



UNITED STATES
NUCLEAR REGULATORY COMMISSION

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

October 26, 2006

Mr. J. A. Stall
Senior 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
05000335/2006004, 05000389/2006004 AND 07200061/2006001

Dear Mr. Stall:

On September 30, 2006, the US Nuclear Regulatory Commission (NRC) completed an inspection at your St. Lucie Plant Units 1 and 2. The enclosed integrated inspection report documents the inspection findings which were discussed on October 3, 2006, with Mr. Johnston and other members of your staff.

The inspection examined activities conducted under your license as they relate 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 NRC identified finding and one self-revealing finding of very low safety significance (Green). One of these findings was determined to involve a violation of NRC requirements. Additionally, a licensee-identified violation which was determined to be of very low safety significance is listed in this report. However, because of the very low safety significance and because they were entered into your corrective action program, the NRC is treating these violations as non-cited violations (NCVs) consistent with Section VI.A.1 of the NRC Enforcement Policy. 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 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 NRC's document

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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,

IRA

Joel T. Munday, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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

Enclosure: Inspection Report 05000335/2006004, 05000389/2006004, 7200061/2006001
w/Attachment - Supplemental Information

cc w/encl: (See page 3)

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Report to J. A. Stall from Joel T. Munday dated October 26, 2006

SUBJECT: ST. LUCIE NUCLEAR PLANT - NRC INTEGRATED INSPECTION REPORT
05000335/2006004, 05000389/2006004 AND 07200061/2006001

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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.: 05000335/2006004, 05000389/2006004, 07200061/2006001

Licensee: Florida Power & Light Company (FPL)

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

Location: 6351 South Ocean Drive
Jensen Beach, FL 34957

Dates: July 1 - September 30, 2006

Inspectors: T. Hoeg, Senior Resident Inspector
S. Sanchez, Resident Inspector
D. Jones, Senior Resident Inspector (Acting)
J. Lenahan, Senior Reactor Inspector (Section 4OA5)

Approved by: Joel Munday,
Reactor Projects Branch 3
Division of Reactor Projects

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SUMMARY OF FINDINGS

IR 05000335/2006-004, 05000389/2006-004; 07/01/2006 - 09/30/2006; St. Lucie Nuclear Plant, Units 1 & 2; Permanent Plant Modifications, Event Followup.

The report covered a 3-month period of inspection by resident inspectors and an announced inspection by a Region II reactor inspector. Two Green findings, one of which was a non-cited violation (NCV), were identified. The significance of most findings is identified by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing finding was identified for failure of the licensee to use human performance tools as outlined in their Nuclear Administrative Procedure (NAP) 403, Conduct of Maintenance. Specifically, maintenance personnel did not perform adequate self checking to ensure they were at the right component before manipulating equipment which resulted in a loss of feedwater event and manual reactor trip.

This finding is greater than minor because it is associated with an increase in the likelihood of an initiating event. The finding involved the attribute of human performance and affected the initiating events objective of limiting the likelihood of those events that upset plant stability. Using Manual Chapter 0609, Appendix A, Attachment 1, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because although the finding contributed to a reactor trip, mitigation equipment and functions remained available. A contributing cause of the finding is related to the cross-cutting element of human performance, specifically relating to work practices where personnel did not use human error prevention techniques. (Section 40A3)

Cornerstone: Mitigating Systems

- Green. A Non-Cited Violation was identified for failing to implement administrative procedure ADM-27.11, Scaffold Control, on issues related to the erection of ladders and scaffold structures around safety related equipment. Specifically, over a short period of time (about a week) the inspectors identified four examples where either a structure or ladder was erected without an engineering evaluation being completed to ensure acceptability.

The finding is greater than minor because the failure to implement appropriate procedures to properly construct and seismically qualify scaffold in safety-related areas could become a more significant safety concern, if left uncorrected. The finding involved the attribute of equipment performance and affected the

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mitigating systems objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, Appendix A, Attachment 1, "Significance Determination Process," Phase 1 Worksheet, the finding was determined to have very low safety significance because it only affected the mitigating systems cornerstone, and all subsequent engineering evaluations determined that there was no adverse effect to mitigating equipment. A contributing cause of the finding is related to the cross-cutting element of human performance, specifically work practices, in that personnel failed to follow procedures when erecting ladders and structures near safety-related components. (Section 1R17)

