



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
245 PEACHTREE CENTER AVENUE NE, SUITE 1200  
ATLANTA, GEORGIA 30303-1257

April 28, 2010

Mr. Mano Nazar  
Executive Vice President  
Nuclear and Chief Nuclear Officer  
Florida Power and Light Company  
P.O. Box 14000  
Juno Beach, FL 33408-0420

**SUBJECT: ST. LUCIE NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT  
05000335/2010002, 05000389/2010002**

Dear Mr. Nazar:

On March 31, 2010, the US Nuclear Regulatory Commission (NRC) completed an inspection at your St. Lucie Plant Units 1 and 2. The enclosed inspection report documents the inspection results, which were discussed on April 8, 2010, with Mr. Anderson and other members of your staff.

The inspection examined activities conducted under your license as they related to safety and compliance with the Commission's rules and regulations and with the conditions of your license. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one inspector identified finding and one self revealing finding of very low safety significance (Green). These findings were determined to involve a violation of NRC requirements. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating the findings as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. Also, three licensee identified violations which were of very low safety significance are listed in Section 4OA7 of the report. If you contest these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the St. Lucie facility. In addition, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at St. Lucie. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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

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Sincerely,

*/RA/*

Marvin D. Sykes, Chief  
Rector Projects Branch 3  
Division of Reactor Projects

Docket Nos. 50-335, 50-389  
License Nos. DPR-67, NPF-16

Enclosure: Inspection Report 05000335/2010002, 05000389/2010002  
w/ Attachment: Supplemental Information

cc w/encl: (See next page)

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4

Letter to Mano Nazar from Marvin D. Sykes dated April 28, 2010

SUBJECT: ST. LUCIE NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT  
05000335/2010002, 05000389/2010002

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-335, 50-389

License Nos.: DPR-67, NPF-16

Report No: 05000335/2010002, 05000389/2010002

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

Facility: St. Lucie Nuclear Plant, Units 1 & 2

Location: 6351 South Ocean Drive  
Jensen Beach, FL 34957

Dates: January 1 to March 31, 2010

Inspectors: T. Hoeg, Senior Resident Inspector  
S. Sanchez, Resident Inspector  
S. Ninh, Senior Project Engineer  
R. Aiello, Senior Operations Engineer (Section 1R011)

Approved by: M. Sykes, Chief  
Reactor Projects Branch 3  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000335/2010002, 05000389/2010002; 1/01/2010 - 3/31/2010; St. Lucie Nuclear Plant, Units 1 & 2; Identification and Resolution of Problems, Operability Evaluations.

The report covered a three month period of inspection by resident inspectors and region based inspectors. Two Green NCVs were identified. The significance of most findings is identified by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP); the cross-cutting aspect was determined using IMC 0310, Components Within the Cross-Cutting Areas; and 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", and Revision 4, dated December 2006.

### A. NRC-Identified and Self-Revealing Findings

#### Cornerstone: Initiating Events

- Green. A self-revealing non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified when safety related surveillance test procedure 2-OSP-08.01, "Main Steam Isolation Valves Periodic Test," was implemented as written in Mode 2 causing the main feed water isolation valves (MFIVs) to close resulting in a momentary loss of feed water to the steam generators. The surveillance procedure did not provide adequate initial conditions or special precautions to prevent plant conditions that would result in a loss of feed water to the steam generators. The issue was entered into the corrective action program (CAP) as condition report (CR) 2009-29332.

The finding was more than minor because it was similar to example 4.b in IMC 0612, Appendix E, in that it challenged steam generator water level control due to closure of the MFIVs and resulted in a feed flow transient. The finding was associated with the procedure quality attribute of the Initiating Events cornerstone and adversely affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was evaluated in accordance with IMC 0609, Attachment 4, and determined to be of very low safety significance per the Significance Determination Process (SDP) Phase 1 Screening because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available, and did not screen as potentially risk significant due to external events. This finding has a cross-cutting aspect in the area of human performance because the licensee did not provide complete, accurate and up-to date procedures to plant personnel (H.2.c). (Section 40A2.2)

Enclosure

### Cornerstone: Mitigating Systems

- Green. The inspectors identified a Non-Cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for failure to promptly identify and correct a condition adverse to quality for degraded wiring in the 2A1 EDG immersion heater power circuitry that resulted in low lube oil temperatures and required Operations to run the diesel several times over the course of a few days to ensure operability. The issue was entered into the CAP as CR 2010-3332.

