UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

~~ATTACHMENT 2 - OFFICIAL USE ONLY - SECURITY-RELATED INFORMATION~~

August 24, 2006

EA-06-200

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 INSPECTION REPORT 05000250/2006015; PRELIMINARY WHITE FINDING

Dear Mr. Stall:

On August 17, 2006, the NRC completed an in-office open item review for your Turkey Point facility. The attached enclosure presents the results of that review, which was discussed on August 17, 2006, with Mr. T. Jones, Turkey Point Plant Site Vice President and other members of your staff.

This review was an in-office examination of unresolved item (URI) 05000250/2006002-03 Loss of Unit 3 decay heat removal on March 8, 2006, which was identified in NRC Inspection Report 05000250/2006002 and forwarded to Florida Power and Light Company (FPL) on April 28, 2006. This issue was unresolved pending further NRC review of this event.

Based on the results of this review, the inspectors identified a finding involving failure to adequately assess and manage the increase in risk of performing maintenance on the A-train 480 volt 3C load center while the facility was operating in decay heat removal mode with one operating A-train residual heat removal (RHR) pump. This finding was assessed based on the best available information, including influential assumptions, using the applicable Significance Determination Process (SDP) and was preliminarily determined to be a White finding (i.e., a finding with some increased importance to safety, which may require additional NRC inspection). This finding was also characterized as an Apparent Violation (AV) of 10 CFR Part 50.65(a)(4) requirements and is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's Web site at http://www.nrc.gov/what-we-do/regulatory/enforcement/enforce-pol.html.

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The NRC acknowledges that the problem was immediately corrected. In addition to promptly restoring decay heat removal, your staff immediately implemented risk management actions that included daily risk reviews of outage work by senior reactor operators. In addition, this matter was entered into your corrective action program.

Before we make a final decision on this matter, we are providing you an opportunity (1) to present to the NRC your perspectives on the facts and assumptions used by the NRC to arrive at the finding and its significance at a Regulatory Conference or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least one week prior to the conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation and the NRC will issue a press release to announce the conference. If you decide to submit only a written response, such submittal should be sent to the NRC within 30 days of the receipt of this letter.

Please contact Mr. Joel T. Munday at (404) 562-4560 within seven days of the date of this letter to notify the NRC of your intentions regarding the regulatory conference for the preliminary White finding. If we have not heard from you within 10 days, we will continue with our significance determination and associated enforcement processes on this finding, and you will be advised by separate correspondence of the results of our deliberations on this matter.

Since the NRC has not made a final determination in this matter, no Notice of Violation is being issued for the inspection finding at this time. Additionally, please be advised that the number and characterization of the apparent violation may change as a result of further NRC review.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, portions of its enclosure and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). However, the NRC is continuing to review the appropriate classification of the SDP Phase 3 Risk Analysis (Attachment 2) within our records management program, considering changes in our practices following the events of September 11, 2001. Attachment 2 contains Sensitive Unclassified Information and its disclosure to unauthorized individuals could present a security vulnerability. Therefore, in accordance with 10 CFR 2.390(d)(1), Attachment 2 will not be made available electronically for public inspection in the NRC Public Document Room or from the NRC's document system (ADAMS) accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

We will inform you if the classification of these documents changes as a result of our ongoing assessments. ADAMS is accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles A. Casto, Director
Division of Reactor Projects

Docket No. 50-250
License No. DPR-31

Enclosure: Inspection Report 05000250/2006015
w/Attachment: 1. Supplemental Information
2. Phase 3 SDP Risk Analysis **(Official Use Only - Security-Related Information**)

cc w/encl: (See page 4)

~~ATTACHMENT 2 - OFFICIAL USE ONLY - SECURITY-RELATED INFORMATION~~

We will inform you if the classification of these documents change as a result of our ongoing assessments. ADAMS is accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles A. Casto, Director
Division of Reactor Projects

Docket No. 50-250
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w/Attachment: 1. Supplemental Information
2. Phase 3 SDP Risk Analysis **(Official Use Only - Security-Related Information)**

cc w/encl: (See page 4)

