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

October 30, 2009

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 05000335/2009004, 05000389/2009004

Dear Mr. Nazar:

On September 30, 2009, the US Nuclear Regulatory Commission (NRC) completed an inspection at your St. Lucie Plant. The enclosed inspection report documents the inspection results, which were discussed on October 8, 2009, with Mr. Robert Hughes 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 self-revealing finding of very low safety significance (Green). This finding was determined to involve a violation of NRC requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating the finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest this NCV, 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

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/

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 05000335/2009004, 05000399/2009004
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Report to M. Nazar from Marvin Sykes dated October 30, 2009.

SUBJECT: ST. LUCIE NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT 05000335/2009004, 05000389/2009004

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-335, 50-389
License Nos.:	DPR-67, NPF-16
Report Nos.:	05000335/2009004, 05000389/2009004
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:	July 1 to September 30, 2009
Inspectors:	T. Hoeg, Senior Resident Inspector S. Sanchez, Resident Inspector N. Smith, Project Engineer J. Sowa, Project Engineer T. Morrissey, Senior Resident Inspector R. Chou, Reactor Inspector A. Vargas Mendez, Reactor Inspector T. Ross, Senior Resident Inspector
Approved by:	M. Sykes, Chief Reactor Projects Branch 3 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000335/2009-004, 05000389/2009-004; 07/01/2009 - 09/30/2009; St. Lucie Nuclear Plant, Units 1 & 2; Identification and Resolution of Problems.

The report covered a three month period of inspection by resident inspectors and several region based inspectors. One Green NCV was 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 305, Operating Reactor Assessment Program; 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: Mitigating Systems

Green. A self-revealing Non-Cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, was identified for failure of the licensee to take timely and effective corrective actions to prevent recurrence of Unit 1 emergency diesel generator (EDG) day tank level switch failures following identification of Murphy® switch reliability issues and issuance of NRC NCV 05000335/2009002-02. Specifically, on July 19, 2009, during functional testing of the 1B EDG day tank level switches, both the low and low-low level Murphy® switches failed.

The finding is more than minor because it is associated with the equipment performance attribute of the mitigating systems cornerstone. The finding was previously determined to have very low safety significance based on an SDP Phase 3 analysis. The analysis determined that the risk was less than 1E-6/year. This finding was related to the corrective action attribute of the problem identification and resolution cross-cutting area in the aspect of appropriate and timely corrective actions (IMC 0305 aspect P.1.d). (Section 4OA2.3)

B. Licensee Identified Violations

None.

REPORT DETAILS

Summary of Plant Status:

Unit 1 began the period at full Rated Thermal Power (RTP) and operated at full power for the entire period. Unit 2 began the period at full RTP and on July 12 was shutdown due to increased unidentified reactor coolant system leakage. Unit 2 returned to full RTP on July 29 and operated at full power until September 10 when the unit was shutdown due to increased vibrations on 2B2 reactor coolant pump. Unit 2 was returned to full RTP on September 30, 2009.

1. REACTOR SAFETY

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

1R01 Adverse Weather Protection

External Flooding Preparations

a. Inspection Scope

The inspectors performed walkdown inspections of Unit 1 and Unit 2 Reactor Auxiliary Buildings, including doors, flood protection barriers, penetrations and integrity of the perimeter structure. The inspectors also reviewed the applicable Updated Final Safety Analysis Report (UFSAR) sections, Technical Specifications, and other licensing basis documents regarding external flooding and flood protection, including specific plant design features to mitigate the maximum flood level. Furthermore, the inspectors reviewed ADM-04.01, Hurricane Season Preparation, and AP-0005753, Severe Weather Preparations, with regard to actions and physical features relied upon to mitigate potential external flooding events. Condition reports (CRs) and work orders (WO) related to actual flooding or water intrusion events over the past year were also reviewed by the inspectors to assure that the licensee was identifying and resolving severe weather related issues that caused or could lead to external flooding of safety related equipment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

Partial Equipment Walkdowns

a. Inspection Scope

The inspectors conducted four partial 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 Shutdown Cooling System while 2A Shutdown Cooling System was In-service
- 1B High Pressure Safety Injection (HPSI) System while 1A HPSI System OOS
- 2A HPSI System while 2B HPSI System OOS
- 1B Component Cooling Water (CCW) System while the 1A CCW System OOS

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Area Walkdowns

a. Inspection Scope

The inspectors toured the following four 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 Pipe Penetration Room 19.5' Elevation
- Unit 2 Auxiliary Feedwater Pump Area
- Unit 1 Intake Cooling Water Pump Area
- Unit 1 Component Cooling Water Heat Exchanger Area

b. Findings

No findings of significance were identified.