The finding was more than minor because it affected the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of the 2A EDG to respond to initiating events to prevent undesirable consequences. SDP Phase 1 Screening indicated that the finding was of very low safety significance because it was not a design deficiency, nor did it result in an actual loss of system or single train function, nor did it screen as potentially risk significant due to external events. This finding has a cross-cutting aspect in the problem identification and resolution area of the corrective action program component because the licensee did not perform a thorough evaluation of problems such that the resolutions address causes and extent of conditions (P1.c) (Section 1R15)

### B. Licensee Identified Violations

Three violations of very low safety significance were identified by the licensee and have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into their corrective action program. These violations and corrective actions are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status:

Unit 1 began the period at full Rated Thermal Power (RTP) and remained at full RTP until March 16 when a slow downpower of about 1% per day was initiated prior to a refueling outage scheduled to start on April 5. Unit 2 began the period at full RTP and remained there until January 8 when it was downpowered to 40% in response to a 2A condensate pump seal leak. Unit 2 was returned to full RTP on January 9 and operated at full RTP for the remainder of the period.

### **1. REACTOR SAFETY**

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity (Reactor-R)

#### 1R01 Adverse Weather Protection

##### .1 Seasonal Winter Weather Conditions

###### a. Inspection Scope

During the week of January 4 the inspectors reviewed the status of licensee actions in accordance with ADM-04.03, Cold Weather Preparations for winter weather conditions. The inspectors verified conditions were met for entering the subject procedure and that equipment status was verified as directed by the procedure. The inspectors performed a walkdown of the following safety-related equipment on both units that are exposed to the outside weather conditions to identify any potential adverse conditions. Condition reports (CRs) were checked to assure that the licensee was identifying and resolving weather related issues.

- Unit 2 Emergency Diesel Generator (EDG) Rooms
- Unit 1 'C' Auxiliary Feedwater (AFW) Pump Area
- Unit 2 Main Feedwater Isolation Valve Area
- Unit 1 Condensate Storage Tank Area
- Unit 1 EDG Rooms
- Unit 1 Refueling Water Tank (RWT)
- Unit 2 RWT

###### b. Findings

No findings of significance were identified.

##### .2 Impending Adverse Weather Conditions

###### a. Inspection Scope

On January 6 the inspectors reviewed the overall preparations of the licensee for an overnight weather forecast of freezing temperatures. The inspectors verified conditions

Enclosure

were established for the onset of the freezing temperatures including the placement of temporary heaters around equipment affected by low temperatures. The inspectors reviewed compensatory measures put in place or expected to be put in place during the forecasted freezing temperatures while considering equipment controls, area accessibility, and system indications. The inspectors performed a walkdown of the following areas:

- Unit 2 Emergency Diesel Generator (EDG) Rooms
- Unit 1 Refueling Water Tank (RWT)
- Unit 1 Intake Cooling Water (ICW) Pump Area

#### 1R04 Equipment Alignment

##### .1 Partial Equipment Walkdowns

###### a. Inspection Scope

The inspectors conducted three partial equipment alignment verifications of the safety-related systems listed below. These inspections included reviews using plant lineup procedures, operating procedures, and piping and instrumentation drawings, which were compared with observed equipment configurations to verify that the critical portions of the systems were correctly aligned to support operability. The inspectors also verified that the licensee had identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers by entering them into the corrective action program (CAP).

- 2B EDG While 2A EDG Out of Service (OOS)
- 2A EDG While the 2B EDG OOS
- 1A Emergency Core Cooling System (ECCS) Train While 1B ECCS OOS

###### b. Findings

No findings of significance were identified.

#### 1R05 Fire Protection

##### .1 Fire Area Walkdowns

###### a. Inspection Scope

The inspectors toured the following five plant areas during this inspection period to evaluate conditions related to control of transient combustibles and ignition sources, the material condition and operational status of fire protection systems including fire barriers used to prevent fire damage or fire propagation. The inspectors reviewed these activities against provisions in the licensee's procedure AP-1800022, Fire Protection Plan, and 10 CFR Part 50, Appendix R. The licensee's fire impairment lists, updated on an as-needed basis, were routinely reviewed. In addition, the inspectors reviewed the

CR database to verify that fire protection problems were being identified and appropriately resolved. The following areas were inspected:

- Unit 1 Charging Pump Rooms
- Unit 1 AFW Pump Rooms
- Unit 1 Electrical Penetration Rooms
- Unit 2 Component Cooling Water (CCW) Building
- Unit 2 Spent Fuel Pool Building 62 foot elevation

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Training Program

.1 Resident Inspector Quarterly Review

a. Inspection Scope

On February 17, 2010, the inspectors observed and assessed licensed operator actions during a simulated steam generator tube rupture, Loss of Offsite Power and subsequent reactor trip with malfunctioning control rods training exercise. The inspectors also reviewed simulator physical fidelity and specifically evaluated the following attributes related to the operating crews' performance:

- Clarity and formality of communication
- Ability to take timely action to safely control the unit
- Prioritization, interpretation, and verification of alarms
- Correct use and implementation of off-normal and emergency operation procedures; and emergency plan implementing procedures
- Control board operation and manipulation, including high-risk operator actions
- Oversight and direction provided by supervision, including ability to identify and implement appropriate technical specification actions, regulatory reporting requirements, and emergency plan classification and notification
- Crew overall performance and interactions
- Effectiveness of the post-evaluation critique.

b. Findings

No findings of significance were identified.

