



AUG 05 2004

L-2004-181
10 CFR 50.90
10 CFR 50.91

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

Re: Turkey Point Unit 4
Docket No. 50-251
Response to Request for Additional Information for
Proposed License Amendment
Inoperable Rod Position Indication

By letter L-2004-174, dated July 28, 2004, Florida Power and Light Company (FPL) submitted an exigent amendment request to revise applicable Technical Specifications to allow the use of an alternate method for determining rod position for control rod F-8 in Shutdown Bank B, for Turkey Point Unit 4.

NRC's request for additional information (RAI), Attachment 1, was discussed with the NRC staff on July 30, 2004. FPL's response to the RAI questions is provided in Attachment 2.

FPL has determined that the additional information provided herein does not change the conclusions reached in the original no significant hazards consideration determination provided in FPL letter L-2004-174, dated July 28, 2004.

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

Please contact Walter Parker, Licensing Manager, at (305) 246-6632, if there are any questions regarding this submittal.

Very truly yours,

A handwritten signature in cursive script that reads "Terry Joties".

Terry O. Joties
Vice President
Turkey Point Nuclear Plant

SM

Attachments

cc: Regional Administrator, Region II, USNRC
Senior Resident Inspector, USNRC, Turkey Point Plant
Mr. W. A. Passetti, Florida Department of Health

A001

Turkey Point Unit 4
Docket No. 50-251
Response to Request for Additional Information for
Proposed License Amendment
Inoperable Rod Position Indication

L-2004-181
Page 2

STATE OF FLORIDA)
) ss.
COUNTY OF MIAMI-DADE)

Terry O. Jones being first duly sworn, deposes and says:

That he is Vice President, Turkey Point Plant, of Florida Power and Light Company, the Licensee herein;

That he has executed the foregoing document; that the statements made in this document are true and correct to the best of his knowledge, information and belief, and that he is authorized to execute the document on behalf of said Licensee.


Terry O. Jones

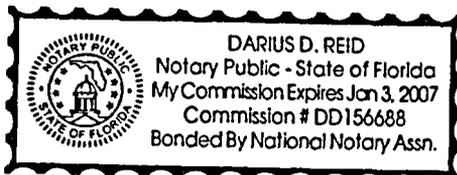
STATE OF FLORIDA
COUNTY OF Miami-Dade

Sworn to and subscribed before me

this 5 day of AUGUST, 2004

by, Terry O. Jones who is personally known to me.


Signature of Notary Public-State of Florida



Attachment 1
Request for Additional Information
Analog Rod Position Indication for Control Rod F-8 Exigent Amendment

1. In FPL's "Justification for Proposed TS [Technical Specification] Change" section of the exigent amendment request, the licensee stated that "Following a reactor trip, the analog rod position indication system is used to verify that all rods have fully inserted. Emergency boration is required if more than one rod fails to insert." The licensee also states that the inoperability of the position indication system will prevent verification that control rod F-8 has inserted following a reactor trip. The licensee contends that heightened awareness of this condition by operators will ensure that emergency boration is initiated if another control rod other than F-8 does not fully insert during a reactor trip. However, there is a concern regarding the reliance on emergency procedures for a known condition under which the licensee intends to operate the plant, satisfies the intent of maintaining appropriate shutdown margin (SDM). Additionally, the inoperable rod position indication will prevent the licensee from performing TS surveillance requirement 4.1.3.1.2 on control rod F-8 to ensure that the control rod remains able to be tripped. Therefore, the staff requests the licensee demonstrate that the required SDM of TS 3.1.1 will be maintained in the event that control rod F-8 and the worst case stuck rod remain fully withdrawn following a reactor trip.
2. In the July 28 submittal, FPL provided a brief description of the proposed alternate monitoring equipment. The licensee stated that it will install alternate monitoring equipment to track parameters of the stationary gripper coil of the Control Rod Drive Mechanism of control rod F-8. The staff requests the licensee provide the following additional information on the operation and monitoring of these alternate parameters:
 - a. The specific parameters being monitored, (i.e. gripper coil current, voltage, etc.), as well as a description of the equipment to be used to measure the specific parameters and record the output.
 - b. A summary of who will be responsible for reviewing the output data from the alternate monitoring equipment and how these individuals will identify the described "changes in state" of the gripper coils.
3. The licensee concluded that the fault in the analog rod position indication (ARPI) for control rod F-8 occurred at a location that cannot be safely reached for repair during power operations. The ARPI system typically provides input to a number of alarms and instrumentation systems in the control room. The staff requests the licensee provide a summary of all the indications and alarms affected by the inoperable ARPI for control rod F-8. Additionally, the staff requests that for each affected indication or alarm, the licensee describe compensatory measures that will be used to offset the loss of its features.

