



UNITED STATES
NUCLEAR REGULATORY COMMISSION

REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

May 11, 2007

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

SUBJECT: TURKEY POINT NUCLEAR PLANT - NRC SUPPLEMENTAL INSPECTION
REPORT 05000250/2007007 AND 05000251/2007007

Dear Mr. Stall:

On April 13, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed a supplemental inspection at your Turkey Point, Units 3 and 4, facility. The enclosed report documents the inspection findings, which were discussed on April 13, 2007, with Mr. W. Jefferson and other members of your staff.

As required by the NRC Reactor Oversight Process Action Matrix, this supplemental inspection was performed in accordance with Inspection Procedure 95001. The purpose of the inspection was to examine the causes for and actions taken for the White inspection finding involving the failure to adequately assess and manage maintenance risk during shutdown operations (Violation 05000250/2006016-01). This supplemental inspection was conducted to provide assurance that the root causes and contributing causes resulting in the White inspection finding are understood, to assess the extent of condition, and to provide assurance that the corrective actions for the risk significant performance issue are sufficient to address the root causes and contributing causes and to prevent recurrence. The inspection also reviewed the causes for and the actions taken for the associated Licensee Event Report (LER) 05000250/2006-004-00 and LER Supplement 05000250/2006-004-01 involving automatic actuation of the emergency diesel generator due to loss of power to a vital bus. The inspection consisted of reviewing selected procedures and records and interviews with personnel.

Based on the results of this inspection, no findings of significance were identified. The inspectors determined that the problem identification, root cause, and corrective actions for the White finding were generally adequate. Additionally, the corrective actions (both planned and already completed) were considered appropriate to address the causes for the associated LER. Therefore, the White inspection finding, Violation 05000250/2006016-01, is considered closed. The associated LER 05000250/2006-004-00 and LER Supplement 05000250/2006-004-01 are also closed.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). Adams is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Michael E. Ernstes, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 05000250/2007007 and 05000251/2007007
w/Attachment: Supplemental Information

cc w/encl: (see page 3)

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cc w/encl: (see page 3)

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| NAME | M.Thomas | DMasPenaranda | L.Bradford | S.Ninh | M.Ernstes | | |
| DATE | May 15, 2007 | May 15, 2007 | May 15, 2007 | May 15, 2007 | May 15, 2007 | | |
| E-MAIL COPY? | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO | YES NO |

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-250, 50-251

License Nos: DPR-31, DPR-41

Report No: 05000250/2007007, 05000251/2007007

Licensee: Florida Power & Light Company (FP&L)

Facility: Turkey Point Nuclear Plant, Units 3 and 4

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

Dates: April 9-13, 2007

Inspectors: D. Mas-Peñaranda, Reactor Inspector
M. Thomas, Senior Reactor Inspector

Accompanying: L. Bradford, Nuclear Safety Professional Development Program

Approved by: Michael E. Ernstes, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000250/2007007, 05000251/2007007; 04/09/2007 - 04/13/2007; Turkey Point Nuclear Plant, Units 3 and 4; Supplemental Inspection IP 95001 for a White inspection finding in the initiating events cornerstone, other activities.

This inspection was conducted by a senior reactor inspector, a reactor inspector, and an inspector in training. No violations of regulatory requirements were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process", Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

The U.S. Nuclear Regulatory Commission (NRC) performed this supplemental inspection in accordance with Inspection Procedure 95001, to assess the licensee's evaluation associated with the White inspection finding for failure to adequately assess and manage maintenance risk during shutdown operations, Violation 05000250/2006016-01. Specifically, the licensee elected to move up restoration maintenance on the Unit 3 A-train 480 volt 3C load center and proceeded without measures to reduce the risk during maintenance on the 3C load center, while Unit 3 was operating in the decay heat removal mode with one operating A-train residual heat removal (RHR) pump. During the maintenance activity the licensee installed a breaker associated with the 480 volt 3C load center that was later determined to be defective, which caused a loss of the operating A-train RHR pump. This resulted in a temporary loss of all decay heat removal on March 8, 2006.

The licensee's problem identification, root cause and extent-of-condition evaluations, and corrective actions for this White inspection finding were generally adequate. Therefore, the White finding is considered closed. Given the licensee's performance in addressing this issue, the White finding will only be considered in assessing plant performance for a total of four quarters (from the third quarter of 2006) in accordance with the guidance in NRC Inspection Manual Chapter 0305, "Operating Reactor Assessment Program." The associated LER 05000250/2006-004-00 and LER Supplement 05000250/2006-004-01 are also closed.