.2 Annual Review of Licensee Requalification Examination Results

a. Inspection Scope

On November 25, 2009, the licensee completed the requalification annual operating tests, required to be given to all licensed operators by 10 CFR 55.59(a) (2). The inspectors performed an in-office review of the overall pass/fail results of the individual operating tests and the crew simulator operating tests. These results were compared to the thresholds established in Manual Chapter 0609 Appendix I, Operator Requalification Human Performance Significance Determination Process.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed system performance data and associated CRs for the two systems listed below to verify that the licensee's maintenance efforts met the requirements of 10 CFR 50.65 (Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants) and licensee Administrative Procedure ADM-17-08, Implementation of 10CFR50.65, Maintenance Rule. The inspectors' efforts focused on maintenance rule scoping, characterization of maintenance problems and failed components, risk significance, determination of a(1) and a(2) classification, corrective actions, and the appropriateness of established performance goals and monitoring criteria. The inspectors also interviewed responsible engineers and observed some of the corrective maintenance activities. The inspectors also attended applicable expert panel meetings and reviewed associated system health reports. The inspectors verified that equipment problems were being identified and entered into the licensee's CAP.

- Unit 1 Low Pressure Safety Injection (LPSI) System
- Unit 1 Containment Spray System

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors completed in-office reviews, plant walkdowns, and control room inspections of the licensee's risk assessment of five emergent or planned maintenance activities. The inspectors verified the licensee's risk assessment and risk management activities using the requirements of 10 CFR 50.65(a)(4); the recommendations of Nuclear Management and Resource Council 93-01, Industry Guidelines for Monitoring

Enclosure

the Effectiveness of Maintenance at Nuclear Power Plants, Revision 3; and licensee procedure ADM-17.16, Implementation of the Configuration Risk Management Program. The inspectors also reviewed the effectiveness of the licensee's contingency actions to mitigate increased risk resulting from the degraded equipment. The inspectors interviewed responsible Senior Reactor Operators on-shift, verified actual system configurations, and specifically evaluated results from the online risk monitor (OLRM) for the combinations of out of service (OOS) risk significant systems, structures, and components (SSCs) listed below:

- 1A Charging Pump and 1C AFW Pump OOS
- 1B Containment Instrument Air Compressor (IAC), 1C IAC, 1C AFW Pump OOS
- 2A ECCS Pumps, 2A Boric Acid Makeup Tank, 2C AFW Pump, 2C Charging Pump OOS
- 2A ECCS Pumps and 2A EDG OOS
- 2B EDG, 2C CCW Pump, and 2C Charging Pump OOS

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following seven condition report (CR) interim dispositions and operability determinations to ensure that operability was properly supported and the affected SSCs remained available to perform its safety function with no increase in risk. The inspectors reviewed the applicable UFSAR, and associated supporting documents and procedures, and interviewed plant personnel to assess the adequacy of the interim disposition.

- CR 2010-58, ICW Flow Through Valve 1-TCV-14-4A Degraded
- CR 2010-332, 2A1 EDG Immersion Heater Control Circuit Burnt Wire
- CR 2010-695, 1B EDG Fast Start Failure
- CR 2010-1118, Unit 2 Emergency Response Data Acquisition and Display System (ERDADS) Degraded Wiring
- CR 2010-1510, 1C AFW Pump Trip Mechanism Failure
- CR 2010-6080, 2A EDG Air Start Receiver Tank Leaks
- CR 2010-6740 and 6778, Unit 2 ICW Through-Wall Leakage

b. Findings

Introduction: The inspectors identified a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee failing to identify and correct a condition adverse to quality for degraded wiring in the 2A1 Emergency Diesel Generator (EDG) immersion heater power circuitry that resulted in low lube oil temperatures during cold weather. Specifically, on two previous occasions in 2009, the

Enclosure

licensee identified degraded wiring in the 2A1 immersion heater circuitry but failed to evaluate and understand what was causing the wire to degrade and short circuit.

Description: On January 15, 2009, while performing cold weather preparations, the licensee identified lower than expected current readings on the 2A1 and 2A2 EDG immersion heaters, with a zero amperes reading on the B-phase of the 2A1 immersion heater. Condition Report (CR) 2009-1118 was written documenting the discovery and Work Order (WO) 39000872 was completed on January 16, 2009, for repairs to the degraded wiring in the 2A1 EDG immersion heater electrical power circuitry. The corrective actions included cutting back the B-phase lead and swapping with the C-phase lead. There was no further action to determine why the lead had degraded and short-circuited. On April 8, 2009, another CR, CR 2009-10661, was written documenting the 2A1 EDG immersion heater power circuitry showing signs of overheating/degradation. WO 39007952 was written for repairs (this WO remained open until repairs in January 2010) and the associated CR was closed on August 14, 2009, without any further evaluation or understanding as to why the wiring continued to rapidly degrade and short circuit.