10/10/2013 10:03 AM
Page 4 of 9

Attachment 1
Request for Additional Information
Analog Rod Position Indication for Control Rod F-8 Exigent Amendment

4. Since the failure of the ARPI for control rod F-8, the licensee has been complying with TS 3.1.3.2, Action Statement a., which requires the operators to “[d]etermine the position of the nonindicating rod(s) indirectly by the movable incore detectors at least once per 8 hours and within one hour after any motion on the nonindicating rod which exceeds 24 steps in one direction since the last determination of the rod's position.” This results in the licensee exercising the movable incore detection system approximately 90 times per month. The licensee has cited excessive wear on the movable incore detectors as a justification for monitoring of the gripper coil position. The licensee’s justification implies a potential reduction in safety margin or fatigue-induced equipment failure will occur from continued use of the incore movable detectors. The staff requests the licensee provide a detailed description of the potential consequences of continued use of the movable incore detectors. This should include, as appropriate, postulated failure methods, estimated fatigue times, and projected failure consequences. Additionally, the licensee should identify whether the projected failure methods and consequences are bounded by any existing transient or accident analyses.

Attachment 2
Response to Request for Additional Information
Inoperable Rod Position Indication

Response to RAI Question # 1

A Shutdown Margin (SDM) Calculation was performed with Control Rod F-8 and the worst case stuck rod fully withdrawn using NRC approved methodology as described in the Core Operating Limits Report (COLR) for Turkey Point Units. The results of the analysis show that the required Shutdown Margin of Technical Specification (TS) 3.1.1.1 is met for the entire cycle as shown below:

Time in Cycle	Original Nuclear Design Analysis All Rods In Minus the Worst Stuck Rod (ARI-1) SDM (PCM)	Current Analysis All Rods In Minus the Worst Stuck Rod Minus the control rod F-8 (ARI-1-F8) SDM (PCM)	TS 3.1.1.1 SDM LIMIT (PCM)
Beginning Of Cycle	3891	3656	1000
End Of Cycle	2481	2290	1770

Response to RAI Question # 2a

The parameter monitored for Control Rod F-8 will be the stationary gripper coil current. The control rods are held in place by energized stationary gripper coils. The control rod can not be moved without de-energizing the stationary gripper coil. The rod control power cabinet design uses a resistor to monitor the coil current. The gripper coil current (measured as an equivalent voltage) will be monitored on an existing control room recorder, R-4-448. This digital recorder is a Yokogawa model DX-208 eight-channel recorder. This is mounted on a vertical panel within the control room surveillance area. R-4-448 is a multi-channel recorder with currently one channel in continuous use for Generator Gross Mega-Watts and one channel used periodically for Auxiliary Feedwater testing. A spare channel will be used to display gripper current for Control Rod F-8. The normal gripper current is 4.4 amps, which when measured across the resistor will be equivalent to 275 milli-volts. The recorder has alarm indication in a form of a display window, which is programmed for a low voltage alarm indicative of a gripper coil change of state.

Response to RAI Question # 2b.

The licensed Reactor and Senior Reactor Operators will be responsible for monitoring the output data from the alternate monitoring equipment, recorder R-4-448. The recorder will be programmed to display Control Rod F-8 gripper trends and numerical values. Operating procedure 4-OSP-201.1 "RCO Daily Log", will provide instructions for monitoring gripper trends. Accordingly, the indicated value for Control Rod F-8 will be logged by the Operators every 4 hours. The Operators will be able to identify any changes in gripper coil state based on a deviation from the normal state, which is defined by a predetermined operating band as well as by a programmed alarm, and by observing the historical trend line displayed on the recorder. The actions prescribed in the Annunciator Response and Off Normal Operating procedures for a change in the gripper value are the same as those for a rod that is indicated to be deviating based on an individual rod position indicator (RPI).