B. Licensee-Identified Violations

None.

REPORT DETAILS

01 INSPECTION SCOPE

The purpose of this supplemental inspection was to assess the licensee's evaluation associated with the White inspection finding for failure to adequately assess and manage maintenance risk during shutdown operations, Violation 05000250/2006016-01. Specifically, the licensee elected to move up restoration maintenance on the Unit 3 A-train 480 volt 3C load center and proceeded without measures to reduce the risk during maintenance on the 3C load center, while Unit 3 was operating in the decay heat removal mode with one operating A-train residual heat removal (RHR) pump. During the maintenance activity the licensee installed a breaker associated with the 480 volt 3C load center that was later determined to be defective, which caused a loss of the operating A-train RHR pump. This resulted in a temporary loss of all decay heat removal on March 8, 2006. The licensee performed a root cause evaluation (RCE) of the failure to adequately assess and manage the increase in risk which led to the loss of shutdown cooling event. The inspectors reviewed the licensee's actions associated with this finding, reviewed plant procedures, and conducted interviews with licensee personnel to ensure that the root and contributing causes of the events were identified, understood, and appropriate corrective actions were planned and/or implemented.

02 EVALUATION OF INSPECTION REQUIREMENTS

02.01 Problem Identification

- a. Determination of who identified the issue (i.e., licensee, self revealing, or NRC) and under what conditions.

The performance deficiency associated with the White finding was failure to assess and manage maintenance risk during shutdown operations. This issue was identified by the NRC and documented in Inspection Report (IR) 05000250/2006015 and IR 05000250/2006016. The inspectors noted that the licensee performed a RCE and documented the results in Condition Report (CR) 2006-7472, Root Cause Analysis Loss of Decay Heat Removal Event. The RCE determined the loss of decay removal event to be a self-revealing issue, in that, various control room alarms immediately alerted the operators that the decay heat removal function had been interrupted. However, the NRC concluded that the actual loss of decay heat event was the result of the licensee's failure to adequately assess and manage the risk associated with performing maintenance on the 480 volt 3C load center.

- b. Determination of how long the issue existed, and prior opportunities for identification.

The licensee's RCE focused on the actual loss of decay heat removal event and documented a time line detailing the events leading up to and including the loss of the 3A RHR pump, how long Unit 3 was without RHR cooling, and when RHR cooling was reestablished.

The RCE did not capture how long the failure to adequately assess and manage the risk associated with the maintenance activity on the 480 volt 3C load center existed. The inspectors determined from the review of licensee documentation that the failure to

assess and manage risk for this issue existed from January 19, 2006, when the 480 volt 3C load center maintenance activity was moved up in the outage schedule, until March 8, 2006, when decay heat removal was temporarily lost during shutdown operations. This outage schedule change was not adequately assessed nor evaluated for potential risk impact and defense-in-depth.

The RCE documented one prior opportunity for identification that occurred earlier in the day on March 8, 2006, prior to the loss of decay heat removal event. Unit 3 was in Mode 5 with decay heat removal being provided by the operating 3A RHR pump. At that time, the licensee considered both the 3A and 3B RHR pumps were protected in accordance with procedure 0-ADM-051, Outage Risk and Control. Maintenance activities were being conducted which could have potentially affected the operating 3A RHR pump. In support of maintenance activities on the Unit 3 startup transformer, operations personnel were in the final procedural steps to place the 3A 4kV bus on backfeed in accordance with procedure 3-OP-092.1. The 3A RHR pump motor was being powered by the 3A 4kV bus. During this evolution, an independent observer in the outage control center, who had knowledge of recent industry operating experience related to switching activities on a protected train, suggested that the 3B RHR pump (powered from the 3B 4kV bus) be started prior to the transfer to ensure shutdown cooling would be maintained in the event of a loss of the 3A 4kV bus during the transfer to backfeed. Operations personnel started the 3B RHR pump and the transfer to backfeed was completed as scheduled without incident. After the transfer to backfeed, the 3B RHR pump was stopped and returned to standby. The 3A RHR pump was operating and providing shutdown cooling when maintenance was performed on the 480 volt 3C Load Center later that day on March 8, 2006. Operations personnel did not recognize the need to start the 3B RHR pump to ensure that decay heat removal would be maintained.

- c. Determination of the plant specific risk consequences (as applicable) and compliance concerns associated with the issue.