.2 Fire Protection - Drill Observation

a. Inspection Scope

The inspectors observed two fire drills during this inspection period. The first one simulated a fire in the Unit 1 Turbine Building Switchgear Room on August 4, 2009. The second drill simulated a fire in the Unit 1 Chemistry Cold Lab August 25, 2009. The drills were observed to evaluate the readiness of the plant fire brigade to fight

fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the debrief, and took appropriate corrective actions as required. Specific attributes evaluated were: (1) proper wearing of turnout gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire fighting techniques; (4) sufficient fire fighting equipment brought to the scene; (5) effectiveness of command and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario; and (10) drill objectives.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

Internal Underground Manhole Inspections

a. Inspection Scope

The inspectors reviewed applicable drawings and previously performed preventive maintenance work orders for safety related manhole inspections. The inspectors also walked down manhole locations per the drawings and conducted inspections of selected underground manholes containing safety related cables. The interior of the following specific manholes were examined: M128, M226, M228, M236, M237, M242, M265, M277, M298, M299V, M299X, M299Y, M299Z, and ECB-1. The inspectors verified the presence of water intrusion and dewatering capabilities related to the manholes containing safety related cabling. Furthermore, the inspectors reviewed several condition reports (e.g., 2009-26682) associated with the licensee's manhole inspection program and specific inspection findings. Additional condition reports (CRs) were also reviewed to assure that the licensee was identifying and resolving weather related issues.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Training Program

Resident Inspector Quarterly Review

a. Inspection Scope

On September 3, 2009, the inspectors observed and assessed licensed operator actions during a simulated steam generator tube rupture and subsequent reactor trip training exercise. The exercise was performed in accordance with St. Lucie Plant Simulator Exercise Guide 0815018, Revision 15. 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.

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 CAP

- Unit 2 Reactor Coolant System
- Unit 1 Chemical Volume and Control 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 six 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 the Effectiveness of Maintenance at Nuclear Power Plants, Revision 3; and 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:

- 1C Intake Cooling Water (ICW) Pump, 1A Charging Pump, 2A EDG OOS
- 1C ICW Pump, 1B Charging Pump, 1B EDG, Fan HVE-9B OOS
- 2A High Pressure Safety Injection (HPSI) Pump, 2A Low Pressure Safety Injection (LPSI) Train OOS
- 1C ICW Pump, Valve HCV-08-2A, 1A HPSI Pump OOS
- 1C ICW Pump, 1B Vital Battery OOS
- 1C ICW Pump, 1A1 Circulating Water Pump, 1A LPSI Pump OOS

a. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following five 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 2009-17069, 1A Charging Pump Failure to Start on Demand
- CR 2009-20422, 1B EDG Level Switch Failures
- CR 2009-21537, Unit 2 Analog Display System Failures
- CR 2009-24130, 1B EDG Fan Blade Corrosion
- CR 2009-26290, 1A Component Cooling Water Leak

b. Findings

No findings of significance were identified

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed the documentation for the following three temporary system alterations (TSA) associated with Unit 2. The inspectors reviewed the 10 CFR 50.59 screening and evaluation, fire protection review, environmental review, As Low As Reasonably Achievable (ALARA) screening, and license renewal review, to verify that the modification had not affected system operability/availability. The inspectors reviewed all 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. Additionally, the inspectors verified that problems associated with modifications were being identified and entered into the corrective action program.