B. Licensee-Identified Violations

One violation of very low safety significance, which was identified by the licensee, has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and corrective actions are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Both units operated at or near full Rated Thermal Power (RTP) for the entire inspection report period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

On August 29 and 30, the inspectors reviewed and verified licensee actions taken in accordance with their procedural requirements prior to the onset of tropical storm Ernesto. The inspectors observed plant conditions and evaluated those conditions using criteria documented in licensee procedure 0005753, "Severe Weather Preparations." The inspectors performed site walkdowns and plant tours to verify the licensee had made the required preparations. The inspectors performed reviews of plant exterior areas vulnerable to high wind conditions which included the following areas:

- Unit 1 and 2 Transformer Yards
- Unit 1 and 2 Turbine Buildings
- Unit 1 and 2 Intake Cooling Water (ICW) Basins
- Unit 1 and 2 Radiologically Controlled Areas (Outdoors)

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

Partial Walkdowns

a. Inspection Scope

The inspectors conducted four partial equipment alignment verifications of the safety-related systems listed below to review the operability of required redundant trains or backup systems while the other trains were inoperable or out of service (OOS). The inspectors looked to identify any discrepancies that could impact the function of the system, and therefore, potentially increase risk. These inspections included reviews of applicable Technical Specifications (TS), plant lineup procedures, operating procedures, and piping and instrumentation drawings (P&ID), which were compared with observed equipment configurations. The inspectors also reviewed applicable reactor control operator (RCO) logs; equipment OOS and operator workaround (OWA) lists; active

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temporary system alterations (TSA); and outstanding condition reports (CRs) regarding system alignment and operability.

- 2B Emergency Core Cooling System (ECCS) train with the 2A ECCS train OOS
- 1B/2B Startup Transformers (SUT) with 1A/2A SUT OOS
- 2B Emergency Diesel Generator (EDG) with 2A EDG OOS
- 1A EDG with 1B EDG OOS

b. Findings

No findings of significance were identified.

1R05 Fire Protection

Fire Protection - Tours

a. Inspection Scope

The inspectors conducted tours of the eight areas listed below to verify they conformed with licensee procedure AP-1800022, Fire Protection Plan. The inspectors specifically examined any transient combustibles in the areas and any ongoing hot work or other potential ignition sources. The inspectors also assessed whether the material condition, operational status, and operational lineup of fire protection systems, equipment and features were in accordance with the Fire Protection Plan. Furthermore, the inspectors evaluated the use of any compensatory measures being performed in accordance with the licensee's procedures and Fire Protection Plan.

- 2A SUT Area
- Unit 1 Vital Switchgear Rooms
- Unit 1 Cable Spreading Room
- Unit 1 EDG Fuel Oil Tank Areas
- Unit 2 ICW Pump Room
- Unit 2 Remote Shutdown Panel Room
- Unit 1 Pipe Penetration Room
- 2B EDG Room

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification ProgramResident Inspector Quarterly Reviewa. Inspection Scope

On September 11, 2006, an inspector observed and assessed licensed operator actions during a simulator requalification evaluation. During this simulator evaluation, the inspector witnessed the operating crew respond to a station blackout event. The inspector also reviewed simulator physical fidelity. The inspector specifically evaluated the following attributes related to the operating crews' performance:

- Clarity and formality of communication
- Prioritization, interpretation, and verification of alarms
- Control board operation and manipulation, including high-risk operator actions
- Oversight and direction provided by operations supervision, including ability to identify and implement appropriate TS actions, regulatory reporting requirements, and emergency plan actions and notifications
- Effectiveness of the post-evaluation critique

b. Findings

No findings of significance were identified.

1R12 Maintenance EffectivenessQuarterly Evaluationa. Inspection Scope

The inspectors reviewed the reliability and deficiencies associated with the two systems listed below, including associated CRs. The inspectors verified the licensee's maintenance effectiveness efforts met the requirements of 10 CFR 50.65 and licensee Administrative Procedure ADM-17.08, Implementation of 10 CFR 50.65, Maintenance Rule. The inspectors focused on the licensee's system functional failure determination, a(1) and a(2) classification determination, corrective actions, and the appropriateness of established performance goals and monitoring criteria. The inspectors also attended applicable expert panel meetings, and interviewed responsible engineers. The inspectors reviewed associated system health reports, and the licensee's goal setting and monitoring requirements.