The licensee conducted a quantitative risk assessment using a detailed significance determination process (SDP) analysis in response to the preliminary White finding documented in IR 05000250/2006015. During the Regulatory Conference held on October 23, 2006, the licensee described the finding as being of very low safety significance (Green). On November 22, 2006, the NRC issued its Final Significance Determination and Notice of Violation for this issue in IR 05000250/2006016 and concluded that the final inspection finding was appropriately characterized as White (of low to moderate risk significance) in the Initiating Events cornerstone for reasons discussed at the Regulatory Conference.

02.02 Root Cause/Extent of Condition/Extent of Cause Evaluation

- a. Evaluation of methods used to identify root causes and contributing causes.

The licensee used both the "Why Staircase" and TapRoot® analysis methods as well as staff and personnel interviews to identify and evaluate the variety of potential causes and contributing factors associated with the loss of decay heat removal event. The "Why Staircase" is a cause and effect analysis technique used to discover root and

contributing causes of problems. The technique consisted of describing the problem in specific terms and then asking why it happened successive times until the question no longer yielded any useful information. The TapRoot® analysis constructed an event and causal factor chart in order to identify event causal factors. Each causal factor was then examined by completion of a TapRoot® Root Cause Tree®. The licensee compared the results from their “Why Staircase” and TapRoot® analyses. Based on comparison of the results from the two analysis methods, the root cause team elected to use the results of the “Why Staircase” as the analysis output because the “Why Staircase” output enveloped the results from the TapRoot® analysis and allowed for more comprehensive corrective actions. The inspectors determined that the methods employed to identify the root and contributing causes for the loss of decay heat removal event were generally adequate.

b. Level of detail of the root cause evaluation.

The licensee’s RCE was documented in CR 2006-7472. The root cause team focused on the operational decision-making aspects of using the 3A RHR pump to provide core cooling during maintenance on the 480 volt 3C load center instead of the 3B RHR pump. The licensee determined that the root cause was the plant did not establish sufficient defense-in-depth to preclude the loss of RHR for a single equipment failure. The RCE also identified the following contributing causes: 1) the shutdown risk procedure did not specify operating equipment requirements to ensure protection against a single equipment failure or human performance event; 2) schedule development did not include a review for each task to identify the potential for a loss of cooling; and 3) Turkey Point Nuclear Plant (PTN) experience and knowledge for maneuvering the plant concurrent with significant shutdown maintenance was low.

The inspectors reviewed the RCE and the methods used to identify the root and contributing causes. The review determined that the RCE had been performed to a level of detail commensurate with the significance of the issue and provided reasonable assurance that the root cause and contributing causes had been identified for the failure to assess and manage maintenance risk during shutdown operations.

c. Consideration of prior occurrences of the problem and knowledge of prior operating experience.

The inspectors determined that the RCE considered prior occurrences of similar problems where applicable.

The licensee reviewed numerous sources of information to identify other potential opportunities to have recognized this issue. The documents reviewed included corrective action program documents, operating experience data from other licensees, and NRC Generic Communications.

d. Consideration of extent of condition and extent of cause of the problem.

The licensee’s RCE included an extent of condition (EOC) review for the issue. The inspectors noted that the EOC review scope was defined by the root cause team as those remaining Unit 3 scheduled outage activities that could pose a risk to core cooling. The inspectors questioned if the EOC scope was too narrowly defined. After

discussions with licensee personnel, the NRC Senior Resident Inspector, and review of additional documentation, the inspectors determined that the EOC review performed for the issue was broader and more thorough than the review scope defined in the RCE.

The root cause team also performed an extent of cause review. The extent of cause determined that the failure of PTN personnel to adequately assess shutdown risk had generic implications for the site's on-line risk assessment and protected train program. The site's on-line risk assessment and protected train methodology was reviewed by the licensee to determine if PTN's current practices aligned with industry best practices and standards.

e. Consideration of safety culture components.

The inspectors noted that the licensee's RCE, EOC, and extent of cause appropriately considered safety culture components. NRC IR 05000250/2006015 identified that the White finding associated with the issue affected the work control component of the Human Performance safety culture cross-cutting area because the licensee did not appropriately plan work activities using risk insights. The licensee incorporated the work control component into Contributing Cause #1. The licensee also reviewed the issue against the other Human Performance safety culture components of decision-making, resources, and work practices; and the PI&R components of corrective action, operating experience, and self and independent assessments.

02.03 Corrective Actions

a. Appropriateness of corrective actions.