- TSA # 2-09-012, Remove and Cap on the Lower Seal Injection Lines for Unit 2 RCPs
- TSA # 2-09-013, Installation of a Vibration Monitoring System to Monitor RCP 2B1 and 2B2 Associated Seal Cartridges and Pipe Lines
- TSA # 2-09-014, Remove and Cap on the Upper Seal Cavity Lines for Unit 2 RCPs 2B1 and 2B2

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 completed and demonstrated that the affected equipment was functional and operable. The inspectors verified that the requirements of 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 39017324, Replace Motor on Safety Injection Tank Valve V3614
- WO 39017574, Tighten Packing on Letdown Valve V2516
- WO 38012463, Limit Switch Adjustment on LPSI Header Valve 2-HCV-3635
- WO 38016639, Rebuild 2B1 Safety Injection Tank Sample Valve SE-05-1C
- WO 39018824, Rebuild Unit 2 ECCS RWT Recirculation Valve V3495

- WO 39020513, Replace Pressurizer Code Safety Valve V1202

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities

Unit 2 Forced Outages for Maintenance

a. Inspection Scope

On July 12-13, 2009, Unit 2 operators performed a reactor plant shutdown when unidentified reactor coolant system leakage increased to almost 0.2 gallons per minute (gpm) due to a reactor coolant pump shaft seal line leaking at a welded pipe joint. The inspectors observed control room activities during the plant downpower, reactor shutdown, and the reactor startup including synchronizing the turbine generator to the grid.

On September 10, 2009, Unit 2 operators performed a reactor plant shutdown when the 2B2 reactor coolant pump motor vibration began trending upward before reaching 25 mils. The inspectors observed portions of control room activities during the plant downpower, reactor shutdown, and the reactor startup including synchronizing the turbine generator to the grid.

Monitoring and Shutdown Activities

During both forced outage periods, the inspectors observed portions of the plant shutdown to Mode 5 Cold Shutdown conditions to verify that operating restrictions and similar procedural requirements were followed. The inspectors reviewed and monitored licensee controls and procedural compliance associated with decay heat removal operations including reduced inventory on July 16, 2009. The inspectors entered the containment building to verify no evidence of unknown RCS leakage and containment sump FME controls. The inspectors observed control room operator communications, place keeping, and reviewed chronological log entries.

Monitoring of Heat up and Startup Activities

On July 20, 2009, the inspectors observed activities during the reactor restart to verify that reactor parameters were within safety limits and that the startup evolutions were performed in accordance with licensee procedure 2-GOP-302, Reactor Startup Mode 3 to Mode 2.

On September 29, 2009, the inspectors observed activities during the reactor restart to verify that reactor parameters were within safety limits and that the startup evolutions were performed in accordance with licensee procedure 2-GOP-302, Reactor Startup Mode 3 to Mode 2. The inspectors observed synchronization of the turbine to the grid and reactor power escalation.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors either reviewed or witnessed the following nine surveillance tests to verify that the tests met the TS, 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 one in-service test (IST) surveillance. The inspectors verified that surveillance issues were documented in the CAP.

- 2-OSP-01.03, RCS Inventory Balance
- 1-PMI-59.03A, 1A EDG Day Tank Level Switch
- 2-OSP-09, 2A AFW Pump Surveillance and Valve Stokes (IST)
- 2-OSP-59.01A, 2A EDG Monthly Surveillance Test
- 2-1400153G, ESF System Loop instrument Calibration for RWST Level
- 2-1400064P, Installed Plant Instrumentation Calibration
- 1-OSP-03.05A, 1A HPSI Pump Code Run
- 1-OSP-03.06A, 1A LPSI Pump Code Run
- 1-OSP-07.04A, 1A Containment Spray Pump Code Run

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

Initiating Events and Mitigating Systems Cornerstones

a. Inspection Scope

The inspectors checked licensee submittals for the performance indicators (PIs) listed below for the period July 1, 2008, through June 30, 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 procedures ADM-25.02, NRC Performance Indicators, and NAP-206, NRC Performance Indicators, were used to check the reporting for each data

element. The inspectors checked licensee event reports (LERs), 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 Safety System Functional Failures
- Unit 2 Safety System Functional Failures

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: Operator Work Around Record 2-007-3 and 2-007-4, Seat Leakage Past 2-MV-07-3 and 4.

a. Inspection Scope

The inspectors selected CR 2007-41688, "MV-07-3 and MV-07-4 Repetitive Failures and Rework Including Operator Work Around," for a more in-depth review of the circumstances that preceded the condition and the corrective actions taken.

