



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 179 TO FACILITY OPERATING LICENSE NO. DPR-31
AND AMENDMENT NO. 173 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 July 26, 1995, as supplemented by letter dated October 4, 1995, Florida Power and Light Company (FPL or the licensee) proposed a change to the Technical Specifications (TS) for Turkey Point Units 3 and 4. The changes requested involved modifying the TS to allow longer surveillance test intervals (STIs) and allowed outage times (AOTs) for the reactor trip system (RTS) and engineered safety features actuation system (ESFAS) instrumentation. This proposed modification to the TS would minimize the potential number of inadvertent ESFAS actuations and reactor trips during surveillance testing, increase operational effectiveness of plant personnel, and allow resources to be used for other tasks such as preventive maintenance. In addition, the increased AOTs would result in fewer human errors since more time would be allowed to perform test and maintenance actions.

2. BACKGROUND

Operating utilities have become increasingly aware of the effects of current STI and maintenance requirements on plant operation. Inadvertent reactor trips have occurred that could be attributed to human errors during performance of these activities. Human errors were found to be directly proportional to the frequency of surveillance tests (STs) and inversely proportional to the time allowed for an inoperable channel to remain in a bypassed condition before repairs could be made. Thus, a greater frequency of STs and shorter AOTs were, in part, responsible for inadvertent trips and challenges to safety systems.

To resolve the above concerns, the Westinghouse Owners Group (WOG) initiated a program to evaluate the effect of such undesirable events and proposed TS changes to increase STIs and AOTs as remedial actions to preclude inadvertent trips and challenges to the safety systems while maintaining the benefits of routine tests and maintenance activities to ensure the reliability of the RTS and ESFAS instruments.

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3. PREVIOUSLY APPROVED REVISIONS AND ASSOCIATED CONDITIONS

The WOG published results of its study and proposals for remedial actions in 1983 in the original WCAP-10271. This document was later revised several times in response to NRC's comments and the current version of WCAP-10271, Supplement 2, Revision 1, was published on May 12, 1987. The staff reviewed all versions of WCAP-10271 including WOG's responses to staff's questions on these submittals. During this review, the NRC staff engaged the services of Brookhaven National Laboratory (BNL) to evaluate the approach used and the analyses performed in the WOG reports. BNL determined the adequacy of WOG's methodology to establish technical bases for unavailability data, reliability calculations, and proposed STI/AOT extensions. After the NRC staff and BNL staff had completed their review, the NRC issued three safety evaluation reports (SERs): RTS SER on February 21, 1985; ESFAS SER on February 22, 1989; and a supplemental SER (SSER) on April 30, 1990. These SERs approved various TS changes relating to extending STIs, test/maintenance AOTs, and bypass time for instrument channels in RTS, ESFAS, and the logic cabinets for these systems. In the SERs, the NRC staff approved extensions to STIs/AOTs and the time during which the instrument channels could be bypassed. However, the staff stipulated certain conditions that licensees must meet to include these previously approved changes in plant-specific TS. The previously approved changes and associated conditions are addressed below.

3.1 PREVIOUSLY APPROVED CHANGES

As mentioned above, the NRC staff stipulated certain conditions to be met before the approved TS changes to RTS and ESFAS and to the logic cabinets of these systems could be made in any plant-specific TS. The previously approved TS changes are described below and the associated conditions are described in section 3.2 of this report.

- 3.1.1 SER issued on February 21, 1985 (RTS SER). In this SER the staff approved the following TS changes relating to RTS instruments:
- (1) STI for RTS analog channel operational testing may be increased from once a month to once per quarter.
 - (2) The duration for which an inoperable RTS analog channel may be maintained in an untripped condition may be increased from 1 hour to 6 hours.
 - (3) The duration for which an inoperable RTS channel may be bypassed to allow testing of another channel in the same function may be increased from 2 hours to 4 hours. Also, the channel test may be done in the bypass mode, leaving the inoperable channel in a tripped condition.
 - (4) Testing of RTS analog channels in a bypassed condition instead of a tripped condition will be allowed.



