



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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ATLANTA, GEORGIA 30303-1257

October 24, 2017

Mr. Mano Nazar
President and Chief Nuclear Officer
Nuclear Division
Florida Power & Light Company
Mail Stop: EX/JB
700 Universe Blvd.
Juno Beach, FL 33408

SUBJECT: ST. LUCIE PLANT – NRC INTEGRATED INSPECTION REPORT
05000335/2017003 AND 05000389/2017003

Dear Mr. Nazar:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your St. Lucie Plant Units 1 and 2. On October 10, 2017, the NRC inspectors discussed the results of this inspection with Mr. DeBoer and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented one finding of very low safety significance (Green) in this report. This finding involved a violation of NRC requirements. The NRC is treating this issue as a non-cited violation consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violation or significance of the non-cited violation, 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; and the NRC resident inspector at the St. Lucie Power Plant.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

LaDonna B. Suggs, Chief
Reactor Projects Branch 3
Division of Reactor Projects

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

Enclosure:
IR 05000335/2017003 and 05000389/2017003
w/Attachment: Supplemental Information

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05000335/2017003 AND 05000389/2017003 October 24, 2017

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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: 05000335/2017003, 05000389/2017003

Licensee: Florida Power & Light Company (FPL)

Facility: St. Lucie Plant, Units 1 and 2

Location: 6501 South Ocean Drive
Jensen Beach, FL 34957

Dates: July 1, 2017 to September 30, 2017

Inspectors: T. Morrissey, Senior Resident Inspector
S. Roberts, Resident Inspector
B. Bishop, Project Engineer (Sections 1R01, 1R11, and 4OA3)
R. Reyes, Resident Inspector Turkey Point (Sections 1R05, 1R15
and 1R22)
R. Taylor, Senior Project Inspector (Sections 1R01, 1R11, and 4OA3)

Approved by: LaDonna B. Suggs, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000335/2017003, 05000389/2017003; 07/01/2017 – 09/30/2017; St. Lucie Nuclear Plant, Units 1 and 2; Follow-up of Events and Notice of Enforcement Discretion.

The report covered a three month period of inspection by resident inspectors and region based specialist inspectors. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, or Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. All violations of NRC requirements were dispositioned in accordance with the NRC's Enforcement Policy dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green: A self-revealing Green non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified for the licensee's failure to verify the adequacy of the design of Unit 2, engineered safeguards 4.16 kilovolt (kV) bus under-voltage (UV) protection circuits. Specifically, the licensee failed to install protective devices such as isolation fuses for the Unit 2 local emergency diesel generator (EDG) voltmeters. Immediate corrective actions included: 1) placing caution tags on the 2A and 2B EDG voltmeter switches which directed the switches to not be left in position "1-3", 2) replaced the local 2A EDG voltmeter, and 3) implemented actions to replace the 2B EDG voltmeter. The licensee entered the issue into the corrective action program (CAP) and planned actions to prevent recurrence by developing and implementing a modification to install isolation fuses for both 2A and 2B EDG local voltmeter circuits.

The licensee's failure to install protective devices such as fuses in the Unit 2 4.16 kV engineered safeguards bus UV protection circuits, in accordance with Institute of Electrical and Electronics Engineers (IEEE) 308-1971, was a performance deficiency. The performance deficiency was determined to be more than minor because it affected the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failing to install protective devices to automatically isolate a faulted voltmeter could lead to the loss of offsite power to a Unit 2 4.16 kV engineered safeguards bus. The finding was not greater than low safety significance (Green), because the deficiency affected the design or qualification of a structure, system, or component (SSC) and the deficiency on its own did not impact the operability of the SSC. This finding was not assigned a cross-cutting aspect because the issue did not reflect current licensee performance. (Section 4OA3)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). On September 11, 2017 the east switchyard bus automatically de-energized due to electrical grounds from salt accumulation deposited from tropical storm winds from Hurricane Irma. Unit 1 reduced power to approximately 25 percent RTP and the unit was placed in hot shutdown. The east switchyard bus was washed down and returned to service. On September 12, 2017, Unit 1 was restarted and reached 100 percent RTP on September 13, 2017.

