

U.S. NUCLEAR REGULATORY COMMISSION  
REGION II

Docket Nos: 50-250, 50-251  
License Nos: DPR-31, DPR-41

Report Nos: 50-250/99-06, 50-251/99-06

Licensee: Florida Power and Light Company

Facility: Turkey Point Nuclear Plant, Units 3 & 4

Location: 9760 S. W. 344 Street  
Florida City, FL 33035

Dates: September 5 - October 16, 1999

Inspectors: C. Patterson, Senior Resident Inspector  
R. Reyes, Resident Inspector

Approved by: L. Wert, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Enclosure

## EXECUTIVE SUMMARY

### Turkey Point Nuclear Plant, Units 3 & 4 NRC Inspection Report 50-250/99-06, 50-251/99-06

This integrated inspection included aspects of licensee operations, maintenance, engineering, and plant support. The report covers a 6-week period of resident inspection.

#### Operations

- A clearance release was inadequately developed and reviewed. This resulted in reduced seal water injection flow to a reactor coolant pump seal assembly. A non-cited violation was identified for failure to follow clearance release procedures (Section O1.2).
- The morning control room shift turnover meetings were well run and good communications were noted throughout the meetings (Section O1.3).
- The Operations control room shift turnover instruction had not been updated to reflect the current shift scheduling (Section O1.3).
- The plant nuclear safety committee and monthly management status meetings were conducted with a strong focus on nuclear safety (Section O7.1).

#### Maintenance

- In preparation for maintenance activities, a supervisor briefed an electrical worker on the incorrect pump motor. Subsequently, the worker failed to properly identify the correct motor as described in the clearance and work order package, and performed troubleshooting on a motor that was still connected to a 480-Volt power source. A non-cited violation was identified for failing to adequately verify the correct pump motor prior to initiating troubleshooting on the motor (Section M1.1).

#### Engineering

- Plant drawings were being maintained current, legible, and useable. The backlog of drawing revisions was very low and revisions were made in accordance with the priority described in the procedure (Section E2.1).

#### Plant Support

- Preparations for the approach of tropical storms and hurricanes were prompt and thorough. A thorough critique of the preparations was promptly conducted after hurricane Floyd (Section P1.1).

## Report Details

### Summary of Plant Status

Unit 3 reduced power to 90 percent for about one hour on October 13, 1999, to repair a valve on the heater drain system. On September 10, 1999, power was reduced to 35 percent to perform heat exchanger cleaning and turbine valve testing. The unit returned to full power on September 12, 1999. The unit has been online since June 24, 1999.

Unit 4 operated at full power this period. The unit has been online since April 18, 1999.

### I. Operations

#### O1    **Conduct of Operations**

##### O1.1    General Comments (71707)

Using Inspection Procedure 71707, the inspectors conducted frequent reviews of ongoing plant operations. In general, the conduct of operations was professional and safety-conscious; specific events and noteworthy observations are detailed in the sections below.

##### O1.2    Clearance Release

###### a.    Inspection Scope (71707, 62707)

The inspectors reviewed an inadequate clearance release issue that caused reduced filtered seal water flow to the seals on a reactor coolant pump (RCP).

###### b.    Observations and Findings

On September 20, 1999, during execution of a clearance release for the 3B RCP seal water injection filter, an operator opened the inlet valve that supplied RCP seal water from the charging pump to the RCP seal water filter. However, the RCP seal water system still had the RCP filter drain valve open. This caused RCP seal water flowing into the RCP filter to go out the drain valve and into a drain header. There was an immediate reduction of RCS charging flow and filtered seal water injection flow. Initial indication of low seal flow was observed in the control room when an annunciator alarmed for RCP labyrinth seal low differential pressure. Consequently, there was a charging/letdown flow mismatch at the regenerative heat exchanger. The letdown flow increased in temperature and started to flash. Seal water injection flow is important for proper performance of the RCP seals which provide the RCS boundary along the RCP shaft. The licensee wrote condition report (CR) 99-1305 and initiated a review of this issue.