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3.1.2 SER issued on February 22, 1989, (ESFAS SER). In this SER, the staff approved the following TS changes relating to ESFAS instruments:

- (1) The STIs for the analog channels may be increased from once a month to once a quarter.
- (2) The AOTs for testing of analog channels may be increased from 2 hours to 4 hours for both relays and solid state systems.
- (3) The AOTs for testing all components may be up to 4 hours in solid state systems.
- (4) In relay systems, the AOTs for testing of the logic trains and master relays could be increased to 8 hours and for the slave relays to 12 hours.
- (5) The AOTs for maintenance on all components may be extended to 12 hours for both relays and solid state systems. All components except the analog channels could be in the bypass mode during maintenance AOT, with an analog channel tripped after spending 6 hours in the bypass mode. Therefore, the maximum duration for which an inoperable ESFAS analog channel could be in untripped condition is 6 hours.
- (6) Staggered testing is not required for analog channels in the ESFAS and this requirement may be removed for analog channels in RTS.

3.1.3 SER issued on April 30, 1990, (SSER). The staff's approval of the proposed STI/AOT extensions for the logic cabinets and reactor trip breakers for the RTS system was based on its evaluation of Appendix D to the WCAP-10271, Supplement 2, Revision 1. The RTS and ESFAS share some common instrumentation; therefore, it was necessary to consider STI/AOT extensions for RPS logic cabinets. The staff's conclusions are given below.

- (1) The AOT extensions for the RPS logic cabinets as presented in Appendix D are acceptable. These are 4 hours for testing and 12 hours for maintenance instead of 2 hours and 6 hours respectively.
- (2) The STI/AOT extensions (covered by the ESFAS SER) for ESFAS functions associated with the Safety Injection, Steam Line Isolation, Main Feedwater Isolation, and Auxiliary Feedwater Pump Start Signals are acceptable.
- (3) The STI/AOT extensions proposed in Appendix D are not acceptable for reactor trip breakers because the extensions would reduce availability of these breakers.

3.2 ASSOCIATED CONDITIONS FOR APPROVAL

3.2.1 For the RTS SER Changes:

- (1) Performance of testing shall be done on a staggered basis. (This condition was later removed by the ESFAS SER.)
- (2) Procedures should be implemented to evaluate test-failures for common cause effects and additional testing should be performed if necessary.
- (3) Approval of channel testing (items 3.1.1.(3) and (4) above) in a bypassed condition assumes that the plant design allows such testing without lifting any leads or installing temporary jumpers.
- (4) The approved revisions to TS as described above in items 3.1.1(1) through (4), also applies to the reactor coolant pump undervoltage and underfrequency functional units.
- (5) For RTS channels which provide dual inputs to other safety-related systems such as ESFAS, the approval of items 3.1.1(1) through (4) above applies only to RTS functions.
- (6) Increased STI would change the margin for analog channel setpoint; therefore, approval of increased STI is contingent on confirmation by the licensee that their setpoint methodology includes sufficient margin to offset the drift anticipated as a result of less frequent surveillance.

3.2.2 For the ESFAS SER Changes:

- (1) The licensee must confirm the applicability of the generic analyses to the plant.
- (2) The licensee must confirm that any increase in instrument drift due to the extended STIs is properly accounted for in the setpoint calculation methodology.

3.2.3 For SSER changes:

- (1) Acceptance of item 3.1.3.(1) is contingent on including a separate new action statement for modes 1 and 2 for RPS Automatic Trip and Interlock Logic Functional Units. The model Action Statement given below is in the format of Westinghouse Standard Technical Specifications, Revision 4, Table 3.3-1 (the licensee did not request this change).