Unit 2 was at 100 percent RTP during the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (IP 71111.01)

.1 Impending Adverse Weather Conditions - Hurricane Irma

a. Inspection Scope

The inspectors reviewed the licensee's overall preparations and protective actions prior to and during the onset of tropical storm force winds experienced onsite that were associated with Hurricane Irma on September 9-10, 2017. The inspectors independently reviewed and verified the status of licensee actions completed in accordance with the licensee's administrative procedure 0005753, "Severe Weather Preparations." The inspectors also toured the protected area and exterior plant grounds to verify any loose debris and unsecured material, supplies, and equipment which could pose a hazard to important plant SSCs during high winds had been removed or tied down. Additional areas toured are listed below.

- Unit 1 and Unit 2 radiological controlled area
- Unit 1 and Unit 2 EDG buildings
- Unit 1 and Unit 2 intake cooling water (ICW) system areas
- Unit 1 and Unit 2 component cooling water (CCW) areas
- Unit 1 and Unit 2 turbine buildings
- Unit 1 and Unit 2 startup transformer (SUT), auxiliary transformer and main transformer areas

During the approach, onset and passing of Hurricane Irma, inspectors continuously monitored control room activities, including monitoring the shutdown of Unit 1 after the storm passed. The inspectors walked down the areas listed above to verify there was no damage to safety-related equipment. The inspectors routinely attended hurricane preparation status and progress meetings in the outage command center. The licensee declared an Unusual Event emergency classification due to the site being under a hurricane warning. The inspectors verified the licensee documented and resolved weather-related problems in the CAP

b. Findings

No findings were identified.

1R04 Equipment Alignment (IP 71111.04)

Partial Equipment Walkdowns (Quarterly)

a. Inspection Scope

The inspectors conducted 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 and that those issues were documented in the CAP. Documents reviewed are listed in the Attachment. This inspection constitutes four samples as noted below.

- Unit 2, 2A, and 2C CCW trains lined up to the 2A CCW heat exchanger (HX) while the 2B CCW HX was out of service (OOS) to plug a leaking tube
- Unit 2, 2B high pressure safety injection (HPSI) train, while the 2A HPSI train was OOS for planned surveillance testing
- Unit 2, 2A ICW train, while the 2B CCW HX was OOS to plug a leaking tube
- Unit 1, charging pumps 1A and 1C while 1B charging pump was OOS for planned maintenance

b. Findings

No findings were identified.

1R05 Fire Protection (IP 71111.05)

Fire Area Walkdowns (Quarterly)

a. Inspection Scope

The inspectors toured the following 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 procedures 1800022, "Fire Protection Plan," and ADM-19.02, "Pre-Fire Plan Standard Operating Procedure." The licensee's fire impairment lists, updated on an as-needed basis, were routinely reviewed. In addition, the inspectors reviewed the CAP database to verify that fire protection problems were being identified and appropriately resolved. Documents reviewed are listed in the Attachment. This inspection constitutes six samples. The following areas were inspected:

- Unit 1, 1A, and 1B 4.16 kV engineered safeguards switchgear rooms
- Unit 2, ICW system pump area
- Unit 2, 2B containment spray pump and 2B HPSI pump area
- Unit 1, 1A containment spray pump and 1A HPSI pump area
- Unit 1, Cable spreading room
- Unit 2, 2A, and 2B EDG buildings

b. Findings

No findings were identified.