☐ PUBLICLY AVAILABLE ☐ NON-PUBLICLY AVAILABLE ☐ SENSITIVE ☐ NON-SENSITIVE

ADAMS: ☐ Yes ACCESSION NUMBER:_____

OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:EICS		RII:ORA	
SIGNATURE	SON for	SON	JSS1	CFE		WGR1	
NAME	JMunday:rcm	SNinh	SStewart	CEvans		WRogers	
DATE	08/22/2006	08/22/2006	08/22/2006	08/23/2006	8/ /2006	08/23/2006	8/ /2006
E-MAIL COPY?	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO	YES NO

OFFICIAL RECORD COPY DOCUMENT NAME: E:\Filenet\ML062410147.WPD

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cc: w/encl:
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Distribution w/encl: (See page 5)

Report to Mr. J. A. Stall from Charles A. Casto dated August 24, 2006

SUBJECT: TURKEY POINT NUCLEAR PLANT - NRC INSPECTION REPORT 05000250/2006015; PRELIMINARY WHITE FINDING

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-250
License Nos:	DPR-31
Report No:	05000250/2005015
Licensee:	Florida Power & Light Company (FP&L)
Facility:	Turkey Point Nuclear Plant, Unit 3
Location:	9760 S. W. 344th Street Florida City, FL 33035
Dates:	August 6, 2006 - August 17, 2006
Inspectors:	S. Stewart, Senior Resident Inspector S. Ninh, Senior Project Engineer
Approved by:	Joel T. Munday, Chief Reactor Projects Branch 3 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000250/2006-015; 08/06/2006 - 08/17/2006; Turkey Point Nuclear Power Plant, Unit 3; Other Activities.

This in-office review was conducted by a regional senior project engineer and the senior resident inspector at Turkey Point. The inspectors identified one preliminary White finding with an apparent violation. The significance of most findings is identified by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process", Revision 3, dated July 2000.

A Inspector Identified & Self-Revealing Findings

Cornerstone: Mitigating Systems

- TBD. An Apparent Violation (AV) of 10 CFR Part 50.65(a)(4) was identified for failure to adequately assess and manage the increase in risk of performing maintenance on the A-train 480 volt 3C load center while Unit 3 was operating in decay heat removal mode with one operating A-train residual heat removal (RHR) pump. The licensee elected to move up restoration maintenance on the A-train 480 volt 3C load center and proceeded without implementation of procedurally required measures to reduce the risk during the activity. During the maintenance activity the licensee installed a breaker associated with 3C 480 volt load center that was later determined to be defective, which caused a loss of the operating A-train RHR pump. This resulted in a loss of all decay heat removal for seven minutes, which caused reactor coolant temperature to increase from 113 F to 140 F. The finding affected the cross cutting area of Human Performance, specifically the Work Control component because the licensee did not appropriately plan work activities using risk insights. The licensee entered this issue in the Corrective Action Program as condition report (CR) 2006-7036.

  The finding was greater than minor because the risk assessment failed to account for the loss of decay heat removal during shutdown operations. The Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capacity of systems that respond to initiating events to prevent undesirable consequences was affected by the finding. This finding was evaluated in accordance with NRC Inspection Manual Chapter 0609 Shutdown Appendix G Phase 1 and 2 Significance Determination Process (SDP) templates and determined to be greater than Green. Subsequently, a Phase 3 assessment was performed and determined that there were two dominant core damage sequences. One sequence involved failure of operators to start either RHR train A or B before boiling began. In this scenario, the operators were assumed to

successfully initiate feed and bleed cooling but failed to maintain a long term inventory source to the refueling water storage tank (RWST) (recirculation requires the RHR pumps). The conditional core damage probability for this scenario was estimated as 3.5E-06. The other sequence involved failure of operators to start either RHR train A or B before boiling and the operators fail to initiate feed and bleed cooling before core damage, which was estimated to be 3E-6. Therefore, the risk significance of this finding was determined to be White.

