the level of detail and scope of the PRA are appropriate for the proposed application. The staff did not identify any significant weaknesses or deficiencies associated with the licensee's risk analysis used to support the proposed changes that could impact the overall quantitative conclusion. The results of the risk analysis indicate that the risk impact of the proposed changes would be small. The staff finds that the licensee's application met the intent of the applicable RGs 1.174 and 1.177, and concludes that risk results and insights support the proposed EDG AOT extension. Therefore, the TS changes are acceptable.

### 4.5 Administrative Changes

The changes that include deleting four footnotes that are no longer applicable and adding two footnotes that are consistent with the approved EDG AOT TS changes discussed above are administrative in nature and, therefore, are acceptable.

## 5.0 STATE CONSULTATION

Based upon a letter dated March 8, 1991, from Mary E. Clark of the State of Florida, Department of Health and Rehabilitative Services, to Deborah A. Miller, Licensing Assistant, U.S. Nuclear Regulatory Commission, the State of Florida does not desire notification of issuance of license amendments.

## 6.0 ENVIRONMENTAL CONSIDERATION

These amendments involve a change in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 and changes surveillance requirements. 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 no significant hazards consideration, and there has been no public comment on such finding (66 FR 20005). Accordingly, these 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.

The administrative changes discussed in 4.5 are categorically excluded by 10 CFR 51.22 (c)(10).

## 7.0 CONCLUSION

The Commission has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) 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.

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Date: August 8, 2001

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