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 condition report 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

While reviewing condition report 2007-41688, the inspectors determined that seat leakage past containment spray system isolation valves 2-MV-07-3 and 2-MV-07-4 dates back to 1990. The valves are Pacific® 12 inch gate valves with SB-0 Limitorque motor operators. Leakage has been as high as 3.37 gpm measured in 2004. Repairs on the valve seats and wedges have been ineffective. The repair activities have mainly consisted of lapping the valve seating surfaces and performing a satisfactory blue dye check. The valves are not containment isolation valves and require no periodic in-service test. The licensee has repeatedly planned replacement of the valve with an updated flexible wedge style valve during multiple refueling outages. However, as the refueling outages approach, the repair is cancelled due to scheduling conflicts or to further evaluate the condition. This has been noted by the inspectors during the last two refueling outages as the operator work around remains active.

The inspectors determined that in 1996, the licensee developed a compensatory measure and procedure change to install a temporary hose from a drain valve downstream of 2-MV-07-3/4 to allow the seat leakage to drain to the floor drain system in the auxiliary building vice leaking into the containment spray system and discharging down into containment during shutdown cooling operations. Essentially, the licensee has created an operator work around that could have an adverse effect on shutdown cooling operations and reactor coolant system inventory while in mid-loop conditions which requires frequent makeup to the RCS to maintain reactor vessel inventory and adequate net positive suction head (NPSH) on the operating pump. This issue is unresolved pending completion of NRC review and analysis of licensee actions associated with the operator work around and is identified as Unresolved Item (URI) 05000389/2009-004-01, Seat Leakage of Containment Spray Valves 2 MV-07-3 and 2 MV-07-4.

.3 Annual Sample: 1B Emergency Diesel Generator (EDG) Day Tank Level Switch Failures.

a. Inspection Scope

The inspectors selected CRs 2009-20422, “1B EDG Out of Service Due to Failure of Level Switches,” and 2009-21111, “Quarterly Functional Test on 1B EDG Level Switches Not Completed in Required Timeframe,” for a more in-depth review of the circumstances that led up to the condition 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 these selected condition reports 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 Non-Cited Violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, was identified for failure of the licensee to take timely and effective corrective actions to prevent recurrence of Unit 1 emergency diesel generator (EDG) fuel oil day tank level switch failures following known Murphy® switch unreliability and NRC NCV 05000335/2009002-02. Specifically, on July 19, 2009, the licensee was performing a new test procedure to determine functionality of the 1B EDG day tank level switches when both the low and low-low level Murphy® switches failed.

Description. The St. Lucie Unit 1 EDGs have engine skid mounted fuel oil day tanks supplied by a larger external storage tank for fuel supply during extended periods of operation. The day tank fuel oil inventory is controlled by use of several Murphy® level switches. The switch design consists of a reservoir and float mechanism assembly that moves with level changes in the day tank to actuate micro switches which in turn controls alarms, pumps, and valve operation to maintain an adequate fuel oil inventory in the day tank. In February of 2009, there were several failures of both the 1A EDG and 1B EDG level switches during maintenance activities. A previous NRC inspection report for St. Lucie Plant (2009-002) documented a performance deficiency associated with corrective actions leading up to those level switch failures. Following the February 2009 level switch failures, the licensee acknowledged a trend, wrote condition report 2009-3756, and established a root cause team to evaluate the failures. Several corrective actions were developed. Part of the corrective action from this root cause evaluation was to create and implement a preventive maintenance (PM) procedure that would test the functionality of the day tank level switches on a quarterly basis starting on May 14, 2009. The licensee did not schedule the activity quarterly as originally planned and eventually scheduled it for July 19, 2009.

On July 19, 2009, while performing the PM procedure to test the functionality of the 1B EDG day tank level switches, both the low and low-low level switches failed. Procedure 1-PMI-59.03B, “1B Emergency Diesel Generator Day Tank Level Switch Functional Test,” lowers and raises actual day tank fuel oil level in an attempt to actuate all four switches. To complete the test, the diesel is declared out of service and the applicable Technical Specification (TS) is entered. In addition, the diesels are tested monthly in accordance with TS, but the only level switch that actuates during this test is the high level switch as a relatively small amount of fuel is consumed. The last successful test of the other three switches was after the February 2009 maintenance activities, which is approximately five months between testing. The inspectors concluded that had the corrective actions been implemented in a timely manner, the resultant failures may have been identified earlier, reducing the period of time that the EDG was susceptible to this type failure.