During the week of January 4, 2010, temperatures onsite were in the low 40s for a number of consecutive days, causing the 2A EDG lube oil temperatures to approach the 85°F procedural limit. On January 6, 2010, the licensee identified that the C-phase lead of the 2A1 EDG immersion heater power circuit had short-circuited and failed to heat the engine jacket water. As a result of this discovery, plant operators had to start the EDG several times over the course of a few days to ensure the diesel remained operable, until the degraded wiring could be repaired under open WO 39007952. A separate CR, CR 2010-332 was written documenting the condition. The inspectors reviewed the CR and questioned the licensee regarding the cause of the short-circuiting and what had been done following the previous wiring discoveries of the exact same condition. The licensee had not evaluated the previous condition other than to repair the wire and test the circuit to make sure that the proper current was achieved. The inspectors determined that had the cause for the degraded wiring been identified, the condition could have been corrected to prevent recurrence. The licensee performed an apparent cause evaluation and concluded that although aging was a contributor, the lack of evaluation and inadequate post maintenance testing were the two causes for the repeat failures. Corrective actions to replace the wiring on all four Unit 2 EDG immersion heater power circuits and preventive maintenance actions to periodically check proper current and voltage readings are now in place.

Analysis: The inspectors determined that failure of the licensee to promptly identify and correct a condition adverse to quality for degraded wiring in the 2A1 EDG immersion heater power circuitry that resulted in low lube oil temperatures challenging operability of the 2A1 and 2A2 EDGs requiring Operations to run the diesel several times over the course of a few days to ensure operability, was a performance deficiency. The finding is greater than minor because it affects the equipment performance attribute of the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of the 2A EDG to respond to initiating events to prevent undesirable consequences. The finding was evaluated in accordance with IMC 0609, Attachment 4, and determined to be of very low safety significance (Green) per the SDP Phase 1

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Screening because the finding is not a design deficiency, nor did it result in an actual loss of system or single train function, nor did it screen as potentially risk significant due to external events. The inspectors also determined that this finding has a cross-cutting aspect in the problem identification and resolution area of the corrective action program component because the licensee did not perform a thorough evaluation of problems such that the resolutions address causes and extent of conditions. (MC 0310 aspect P.1.c)

Enforcement: Criterion XVI of 10 CFR Part 50, Appendix B, states in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances, are promptly identified and corrected. Contrary to this requirement, the licensee failed to identify and correct the cause of the 2A EDG immersion heater wiring degradation prior to the onset of cold weather that necessitated starting and running the diesel several times to maintain operability. Because the licensee entered the issue into their CAP as CR 2010-3332 and the finding is of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000389/2010002-01: Failure to Identify and Correct the Cause of Wiring Degradation in EDG Immersion Heater Circuitry.

#### 1R18 Plant Modifications

##### a. Inspection Scope

The inspectors reviewed the documentation for a temporary modification to the 2A1 EDG immersion heater circuitry. Temporary System Alteration (TSA) 2-10-01 was implemented January 7, 2010, to jumper out some degraded wiring until permanent repairs could be made the following week. The inspectors reviewed the 10 CFR 50.59 screening and evaluation, fire protection review, environmental review, and license renewal review, to verify that the modification had not affected system operability/availability. The inspectors reviewed associated plant drawings and UFSAR documents impacted by this modification and discussed the changes with licensee personnel to verify that the installation was consistent with the modification documents. The inspectors walked down the modification to determine if it was installed in the field as described in the subject TSA. Additionally, the inspectors verified that problems associated with modifications were being identified and entered into the CAP.

##### b. Findings

No findings of significance were identified.

#### 1R19 Post Maintenance Testing

##### a. Inspection Scope

For the six post maintenance tests (PMTs) listed below, the inspectors reviewed the test procedures and either witnessed the testing and/or reviewed test records to determine whether the scope of testing adequately verified that the work performed was correctly

Enclosure

completed and demonstrated that the affected equipment was functional and operable. The inspectors verified that the requirements of licensee procedure ADM-78.01, Post Maintenance Testing, were incorporated into test requirements. The inspectors reviewed the following work orders (WO) and/or work requests (WR):

- WO 39021759, 1C Charging Pump Accumulator Maintenance
- WO 39003115, 2A EDG Maintenance
- WO 39003119, 2B EDG Maintenance
- WO 40003915, Unit 1 LPSI Valve HCV-3625 Maintenance
- WO 40003796, 2B EDG Starting Air Receiver Tank Repairs
- WO 40004126, 1A EDG Starting Circuit Relay Replacement

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors either reviewed or witnessed the following seven surveillance tests to verify that the tests met the technical specifications, the UFSAR, the licensee's procedural requirements, and demonstrated the systems were capable of performing their intended safety functions and their operational readiness. In addition, the inspectors evaluated the effect of the testing activities on the plant to ensure that conditions were adequately addressed by the licensee staff and that after completion of the testing activities, equipment was returned to the positions/status required for the system to perform its safety function. The tests reviewed included two in-service test (IST) surveillances. The inspectors verified that surveillance issues were documented in the CAP.