Attachment 2
Response to Request for Additional Information
Inoperable Rod Position Indication

Response to RAI Question # 3.

The following table provides a summary of the Indications and alarms and how they are affected by the inoperable RPI for Control Rod F-8:

Function	Indication / Alarm Identification	Normal Operation	Affect of Modified Operation
Analog Meter Indication	RPI F-8 Panel 4C02	Provides analog rod position reading for Control Rod F-8.	This indication will be considered out-of-service. The indication will continue to provide a reading, but this reading is not accurate for verification of the status of control rod F-8.
Rod Bottom Indication Light	RPI F-8 Panel 4QR71	Light illuminates when any rod is within 20 steps or closer to the bottom of the core.	The function of the light on 4QR71 for rod F-8 will <u>not</u> be modified, but will <u>not</u> provide conclusive indication that Rod F-8 is on the bottom. This indication will be considered out-of-service for Rod F-8.
Rod Bottom / Rod Drop Annunciation	Annunciator window B7/1 – NIS / RPI Rod Drop Rod Stop	This annunciation is actuated when any rod is within 20 steps or closer to the bottom of the core.	The function of the annunciation for Rod F-8 will <u>not</u> be modified, but will <u>not</u> provide conclusive indication that Rod F-8 is on the bottom. This annunciation will be considered out-of-service for Rod F-8.
Shutdown Rod Off Top Indication Light	RPI F-8 Panel 4QR64	This light will illuminate when any Shutdown rod is off top.	The function of the light on 4QR64 for Rod F-8 will <u>not</u> be modified and will be considered out-of-service. Therefore, this indication may be illuminated at times when the output indication from RPI F-8 drifts to the actuation set point.
Shutdown Rod Off Top / Deviation Annunciation	Annunciator window B9/3 – Shutdown Rod Off Top / Deviation	This annunciation is actuated when any shutdown rod is below 218 steps and Control Bank B is greater than 35 steps OR Deviation of 12 (24 moving) steps between any two rods in the same bank.	The ability of RPI F-8 to actuate this annunciation will be disabled.
Gross Megawatts Recorder	Yokogawa Recorder R-4-448 Panel 4C04	Provide a single continuous recording of the gross megawatts from the main generator.	An additional recorder channel indication will be added to the function of the equipment. This indication will provide continuous recording and indication of the Stationary Gripper status for Rod F-8.
Gross Megawatts Recorder	Yokogawa Recorder R-4-448 Panel 4C04	No alarms are utilized on this recorder.	High and low alarm indication light settings will be provided on this recorder for the Stationary Gripper status for Rod F-8.

Attachment 2
Response to Request for Additional Information
Inoperable Rod Position Indication

The following compensatory measures will be used to offset the loss of indication and alarms affected by the inoperable RPI for Control Rod F-8:

For the Analog Meter Indication:

The specific position indication of height for the individual RPI of Control Rod F-8 that will not be available on the alternate monitoring equipment will be compensated for by performing flux traces. Flux traces will be required following rod motion that affects Shutdown Bank B. This measure will be procedurally driven by the general operating procedures that govern a reactor startup and the surveillance procedure that exercises all of the rods on a routine basis. The flux trace which is used to verify that Control Rod F-8 is fully withdrawn during the startup sequence, will be performed prior to exceeding 30% reactor power. The traces during the rod exercising procedure will be performed following the insertion of Shutdown Bank B and following the subsequent withdrawal to 230 steps.

For the Rod Bottom Light Indication and Rod Bottom Annunciation Alarm:

The F-8 Rod Bottom Light and Rod Bottom Annunciation Alarm that will not be available on the alternate monitoring equipment will be compensated for by the procedurally driven requirement to perform a flux trace any time a change in state is indicated on the recorder. In the case of an indicated dropped rod on the individual rod position indicator for F-8, the Operators will monitor the plant response as trained for a Dropped Rod event. They will specifically monitor for changes in reactor coolant system temperature and pressure, changes of indicated reactor power and indicated neutron flux, changes in generator output and pressurizer level. If no changes in plant parameters are noted along with no change in state based on the alternate monitoring indication, a flux trace is still procedurally required. If changes are noted in plant parameters, it will be assumed that the rod has dropped and treated accordingly. If another rod drops in conjunction with the indications discussed for F-8, it will be assumed that two rods have dropped and Operators will take appropriate actions.