Analysis. The finding was determined to be more than minor because it affected the Mitigating Systems Cornerstone objective to ensure the availability, reliability, and capacity of systems that respond to initiating events to prevent undesirable consequences. The finding was again evaluated in accordance with NRC Inspection Manual Chapter 0609.04, Significance Determination Process (SDP) Phase 1

screening worksheets. Because it represented an actual loss of the EDG system safety function of a single train for greater than its Technical Specification (TS) allowed outage time (14 days), SDP Phase 2 worksheets were re-evaluated. The finding was determined to be potentially greater than Green because the 1B-EDG was inoperable since February 2009 and no operator recovery credit was allowed. A previous SDP Phase 3 analysis used for the initial performance deficiency in NRC NCV 05000335/2009002-02 was used for this repeat occurrence. The resulting analysis, including the risk contribution due to external sources, was slightly less than 1E-6/year and the finding is GREEN. The analysis showed the plant is very sensitive to changes in reliability of the switches. The inspectors determined that the cause of this finding was related to the appropriate and timely corrective actions aspect of the corrective action program component in the problem identification and resolution cross-cutting area (P.1 (d)).

Enforcement. Criterion XVI of 10 CFR 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 nonconformances are promptly identified and corrected." Contrary to this requirement, the licensee failed to take timely and effective corrective actions to prevent recurrence of Unit 1 EDG day tank level switch failures resulting in the 1B EDG being inoperable since February 2009. Because the licensee entered the issue into their CAP as CR 2009-21111 and the finding is Green, this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000335/2009004-01: Failure to Take Timely and Effective Corrective Actions to Prevent Recurrence of EDG Day Tank Level Switch Failures.

4OA3 Event Follow-up

.1 (Closed) LER 05000389/2009-002-00: Ingress of Algae Results in Manual Reactor Trip of St. Lucie Unit 2

The LER documented that on April 1, 2009, while Unit 2 was operating at 96 percent power, a buildup of algae on the intake cooling water debris filters caused a reduction of circulating water flow. The reduced circulating water flow led to a loss of main condenser vacuum and resulted in a manual reactor trip. The licensee determined that the loss of circulating water flow and condenser vacuum was caused by a greater than expected influx of a strain of algae not previously experienced at the site. The licensee determined that a contributing cause of the unit trip was the design of the weir pit which allows recirculation of neutrally buoyant debris back into the intake canal. Corrective actions included: additional monitoring to detect debris entering the intake canal to allow quicker response; evaluation of weir pit design and maintenance practices; and, development of a procedure for mitigating intake intrusion events. The inspectors reviewed the LER and CR 2009-10015 documenting the event. The inspectors checked the accuracy and completeness of the LER and the appropriateness of the licensee's corrective actions. No findings of significance or violations of NRC requirements were identified. This LER is closed.

.2 (Closed) LER 05000335/2009-001-00: Unit 1 Verbatim Technical Specification Surveillance Testing

The LER documented that on February 19, 2009, while Unit 2 was operating at 100 percent power, it was determined that the completed surveillance test for the Unit 1 emergency diesel generators fuel oil transfer pumps was not performed as prescribed in technical specifications and therefore the facility was in a condition prohibited by technical specifications. The licensee determined that this condition was a legacy issue and misinterpretation of the technical specifications allowing for overlap testing of the fuel oil transfer system. Corrective actions included changing the surveillance procedures to eliminate the use of overlap testing. The inspectors previously reviewed the circumstances of this condition as documented in NRC Inspection Report 2009-002 and issued NCV 05000335/2009002-01. The inspectors reviewed the LER and CR 2009-4976 documenting the event. The inspectors checked the accuracy and completeness of the LER and the appropriateness of the licensee's corrective actions. No new findings of significance or violations of NRC requirements were identified. This LER is closed.

.3 (Open) LER 05000389/2009-003-00: Unit 2 2B2 Reactor Coolant Pump Lower Seal Cavity Line Leak

On July 8, 2009, during mid-shift operation, a Reactor Coolant System (RCS) Inventory Balance was performed and a 0.065 gpm RCS unidentified leak rate was calculated. Additionally, a Containment Atmosphere Particulate Radiation Monitor indicated an upward trend. The licensee performed a robotic inspection of containment in an attempt to identify any RCS leaks before shutting the unit down on July 13, 2009. Further investigation verified RCS pressure boundary leakage at the lower cavity piping J-groove weld of the 2B2 Reactor Coolant Pump (RCP).