- 1-OSP-66.01, Control Element Assembly (CEA) Quarterly Exercise
- 2-OSP-69.24, Engineered Safeguards Relay Test Train A
- 2-OSP-59.01B, 2B EDG Monthly Test
- 2-OSP-66.02, Unit 2 CEA Position Verification
- 2-OP-0010125A, Valve MV-07-01A In-service Stroke Test (IST)
- 1-OSP-1.03, Unit 1 Reactor Coolant System Inventory Balance
- 2-OP-0010125A, Valve MV-07-2B In-service Stroke Test (IST)

b. Findings

No findings of significance were identified.

1EP6 Drill EvaluationEmergency Preparedness Drilla. Inspection Scope

On January 27, 2010, the inspectors observed licensed operators in the simulator, technical support center staff, and the operations support center staff during a drill of the site emergency response organization. The drill included a spent resin spill with a steam generator tube rupture event followed by a loss of coolant accident. During the drill the inspectors assessed operator actions to verify that emergency classifications and notifications were made in accordance with licensee emergency plan implementing procedures (EIPs) and 10 CFR 50.72 requirements. The inspectors specifically reviewed that the Notification of Unusual Event, Alert, and Site Area Emergency classifications and notifications were in accordance with licensee procedures EPIP-01, Classification of Emergencies, and EPIP-02, Duties and Responsibilities of the Emergency Coordinator. The inspectors also observed whether (1) the initial activation of the emergency response centers was timely and as specified in the licensee's emergency plan; (2) the required TS actions for the drill scenario were reviewed to assess correct implementation; (3) the licensee identified critique items were discussed and reviewed to verify that drill weaknesses were identified and captured in the CAP.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**4OA1 Performance Indicator VerificationInitiating Events Cornerstonesa. Inspection Scope

The inspectors checked licensee submittals for the performance indicators (PIs) listed below for the period January 2009 through December 2009, to verify the accuracy of the PI data reported during that period. Performance indicator definitions and guidance contained in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, and licensee procedure ADM-25.02, NRC Performance Indicators, were used to check the reporting for each data element. The inspectors checked operator logs, plant status reports, condition reports, system health reports, and PI data sheets, to verify that the licensee had identified the required data, as applicable. The inspectors interviewed licensee personnel associated with performance indicator data collection, evaluation, and distribution.

- Unit 1 Unplanned Scrams per 7000 Critical Hours
- Unit 2 Unplanned Scrams per 7000 Critical Hours

- Unit 1 Unplanned Scrams With Complications
- Unit 2 Unplanned Scrams With Complications
- Unit 1 Unplanned Power Changes per 7000 Critical Hours
- Unit 2 Unplanned Power Changes per 7000 Critical Hours

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.1 Daily Review

a. Inspection Scope

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a screening of items entered daily into the licensee's CAP. This review was accomplished by reviewing daily printed summaries of CRs and by reviewing the licensee's electronic CR database. Additionally, reactor coolant system unidentified leakage was checked on a daily basis to verify no substantive or unexplained changes.

b. Findings

No findings of significance were identified.

.2 Annual Sample: Infrequent Operations Performed During Control Room Turnover Resulting in a Loss of Feed Water, CR 2009-28516.

a. Inspection Scope

The inspectors selected this CR 2009-28516 for a more in-depth review of the circumstances that led to the event and loss of feed water and the corrective actions that followed.

The inspectors reviewed the licensee's evaluation of the event and the associated corrective actions. The inspectors interviewed plant personnel and evaluated the licensee's administration of this selected CR in accordance with their CAP as specified in licensee procedures PI-AA-204, "Condition Identification and Screening Process", and PI-AA-205, "Condition Evaluation and Corrective Actions."

b. Findings and Observations

Introduction: A self-revealing Green Non-Cited Violation (NCV) of 10 CFR Part 50, Appendix B, Criterion V, Instructions, Procedures, and Drawings, was identified regarding the licensee's failure to provide adequate guidance in a safety related

surveillance test procedure to prevent a loss of feed water to the steam generators. The operations surveillance test procedure 2-OSP-08.01, "Main Steam Isolation Valves Periodic Test," was implemented as written in Mode 2 when the main feed water isolation valves closed unexpectedly and resulted in a momentary loss of feed water to the steam generators. Specifically, the test procedure required initiation of a Main Steam Isolation Signal (MSIS) to close the Main Steam Isolation Valves (MSIV) which also closed the Main Feed Water Isolation Valves (MFIV) isolating main feed water to the steam generators. The test procedure was inadequate in that it did not provide precautions or limitations to the operators regarding the main feed water system response when initiating the MSIS to prevent a loss of feed water event.