The 3B seal water injection filter (SWIF) had been removed from service to change the filter cartridge in accordance with clearance 3-99-09-007. The licensee's investigation concluded that the clearance release order had assumed that the 3B RCP filter drain valve would be positioned by the procedure for placing the filter in service. However, the procedure did not require the drain valve be closed. The licensee's review also

noted that the Unit 3 Assistant Nuclear Plant Supervisor (ANPS) and the Unit 4 ANPS did not adequately review the work control documents and caused the incorrect clearance restoration that left the drain valve open.

The inspectors reviewed the issue with plant management and the supervisors who wrote and approved the clearance release. Operations management considered the incident significant and conducted a critical review. Additionally, the inspectors reviewed the release order and system procedure. Station clearance procedure ADM 0-212, In-Plant Equipment Clearance Orders, specifies the requirements for writing and approving clearances. In reviewing this issue and procedural requirements with the ANPS that wrote the clearance, he indicated that he had misread the specified system procedure and believed it included a step to close the filter drain valve. Additionally, the ANPS who performed the independent verification of the clearance release sequence, did not perform a adequate independent review and referred to the wrong attachment of the system procedure. The non-licensed operator that executed the release followed the instructions verbatim which then resulted in the reduction of injection seal water to the RCP seals.

Technical Specification (TS) 6.8.1 requires that written procedures shall be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, dated February 1978. Section 1.C of Regulatory Guide 1.33 specifies procedures for equipment control (e.g., locking and tagging). Section 5.12, Clearance Release, of 0-ADM-212, In-Plant Equipment Clearance Orders, states that the component position I for each clearance tag to be removed shall be specified by using system prints to develop the alignment, and verified by using the system procedure. Additionally, the restoration positions and sequence of steps in the release section are to be independently verified as correct. Contrary to that requirement, the ANPS that wrote the clearance release did not adequately verify the release steps. In addition, the ANPS assigned the independent verification review of the release did not perform an adequate independent verification and approved an inadequate release. This Severity Level IV violation is being treated as a Non-Cited Violation, consistent with Appendix C of the NRC Enforcement Policy. This is identified as NCV 50-250, 251/99-06-01, Inadequate RCP Seal Water Clearance Restoration Due to Failure to Follow Procedures. This violation is in the licensee's corrective action program as CR 99-1305.

c. Conclusions

A clearance release was inadequately developed and reviewed. This resulted in reduced seal water injection flow to a reactor coolant pump seal assembly. A non-cited violation was identified for failure to follow clearance release procedures .

O1.3 Control Room Shift Turnover Meetings

a. Inspection Scope (71707)

The inspectors attended control room turnover meetings and observed communications that occurred on the morning meetings. Evening meeting attendance was reviewed.

b. Observations and Findings

Conduct of the control room shift turnover meeting is described in Operations Department Instruction ODI-CO-02, Conduct of Operations Shift Turnover Meetings. The intent of the shift turnover meeting is to ensure that all members of the operating crew are aware of the current status of the units and the plan of events for the upcoming shift. In reviewing the instruction, the inspectors found that it provided good guidance, responsibilities, and expectations in conducting the meetings. The meetings were held in the control room. The inspectors observed that the 7:00 a.m. meetings were conducted as described in the instruction. Good communications were noted throughout the meetings. Attentiveness of the meeting participants was good and the exchange of communications between the maintenance personnel and the Operations crew was noteworthy. The assistant nuclear plant supervisors (ANPS) satisfactorily addressed plan of the day issues or conflicts that were identified during the meeting.

The inspectors identified that the Operations shift turnover meeting Instruction had not been updated to reflect the actual current shift schedule. Operations is on a 12-hour shift and has the control room turnover meeting at 7:00 a.m. and at 7:00 p.m. The instruction describes that the turnover meetings occur at 0735, 1535, and 2335. Operations has been on the 12-hour shift schedule since January 1, 1999. In addition, the inspectors noted that there were inconsistencies associated with the attendance of different work groups at some of the meetings due to the revised shift schedules. No violations of NRC regulations were identified.

c. Conclusions

The morning control room shift turnover meetings were well run and good communications were noted throughout the meetings. The Operations control room turnover instruction had not been updated to reflect the current shift scheduling.