The licensee entered this issue into the Corrective Action Program (CAP) as CR 2009-19624. The licensee's immediate corrective action included replacing seal packages to reset fatigue usage at the J-groove welds, flange removal, cutting and capping of the upper cavity lines and replacing middle cavity piping between the flange and next piping flange. To conduct repairs, the licensee entered into a higher risk Plant Operating Status (POS) of mid-loop configuration with reduced inventory.

The inspectors noted that potentially similar weld failures took place in August 2007, on the 2B1 RCP pipe-to-elbow weld on the outboard side of the first flanged coupling of the 2B1 RCP seal injection ¾ inch diameter line; in December 2007, on the 2B2 RCP weld connecting the ¾ inch diameter seal injection line with the seal housing; and in January, 2009, on the 2B1 RCP pipe-to-flange weld on the outboard side of the first flanged coupling of the upper cavity pressure sensing line. The inspectors remained concerned whether licensee corrective actions associated with the previous weld failures were appropriate considering the repetitive failures. This issue is unresolved pending completion of NRC review and analysis of the final root cause evaluation and is identified as URI 05000389/2009004-02, Reactor Coolant Pump Failed Seal Injection Line. This LER is open.

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.

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. Hughes and other members of licensee management on October 8, 2009. 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.

ATTACHMENT: SUPPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:
C. Ali, Licensing Engineer
E. Belizar, Projects Manager
D. Calabrese, Emergency Preparedness Manager
D. Cecchett, Licensing Engineer
J. Connor, Engineering Manager - Programs
T. Cosgrove, Site Engineering Director
B. Hughes, Plant General Manager
A. Day, Chemistry Manager
M. Delowery, Maintenance Manager
S. Duston, Training Manager
K. Frehafer, Licensing Engineer
D. Hanley, Maintenance Programs Supervisor
J. Heinold, Chemistry Technical Supervisor
M. Hicks, Operations Manager
D. Huey, Work Control Manager
G. Johnston, Site Vice President
J. Klauck, Assistant Operations Manger
J. Kramer, Site Safety Manager
R. McDaniel, Fire Protection Supervisor
M. Moore, Radiation Protection Manager
P. Paradis, Fix-It-Now Team Supervisor
T. Patterson, Performance Improvement Department Manager
J. Porter, Design Engineering Manager
M. Snyder, Site Quality Assurance Manager
G. Swider, Systems and Component Engineering Manager
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

05000389/2009004-01	URI	Seat Leakage of Containment Spray Valves 2 MV-07-3/4 (4OA2.2).
05000389/2009004-02	URI	2B2 Reactor Coolant Pump Failed Seal Injection Line (4OA3.3).

Opened and Closed

05000335/2009004-01	NCV	Failure to Take Timely and Effective Corrective Actions to Prevent Recurrence of EDG Day Tank Level Switch Failures (4OA2.3)

Closed

05000335/2009-001-00	LER	Unit 1 Verbatim Technical Specification Surveillance Testing (4OA3.2)
05000338/2009-002-00	LER	Ingress of Algae Results in Manual Reactor Trip of St. Lucie Unit 2 (4OA3.1)

Discussed

NONE

LIST OF DOCUMENTS REVIEWED

IP 71111.18, Section 1R018, Plant Modifications
ADM-29.03, Boric Acid Corrosion Control Program, Rev. 6C
STD-W-012, REV. 7, Examination Requirements for Welds
MMP-01.17, rev. 10, Reactor Coolant Pump MODEL N-9000 Seal Removal and Installation
ASME Section III Socket Weld Examination Requirements for Construction
ASME Section XI Socket Weld Examination Requirements for Pre-service Inspection
Temporary System Alteration (TSA) # 2-09-012, Remove and Cap on the Lower Seal Injection Lines for Unit 2 RCPs
TSA # 2-09-013, Installation of a Vibration Monitoring System to Monitor RCPs 2B1 and 2B2 Associated Seal Cartridges and Pipe Lines
TSA # 2-09-014, Remove and Cap on the Upper Seal Cavity Lines for Unit 2 RCPs 2B1 and 2B2
Data Input on Procedure MMp-01.17, Rev. 10, Reactor Coolant Pump MODEL N-9000 Seal Removal and Installation
2B2 RCP Seal Piping Repair Determination Chart
ENG/JB-CSI-09-013, Preliminary Failure Analysis of PSL 2B2 RCP Seal J-Weld, Dated July 18, 2009
Report Number 0900835.401.R0, Evaluation of Plant St. Lucie (PSL) Nuclear Plant Unit 2 Reactor Cooling Pump (RCP) Small Bore Piping, By Structural Integrity Associates, Inc, Dated July 17, 2009
General Engineering Examination Report GIR No. 09-053, Penetrant Examination of Welds on RCP 2B2 Seal Connection Piping Runs
Work Order (WO) 39016662-10, Removing Pipe Spool and Installing a Blind Flange on Line RC-183, RCP 2B2
WO 39016719-01, Replace the Mechanical Seal Housing and Mechanical Seal on RCP 2B2
Appendix A Post Maintenance Test Form on RCP 2B2 Lower Cavity Seal Vent Cap and RC-228 Line Cap for External Leak Checks