- Unit 2 Emergency Diesel Generator (EDG) System
- Unit 2 High Pressure Safety Injection (HPSI) System

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the risk assessments for the following six Systems, Structures, and Components (SSCs), or a combination thereof, that were non-functional due to planned and/or emergent work. The inspectors also walked down and/or reviewed the scope of work to evaluate the effectiveness of licensee scheduling, configuration control, and management of online risk in accordance with 10 CFR 50.65(a)(4) and applicable licensee program procedure ADM-17.16, Implementation of the Configuration Risk Management Program. 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 OOS risk significant SSCs listed below:

- 2A Emergency Core Cooling System (ECCS) Train Critical Maintenance Management (CMM)
- 2B ECCS Train CMM
- 1B Component Cooling Water (CCW) Pump Overhaul, 1B EDG Surveillance, 1B Battery Charger Preventative Maintenance (PM)
- 2A SUT CMM, 2A Charging Pump PM
- 1B CCW Pump Overhaul, 1A SUT CMM
- Unit 2 Power Operated Relief Valve (PORV) Block Valve

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following five 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 Updated Final Safety Analysis Report (UFSAR), and associated supporting documents and procedures, and interviewed plant personnel to assess the adequacy of the interim disposition.

- CR 06-17344, Unit 2 PORV Block Valve
- CR 06-20363, 1B Steam Generator Level Channel Higher Than Other Three Channels
- CR 06-25341, High Amperage on Valve Operator MV-03-1A
- CR 06-26030, Valve V3809 Boric Acid Leak
- CR 06-26280, Valve MV-07-2A

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed licensee procedures QI-3-PSL-1, Design Control, ENG-QI-1.7, Design Input Verification, ADM-17.11, 10CFR 50.59 Screening, and observed part of the licensee's activities to implement a design change that installed concrete floors in the Unit 1 Diesel Oil Storage Tanks (DOST) areas. (The licensee installed concrete floors so that in the event that a spill occurs, the fuel oil would not be absorbed into the ground and possibly carried into the ground water system.) The inspectors reviewed the associated 10 CFR 50.59 screening against the system design basis documents to verify that the modifications had not affected system operability and availability. The inspectors reviewed selected ongoing and completed work activities to verify that installation was consistent with the design control documents listed in Minor Engineering Package (MEP) 05119, Secondary Containment of Unit 1 Diesel Oil Storage Tanks 1A and 1B.

b. Findings

Introduction: The inspectors identified a Green Non-Cited Violation (NCV) of TS 6.8.1.a and Regulatory Guide (RG) 1.33, for the licensee failing to implement administrative procedure ADM-27.11, Scaffold Control, on issues related to the erection of ladders and structures comprised of scaffold material around safety related equipment. Specifically, over a short period of time (about a week) the inspectors identified four examples where either a structure or ladder was erected without an engineering evaluation being completed to ensure acceptability.

Description: On August 9, 2006, while performing a walkdown during the Unit 2 ECCS Critical Maintenance Management (CMM), the inspectors identified a structure comprised of scaffold poles that had been erected for weather protection as maintenance was performed on the refuel water tank (RWT) ECCS suction valves. The inspectors questioned whether the structure met seismic qualifications since no horizontal restraints were observed on the structure. After the inspectors brought the concern to the main control room, CR 06-22980 was written and engineering evaluated the structure for seismic adequacy following the installation of additional horizontal restraints.

Also on August 9, 2006, while performing a Unit 2 EDG system walkdown as part of the biennial PI&R team inspection, the inspectors observed ladders attached to the EDG radiator shrouds for use by Operations to access the expansion tanks when adding water. The inspectors questioned the close proximity of the ladders to redundant safety-related equipment. After further questioning by the inspectors it was identified that engineering had not evaluated the seismic aspects of these ladders being left in place

until a permanent modification could be installed. CR 06-23014 was written to address this concern and an operability assessment determined that the configuration was acceptable.

On August 16, 2006, while performing a modification inspection walkdown, the inspectors identified a structure comprised of scaffold poles that had been erected for weather protection over the Unit 1 EDG fuel oil storage tanks area. The inspectors questioned the adequacy of several parts of the structure being so close to, and in some cases touching, redundant safety-related equipment, including the fuel oil storage tanks and electrical conduit. After further questioning by the inspectors it was identified that engineering had again not evaluated the seismic aspects of this large structure. CR 06-23703 was written and engineering determined that although the structure would not have collapsed during a seismic event, there were several areas where scaffold knuckles were relocated and more restraints were added to provide structural strength to the design margin.