Description: On September 29, 2009, Unit 2 was in Mode 2 at about 4 percent reactor power performing MSIV periodic stroke time testing when main feed water flow was unexpectedly isolated to the steam generators. The MSIV stroke test was initiated by closing the MSIVs using the MSIS which also closes the MFIVs by design. The main feed water system was in operation supplying feed water to the steam generators at the time of the test. The MFIVs must be open in order to provide a flow path from the main feed water pumps to the steam generators while in operation. Upon closure of the MFIVs, the steam generator water levels lowered by 10 percent to almost the 53 percent level before levels were restored by the operators. The operators had to reset the MSIS and reopen the MFIVs. The operators would have had to trip the reactor had steam generator water levels not been restored before reaching 50 percent level.

The licensee determined that the control room brief performed just prior to the test did not identify or discuss the plant conditions that would result from performing the test with the main feed water system in operation as described in condition report 2009-28516. The inspectors determined the control room operators were not prepared for or expecting a loss of feed water during the test. The surveillance test procedure 2-OSP-08.01, "Main Steam Isolation Valves Periodic Test," had been revised on July 31, 2008. The revision allowed the test to be performed in Mode 2 with the main feed water system or the auxiliary feed water system in operation with no precautions or reference to MSIS and MFIV effects on steam generator water levels. The main feed water system is upstream of the MFIVs and the auxiliary feed water system is downstream of the MFIVs. At low power reactor levels around 1-2 percent, the auxiliary feed water system is capable of providing enough flow to the steam generator to maintain required levels. At reactor power levels above 1-2 percent, the main feed water system is necessary to maintain levels. The inspectors determined that procedure 2-OSP-08.01 did not provide adequate required initial conditions or special precautions to the control room operators to prevent plant conditions that would result in a loss of feed water to the steam generators while performing the periodic test procedure. The licensee entered this condition in their corrective action program as condition report 2009-29332.

Analysis: The inspectors determined that the licensee's failure to provide adequate initial conditions or special precautions in surveillance test procedure 2-OSP-08.01, "Main Steam Isolation Valves Periodic Test" to prevent plant conditions that would result in a loss of feed water to the steam generators was a performance deficiency. The finding was more than minor because it was similar to example 4.b in IMC 0612, Appendix E, in that it challenged steam generator water level control due to closure of the MFIVs and resulted in a feed flow transient. The finding was associated with the

Enclosure

procedure quality attribute of the Initiating Events cornerstone and adversely affected the associated cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. The finding was evaluated in accordance with IMC 0609, Attachment 4, and determined to be of very low safety significance (Green) per the SDP Phase one determination because the finding did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions would not be available, and did not screen as potentially risk significant due to external events. This finding has a cross-cutting aspect in the area of human performance because the licensee did not provide complete, accurate and up-to date procedures to plant personnel. (H.2(c) per IMC 0310).

Enforcement: 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," states, in part, "Activities affecting quality shall be prescribed by documented Instructions, Procedures, or Drawings, of a type appropriate to the circumstances." Contrary to the above, on September 29, 2009, procedure OSP-08.01, "Main Steam Isolation Valves Periodic Test" that was used to perform Unit 2 MFIV testing was not appropriate to the circumstances, in that it did not account for the MFIV closure with the main feed water system in operation when initiating an MSIS. This resulted in an unexpected loss of feed water condition and subsequent operator actions to restore steam generator water level to prevent having to trip the reactor. Because this violation was of very low safety significance and was entered into the CAP as CR 2009-29332, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy: NCV 05000389/2010-02, Inadequate Procedure for Main Steam Isolation Valve Testing.

.3 Semi-Annual Trend Review: Foreign Material Exclusion Log Keeping Events

a. Inspection Scope

As required by Inspection Procedure 71152, Identification and Resolution of Problems, the inspectors reviewed the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors selected foreign material exclusion (FME) control events for trending due to several recent Containment Building FME log keeping inadequacies identified by the licensee during recent Unit 2 forced outages in CR 2010-4094. The inspectors' review was focused on the repetitive nature of the inadequate log keeping as well as the apparent cause performed by the licensee in a previous CR 2009-28108. The inspectors also considered the results of daily inspector CR item screening discussed in Section 4OA2.1 above, plant status reviews, plant tours, document reviews, and licensee trending efforts. The inspectors' review nominally considered the six month period of July through December 2009. Corrective actions associated with a sample of the issues identified in the licensee's CAP were reviewed for adequacy.

b. Findings and Observations

No findings of significance were identified.