Report No. 0800047.401.R0, Vibration Stress Analysis of Reactor Coolant Pump Small Bore Piping PSL Unit 2, by Structural Integrity Associates, Inc, Dated April 2008

P 71111.01, Section 1R01, External Flooding
ADM-04.01, Hurricane Season Preparation
AP-0005753, Severe Weather Preparations
Unit 2 TS 3.7.6, Flood Protection
Unit 2 TS Bases 3.7.6, Flood Protection
Unit 1 UFSAR Section 2.4.5, Probable Maximum Flood Surge and Seiche Flooding
Unit 1 UFSAR Section 2.4.5.9, Updated Surge Level and Wave Runup Analysis
Unit 2 UFSAR Section 2.4.5.3.2, Wave Runup
Unit 2 UFSAR Section 2.4.14, Technical Specification and Emergency Operation Requirements
Unit 1 and 2 UFSAR, Table 3.2-1, Design Classification of Structures, Systems and Components
Unit 1 UFSAR Section 3.4.4, Flood Protection
Unit 2 UFSAR Section 3.4.1, Flood Protection
Safety Evaluation Report for Facility Operating License DPR-67 and NPF-16 Amendments No. 142 and 82
Condition Reports related to flooding for the past 12 months
Outstanding WO's coded for "water intrusion"
CR 2009-26284, Degraded sealant along RAB Wall and 4" Hole Thru Unit 2RAB Wall

IP71111.06, Section 1RO6, Flood Protection Measures - Underground Manholes

Unit 1 Drawing 8770-G-701, Electrical Manhole & Handhole Drainage System
Unit 2 Drawing 2998-G-486, Electrical Manhole & Handhole Drainage System
WO 36018192, Unit 1 Inspect Safety-Related Manholes (completed 1/6/2008)
WO 37000775, Unit 2 Inspect Safety-Related Manholes (completed 2/15/2008)
CR 02-3235, Review PSL Electrical Manhole Inspection Program
PM Program Change Request #03-0049 for PM No. 99-MS-Hole, Manhole Inspection PM
CR 2009-26682, Details and Task Instructions of Manhole WO Need Improvement
CR 2009-26690, Unit 1 Manhole #136 Missing From Inspection WO
CR 2009-26904, Manhole Inspection WO 37000775 Closed Out With Some Manholes Uninspected

Condition Reports

2009-10624	2009-20387	2009-21124	2009-21887	2009-25146
2009-19025	2009-20399	2009-22623	2009-22043	2009-25177
2009-19038	2009-20410	2009-22728	2009-22098	2009-25189
2009-19122	2009-20422	2009-22763	2009-22180	2009-25301
2009-19293	2009-20424	2009-23550	2009-22182	2009-25371
2009-19361	2009-20447	2009-24019	2009-22211	2009-25637
2009-19365	2009-20554	2009-24112	2009-22251	2009-26282
2009-19395	2009-20581	2009-24130	2009-22335	2009-26298
2009-19397	2009-20944	2009-24332	2009-22357	2009-26379
2009-19441	2009-20978	2009-21280	2009-22520	2009-26402

2009-19540	2009-21000	2009-21429	2009-24339	2009-26413
2009-19624	2009-21085	2009-21537	2009-24340	2009-26849
2009-19774	2009-21088	2009-21636	2009-24387	2009-26857
2009-20029	2009-21100	2009-21705	2009-24527	2009-27061
2009-20298	2009-21104	2009-21878	2009-24850	
2009-20312	2009-21111	2009-21615		

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