On August 21, 2006, while performing a Unit 2 ICW system walkdown as part of the PI&R team inspection, the inspectors identified scaffolding that potentially could hinder the ability of the fire brigade to respond to a fire in the ICW pump house. The inspectors questioned whether members of the fire brigade, dressed in full fire-fighting gear would be able to access past the scaffolding erected immediately upon entering the ICW pump house, which is already a tight area to access without the installed scaffolding. CR 06-28404 was written and the licensee subsequently modified the structure to ensure that all members of the fire brigade could access the ICW pump house area.

Analysis: The inspectors determined that the licensee's failure to follow the scaffolding procedure was a performance deficiency. The inspectors concluded that the finding was greater than minor in accordance with IMC 0612, "Power Reactor Inspection Reports," Appendix B, "Issue Disposition Screening." The failure to implement appropriate procedures to properly construct and seismically qualify scaffold in safety-related areas, if left uncorrected, could become a more significant safety concern. The finding involved the attribute of equipment performance and affected the mitigating systems objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Using Manual Chapter 0609, Appendix A, Attachment 1, "Significance Determination Process," Phase 1 Worksheet, the finding is determined to have very low safety significance because it only affected the mitigating systems cornerstone, and all subsequent engineering evaluations determined that there was no adverse affect to the subject mitigating equipment. A contributing cause of the finding is related to the cross-cutting element of human performance, specifically work practices, in that personnel failed to follow procedures when erecting ladders and structures near safety-related components.

Enforcement: TS 6.8.1.a requires that written procedures shall be established, implemented, and maintained covering the activities specified in RG 1.33, Revision 2, February 1978. RG 1.33, Appendix A, Item 9.a, requires maintenance that can affect safety related equipment be properly preplanned and performed in accordance with

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written instructions appropriate to the circumstances. Licensee administrative procedure ADM-27.11, Scaffold Control, Revision 6, Sections 4.6, 6.3.1.A, 6.3.1.G, and 6.4.2.A, defines what is considered scaffolding, when an engineering evaluation is necessary, and requires restraints and bracing to be installed when there is a potential for the scaffold material to interact with safety-related or redundant equipment. In addition, ADM-27.11 requires Operations review and approval for the erection of scaffold over redundant safety-related equipment, as well as minimizing the duration that the scaffold remains in place. Contrary to the above, during a short period of time (from August 9 through 21, 2006), ADM-27.11, was not routinely followed when ladders and structures comprised of scaffold material were erected over and/or around redundant safety-related equipment without an engineering evaluation for seismic adequacy. Because the failure to implement the subject procedure is of very low safety significance and has been entered in the licensee's corrective action program (CAP), this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000335, 389/2006004-001, Failure to Follow Procedure for Erection of Temporary Ladders and Structures on or Around Safety Related Equipment. The licensee initiated a CR to assess the conditions and implement corrective actions for each of the above examples.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors witnessed and reviewed Work Order (WO) post maintenance test (PMT) activities of the six risk significant SSCs listed below. The following aspects were inspected: (1) Effect of testing on the plant recognized and addressed by control room and/or engineering personnel; (2) Testing consistent with maintenance performed; (3) Acceptance criteria demonstrated operational readiness consistent with design and licensing basis documents such as TS, UFSAR, and others; (4) Range, accuracy and calibration of test equipment; (5) Step by step compliance with test procedures and/or work orders (WO), and applicable prerequisites satisfied; (6) Control of installed jumpers or lifted leads; (7) Removal of test equipment; and, (8) Restoration of SSCs to operable status. The inspectors also reviewed problems associated with PMTs that were identified and entered into the licensee's CAP.

- WO 36016631, 1A Reactor Protection System (RPS) Delta Temperature Power Flux
- WO 34010575, Replace Output Breaker on 1B Battery Charger
- WO 33022719, 120 Month Overhaul of HVE-13B Fan Motor
- WO 36012850, PM on Valve Operator MV-03-1A
- WO 36009843, PM on Louver for Unit 2 HVE-9A Fan
- WO 36013497, PM on 2C Auxiliary Feedwater (AFW) Pump Trip and Throttle Valve

b. Findings

No findings of significance were identified.

1R22 Surveillance Testinga. Inspection Scope

The inspectors witnessed portions of the following five surveillance tests and monitored personnel conducting the tests as well as equipment performance, to verify that testing was being accomplished in accordance with applicable operating procedures. The test data was reviewed to verify it met TS, UFSAR, and/or licensee procedure requirements. The inspectors also verified that the testing effectively demonstrated the systems were operationally ready, capable of performing their intended safety functions, and that identified problems were entered into the licensee's CAP for resolution. The tests included two inservice tests (IST).