#### 4OA3 Event Followup

##### (Closed) LER 05000389/2009-001-00, Unit 2 Main Feedwater Isolation Valves Stroke Time Potentially Affected by Temperature

On March 19, 2009, the licensee determined that St. Lucie unit 2 MFIVs stroke times could not meet plant TS 4.7.1.6 of 5.15 seconds based on review of Seabrook's operating experience report. Technical Manual (T/M) 2998-11467, Section 9.2 states that the fluid becomes very viscous at 60 degree F or less thus preventing a 5 second actuator closure. This information was not apparent to FPL staff and not previously identified. Therefore, plant procedures did not provide adequate guidance to prevent the MFIVs temperature from going below 60 degree F during the winter months. Based on review of last three years of ambient temperature data revealed the worst case condition in 2007 for ambient temperature less than 60 degree F existed for a 22 hour period, with 39 degree F being lowest temperature. This condition could have been applicable to all four MFIVs and these valves could have been inoperable longer than the required Technical Specification (TS) 3.7.1.6 allowable time. St. Lucie Unit 2 TS 3.7.1.6 requires four MFIVs to be operable in Modes 1, 2, and 3 except when the MFIV is closed and deactivated. The loss of all MFIVs would result in entry into TS 3.0.3 and require action within one hour to place the unit in a Mode in which TS 3.7.1.6 does not apply in Modes 4,5, or 6.

Corrective actions included to monitor ambient temperature in the steam trestle, to cover MFIVs with tarps, to place space heaters to maintain ambient temperature above 60 degree F; and to revise procedure ADM-04.03, Cold Weather Preparation, to include Unit 2 MFIVs and guidance for maintaining temperature above 60 degree F. The finding was more than minor because it affected the equipment availability attribute of the Mitigating Systems cornerstone and resulted in four MFIVs being inoperable for a period of time greater than allowed by TS. Since these valves would not have performed its safety function for greater than the TS allowed outage time, a SDP Phase 2 analysis was required. Using the SDP Phase 2 worksheets associated with MSLB, the finding is determined to have very low safety significance (Green) since all remaining mitigation capability was available. This licensee-identified finding involved a violation of 10 CFR Part 50 Appendix B, Criterion V, for inadequate plant procedures allowing the MFIVs to operate at the temperature below 60 degree F resulted in all four MFIVs inoperable and in entry into TS 3.0.3. The enforcement aspects of the violation are discussed in Section 4OA7. This LER is closed.

#### 4OA5 Other Activities

##### Quarterly Resident Inspector Observations of Security Personnel and Activities

###### a. Inspection Scope

During the inspection period the inspectors conducted observations of security force personnel activities to ensure that the activities were consistent with the licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

Enclosure

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Findings

No findings of significance were identified.

4OA6 Meetings

Exit Meeting Summary

Resident Inspection

The resident inspectors presented the inspection results to Mr. Anderson and other members of licensee management on April 8, 2010. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary information. The licensee did not identify any proprietary information.

4OA7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as a NCV.

- 10 CFR 26.205(d) requires, in part, that individuals subject to work controls do not exceed 26 work hours in any 48-hour period and 72 work hours in any 7-day period; requires a 34-hour break in any 9-day period; and a 10-hour break between successive work periods. During the periods of November 29 to December 07, 2009, two workers did not have the 34-hour break in a 9-day period; and March 07 to March 15, 2010, one worker did not have the 34-hour break in a 9-day period. The violation occurred in two separate work groups being mechanical maintenance and operations (non-licensed operator). The licensee determined that the personnel involved did not have a firm understanding of the revised 10 CFR Part 26 requirements. The finding was more than minor because if left uncorrected, it would become a more significant safety concern. Specifically, the excessive work hours would increase the likelihood of human performance errors during plant maintenance activities that could affect equipment performance. The finding is of very low safety significance (Green) because no significant events or human performance issues were directly linked to personnel fatigue as a result of the hours worked. This issue was documented in the licensee's corrective action program as condition reports 2009-34850 and 2010-6788.
- 10 CFR 50 Appendix B, Criterion V, states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a

Enclosure

type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings.

Contrary to the above, on March 19, 2009, the licensee determined that safety-related Administrative Procedure ADM-04.03, Colds Weather Preparations, did not provide adequate guidance to prevent the MFIVs temperature from going below 60 degree F during the winter months. All four MFIVs valves could have been inoperable longer than the required TS 3.7.1.6 allowable time in 2007 when the ambient temperature less than 60 degree F existed for a 22 hour period, with 39 degree F being lowest temperature. This condition had existed for a long time and was not apparent to the FPL staff. This was identified in the licensee's CAP as CR 2008-15821. Since these valves would not have performed their safety function for greater than the TS allowed outage time, a SDP Phase 2 analysis was required. Using the SDP Phase 2 worksheets associated with MSLB, the finding is determined to have very low safety significance (Green) since all remaining mitigation capability was available.