O1.4 Auxiliary Feedwater (AFW) System Alignment (71707)

The auxiliary feedwater system at Turkey Point consists of three turbine driven pumps which supply two headers. The inspectors reviewed a change to the normal alignment. Pump "C" is normally aligned to train two along with pump "B". Pump "A" is normally aligned to train one. Due to acceptable, but slower than normal, system start time on pump "A", the licensee decided to align pump "C" to train one to provide some redundancy to pump "A". Pump "A" was restarted and the pump response was normal. This alignment will be maintained until scheduled maintenance is completed on pump "A". The inspector reviewed the system alignment per 3-OP-075. Auxiliary Feedwater System, and associated clearance 0-99-10-008. The clearance was walked down in the AFW vital area. The system alignment was discussed with plant operators. No problems were identified.

**O7 Quality Assurance in Operations****O7.1 Licensee Self-Assessment Activities (40500)**

The inspectors attended the Plant Nuclear Safety Committee meetings conducted on September 21, and October 19, 1999. The meetings were properly conducted in accordance with the TS requirements. A safety focus was observed during the meeting and items presented that were unsatisfactory were not approved.

On September 30, 1999, the inspectors attended the site monthly management status meeting. The attendees included the President of the FPL Nuclear Division, Turkey Point Vice President, Turkey Point Plant Manager, St. Lucie Plant Manager, and several of their direct reports. Issues presented included a briefing on several clearance issues that have recently occurred at the plant. Additionally, there was a detailed presentation on the root cause of the most recent clearance issue where an electrical worker performed troubleshooting on a motor that was not part of the job clearance and which was connected to a 480-volt power source. The agenda also included management presentations in Engineering, Quality Assurance, Operations, Protection Services, and on the newly formed Fix It Now Maintenance Team. Significant accomplishments and areas for improvements were presented in all areas. Upper management exhibited a strong nuclear safety focus during the presentations as was evidenced by several challenging questions to the presenters. The meeting was well run and provided for a good information exchange, including lessons learned in several topics, between the Turkey Point and St. Lucie management.

**II. Maintenance****M1 Conduct of Maintenance****M1.1 Electrical Troubleshooting of Incorrect Pump Motor****a. Inspection Scope (62707)**

The inspectors reviewed a clearance issue where an electrical maintenance worker performed troubleshooting on the incorrect pump motor. The motor he worked on was not covered under the job clearance order and was still powered from a 480-Volt power source.

**b. Observations and Findings**

On September 13, 1999, work order 99016781, Deaerated Water Transfer Pump Motor, was issued to Maintenance. This pump is used to transfer water to the primary water storage tank. The work order task description was to perform troubleshooting and provide appropriate repair/replacement activities as required. The maintenance supervisor conducted a pre-job briefing with the assigned worker. However, due to historical problems with the deaerator vacuum pump, the supervisor assumed the work was for the deaerator vacuum pump motor and conducted a briefing for the vacuum

pump motor instead. Neither the maintenance supervisor nor the worker identified that the work order specified the deaerator water transfer pump motor and not the vacuum pump motor. Clearance 4-99-09-033 was then processed to initiate troubleshooting work on the transfer pump motor. The worker proceeded to start work on the vacuum pump motor. He attempted to verify the component tag number but the tag was missing. He recalled from the briefing that the work was on the vacuum pump and satisfied himself that he was at the right component. He removed the tape from the motor leads and started troubleshooting, including meggering the leads of the motor. At shift end, the worker left the job site and left the motor connection box open with the leads exposed. The job was then turned over to the peak-shift electrical crew. The peak shift identified that the deaerator water transfer pump motor had not been worked on and noted that the deaerator vacuum pump motor connection box was open and the motor leads were exposed. Maintenance wrote a severity level one CR 99-1340 requiring a root cause analysis. A multi-discipline root cause task team was assembled to review this issue.

The root cause analysis attributed this issue to human performance errors and lack of attention to details. Inadequate review and utilization of the work order document occurred. Additionally, there was inadequate component tag number verification of a clearance order component prior to the start of maintenance. Licensee corrective actions included initiating a process to ensure that work activities/components requiring a clearance order shall have an initial check and peer check to ensure component correctness prior to the start of work. Both component checks shall be documented, initialed, and dated in the work order's journeyman work report. A replacement tag was issued for the missing component tag on the vacuum pump motor.