1R06 Flood Protection Measures (IP 71111.06)

Internal Flooding

a. Inspection Scope

The inspectors conducted a walkdown of the Unit 2 charging pump area which included checks of building structure drainage sumps to ensure that flood protection measures were in accordance with design specifications and the Unit 2 Updated Final Safety Analysis Report (UFSAR), Section 3.4.3, "RAB Internal Flooding Due to Equipment Failure." The inspectors also reviewed plant procedures that discussed the protection of areas containing safety related equipment that may be affected by internal flooding. Specific plant attributes that were checked included structural integrity, sealing of penetrations, control of debris, and operability of sump pump systems. Documents reviewed are listed in the Attachment. This inspection constitutes one sample.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (IP 71111.11Q)

.1 Resident Inspector Quarterly Review

a. Inspection Scope

On July 31, 2017, the inspectors observed and assessed an evaluated licensed operator simulator scenario during continuing training on the control room simulator. The simulated scenario included a loss of a CCW pump, a loss of coolant accident (LOCA) and a manual reactor trip. The LOCA resulted in an Alert classification and notification to the State. The inspectors also reviewed simulator physical fidelity and specifically evaluated the following attributes related to the operating crews' performance. Documents reviewed are listed in the Attachment.

- 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 abnormal 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 (TS) actions, regulatory reporting requirements, and emergency plan classification and notification
- Crew overall performance and interactions
- Effectiveness of the post-evaluation critique

This inspection constitutes one review of licensed operator requalification sample.

b. Findings

No findings were identified.

.2 Control Room Observations

a. Inspection Scope

The inspectors observed and assessed licensed operator performance in the plant and main control room, particularly during periods of heightened activity or risk and where the activities could affect plant safety. Documents reviewed are listed in the Attachment. Specifically, the inspectors observed activities in the control room during the following evolutions:

- September 11, 2017, Unit 1 shutdown to Mode 3 (hot standby)
- September 10-11, 2017, control room heightened activity associated with abnormal operating procedure (AOP) entries due to reduced off-site transmission capacity, loss of startup transformer due to loss of east switchyard bus, and influx of seaweed due to Hurricane Irma
- September 12, 2017, Unit 1 startup activities from Mode 3 to Mode 2 (Startup)

The inspectors focused on the following conduct of operations attributes as appropriate:

- Operator compliance and use of procedures
- Control board manipulations
- Communication between crew members
- Use and interpretation of plant instruments, indications and alarms
- Use of human error prevention techniques
- Documentation of activities, including initials and sign-offs in procedures
- Supervision of activities, including risk and reactivity management

This inspection constitutes three samples of control room observations.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (IP 71111.12Q)

a. Inspection Scope

The inspectors reviewed the performance data associated with the one system, and for the equipment issues 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 10 CFR 50.65, The Maintenance Rule (MR)." The inspectors focused on maintenance rule scoping, characterization of maintenance problems and failed components, risk significance, determination of MR 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 reviewed some of the corrective maintenance activities. The inspectors reviewed associated system health reports. The inspectors verified that equipment problems were being identified and entered into the licensee's CAP. The inspectors reviewed quality control aspects associated with the replacement of the 2C ICW pump motor in Work Order (WO) 40296168. The inspectors verified quality parts were installed and foreign material exclusion closeouts were properly completed. The inspectors verified that proper consumable items such as lubricants, sealers, and cleaners were utilized. The inspectors verified the correct lubricating oil was used in the motor bearings. Documents reviewed are listed in the Attachment. This inspection constitutes three inspection samples.

- Action request (AR) 2187421, Unit 2 low pressure safety injection (LPSI) system header control valve HCV-3615
- AR 2213017, Unit 2 CCW surge tank slowly lowering due to 2B CCW HX tube leakage
- Unit 2 ICW system (QC Sample)

b. Findings

No findings were identified

1R13 Maintenance Risk Assessments and Emergent Work Control (IP 71111.13)

a. Inspection Scope

The inspectors completed in-office reviews, plant walkdowns, and control room inspections of the licensee's on-line risk assessment of 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," and licensee procedures 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 OOS risk significant SSCs listed

below. Documents reviewed are listed in the Attachment. This inspection constitutes seven samples.