B. Licensee Identified Violations

None

REPORT DETAILS

4OA5 Other Activities

Cornerstone: Mitigating Systems

(Closed) Unresolved Item (URI) 05000250/2006002-03, Loss of Unit 3 decay heat removal on March 8, 2006

a. Inspection Scope

The inspectors reviewed the March 8, 2006, sequencer actuation and loss of decay heat removal event, to assess the licensee's risk management during reactor draining and concurrent plant maintenance. The inspection was done by reviewing relevant documents and interviewing plant personnel. The inspectors evaluated the licensee activities using the licensee's outage risk assessment and control procedure and the requirements of 10 CFR Part 50.65(a)(4). In addition, on June 7, 2006, NRC headquarters staff and the regional senior reactor analyst were onsite to obtain information related to the loss of decay heat removal event to assist in a SDP risk assessment. This URI was opened for additional inspection to resolve this issue.

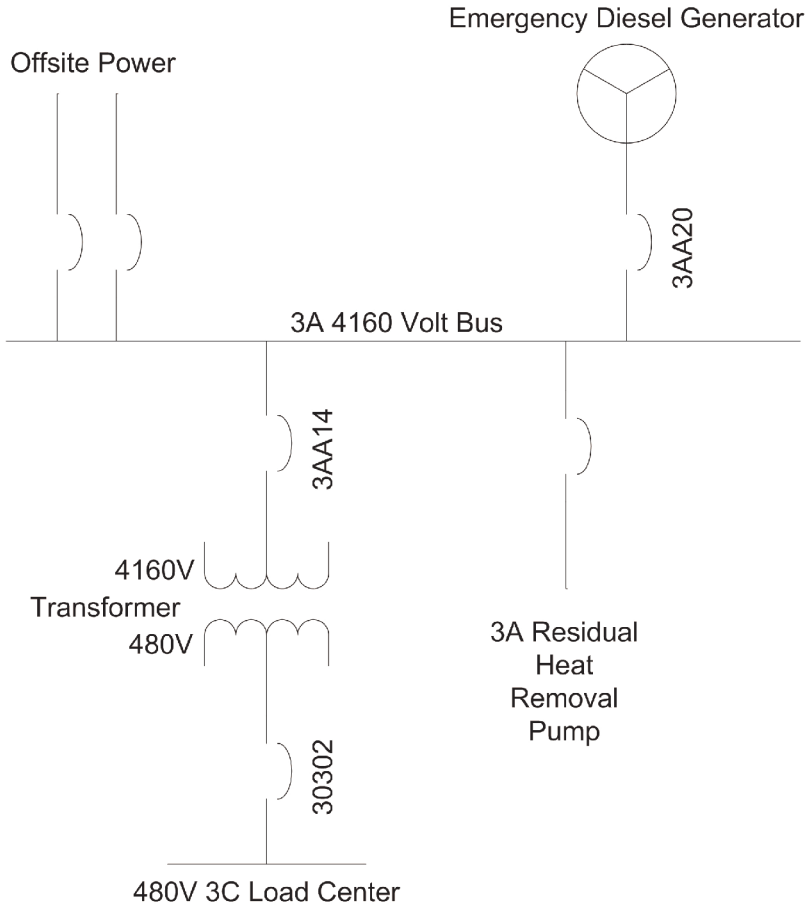
b. Findings

Introduction: A preliminary White Finding with an Apparent Violation (AV) of 10 CFR Part 50.65(a)(4) was identified for failure to adequately assess and manage the increase in risk of performing maintenance on the A-train 480 volt 3C load center while Turkey

Point Unit 3 was operating in decay heat removal mode with one operating A-train RHR pump. At the time the reactor coolant system was being drained, there was a large decay heat load, the reactor coolant loops were not available, and the reactor coolant system (RCS) temperature was less than 200 degrees F. Maintenance, which had been moved up in the outage schedule, resulted in a loss of all decay heat removal for seven minutes, which caused reactor coolant temperature to increase from 113 F to 140 F. Plant operators took prompt action to restore core cooling which terminated the event.

Description: On March 8, 2006, following the early completion of electrical bus maintenance, the licensee initiated an electrical restoration to the 3C 480 volt load center from the A 4160 volt safety bus (See figure below).

Turkey Point
3A 4160 Volt Bus (Simplified)



At the time, the A RHR pump was running, providing reactor decay heat removal. The reactor coolant system was being drained and level was near the vessel flange. Reactor coolant pumps were secured and the plant was depressurized with a small reactor head vent and a small pressurizer vent open. Core exit thermocouples had been disconnected and reactor coolant temperature was estimated at 113 degrees F using RHR temperatures. Unit 3 was in a yellow risk condition at the time due to containment area radiation monitors being out of service for calibration as well as pressurizer level being less than 5 percent.