- 2-2200050A, 2A EDG Periodic Test and General Operating Instructions
- 2-2200050B, 2B EDG Periodic Test and General Operating Instructions
- 1-2200050B, 1B EDG Periodic Test and General Operating Instructions
- 2-0700050, 2C AFW Pump Periodic Test
- 1-0700050, 1C AFW Pump Periodic Test
-

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modificationsa. Inspection Scope

The inspectors continued to periodically screen active Temporary System Alterations (TSA) for risk significant systems. The inspectors examined the two TSAs listed below, including a review of the technical evaluation and its associated 10 CFR 50.59 screening. The TSA was compared to the system design basis documentation to ensure that: (1) the modification did not adversely affect operability or availability of other systems; (2) the installation was consistent with applicable modification documents; and, (3) did not affect TS or require prior NRC approval. The inspectors also observed accessible equipment related to the TSA to verify configuration control was maintained.

- 1-06-010, RPS D Linear Power Detector and Power Range Control Channel #2
- 2-06-14, Diesel Generator 2B Air Start System, Diesel Air Compressor 2B

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors reviewed the PI data of both Units 1 and 2 for the previous nine quarters (i.e., First Quarter 2004 through First Quarter 2006). Monthly Operating Reports, Licensee Event Reports (LERs), RCO Chronological Logs, and CRs were reviewed to verify the reported PI data was complete and accurate. The inspections were conducted in accordance with NRC Inspection Procedure 71151, "Performance Indicator Verification." The applicable planning standard, Nuclear Energy Institute (NEI) 99-02, Revision 4, "Regulatory Assessment Performance Indicator Guidelines," were used as reference criteria. The inspectors assessed the accuracy of the following PIs reported to the NRC:

- Unit 1 Safety System Functional Failures
- Unit 2 Safety System Functional Failures

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution of Problems

.1 Review of Items Entered into the Corrective Action Program

As required by Inspection Procedure 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for followup, the inspectors performed screening of items entered into the licensee's CAP. This was accomplished by reviewing the CR summaries from daily printed reports and periodically attending CR oversight group meetings.

.2 Annual Sample: Preventive Maintenance (PM) Program Deficiencies

a. Inspection Scope

The inspectors selected condition report CR 2006-15933, "1B EDG Output Breaker Failure to Open Following Surveillance Run," for a detailed review and discussion with the licensee. The inspectors reviewed the CR to ensure that the description of the condition was accurate and properly captured in their CAP; that the condition was properly classified and prioritized; and that the corrective actions were appropriate, timely, and consistent with the safety significance of the condition. The inspectors evaluated the CR in accordance with the licensee's corrective action process as specified in licensee procedure NAP-204, "Condition Reporting."

b. Findings and Observations

No findings of significance were identified. The licensee's review of the condition was comprehensive and thorough with eleven action items assigned for addressing the condition. A number of causes for the condition were identified by the licensee including weak procedural guidance for performing Truck Operated Cell (TOC) switch maintenance resulting in a high electrical resistance on the breaker cubicle switch contact due to the buildup of silver sulfide. Numerous corrective action items were assigned including but not limited to, improving maintenance procedures, checking resistance of other safety related TOC switches, and cleaning of selected TOC switches. At the close of this inspection period, the CR remained open with a number of actions planned for completion in 2006 and 2007. The inspectors found that the due dates of these actions were acceptable considering the potential consequences of the deficiency.

40A3 Event Followup

.1 (Closed) Licensee Event Report (LER) 05000389/2005002, Valve Mispositioning Led to Inoperable Iodine Removal System Train

On May 13, 2005, while in Mode 1 at 100% power, the licensee performed a quarterly valve line-up for the containment spray and iodine removal system and discovered the 2A hydrazine pump discharge to storage tank relief bypass valve (V07408) to be locked open instead of locked closed. Upon discovery the licensee promptly repositioned the valve to its required position. The licensee's investigation determined that the valve was mispositioned during surveillance test restoration activities on May 10, 2005. The licensee determined the cause to be human performance errors. This licensee-identified finding involved a violation of TS 3.6.2.2, Iodine Removal System. The Iodine Removal System (Train A) was inoperable for 78 hours which is greater than the 72 hours that is allowed by TS 3.6.2.2. The enforcement aspects of the violation are discussed in Section 40A7. This LER is closed.