- Unit 1, Yellow OLRM assessment with 1A CCW HX OOS for planned maintenance
- Unit 2, Yellow OLRM assessment with 2B CCW HX OOS for emergent HX tube plugging
- Unit 1, Yellow OLRM assessment with 1B HPSI pump OOS for planned maintenance
- Unit 2, Green OLRM assessment with 2A HPSI and 2A LPSI OOS for planned surveillance testing
- Unit 1, Green OLRM assessment with electrical equipment supply fan 5B OOS for planned maintenance
- Unit 1, Green OLRM assessment with 1A start-up transformer OOS for post Hurricane Irma cleaning
- Unit 2, Green OLRM assessment with 2B CCW HX OOS for emergent HX tube plugging

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (IP 71111.15)

a. Inspection Scope

The inspectors reviewed the following ARs' interim dispositions and operability determinations, or functionality assessments, to ensure that they were properly supported and the affected SSCs remained available to perform their 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. Documents reviewed are listed in the Attachment. This inspection constitutes six samples.

- AR 2213424, 2B battery cell plates showing degradation
- AR 2212268, Unit 2 CCW system leakage
- ARs 2211670, 2211378, degraded 1B HPSI pump motor air box bolting
- AR 2215752, 2B EDG pressure switch, PS-59-065B, sensing line broken
- AR 2226606, 2B EDG load transient during monthly surveillance
- AR 2221319, 2C ICW piping corrosion cells

b. Findings

No findings were identified.

1R18 Plant Modifications (IP 71111.18)

a. Inspection Scope

The inspectors reviewed the engineering change documentation for the temporary modification listed below. The inspectors reviewed the modification to verify it was implemented as described in procedure EN-AA-205-1100, "Design Change Packages." The inspectors reviewed the 10 CFR 50.59 screening and evaluation review to verify that the modification had not affected system operability and availability. The inspectors reviewed associated plant drawings and UFSAR documents impacted by these modifications and discussed the changes with licensee personnel to verify the installations were consistent with the modification documents. The inspectors observed portions of each modification installation. Additionally, the inspectors verified that any issues associated with the modifications were identified and entered into the licensee's CAP. This inspection constitutes one sample.

- Engineering Change 289348, Install housekeeping enclosure on pressurizer vent valve, V1455, that has packing leakage

b. Findings

No findings were identified.

1R19 Post Maintenance Testing (IP 71111.19)

a. Inspection Scope

For the maintenance WOs listed below, the inspectors reviewed the test procedures, and either witnessed the testing, 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 licensee procedure ADM-78.01, "Post Maintenance Testing," were incorporated into test requirements. Documents reviewed are listed in the Attachment. This inspection constitutes six samples.

- WO 40548654, Unit 2, troubleshoot and replace relay for reactor coolant system loop temperature indication
- WO 40296168, Unit 2, 2B ICW motor replacement
- WO 40478804, Unit 1, replace valve packing for V3654, 1B HPSI pump discharge valve
- WO 40552977, Unit 1, control element assembly 2 transferred to its lower gripper coil, troubleshoot and repair
- WO 40547753, Unit 2 CCW HX 2B tube leak repair
- WO 40553976, Unit 2 reactor protection system (RPS) channel C pressurizer pressure instrument repair

b. Findings

No findings were identified.

1R22 Surveillance Testing (IP 71111.22)a. Inspection Scope

The inspectors either reviewed or witnessed the following surveillance tests to verify that the tests met TS, UFSAR, and licensee procedural requirements. The inspectors verified that the tests 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 standby alignment required for the system to perform its safety function. The inspectors verified that surveillance issues were documented in the CAP. This inspection constitutes six total inspection samples under the testing activities listed below.

In-Service Tests:

- 2-OSP-03.05A, 2A High Pressure Safety Injection Pump Code Run

Surveillance Tests:

- 2-OSP-59.01B, 2B Emergency Diesel Generator Monthly Surveillance (Fast Start)
- 0-OSP-37.01, Emergency Cooling Water Canal – Periodic Test (Unit 2)
- 2-OSP-09.01C, 2C Auxiliary Feedwater Pump Code Run
- 1-SMI-66.12, Operational Control Element Assembly Block Circuit Functional Test

Reactor Coolant System (RCS) Leakage Detection Surveillance:

- 1-OSP-01.03, Reactor Coolant System Inventory Balance

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness (EP)

1EP6 Drill Evaluation (IP 71114.06)Emergency Preparedness Drillsa. Inspection Scope

On July 12, 2017, the inspectors observed the simulator control room and Technical Support Center staff during one drill of the site emergency response organization to verify that the licensee was properly classifying emergency events, completing the required notifications, and making appropriate protective action recommendations. The simulated scenario included an RCS leak, a rapid down power, a small break LOCA, a loss of a safety-related bus and a loss of emergency core cooling. The simulated scenario included assessing classification of the emergency event and completing notifications to the State and NRC.