ACTION 12 - With the number of OPERABLE Channels (analog channels and trip logic) one less than the Minimum Channels OPERABLE requirement, restore the inoperable channel to OPERABLE status within 6 hours or be in at least HOT STANDBY within the next 6 hours; however, one channel may be bypassed for up to 4 hours for surveillance testing per Specification 4.3.1.1, provided the other channel is OPERABLE.

3.2.4 **Expeditious Review:** In the letters transmitting the ESFAS SER and SSER, the staff indicated that a licensee's request for the proposed changes to the plant-specific TS will be expeditiously reviewed by the staff, provided the licensee:

(1) Confirms the applicability of the generic analyses of WCAP-10271, Supplement 2 Revision 0 and Revision 1 to its plant.

(2) Confirms that any increase in instrument drift as a result of the extended STIs has been properly accounted for in setpoint calculation methodology.

(3) Confirms that the proposed TS changes are consistent with those approved by the staff in the SERs.

In the February 21, 1985, and February 22, 1989, SERs, the staff concluded that the increase in core damage frequency (CDF) due to the proposed STI/AOT extensions was small compared to the range of uncertainty in the CDF analysis, the changes constituted an acceptable impact on plant risk, and were, therefore, acceptable.

4. EVALUATION OF PROPOSED REVISIONS

The staff evaluated the licensee's proposed TS changes to verify that they are consistent with previously approved changes and that the licensee has met all the conditions associated with those changes.

4.1 TS Table 3.3-1, Reactor Trip System Instrumentation

Proposed change: Revise ACTION Statements 2a, 6, 12 and 13 to increase the time allowed for a channel to be inoperable or out of service in an untripped condition from 1 hour to 6 hours.

Evaluation: The above change is acceptable because it is consistent with the previously approved change as described in section 3.1.1.(2).

Proposed change: Revise ACTION Statement 2b to increase the time a nuclear instrumentation system (NIS) channel in a functional group may be bypassed to perform testing from 2 to 4 hours.

Evaluation: The above change is acceptable because it is consistent with the previously approved change as described in section 3.1.1.(3).

4.2 TS Table 4.3-1, Reactor Trip System Instrumentation Surveillance Requirements

Proposed change: Revise the surveillance interval for Items 2.a, 4, 7, 8, 10, 11, 12 and Note (9) from monthly to quarterly.

Evaluation: The above change is acceptable because it is consistent with the previously approved change as described in section 3.1.1.(1) of this report.

Proposed change: Revise the surveillance interval for Item 2.b from



monthly to startup, and Item 3 from monthly/startup to startup only.

Evaluation: The above change is acceptable since a valid operation test cannot be performed on these channels at power. This issue was described in NRC letter dated July 24, 1985, from Harold R. Denton. During startup is the appropriate test frequency requirement for these channels.

Proposed change: Revise the surveillance interval for Items 17.a, 17.b, 17.c and 17.d from monthly to refueling.

Evaluation: By letter dated July 24, 1985, the staff concluded that since certain operational testing cannot be performed at power, and during startup is the appropriate test frequency. A specified surveillance frequency of "refueling" was approved by this letter. The frequency is based on the known reliability of the interlocks and the multichannel redundancy available, and has been shown to be acceptable through operating experience.

Proposed change: Revise Note (1) from "7 days" to "31 days" and delete Note (8).

Evaluation: The above change is acceptable since the setpoint drift during this interval is properly accounted for in the licensee's setpoint calculation methodology. By letter dated July 24, 1985, the staff concluded that this frequency should be changed to "31 days" since this change would make the frequency of testing during periods when these channels are required to be operable, consistent with the testing frequency for the channels which must be operable at power.

Note (8) stated that certain testing at power involved only a verification that the annunciator window indicated the proper interlock state. The note is no longer necessary since the associated test will not be performed at power. Therefore, this change is acceptable.

4.3 TS Table 3.3-2, Engineered Safety Features Actuation System Instrumentation

Proposed change: Revise ACTION Statement 14 to increase the time to be in HOT STANDBY with the number of OPERABLE channels one less than the Minimum Channels OPERABLE requirement from 6 to 12 hours.