.2 (Closed) Licensee Event Report (LER) 05000389/2005003, Personnel Error Caused Partial Loss of Feedwater and Manual Reactor Trip

Introduction: A Green self-revealing finding was identified for failure of the licensee to use human performance tools as outlined in their Nuclear Administrative Procedure (NAP) 403, Conduct of Maintenance. Specifically, maintenance personnel did not perform adequate self checking to ensure they were at the right component before manipulating equipment which resulted in a loss of feedwater event and manual reactor trip.

Description: On August 11, 2005, St. Lucie Unit 2 was in Mode 1 operation at 100 percent reactor power when plant maintenance personnel were walking down an equipment clearance order in preparation of working on a non safety related air compressor. The maintenance worker mistakenly went to the wrong non-vital 4160 Volt breaker cabinet to verify the job was safe to work and opened the breaker cubicle door

before realizing he was at the wrong breaker location and reclosed the door. The worker failing to properly verify he was at the correct breaker location and then manipulating the equipment is considered a performance deficiency.

After the breaker cabinet was re-closed, the worker heard the circuit breaker relays chattering which caused the spurious operation of a lockout relay and de-energization of two electrical buses. The lockout relay performed as designed and resulted in de-energizing a condensate pump causing a partial loss of feedwater event and manual reactor scram due to lowering steam generator water level. The subject relays were known to be sensitive door mounted components and susceptible to spurious operation if jarred. The breaker cabinet front door was properly labeled and had a caution placard identifying the cabinet as housing trip sensitive components and being susceptible to jarring when the door is operated. The worker failed to recognize and understand the breaker front labeling prior to opening the cabinet door.

Analysis: The licensee determined the cause of the event to be a human performance error. The finding is considered more than minor because in accordance with Manual Chapter 0612, Appendix B, the finding is associated with an increase in the likelihood of an initiating event. The finding affects the Initiating Events Cornerstone and was considered to have very low safety significance (Green) using Appendix A of the significance determination process because although the finding contributed to a reactor trip, mitigation equipment and functions remained available. This finding is important because it identifies a performance deficiency associated with the licensee's conduct of maintenance expectation to ensure components are correctly identified prior to their manipulation. A contributing cause of the finding is related to the cross-cutting element of human performance, specifically relating to work practices where personnel did not use human error prevention techniques. Because the finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as FIN 05000389/2006004-02, Personnel Error Caused Partial Loss of Feedwater and Manual Reactor Trip. The licensee documented this finding in CR 2005-22187.

Enforcement: Enforcement action does not apply because the performance deficiency did not involve a violation of a regulatory requirement. This LER is closed.

4OA5 Other

.1 Limited Scope 10 CFR Part 21 (Part 21) Program Assessment

a. Inspection Scope

The NRC inspectors reviewed the establishment and implementation of limited portions of St. Lucie's 10 CFR Part 21 program and associated 10 CFR Part 50 Appendix B quality assurance (QA) program focusing on Part 21 procedures and corrective actions. The inspectors assessed the effectiveness of St. Lucie's implementation of the provisions of 10 CFR Part 21, "Reporting of Defects and Noncompliance."

b. Findings

The NRC inspectors reviewed the documents referenced and conducted interviews with key personnel regarding CRs 2004-7759 and 2004-15524 as well as the applicable procedures. Specifically, St. Lucie's Part 21 procedures, QI 2.2, Revision 2, dated March 2, 1998 and Revision 3, dated May 31, 2005, were reviewed for their adequacy to ensure compliance with 10 CFR Part 21 reporting requirements. The inspectors determined that although the licensee had adequately installed in the plant, they had not evaluated equipment stored in the warehouse as spares. However, at the end of the inspection period, additional inspection was needed to resolve this issue. Therefore, pending additional inspection this will remain open as unresolved item URI 05000335, 389/2006-04-02, Inadequate Part 21 Procedures

.2 (Closed) NRC Temporary Instruction (TI) 2515/165: Operational Readiness of Offsite Power and Impact on Plant Risk

The inspectors reviewed licensee procedures and controls and interviewed operations and maintenance personnel to verify these documents contained specific attributes delineated in the TI to ensure the operational readiness of offsite power systems in accordance with plant Technical Specifications; the design requirements provided in 10 CFR 50, Appendix A, General Design Criterion 17, "Electric Power Systems;" and the impact of maintenance on plant risk in accordance with 10 CFR 50.65(a)(4), "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Documents reviewed are listed in the Attachment. Appropriate documentation of the results of this inspection was provided to NRC headquarters staff for further analysis, as required by the TI. This completes the Region II inspection TI requirements for the St. Lucie Nuclear Plant.