The inspectors assessed the licensee's 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 verified the Notice of Unusual Event, Alert, Site Area Emergency, and General 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 verified that licensee identified critique items and any drill/training weaknesses were captured in the CAP.

This inspection constitute one sample of an observation of an emergency preparedness drill.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (IP 71151)

Mitigating Systems

a. Inspection Scope

The inspectors checked licensee submittals for the performance indicators (PIs) listed below for the period July 1, 2016 through June 30, 2017, to verify the accuracy of the PI data reported during that period. PI definitions and guidance contained in Nuclear Energy Institute (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. This inspection constitutes two samples.

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

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (IP 71152)

Daily Review

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," 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 action requests and by reviewing the licensee's electronic CAP database. Additionally, RCS unidentified leak rate data was checked on a daily basis to verify there were no substantive or unexplained changes.

b. Findings

No findings were identified.

4OA3 Follow-up of Events and Notice of Enforcement Discretion (IP 71153)

.1 Unit 1 Shutdown due to Degraded Switchyard Conditions

a. Inspection Scope

On September 11, 2017 at 0240 hours, the east switchyard bus automatically de-energized due to grounds from chloride accumulation on the ceramic insulators. The chloride accumulation was deposited by tropical storm force winds experienced on site during the approach of Hurricane Irma. This resulted in a loss of power to the 1B and 2B SUT and the opening of one of the two Unit 1 generator output breakers. At 0539 hours, the east switchyard bus, as well as the SUTs, were reenergized and the Unit 1 generator output breaker was closed. At 0543, the east switchyard bus again de-energized resulting in the same conditions as noted above. The licensee entered 1-AOP-22.01, "Rapid Down Power" and reduced Unit 1 power to approximately 23 percent RTP due to the degraded switchyard condition. The unit was shut down at 1102 hours on September 11, 2017. The inspectors evaluated operator actions and performance during this unplanned transient to verify that it was appropriate. The inspectors reviewed operator logs, computer and recorder data, and the post trip report to verify that plant equipment responded appropriately. In addition, the inspectors verified that the degraded switchyard condition was appropriately resolved prior to unit restart.

b. Findings

No findings were identified.

.2 (Closed) Licensee Event Report (LER) 05000389/2017-002-00, "2A3 4.16 KV Bus De-Energization Due to Voltage Meter Failure"

a. Inspection Scope

The LER documented an automatic actuation of the emergency AC electrical power system 2A EDG. The inspectors reviewed the LER and the associated root cause evaluation (AR 2205200) to verify the accuracy and completeness of the LER and the appropriateness of the licensee's corrective actions. The inspectors also reviewed the LER and AR to identify any licensee performance deficiencies associated with the issue.

b. Findings

Introduction: A self-revealing Green NCV of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," was identified for the licensee's failure to verify the adequacy of the design of Unit 2, engineered safeguards 4.16 kV bus under voltage protection circuits. Specifically, the licensee failed to install protective devices (i.e. isolation fuses) for the Unit 2 local EDG voltmeters.

Description: On May 15, 2017, with Unit 2 at 100 percent RTP and the 2A EDG out of service for planned maintenance, the 2A3 4.16 kV emergency switchgear UV protection relays actuated, which caused the bus's normal supply breaker to open. With the 2A EDG out of service, the bus remained de-energized until the normal source of power could be restored.