The 480 volt supply breaker to the 3C Load Center (breaker 30302) had been replaced (like for like) with a refurbished breaker, and unknown to the operators, the auxiliary switch of the breaker was installed such that the breaker open contact was “off” with the breaker shut and “on” with the breaker open, while the opposite was desired. The auxiliary contact made up logic for the 3A bus sequencer which used 3C load center

voltage and breaker (30302) position as an indication of proper electrical status of the safety busses. After breaker 30302 was installed (in the open position), the operator shut 4160 volt breaker 3AA14, "3C Load Center Feed from 3A 4160 Volt Bus" (See Figure). The 3C Load Center remained de-energized, as intended, but because of the reversed auxiliary contacts, the lineup made up sequencer logic that the 3C load center power supply breakers were both shut (while breaker 30302 remained open) and the load center had no voltage, which initiated a sequencer load shed of the 3A 4160 volt bus. The load shed stopped the running A RHR pump, which resulted in a loss of decay heat removal. The sequencer started the 3A emergency diesel generator and re-energized the bus. As expected the A train intake cooling water pump and A train component cooling water pump (both part of the decay heat removal train) were sequenced on. The RHR pump was not restarted and operators entered 3-ONOP-004.12, "Loss of 3A 4KV Bus While on Backfeed", which assured proper electrical sequencing. Had proper sequencing not taken place, the procedure would have directed actions to restore power to the 3A bus. Because the sequencer had worked properly, 3-ONOP-004.12 directed transition to 3-ONOP-004.10, "Loss of Offsite Power While on Backfeed", which assured proper starting and loading of the diesel generator. Because decay heat removal had stopped, 3-ONOP-004.10 directed the operators to 3-ONOP-050, "Loss of RHR", which was used to restore decay heat removal. During the loss of cooling, the coolant system temperature increased from an estimated 113 degrees F to 140 degrees F.

The inspectors noted that approximately 7 minutes elapsed from the time decay heat removal cooling was lost until it was restored. If the attempt to restore cooling using the B train had failed, operators would likely have restored the A train, which became available when the diesel generator provided power to the A bus. Because no core exit thermocouples were connected, actual conditions of the reactor core if the loss of decay heat removal were sustained, would not be readily known to control room personnel. The only indication of core temperatures was reactor coolant system (RCS) loop temperature which was not in the area of highest heatup. Additionally, steam generators had been removed from service due to RCS draining and an adequate vent path had not been established to prevent RCS pressurization on a sustained loss of decay heat removal.

The licensee did not identify the restoration of the C load center as a Higher Risk Evolution as required by licensee procedure O-ADM-051, Outage Risk Assessment and Control. The Higher Risk Evolution designation was specified for any activity that caused the plant to be susceptible to a loss of a safe shutdown function such as decay heat removal, or could affect the minimum required equipment specified for the plant condition (such as the running RHR pump and on-site electrical supply). The Higher Risk Evolution designation would have triggered compensatory measures such as a higher level of management review of both the activity and concurrent work (including switchyard and startup transformer work), the development of contingency plans that would ensure defense in depth for the decay heat removal safety function, and higher risk awareness for plant personnel including placing protected equipment signs in the area of work. Operating Experience was not fully factored into the licensee's risk

management activities. NRC Generic Letter 88-17 discussed actions to maintain reactor temperature indications during draining, and the need to avoid activities that could cause perturbations until draining was complete and the reactor placed in a more stable configuration. NRC Information Notice 93-72 discussed risk assessment of schedule changes as an area of concern during shutdown operations.

The loss of shutdown cooling could have been prevented by any one of the following risk management actions: 1) The 3B RHR pump could have been started prior to the switching evolution to provide core cooling while performing the restoration activities on the A 4160 volt to 480 volt load center; 2) The 3A sequencer could have been disabled to prevent load shed should a sequencing or other problem with the restoration operations occur; and 3) The 480 volt breaker being installed could have been appropriately tested or inspected prior to placing the breaker in service to detect the improper auxiliary switch status.