For the Shutdown Rod Off Top/ Rod Deviation Annunciation Alarm

The Shutdown Rod Off Top/Rod Deviation Annunciation Alarm that will be lost for Control Rod F-8 only, will be compensated by flux traces driven from the Annunciator Response procedure as well as the routine surveillance procedure when a gripper coil change in state is observed on the alternate monitoring equipment.

For the Shutdown Rod Off Top/ Rod Deviation Light Indication:

The Shutdown Rod Deviation Light on RPI panel, behind the vertical panel B, will not be available on the alternate monitoring equipment. There is no need for a contingency for this indication as it serves only as a backup for a deviation between the rods in the Shutdown Bank as indicated on the individual rod position indication. If Control Rod F-8 would change position and therefore deviate from the remaining rods in that bank, it will be indicated by a gripper coil change in state on the alternate monitoring equipment.

Attachment 2

Response to Request for Additional Information Inoperable Rod Position Indication

Response for RAI Question # 4

The wear of the incore detector system does not pose a reduction in the margin of safety for operation of Turkey Point Unit 4. Excessive wear of the incore detector system could result in a loss of functionality of the system. This could lead to the inability to complete required surveillances, which if not completed could lead to a required plant power reduction and/or shutdown. The manner in which this could occur, is described as follows:

The movable incore detector system is composed of five detector drive system, five 5-path rotary transfer devices, five 10-path rotary transfer devices and 44 flux thimbles. The 5-path rotary transfer device allows each detector to map its own core locations or another detector's core locations, or to be placed in a shielded storage location. The 10-path rotary transfer device receives the detector from the 5-path device and allows it to access one of ten possible core locations. When a flux trace is taken by a detector, the drive unit pushes the detector through its 5-path rotary transfer device to the selected 10-path rotary transfer device and then through the 10-path to the selected core location. The signal obtained from the detector as it moves through the core is proportional to neutron flux distribution in the core.

Although estimated fatigue times are not available for this system, past operating history indicates that repetitive use of the movable incore detector system every 8 hours to fulfill LCO 3.1.3.2, Required Action a.1, can lead to failure of the detectors, drive units, and transfer devices. If a detector fails, then another detector may be used to map its core locations with no loss of data. However, by using another detector to map its own and the failed detector's core locations, the wear on the second detector is increased. If a drive unit failure causes a detector to become unmovable while inserted into a core location, then the ability to obtain data from the core locations associated with that detector is lost.

If a 5-path rotary transfer device fails, then another detector may be used to map its core locations with no loss of data. However, as with a failed detector, this results in increased wear on the second detector. If a 10-path rotary device fails, then the ability to obtain data from the core locations associated with that 10-path device is lost.

Postulated failure methods of the flux map system include loss of detector response, limit switch failures, loss of 5-path and 10-path rotary transfer devices. These conditions have been experienced in the past and have required a containment entry at power to perform the necessary repairs. FPL is requesting this relief to prevent excessive wear, which could result in the loss of functionality of the system.

Monitoring of core location F-8 is possible using the existing flux map thimble in core location F-8 or using the flux map detector in three adjacent core thimbles. These flux traces can provide the position of the control rod with inoperable RPI. Failure to access these thimbles could prevent the performance of LCO 3.1.3.2, Required Action a.1, which would require a power reduction to less than 75% power in accordance with LCO 3.1.3.2, Required Action a.2.

The failure of drive unit or 10-path rotary transfer device, with the corresponding loss of data from the associated core locations, would prevent the performance of core peaking factors and power distribution measurements every 31 EFPD as required by SR 4.2.2.1 and 4.2.3.3. Failure to perform these core peaking factors and power distribution surveillances would require power reduction and shutdown in accordance with the applicable LCO Required Actions.

Attachment 2
Response to Request for Additional Information
Inoperable Rod Position Indication

There is no creditable failure method associated with the flux map system that can initiate an accident precursor for a transient or accident analysis. Loss of the functionality of the system could unnecessarily result in either power reduction and/or shutdown. Both of these events are bounded by plant accident analyses.