The licensee's troubleshooting team determined that both secondary side potential transformer (PT) fuses for the 2A3 bus were open or blown, which resulted in the de-energization and actuation of the UV relays. Forensic testing identified an internal fault in the 2A EDG local voltmeter that was consistent with the PT blown fuse indication and the loss of power to the UV circuit. The voltmeter and PT fuses were replaced and the 2A3 bus was restored to its normal source of power. The 2A3 bus had been de-energized for approximately 5 hours and 40 minutes. During the event, Unit 2 remained in compliance with Unit 2 technical specifications.

The licensee's root cause evaluation (RCE) determined that the root cause was an internal fault within the local EDG voltmeter which caused a phase to phase short. The fault, in conjunction with the local voltmeter selector switch in position "1-3", exposed both PT fuses to the momentary fault current. As a result of both fuses opening, the UV actuation circuit logic was satisfied. A contributing cause was determined to be a latent design deficiency from original construction of not having isolation fuses for the voltmeter portion of the circuit. Protective devices such as fuses would have automatically isolated a failed voltmeter and prevented any fault current from impacting the UV actuation circuitry.

Interim corrective actions included: 1) placing caution tags on the 2A and 2B EDG voltmeter switches which directed the switches to not be left in position "1-3", 2) replaced the local 2A EDG voltmeter, and 3) implemented actions to replace the 2B EDG voltmeter. Corrective actions planned to prevent recurrence included developing and implementing a modification to install isolation fuses for both 2A and 2B EDG local voltmeter circuits. The licensee's extent of condition review determined that the same condition did not exist for Unit 1. The design for Unit 1 included isolation fuses for both EDG local voltmeters.

Analysis: The licensee's failure to install protective devices, such as fuses in the Unit 2 4.16 kV engineered safeguards bus UV protection circuits, in accordance with IEEE 308-1971, was a performance deficiency. The performance deficiency was determined to be more than minor because it affected the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone's objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failing to install protective devices to automatically isolate a faulted voltmeter could lead to the loss of offsite power to a Unit 2 4.16 kV engineered safeguards bus.

The finding was assessed using IMC 0609, Attachment 4, "Initial Characterization of Findings," issued October 7, 2016, for Mitigating Systems, and IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," issued June 19, 2012, and using Exhibit 2, was determined to be of very low safety significance (Green), because it was a deficiency that affected the design or qualification of an SSC and the deficiency on its own did not impact the operability of the SSC. In accordance with IMC 0308, Attachment 3, "Significance Determination Process Technical Basis," effective June 16, 2016, the SDP screen focused solely on assessing the significance of the degraded condition caused by the licensee performance deficiency and did not consider the degraded conditions caused by the failed voltmeter coincident with the 2A EDG being out of service for planned maintenance.

This finding was not assigned a cross-cutting aspect because the issue did not reflect current licensee performance.

Enforcement: Title 10 CFR Part 50, Appendix B, Criterion III, "Design Control," stated, in part, that design control measures shall be established to assure that applicable regulatory requirements were correctly translated into specifications. Unit 2 UFSAR Section 8.3.1.2.2., "Regulatory Guide Implementation," stated, in part that, "The Class 1E electric systems comply with the requirements of IEEE 308-1971 as modified by Regulatory Guide 1.32." Section 5.2.6 of IEEE 308-1971, "Protective Devices," stated, "Protective devices shall be provided to isolate failed equipment automatically." Contrary to the above, since initial Unit 2 operation in 1983, the licensee failed to ensure that protective devices, such as isolation fuses, were installed for the 2A and 2B EDG local voltmeters. The protective devices (i.e. isolation fuses) would automatically isolate a failed voltmeter such that a voltmeter fault would not result in an unnecessary loss of the preferred offsite power supply. The licensee was planning to restore compliance by implementing a modification to add isolation fuses to the 2A and 2B EDG local voltmeter circuits. To mitigate the risk before this corrective action was completed, the time that the voltmeter selector switches are in the "1-3" position will be minimized. This violation did not present any actual or potential safety consequence, because the performance deficiency was related to a non-conformance with a design standard upon which only one train would be affected by a postulated single failure, and the other train would remain available and capable to respond to the design basis accident. Because this violation was of very low safety significance (Green) and was entered into the licensee's CAP as AR 2205200, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy: NCV 05000389/2017003-01, Adequacy of Unit 2 Engineered Safeguards 4.16 kV Bus UV Protection Design.