The inspectors determined that the licensee had proposed and/or implemented appropriate corrective actions for the root/contributing causes for this issue. Immediate corrective actions taken included: site senior management was augmented by management from other FPL sites for additional oversight after the event; additional reviews of the remaining Unit 3 outage schedule was performed; additional controls of protected plant and switchyard equipment were implemented; and outage schedule changes were subjected to a more rigorous review and approval process. Corrective actions to prevent recurrence included 1) revising Procedure 0-ADM-051, Outage Risk Assessment and Control, to clearly identify required protected in service equipment during higher risk outage evolutions, to provide logic ties for risk significant activities, and a clear identification of higher risk evolutions; and 2) developing and implementing initial and continuing training that included a critical element to evaluate operations risk decision making with respect to shutdown cooling alignment. Another long term corrective action included use of dedicated and more experienced licensed operators for outage planning and risk assessment.

The licensee incorporated risk into its work control processes and practices. Interviews with licensee personnel and review of procedures demonstrated an emphasis on the meaning of the "protected train." In addition to incorporating changes into the risk management of refueling outages, the licensee also implemented these changes to address short duration non-refueling outages.

b. Prioritization of corrective actions.

The inspectors determined that the corrective actions for the failure to assess and manage maintenance risk during shutdown operations, which resulted in a loss of shutdown cooling, were adequately prioritized.

c. Establishment of a schedule for implementing and completing the corrective actions.

The inspectors verified that the licensee's corrective action program identified assigned individuals, completion dates, and reference numbers to ensure that the corrective actions not yet completed would be completed in accordance with their priority.

d. Establishment of quantitative or qualitative measures of success for determining the effectiveness of the corrective actions to prevent recurrence.

The licensee planned effectiveness reviews for the failure to assess and manage maintenance risk during shutdown operations to verify that the corrective actions to prevent recurrence were properly implemented in accordance with the corrective action plan. A review of refueling outage activities for Unit 4 was performed for the fall 2006 outage and a review of Unit 3 is scheduled to be completed by December 15, 2007 (after the Unit 3 fall 2007 refueling outage). The scope of the reviews will include, but not be limited to, an examination of whether the corrective actions implemented were adequate and appropriate barriers are in place to prevent recurrence of the event.

The inspectors concluded that these measures were appropriate to determine the effectiveness of the corrective actions.

03 OTHER ACTIVITIES

.01 (Closed) VIO 05000250/2006016-01: Failure to Assess and Manage Maintenance Risk During Shutdown Operations. Based on the satisfactory results of this supplemental inspection and the licensee's established corrective actions, this violation was determined to be sufficiently addressed to close the associated open item. Given the licensee's acceptable performance in addressing the event, the White finding associated with this issue will only be considered in assessing plant performance for a total of four quarters (from the third quarter of 2006) in accordance with the guidance in NRC Inspection Manual Chapter 0305, "Operating Reactor Assessment Program."

.02 (Closed) Licensee Event Report (LER) 05000250/2006-004-00: Emergency Diesel Generator Automatic Actuation due to Loss of Power to Vital Bus

(Closed) LER 05000250/2006-004-01: Emergency Diesel Generator Automatic Actuation due to Loss of Power to Vital Bus

The inspectors reviewed the subject LERs and CRs 2006-7036 and 2006-7100 to assess the causes and licensee actions taken to address the Loss of Power to Vital Bus and HMA relay failure, respectively. The cause of the loss of power to the vital bus was attributed to a misaligned auxiliary switch contact on the newly refurbished 3C 480V load center feeder breaker (30302). The apparent cause for the misaligned auxiliary

switch contact on the newly refurbished breaker was vendor human error in the configuration of the auxiliary switch during breaker refurbishment. The cause for the relay failure was inadequate contact wipe on normally closed relay contacts. Initial corrective actions included revising the breaker refurbishment standard and the final test and inspection procedure to record as left auxiliary switch contact configuration and compare it to the as found configuration. Also, the licensee revised the procurement specification and applicable receipt inspection procedure for HMA relays to verify adequate contact wipe by vendor and receipt inspection personnel, respectively. No new issues or additional findings of significance were identified during the LERs closeout review. The apparent causes and corrective actions were subsequently completed and documented in CR 2006-7036 and CR 2006-7100.