The inspectors verified that the work order instructions correctly described the pump motor to be worked, that an adequate clearance had been written to perform this job, and reviewed the electrical aspects of this issue with an electrical engineering supervisor. The inspectors attended the Plant Nuclear Safety Committee meeting which reviewed the root cause and corrective actions.

TS 6.8.1, requires that written procedures shall be established, implemented, and maintained covering the activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, dated February 1978. Section 1.C specifies procedures for equipment control (e.g., locking and tagging). Clearance procedure, 0-ADM-212, In-plant Equipment Clearance Orders, specifies requirements for the use of clearances for isolation of equipment to protect personnel from energy sources and for administrative control of equipment. Section 3.18 of this procedure requires that all personnel working under a clearance visually identify clearance tags and ensure the apparatus or circuit is safe to perform work on. These requirements were not met. This Severity Level IV violation is being treated as a non-cited violation, consistent with Appendix C of the NRC Enforcement Policy. This is identified as NCV 50-250, 251/99-06-02, Electrical Troubleshooting of Incorrect Pump Motor.

c. Conclusions

In preparation for maintenance activities, a supervisor briefed an electrical worker on the incorrect pump motor. Subsequently, the worker failed to properly identify the correct motor as described in the clearance and work order package, and performed troubleshooting on a motor that was still connected to a 480-Volt power source. A non-cited violation was identified for failing to adequately verify the correct pump motor prior to initiating troubleshooting on the motor.

**M1.2 Maintenance Work Order and Surveillance Observations**

a. Inspection Scope (61726) (62707)

The inspectors observed surveillance and maintenance activities as follows:

OP-MM-030.1	Condenser Circulating Water (CCW) Heat Exchanger Cleaning
WO-99007911-01	25 Minute Thermo-Lag Turbine Area Fire Zone 79
WO-99017023	3B CCW Heat Exchanger
WO-9900032	Unit 4 Feedwater Platform Pipe Re-insulation
SWO-M-102-02	Heavy Duty Hydroblaster
4-OSP-202.2	Residual heat Removal Pump and Piping Venting
0-OSP-074.3	Standby Steam Generator Feedwater Pumps Availability Test
0-NCOP-076	Chemical Injection System Operation

b. Observations and Findings

All of these activities were performed in accordance with procedural requirements and no problems were identified.

**III. Engineering**

**E2 Engineering Support of Facilities and Equipment**

**E2.1 Drawing Revision Program**

a. Inspection Scope (37551)

The inspectors reviewed selected plant drawings and the process for making drawing revisions.

b. Observations and Findings

On October 5, 1999, the inspectors reviewed the control room drawings. The drawings were legible, neat, and easy to use. No errors were noted. The inspectors also reviewed the licensee's process for onsite revisions of drawings. Drawing revisions are controlled by procedure ENG-QI 3.2, Drawing Control. This procedure provides specific update time requirements for plant operating drawings, control room drawings, and other type drawings. Plant operating drawings are required to be updated at the turnover of the system. Other control room drawings such as fuse lists are allowed 30 days. The inspectors reviewed the current backlog of 50 drawing revisions. Several revisions were compared to the procedure time requirements for drawing revisions. The procedure requirements were being followed.

c. Conclusions

Plant drawings were being maintained current, legible, and useable. The backlog of drawing revisions was very low and revisions were made in accordance with the priority described in the procedure.

## **E8 Miscellaneous Engineering Issues (92903)**

E8.1 (Closed) Licensee Event Report 50-250/99-01-00: Manual Reactor Trip From 100% Power Following Multiple Control Rod Drops. This trip was reviewed in NRC Inspection Report 50-250, 251/99-04. Response and recovery from the control rod power supply failure were excellent. The inspectors reviewed the corrective action for the failed solder connection on the power supply circuit board with the system engineer. Circuit board modifications are planned for the next refueling outage for each unit. These actions are tracked by CR 99-0950. This item is closed.