4OA5 Other Activities

Independent Spent Fuel Storage Installation (ISFSI) Walk down (IP 60855.1)

a. Inspection Scope

The inspectors conducted two walk downs of the ISFSI controlled access fenced-in cask area per Inspection Procedure 60855.1, "Operation of an ISFSI at Operating Plants." One walkdown was completed in the first quarter of 2017 and the second in

the third quarter of 2017. The inspectors observed each cask building temperature indicator and passive ventilation system to be free of any obstruction allowing natural draft convection decay heat removal through the air inlet and air outlet openings. The inspectors observed associated cask building structures to be structurally intact and radiation protection access controls to the ISFSI area to be functional. The inspectors verified that operations personnel were walking down the ISFSI twice daily and a physical inventory had been conducted on all spent fuel stored in the ISFSI at least every 12 months. These walkdowns fulfill the requirements of observing routine performance of normal ISFSI activities for calendar year 2017. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4OA6 Meetings

Exit Meeting Summary

The resident inspectors presented the inspection results to Mr. DeBoer and other members of licensee management on October 10, 2017. 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: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

T. Summers, Southern Region Vice President
D. DeBoer, Site Director
R. Baird, Training Manager
G. Bowen, Emergency Preparedness Manager
E. Burgos, Chemistry Section Supervisor
A. Dong, Maintenance Director
J. Francis, Health Physics Manager
K. Frehafer, Licensing Engineer
M. Haskin, Projects Site Manager
M. Jones, Engineering Director
T. Miller, Assistant Operations Manager - Line
W. Parks, Operations Director
R. Sciscente, Licensing Engineer
M. Snyder, Licensing Manager
T. Spillman, Assistant Operations Manager – Training

NRC Personnel:

LaDonna B. Suggs, Chief, Branch 3, Division of Reactor Projects

LIST OF ITEMS OPENED AND CLOSED

Opened and Closed

05000389/2017003-01	NCV	Adequacy of Unit 2 Engineered Safeguards 4.16 kV Bus UV Protection Design (Section 4OA3.2)
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Closed

05000389/2017-002-00	LER	2A3 4.16 kV Bus De-Energization Due to Voltage Meter Failure (Section 4OA3.2)
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LIST OF DOCUMENTS REVIEWED

Section 1R04 Equipment Alignment

2-NOP-14.01, Component Cooling Water System Initial Alignment
2-NOP-14.02, Component Cooling Water System Operation
2-NOP-03.11, High Pressure Safety Injection System Initial Alignment
2-NOP-21.12, Intake Cooling Water System Initial Valve Alignment
1-NOP-02.11, Charging and Letdown Initial Alignment

Section 1R05 Fire Protection

ADM-0005729, Fire Protection Training, Qualification and Requalification
ADM-1800022, Fire Protection Plan
ADM-19.02, Pre-Fire Plan Standard Operating Procedure
Pre-Fire Plan PFP-2-RAB-(-0.5), Unit 2 Reactor Auxiliary Building
Pre-Fire Plan PFP-1-RAB-(-0.5), Unit 1 Reactor Auxiliary Building
Pre-Fire Plan PFP-1-RAB-43, Unit 1 Reactor Auxiliary Building
Pre-Fire Plan PFP-2-IS, Unit 2 Intake Structure
Pre-Fire Plan PFP-2-DGB-19.5, Unit 2 Diesel Generator Building

Section 1R06 Flood Protection Measures

2-AOP-24.01, RAB Flooding
2-ARP-01-LA00, Control Room Panel LA00
2-ARP-01-LB00, Control Room Panel LB00
2998-G-889 – Unit 2 RAB Plumbing and Drainage Drawing

Section 1R11 Licensed Operator Requalification Program and Licensed Operator Performance