Evaluation: The above change is acceptable because it is consistent with the previously approved change as described in section 3.1.2.(5).

Proposed change: Revise ACTION Statements 14, 20 and 22 to increase the allowed outage time for testing of the logic trains from 2 hours to 8 hours.

Evaluation: The above change is acceptable because it is consistent with the previously approved change as described in section 3.1.2.(4) of this report.

Proposed change: Revise ACTION Statements 15, 18 and 25 to increase the time allowed for a channel to be inoperable and out of service in an



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untripped condition from 1 hour to 6 hours.

Evaluation: The above change is acceptable because it is consistent with the previously approved change as described in section 3.1.2.(5).

4.4 TS Table 4.3-2, Engineered Safety Features Actuation System Instrumentation Surveillance Requirements

Proposed change: Revise the surveillance interval for Items 1.d, 1.e, 1.f, 4.d, 5.c, 6.b, and 8.a from monthly to quarterly.

Evaluation: The above change is acceptable because it is consistent with previously approved change as described in section 3.1.2.(1) of this report.

5. VERIFICATION OF CONDITIONS

Through its submittal, the licensee confirmed that it has met the SER conditions as described below.

(1) Condition 3.2.1.(1): Performance of testing on a staggered basis was stipulated by the RTS SER, but was removed by the ESFAS SER. The licensee stated that FPL does not plan to institute a staggered testing plan at Turkey Point. This is acceptable.

(2) Condition 3.2.1.(2): The licensee stated that existing plant procedures will be enhanced to require the evaluation of a failure of any RPS/ESFAS channel as part of the quarterly test program, in order to determine if that failure could have resulted from a common cause. The plant procedures will require that appropriate remedial action(s), such as additional testing of the other channels in that function, be taken if the failure is determined to have resulted from a plausible common cause mechanism. The intent of the procedure enhancement is to increase the awareness of the potential for common mode failures and to take additional action when a plausible common mode failure(s) is identified. This is acceptable.

(3) Condition 3.2.1.(3): The licensee stated that surveillance testing will continue to be performed by placing the channel in the tripped position prior to testing. The Eagle 21 and NIS instrumentation systems do have design provisions for testing while in a bypass mode. Testing will be conducted without lifting leads or installing temporary jumpers to bypass functions. This is acceptable to the staff.

(4) Condition 3.2.1.(5): The RTS SER states that approval to extend STI and AOT for channels that provide dual inputs to other safety-related systems such as ESFAS only applies to RTS function. Subsequent to stating this condition in the RTS SER, similar extensions were generically approved for the ESFAS analog channels making this condition no longer applicable.

(5) Condition 3.2.2.(1): The ESFAS SER states that the licensee must confirm the applicability of the generic analyses to the plant. The licensee has confirmed the applicability of the generic analyses. This



is acceptable to the staff.

(6) Conditions 3.2.1.(6) and 3.2.2.(2): The RTS SER and the ESFAS SER state that the licensee must confirm that any increase in instrument drift due to the extended STIs is properly accounted for in the setpoint calculation methodology. The licensee stated that the "as-found" versus "as-left" surveillance data for RPS/ESFAS analog rack comparators, which are presently subject to a monthly surveillance interval, were reviewed for Units 3 and 4 for the preceding 18-month period. Based on this review, it was determined that the assumed magnitude of the rack drift conservatively envelopes the actual drift experienced over a 3-month period. The data demonstrated that the basis of the TS setpoint determinations is not adversely affected by extending the surveillance interval from one month to quarterly, that is, quarterly surveillance test intervals would not exceed the allowable instrument drift of these analog devices. This is acceptable to the staff.

6.0 CONCLUSION

Based on the above, the staff finds the proposed TS changes as described in the submittal acceptable.

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.

7.0 STATE CONSULTATION

Based upon the written notice of the proposed amendments, the Florida State official had no comments.

8.0 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 (60 FR 54720). 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.

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