04 MANAGEMENT MEETINGS

Exit Meeting Summary

The inspectors presented the inspection results to Mr. W. Jefferson and other members of licensee management and staff on April 13, 2007. Proprietary information is not included in this inspection report.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

F. Burke, Outage Control Supervisor
S. Cohen, Component Engineering Supervisor
J. Connolly, Acting Licensing Manager
J. DeAngelis, Quality Assurance
R. Earl, Corrective Action Program Manager
S. Greenlee, Engineering Manager
J. Hoffman, St. Lucie Senior Staff Engineer
W. Jefferson, Site Vice-President
J. Matias, Materials Manager
J. Molden, Operations Manager
M. Moore, Performance Improvement Manager
K. O'Hare, Radiological and Industrial Safety Manager
M. Pearce, Plant General Manager
W. Prevatt, Work Controls Manager
S. Shafer, Operations Unit Supervisor
R. Tucker, Operations Shift Manager

NRC Personnel:

M. Ernstes, Chief, Branch 3, Division of Reactor Projects
S. Stewart, Senior Resident Inspector

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

None

Closed

| | | |
|----------------------|-----|---|
| 05000250/2006016-01 | VIO | Failure to Assess and Manage Maintenance Risk During Shutdown Operations (Section 03.01) |
| 05000250/2006-004-00 | LER | Emergency Diesel Generator Automatic Actuation due to Loss Power to a Vital Bus (Section 03.02) |
| 05000250/2006-004-01 | LER | Emergency Diesel Generator Automatic Actuation due to Loss Power to a Vital Bus (Section 03.02) |

Discussed

None

LIST OF DOCUMENTS REVIEWED

Procedures

ISC TS 7.1, Receiving Inspection, Rev. 9
 0-ADM-003, Outage Planning, Scheduling and Implementation, 3/23/07
 0-ADM-051, Outage Risk Assessment and Control, 2/7/07
 0-PME-006.3, 480V AC Load Center Breaker Inspection, 4/2/07
 3-GOP-305, Hot Standby to Cold Shutdown, 9/13/06
 3-OP-038.9, Refueling Activities Checkoff List, 11/18/06
 3-OP-201, Filling/Draining the Refueling Cavity and the SFP Transfer Canal, 3/2/07
 4-GOP-305, Hot Standby to Cold Shutdown, 2/5/07
 4-OP-041.7, Draining the Reactor Coolant System, 10/12/06C

Condition Reports

2005-7315, 4160V General Electric breaker fails to close
 2006-7036, Apparent cause analysis - loss of 3A 4kV bus during restoration of 3C load center
 2006-7100, PTN3-22 Day 3 - 3AA14 HMA relay / anti pumping relay fails
 2006-7472, Root cause analysis for loss of decay heat removal event
 2006-25531, Root cause analysis for NRC cross-cutting letter dated 8/31/06
 2006-26723, Conflicting acceptance criteria
 2006-30160, Procedure changes may challenge outage critical path if implemented after prep
 2007-1259, Work documentation does not suggest that adequate breaker checks performed
 2007-1266, Action # 21 of CR SL1/B 2006-7036 was closed out to CR 2005-8007
 2007-1273, Actions within CR SL1/B 2006-7036 were required to be coded as NRC actions
 2007-4699, Procedures 0-PME-006.3 and O-PME-006.4 placed on administrative hold
 2007-5413, No evidence that purchase order 96786 for ABB breaker refurbishment was met
 2007-10277, Outage defense in depth self assessment
 2007-10581, Good Practice by Electrical Maintenance

Condition Reports Generated During Inspection

2007-10896, No radio transmission signs posted on load sequencer units not readily visible

Work Orders

35009305, 4B 4160 Switchgear Inspect HMA Relays, 4/20/05
 35009774, 4A 4160 Switchgear Inspect HMA Relays, 5/03/05
 35020546, 3B 4160 Switchgear Check All HMA Relays, 3/17/06
 35020543, 3A 4160 Switchgear Check All HMA Relays, 4/03/06
 35010472, Replacement of HMA Relay, 5/03/05
 36011583, FB-4 BKR Preoutage Insp & Outage Swap, 12/08/06
 36017394, Inspect Stamp #12 for Use As A Spare, 2/22/07
 36001374, Breaker Insp AB22 A/B/C Bus Tie, 1/01/07
 35020356, Troubleshooting Strip of The 3A 4kV Bus, 3/08/06

35020405, 3B RX Trip BYP Stamp #15 Insp & Swap, 4/06/06
35020348, 30108 3A CRDM MG Input BKR Inspect, 4/06/06
35020355, 30204 3B NCC BKR Insp & Swap, 3/27/06

Drawings

5610-T-E-1591, Operating Diagram Electrical Distribution, Rev. 60
5610-E-9-6, K600/K1600ITE Bkr W/Electro-Mech Trip Unit Internal Schematic Diagram, Rev. 1

Miscellaneous

00096460, Purchase Order for HMA Relays, 10/31/06
00096786, Purchase Order for ABB K1600 K-line Breakers, 10/31/06
QRNO 07-0004, Unit 3 Loss of RHR Cooling Corrective Action Verification