2-EOP-01, Standard Post Trip Actions SPTA
2-EOP-03, Loss of Coolant Accident
2-EOP-09, Loss of Offsite Power/Loss of Forced Circulation
EPIP-01, Classification of Emergencies
EPIP-02, Duties and Responsibilities of the Emergency Coordinator
1-EOP-01, Standard Post Trip Actions SPTA
1-EOP-02, Reactor Trip Recovery RTR
1-GOP-302, Reactor Plant Startup - Mode 3 - Mode 2
1-AOP-22.01, Rapid Downpower
1-GOP-123, Turbine Shutdown - Full Load to Zero Load
0-AOP-53.04, Reduced Offsite Transmission Capacity
2-AOP-53.04, Loss of Startup Transformer
2-AOP-21.01, Circulating Water System
2-AOP-21.02, Debris Filter System
2-AOP-21.11, Condenser tube Cleaning System
2-AOP-18.01, Loss of Instrument Air

Section 1R12 Maintenance Effectiveness

ER-AA-100-2002, Maintenance Rule Program Administration
SCEG-004, Guideline for Maintenance Rule Scoping, Risk Significant Determination, and Expert Panel Activities.
WO 40296168, Motor 2B ICW replacement
AR 2221319, U2 ICW piping corrosion cells
AR 2205323, Unit 2 CCW surge tank level slowly lowering

Unit 2 CCW system health report

Unit 2 ICW system health report

Section 1R13 Maintenance Risk Assessments and Emergent Work Control

OP-AA-104-1007, Online Aggregate Risk

WCG-016, Online Work Management

Section 1R15 Operability Determinations and Functionality Assessments

EN-AA-203-1001, Operability Determinations and Functionality Assessments

Section 1R19 Post Maintenance Testing

ADM-78.01, Post Maintenance Testing

Section 4OA5: Other Activities

0010439, Physical Inventory of Nuclear Fuel Storage Areas (ISFSI inventory completed March 23, 2017)

LIST OF ACRONYMS

ADAMS	NRC's Agency-wide Documents Access and Management System
AC	Alternating Current
ADM	Administrative Procedure
AOP	Abnormal Operating Procedure
AR	Action Request
ARP	Annunciator Response Procedure
CAP	Corrective Action Program
CCW	Component Cooling Water
CEA	Control Element Assembly
CFR	Code of Federal Regulations
CS	Containment Spray
EC	Engineering Change
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
EP	Emergency Preparedness
EPIP	Emergency Plan Implementing Procedure
ES	Engineered Safeguards
FPL	Florida Power and Light
GOP	General Operating Procedure
HPSI	High Pressure Safety Injection
HX	Heat Exchanger
ICW	Intake Cooling Water
IEEE	Institute of Electrical and Electronics Engineers
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LER	Licensee Event Report
LOCA	Loss of Coolant Accident
LPSI	Low Pressure Safety Injection
MR	Maintenance Rule (10 CFR 50.65)
NCV	Non-Cited Violation
NEI	Nuclear Energy Institute
NOP	Normal Operating Procedure
NRC	Nuclear Regulatory Commission
OCC	Outage Command Center
OLRM	Online Risk Monitor
OOS	Out of Service
OSP	Operations Surveillance Procedure
PARS	Publically Available Record
PD	Performance Deficiency
PFP	Pre-Fire Plan
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PSL	Plant St. Lucie
PT	Potential Transformer
RAB	Reactor Auxiliary Building
RCA	Radiological Control Area
RCE	Root Cause Evaluation

RCS	Reactor Coolant System
RG	Regulatory Guide
RPS	Reactor Protection System
RTP	Rated Thermal Power
SDP	Significance Determination Process
SMI	Surveillance Maintenance Procedure (Instrumentation & Control)
SSC	Systems, Structures, and Components
SUT	Start-up Transformer
TS	Technical Specifications
TSC	Technical Support Center
UFSAR	Updated Final Safety Analysis Report
UV	Undervoltage
WO	Work Order