.3 Independent Spent Fuel Storage Installation (ISFSI)

a. Inspection Scope

The inspectors examined the engineered fill for support of the ISFSI Horizontal Structure Module (HSM) Storage structure.

b. Findings and Observation

The fill has been completed to the specified design elevation in the area for construction of the initial pad. Earthwork construction activities were performed under the supervision of a geotechnical engineer, an employee of the geotechnical engineering firm, GZA Environmental, the designers of the ISFSI foundation.

The inspectors reviewed the Geotechnical and Site Investigation and Evaluation report. This report established the limits of depth of excavation for removal of loose soils, the requirements for preparation of the subgrade, and the requirements for the engineered fill. The report specified the properties of the fill materials, the maximum lift thickness, and the minimum percent compaction (95 % of modified proctor determined by ASTM

(D1557). The inspectors reviewed the design drawings and the project specifications to verify the project design requirements, specified in the geotechnical design report, were translated into the construction documents. Minimum quality control testing requirements were specified in FPL Nuclear Assurance Quality Control Technique Sheet T. S. 10.10-1, PSL ISFSI Soils. The inspectors also reviewed Calculation numbers FPL009-CALC-003, ISFSI Pad Settlement Analysis, and FPL009-CALC-004, ISFSI Pad Slope Stability Analysis.

The inspectors reviewed records documenting excavation, subgrade preparation, and inspection of the engineered fill. These records included gradation testing of the fill materials performed at the offsite source to demonstrate that the material met design requirements, proctor tests performed to determine maximum dry density of fill materials, and nuclear density testing of the compacted fill in accordance with ASTM (D2922). In addition the inspectors reviewed confirmatory density testing performed using a sand cone test (ASTM D1556) to demonstrate the nuclear method density test results were compatible to those obtained with the sand cone method. The frequency of the soils testing were in accordance with requirements in the QC Technique Sheet 10.10-1. The inspectors examined the soils testing laboratory to ascertain equipment was calibrated and in good working order. Personnel performing the test were former QC inspection personnel who had been employed at the site during construction of Unit 2, and had extensive experience in soils testing and construction quality control.

The inspectors concluded that the engineered fill had been placed in accordance with design requirements. No findings of significance were identified.

4OA6 Meetings, Including Exit

On October 3, 2006, the resident inspectors presented the inspection results to Mr. Gordon Johnston and other members of his staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

On September 29, 2006, the Region II reactor inspector performed an interim exit meeting with Mr. Terry Patterson and other members of FPL staff.

4OA7 Licensee-Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCV.

Technical Specification 3.6.2.2 requires, in part, that the Iodine Removal System shall be operable with two iodine removal pumps capable of adding solution from the hydrazine storage tank to the containment spray system flow path. Contrary to this, from May 10 to May 13, 2006, the Unit 2 Iodine Removal System (Train A) was inoperable for 78 hours, which is greater than the 72 hours that is allowed by TS. The Iodine Removal System (Train A) was inoperable because a valve was mispositioned

during surveillance restoration activities. The licensee entered this issue into their CAP as CR 2005-14314. This finding is of very low safety significance because the likelihood of an accident leading to a failed reactor coolant system barrier that required iodine removal was not affected, the probability of early containment failure and therefore a large early release was negligible, and the redundant Iodine Removal System (Train B) remained operable during this time period.

ATTACHMENT: SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

L. Neely, Work Control Manager
B. Jacques, Security Manager
C. Buehrig, Maintenance Rule Coordinator
D. Calabrese, Emergency Preparedness Supervisor
W. Parks, Operations Manager
E. Armando, Site Quality Manager
K. Frehafer, Licensing Engineer
R. Hughes, Site Engineering Manager
M. Danford, Performance Improvement Department Supervisor
C. Costanzo, Plant General Manager
G. Johnston, Site Vice President
R. McDaniel, Fire Protection Supervisor
D. Albritton, Operations Supervisor
T. Patterson, Licensing Manager
G. Swider, Systems Engineering Manager
J. Tucker, Maintenance Manager
S. Wisla, Health Physics Manager
R. Walker, Emergency Preparedness Coordinator
D. Cecchett, Licensing Engineer
R. Merle, Projects Manager