- 10 CFR 50, Appendix B, Criterion V, requires, in part, that activities affecting quality shall be prescribed by documented instructions or procedures, and shall be accomplished in accordance with these instructions or procedures. On January 6, 2010, with the onset of unusually cold weather (consecutive nights of temperatures in the low 40s), the licensee identified that safety-related procedure ADM-04.03, Cold Weather Preparations, had not been completed when it was discovered that the 2A1 EDG immersion heater power circuitry was not able to achieve the necessary current readings as called out in ADM-04.03. This resulted in Operations having to run the diesel several times over the course of a few days to ensure the lube oil temperatures remained above procedural limits, thus ensuring EDG operability. The finding was more than minor because it is similar to Example 2.f, of IMC 0612, Appendix E, Examples of Minor Issues, in that the failure to implement the cold weather procedure resulted in the immersion heaters inability to maintain lube oil temperatures above 85°F going undetected until the procedure was completed. The finding is of very low safety significance (Green) because the 2A EDG was capable of starting and performing its safety-related function. This issue was documented in the licensee's CAP as CR 2010-286.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

## KEY POINTS OF CONTACT

### Licensee personnel:

C. Ali, Licensing Engineer  
R. Anderson, Site Vice President  
E. Belizar, Projects Manager  
D. Calabrese, Emergency Preparedness Manager  
D. Cecchetti, Licensing Engineer  
J. Connor, Systems and Component Engineering Manager  
A. Day, Chemistry Manager  
M. Delowery, Extended Power Uprate Manager  
S. Duston, Training Manager  
K. Frehafer, Licensing Engineer  
J. Hamm, Site Engineering Director  
D. Hanley, Maintenance Programs Supervisor  
M. Haskin, Maintenance Manager  
J. Heinold, Chemistry Technical Supervisor  
M. Hicks, Recovery Excellence Manager  
B. Hughes, Plant General Manager  
D. Huey, Work Control Manager  
E. Katzman, Licensing Manager  
J. Klauck, Assistant Operations Manger  
J. Kramer, Site Safety Manager  
R. Lingle, Operations Manager  
C. Martin, Acting Radiation Protection Manager  
R. McDaniel, Fire Protection Supervisor  
M. Moore, Performance Improvement Department Manager  
P. Paradis, Fix-It-Now Team Supervisor  
J. Porter, Design Engineering Manager  
M. Snyder, Site Quality Assurance Manager  
G. Swider, Engineering Manager - Programs  
T. Young, Security Manager

### NRC personnel:

M. Sykes, Chief, Branch 3, Division of Reactor Projects  
S. Ninh, Senior Project Engineer, Division of Reactor Projects  
W. Rogers, Senior Risk Analyst, Division of Reactor Safety

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Opened and Closed

05000389/2010002-01	NCV	Untimely Corrective Actions for 2A1 EDG Immersion Heaters (1R15)
05000389/2010002-02	NCV	Inadequate Procedure for Main Steam Isolation Valve Testing (4OA2.2)

Closed

05000389/2009-01      LER      Unit 2 Main Feedwater Isolation Valves Stroke Time  
Potentially Affected by Temperature

Discussed

NONE

**LIST OF DOCUMENTS REVIEWED**

Nuclear Policy Procedure NP-910, Plant Readiness for Operations  
ADM-29.03, Boric Acid Corrosion Control Program, Revision 6D  
St. Lucie Nuclear Oversight Report PSL-09-064, Fire Protection Audit  
Maintenance Rule Program Administration, NAP-415  
Conduct of Operations, NAP-402  
2-AOP-09.02, Auxiliary Feedwater System

Condition Reports

2010-8036	2010-7354	2010-6590	2010-6248	2010-5672
2010-7760	2010-7407	2010-6614	2010-6247	2010-5488
2010-8076	2010-7195	2010-6639	2010-6250	2010-5552
2010-8108	2010-7201	2010-6658	2010-6287	2010-5603
2010-8180	2010-7277	2010-6669	2010-5952	2010-3404
2010-8174	2010-7296	2010-6726	2010-6080	2010-4342
2010-7906	2010-6929	2010-6740	2010-6102	2010-4389
2010-7911	2010-6580	2010-6566	2010-6045	2010-4460
2010-7380	2010-6778	2010-6287	2010-6046	2010-4545
2010-7339	2010-6788	2010-6327	2010-6047	2010-4562
2010-7342	2010-6850	2010-6355	2010-5982	2010-4565
2010-3285	2010-6883	2010-6215	2010-6045	2010-3574
2010-3250	2010-6566	2010-6224	2010-5811	2010-4021
2010-3021	2010-2665	2010-6228	2010-5821	2010-4053
2010-2977	2010-2684	2010-6240	2010-5826	2010-3842
2010-2800	2010-2503	2010-2294	2010-5844	2010-2201
2010-1840	2010-1696	2010-1551	2010-1592	2010-2028
2010-1431	2010-1300	2010-974	2010-883	2010-734

## LIST OF ACRONYMS

CAP	Corrective Action Program
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
ECCS	Emergency Core Cooling System
IP	Inspection Procedure
NRC	U.S. Nuclear Regulatory Commission
UFSAR	Updated Final Safety Analysis Report
WO	Work Order
TS	Technical Specifications
IST	Inservice Testing
NAP	Nuclear Administrative Procedure
MSIS	Main Steam Isolation Signal
MSIV	Main Steam Isolation Valve
MFIV	Main Feed Water Isolation Valve
LER	Licensee Event Report
LIV	Licensee Identified Violation
RTP	Rated Thermal Power