Analysis: The performance deficiency associated with this finding was that the licensee failure to adequately assess and manage the increase in risk of performing maintenance on the A-train 480 volt 3C load center while Unit 3 was operating in decay heat removal mode with one operating A-train residual decay removal (RHR) pump. The finding was greater than minor because the licensee's risk assessment failed to anticipate the eventual unavailability of all decay heat removal for seven minutes during shutdown operations. The Mitigating Systems Cornerstone objective to ensure the availability and reliability of systems that respond to initiating events to prevent undesirable consequences was affected by the finding because the lack of risk assessment and risk management challenged primary plant systems used to mitigate reactor accidents. Additionally, the finding affected the cross cutting area of Human Performance, specifically the Work Control component because the licensee did not appropriately plan work activities using risk insights.

The finding was evaluated in accordance with NRC Inspection Manual Chapter (IMC) 0609, Appendix G, Shutdown Operations SDP. The inspectors made the following assumptions: Time to boil was 21 minutes; no sufficient vent path existed for feed and bleed cooling; no core exit thermocouples were available; steam generators were not available for cooling; containment closure was within 20 minutes after the start of boiling; and operators had not been recently trained on loss of RHR or shutdown LOCA mitigation. The results of the phase 2 evaluation indicated that this finding is greater than Green using the shutdown SDP phase 2 templates. Subsequently, a phase 3 assessment was performed and determined that there were two dominant core damage sequences. One sequence involved failure of operators to start either RHR train A or B before boiling begins. In this scenario, the operators successfully initiate feed and bleed cooling but fail to maintain a long term inventory source to the RWST (recirculation requires the RHR pumps). The conditional core damage probability for this scenario was estimated as 3.5E-06. The other sequence involved failure of operators to start either RHR train A or B before boiling begins and the operators fail to initiate feed and bleed cooling before core damage, which was estimated to be 3E-6. Therefore, the risk significance of this finding was determined to be White.

When the loss of decay heat removal cooling occurred, the licensee took prompt action to restore cooling using the B train cooling equipment. The event was documented in the corrective action program as CR 2006-7036. Additionally, the licensee initiated management reviews of outage work to assure that risk was properly defined, breakers that were being installed into the plant were given enhanced inspections and functionality checks, and procedures were revised to assure that the affected sequencer logic was disabled during work that could affect the safety busses during shutdown maintenance. A Senior Reactor Operator was assigned to review work planning on a daily basis to assess activities for risk.

Enforcement: 10 CFR Part 50.65(a)(4) states in part, that before performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Contrary to the above, on March 8, 2006, the licensee failed to adequately assess and manage the increase in risk of performing maintenance on the A-train 480 volt 3C load center while Unit 3 was operating in decay heat removal mode with one operating A-train residual heat removal (RHR) pump. The licensee elected to move up restoration maintenance on the A-train 480 volt 3C load center and proceeded without implementation of procedurally required measures to reduce the risk during the activity. During the maintenance activity the licensee installed a breaker associated with 3C 480 volt load center that was later determined to be defective, which caused a loss of the operating A-train RHR pump. This resulted in a loss of all decay heat removal for seven minutes, which caused reactor coolant temperature to increase from 113 F to 140 F. The violation existed during the duration of the maintenance activity while the plant was susceptible to a loss of decay heat removal. When decay heat removal was lost, the licensee appropriately entered their abnormal procedure and restored core cooling by aligning and starting the B train residual heat removal pump. The licensee entered this issue in the Corrective Action Program as condition report (CR) 2006-7036.

4OA6 Management Meeting

Exit Meeting Summary

The resident inspectors presented the inspection results to Mr. Jones and other members of licensee management at the conclusion of the inspection on August 17, 2006. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. The licensee did not identify any proprietary information.

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SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:
T. Jones, Site Vice-President, Turkey Point

NRC personnel:
J. Munday, Projects Branch Chief, Region II
S. Stewart, Senior Resident Inspector, Turkey Point

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000250/2006015-01	AV	Failure to assess and manage maintenance risk during shutdown operations. (Section 4OA5)

Closed

05000250/2006002-03	URI	Loss of Unit 3 decay heat removal on March 8, 2006. (Section 4OA5)