NRC Personnel

B. Moroney, NRR Senior Project Manager
S. Ninh, Region II Senior Project Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened/Closed

05000335, 389/2006004-01	NCV	Failure to Follow Procedure for Erection of Temporary Ladders and Structures On Or Around Safety Related Equipment (Section 1R17)
05000389/2006004-02,	FIN	Personnel Error Caused Partial Loss of Feedwater and Manual Reactor Trip (Section 4OA3)

Opened

05000335, 389/2006004-03	URI	Inadequate Part 21 Procedures
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Closed

05000389/2005002-00	LER	Valve Mispositioning Led to Inoperable Iodine Removal System Train (Section 4OA3)
05000389/2005003-00	LER	Personnel Error Caused Partial Loss of Feedwater and Manual Reactor Trip (Section 4OA3)
2515/165	TI	Operational Readiness of Offsite Power and Impact on Plant Risk (Section 4OA5)

LIST OF DOCUMENTS REVIEWED

Procedures

ADM-27.11, Scaffold Control, Rev. 6
 2-2200050A, 2A EDG Periodic Test and General Operating Instructions, Rev. 72
 ADM-17.16, Implementation of the Configuration Risk Management Program, Rev. 9
 ADM-04.01, Hurricane Season Preparation, Rev. 15A
 0006128, Hurricane Staffing, Rev. 12
 0005753, Severe Weather Preparations, Rev. 41

Engineering Documents

Safety Evaluation JPN-PSL-SENP-95-049, Alternate NIS Excore Detector Arrangement
 MEP 05119, Secondary Containment of Unit 1 Diesel Oil Storage Tanks 1A and 1B, Rev. 1
 Design Basis Document DBD-EDG-2, Emergency Diesel Generator System, Rev. 3

Drawings and Work Control Documents

2998-G-088, Flow Diagram Containment Spray and Refueling Water Systems, Sheet 2, Rev. 22
 2998-G-078, Flow Diagram Safety Injection System, Sheet 130A, Rev. 12
 2998-G-078, Flow Diagram Safety Injection System, Sheet 130B, Rev. 12
 2998-G-078, Flow Diagram Safety Injection System, Sheet 131, Rev. 1
 2998-G-096, Flow Diagram EDG System Air Start package 2B, Rev. 5
 Manager Summary/Shift Manager Tailboard Agenda for CMM, 2A ECCS

Corrective Action Documents

2005-14314, V07408 was found out of position causing 2A Iodine Removal System to be inoperable

Condition Reports

06-20363	06-20655	06-20656	06-20265	06-20756	06-20811
06-21464	06-21492	06-21860	06-22342	06-22488	06-22463
06-22684	06-22685	06-22688	06-22793	06-22801	06-22852
06-22859	06-22893	06-22980	06-23014	06-23082	06-23084
06-23289	06-23315	06-23329	06-23422	06-23482	06-23504
06-23529	06-23693	06-23779	06-23848	06-23855	06-24021

06-25238	06-25248	06-25341	06-25782	06-25961	06-26999
06-25921	06-25987	06-26016	06-26019	06-26030	06-26075
06-26079	06-26280	06-26388	06-26421	06-26498	06-26532
06-26543	06-26554				

Other

LER 05000389/2005002, Valve Mispositioning Led to Inoperable Iodine Removal System Train

LIST OF ACRONYMS USED

AFW	Auxiliary Feedwater System
CAP	Corrective Action Program
CCW	Component Cooling Water
CMM	Critical Maintenance Management
CRs	Condition Reports
DOST	Diesel Oil Storage Tank
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
HPSI	High Pressure Safety Injection
ICW	Intake Cooling Water System
IST	Inservice Test
LER	Licensee Event Report
NEI	Nuclear Energy Institute
OLRM	Online Risk Monitor
OOS	Out of Service
OWA	Operator Workaround
PARs	Publicly Available Records
PI	Performance Indicator
P&ID	Piping and Instrument Drawings
PM	Preventative Maintenance
PMT	Post Maintenance Test
PORV	Power Operated Relief Valve
RCO	Reactor Control Operator
RG	Regulatory Guide
RPS	Reactor Protection System
RTP	Rated Thermal Power
SG	Steam Generator
SSCs	Systems, Structures, and Components
SUT	Startup Transformer
TS	Technical Specification
TSA	Temporary System Alterations
UFSAR	Updated Final Safety Analysis Report
WO	Work Order