## **IV. Plant Support**

### **P1 Conduct of EP Activities**

P1.1 Tropical Weather Preparations

a. Inspection Scope (71750)

The inspectors reviewed the licensee's preparation for the approach of hurricane Floyd, tropical storm Harvey, and hurricane Irene, and monitored plant status during these times.

b. Observations and Findings

On September 13, 1999, the licensee entered their emergency preparedness procedures for the approach of hurricane Floyd. Later that day, a Notification of Unusual Event (NOUE) was declared after the area was placed under a hurricane warning. The preparations were quickly performed to secure all equipment. These activities were

minimal due to the thorough preparations performed at the start of the hurricane season. Flood protection was implemented with installation of stop logs and sand bags. All four Emergency DGs were satisfactorily tested. The licensee was prepared to shutdown the units but the storm changed direction on September 14, 1999. The NOUE was terminated after cancellation of the hurricane warning. The maximum recorded winds at the site were 30 miles per hour (mph). No complications occurred from the storm.

The inspectors toured the site on September 12, 1999, prior to the storm preparations and monitored the subsequent preparations. The inspectors attended the licensee's critique of the storm preparations held several days later. The critique was thorough with appropriate focus on communications issues.

Likewise, the licensee made thorough preparations to insure equipment was secure for tropical storm Harvey. The storm affected the site on September 21, 1999 with maximum sustained winds of 52 mph. Grass influx from the cooling canals due to the high winds and rain necessitated numerous cooling water systems screen backwashes and cleaning. No other problems were encountered with the units.

On October 15, 1999, hurricane Irene, a minimal category one hurricane, passed just west of the site. The maximum sustained winds on site were 58.8 mph. The site was not in a hurricane warning for this storm. Substantial rainfall was received in the area but the units remained at power without any significant complications. The residents remained onsite during the storm and monitored plant conditions.

c. Conclusions

The preparations for the approach of tropical storms and hurricanes were prompt and thorough. A thorough critique of the preparations was promptly conducted after hurricane Floyd.

**S2 Status of Security Facilities and Equipment**

**S2.1 Protected Area Fence and Lighting (71750)**

On September 16, 1999, the inspectors inspected the protected area fence and lights on the backshift after dark. All lights were working and the fence was intact with good visibility of the isolation zone. No problems were identified.

**V. Management Meetings and Other Areas**

**X1 Exit Meeting Summary**

The inspectors presented the inspection results to members of licensee management at the conclusion of the inspection on October 20, 1999.

The inspectors asked the licensee whether any materials examined during the inspection should be considered proprietary. No proprietary information was identified.

**PARTIAL LIST OF PERSONS CONTACTED****Licensee**

D. Lowens, Quality Assurance Manager  
S. Franzone, Licensing Manager  
R. Hovey, Site Vice-President  
D. Jernigan, Plant General Manager  
T. Jones, Operations Manager  
J. Kirkpatrick, Protection Services Manager  
M. Lacal, Training Manager  
G. Hollinger, Work Control Manager  
R. Rose, Maintenance Manager  
E. Thompson, License Renewal Project Manager  
D. Tomaszewski, Site Engineering Manager  
J. Trejo, Health Physics/Chemistry Supervisor  
A. Zielonka, System Engineering Project Manager

Other licensee employees contacted included office, operations, engineering, maintenance, chemistry/radiation, and corporate personnel.

**NRC**

C. Patterson, Senior Resident Inspector  
R. Reyes, Resident Inspector

**INSPECTION PROCEDURES USED**

IP 37551: Onsite Engineering  
IP 40500: Effectiveness of Licensee Controls in Identifying, Resolving, and Preventing Problems  
IP 61726: Surveillance Observations  
IP 62707: Maintenance Observations  
IP 71707: Plant Operations  
IP 71750: Plant Support Activities  
IP 92903: Followup - Engineering

**ITEMS OPENED AND DISCUSSED****Opened**

50-250, 251/99-06-01	NCV	Inadequate RCP Seal Water Clearance Restoration Due to Failure to Follow Procedures. (Section O1.2)
50-250, 251/99-06-02	NCV	Electrical Troubleshooting of Incorrect Pump Motor. (Section M1.1)

**Closed**

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|----------------------|-----|--|
| 50-250, 251/99-06-01 | NCV | Inadequate RCP Seal Water Clearance Restoration<br>Due to Failure to Follow Procedures. (Section O1.2) |
| 50-250, 251/99-06-02 | NCV | Electrical Troubleshooting of Incorrect Pump Motor.<br>(Section M1.1)                                  |
| 50-250/99-01-00      | LER | Manual Reactor Trip From 100% Power Following<br>Multiple Control Rod Drops. (Section E8.1)            |