



**UNITED STATES  
NUCLEAR REGULATORY COMMISSION**  
REGION II  
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May 9, 2017

Mr. Mano Nazar  
President and Chief Nuclear Officer  
Nuclear Division  
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Juno Beach, FL 33408

**SUBJECT: ST. LUCIE PLANT - NRC INTEGRATED INSPECTION REPORT  
05000335/2017001 AND 05000389/2017001**

Dear Mr. Nazar:

On March 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your St. Lucie Plant Units 1 and 2. The enclosed integrated inspection report documents the inspection results, which were discussed on April 13, 2017, with Mr. DeBoer, Site Director, 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 violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violation or significance of the NCV, or if you disagree with a cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. 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.

M. Nazar

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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 05000335/2017001 and 05000389/2017001  
w/Attachment: Supplemental Information

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M. Nazar

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05000335/2017001 AND 05000389/2017001 May 9, 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: 05000335/2017001, 05000389/2017001

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

Facility: St. Lucie Plant, Units 1 & 2

Location: 6501 South Ocean Drive  
Jensen Beach, FL 34957

Dates: January 1, 2017 to March 31, 2017

Inspectors: T. Morrissey, Senior Resident Inspector  
S. Roberts, Resident Inspector  
A. Wilson, Project Engineer (Sections 1R07, 1R20 and 1R22)  
A. Butcavage, Reactor Inspector (Section 1R08)  
B. Collins, Reactor Inspector (Section 1R08)  
S. Sanchez, Sr. Emergency Preparedness Inspector (Sections 1EP2,  
1EP3, 1EP4, 1EP5, and 4OA1)  
J. Hickman, Emergency Preparedness Inspector (Sections 1EP2, 1EP3,  
1EP4, 1EP5, and 4OA1)  
J. Panfel, Health Physicist Inspector (Sections 1EP2, 1EP3, 1EP4, 1EP5,  
and 4OA1)

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

## SUMMARY

IR 05000335/2017001, 05000389/2017001; 01/01/2017 – 03/31/2017; St. Lucie Nuclear Plant, Units 1 and 2; Operability Determinations and Functionality Assessments.

The report covered a three-month period of inspection by the resident inspectors and region based specialist inspectors. One finding of very low safety significance was identified by the inspectors. This finding was considered a Non-Cited Violation (NCV) of NRC requirements. The significance of inspection findings are indicated by their color (i.e., Green, White, Yellow, or Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. The cross-cutting aspect was determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. 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: An NRC-identified Green, non-cited violation (NCV) of Technical Specification (TS) 6.8.1, "Procedures and Programs," was identified for the licensee's failure to establish, implement, and maintain written procedures covering activities referenced in NRC Regulatory Guide 1.33, Revision 2, dated February 1978. Specifically, the licensee's failure to maintain a plant lubrication manual with correct lubrication oil specifications for the 1B containment spray (CS) pump motor resulted in adding unacceptably low viscosity lubrication oil to the inboard bearing of the 1B CS pump motor. Immediate corrective actions included restoring the 1B CS pump inboard bearing with the correct lubrication oil and placing the issue in the licensee's corrective action program.

The licensee's failure to correctly specify the 1B CS pump motor inboard bearing lubrication requirements in licensee general maintenance procedure GMP-22 was a performance deficiency (PD). The PD was more than minor because it was associated with the procedure quality attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the inadequate procedure resulted in adding the incorrect lubrication oil to the 1B CS pump motor bearing, causing the pump to be declared inoperable for approximately 56.5 hours. The finding screened to Green because the failure did not: (1) affect the design or qualification of the systems, structures and components, (2) represent an actual loss of function, and (3) represent an actual loss of function of at least a single train for greater than its TS allowed outage time. The finding involved the cross-cutting area of human performance, in the aspect of avoid complacency, in that, the individuals involved with the procedure revision did not implement appropriate error reduction tools to ensure the procedure was appropriately changed to reflect the new lubrication oil requirement [H.12]. (Section 1R15)

## REPORT DETAILS

### Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). On January 31, 2017, the unit was shutdown to investigate and repair reactor coolant system (RCS) leakage from the 1B2 reactor coolant pump (RCP) seal area. The unit was cooled down to Mode 5 (<200° Fahrenheit (F)) in accordance with Technical Specifications (TS) when the leakage was determined to be reactor coolant pressure boundary leakage. The leakage emanated from a through-wall crack on the RCP's lower seal heat exchanger piping which was repaired. The unit was restarted on February 7, 2017 and reached 100 percent RTP on February 8, 2017. The unit was at 100 percent RTP for the remainder of the inspection period.

Unit 2 began the inspection period at 100 percent RTP. On February 19, 2017, the control room operators commenced a planned power reduction and manually tripped the reactor at 25 percent RTP on February 20, 2017, to start a planned refueling outage. The unit was restarted on March 23, 2017 and reached 100 percent RTP on March 27, 2017. The unit was at 100 percent RTP for the remainder of the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R04 Equipment Alignment (IP 71111.04)

##### Partial Equipment Walkdowns

##### 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 the issues were documented in the licensee's corrective action program (CAP). Documents reviewed are listed in the Attachment. This inspection constitutes four samples.

- Unit 2, 2B and 2C charging pumps while 2A charging pump was out of service (OOS) for maintenance
- Unit 1, 1B trains of high pressure safety injection (HPSI), low pressure safety injection (LPSI), and containment spray (CS) while their corresponding 1A trains were OOS for maintenance
- Unit 1, 1A and 1B auxiliary feed water (AFW) trains while the 1C AFW train was OOS for maintenance
- Unit 2, 2B train HPSI system while the 2A train was OOS for maintenance

b. Findings

No findings were identified.

1R05 Fire Protection (IP 71111.05Q)

Fire Area Walkdowns

a. Inspection Scope

The inspectors toured the following plant areas during this inspection period to evaluate conditions related to control of transient combustibles, ignition sources, and 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 administrative procedure 1800022, "Fire Protection Plan." 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.

- Unit 1 cable spreading room
- Unit 2 electrical penetration rooms
- Unit 1 and 2 intake cooling water (ICW) pump area
- Unit 1 and 2 condensate storage tank areas
- Unit 2 reactor containment building (RCB) all elevations
- Unit 2 reactor auxiliary building (RAB), -0.5 foot (ft.) elevation

b. Findings

No findings were identified.

1R06 Flood Protection Measures (IP 71111.06)

.1 Underground Manhole Inspections

a. Inspection Scope

The inspectors performed inspections of manholes MH129, MH130 and MH136. The manholes contained safety-related cables associated with the Unit 1, 1A and 1B emergency diesel generator (EDG) systems and safety-related cables associated with the Unit 1 component cooling water (CCW) system. The inspectors verified cables were not submerged in water, cable support structures were not damaged, splices (if present) appeared intact, and adequate drainage was provided. The inspectors interviewed the responsible licensee personnel performing manhole inspections to determine whether they were knowledgeable of the inspection requirements contained in work order (WO) 40426947. Documents reviewed are listed in the Attachment. This inspection constitutes one sample and completes the underground cable inspection.

b. Findings

No findings were identified.

.2 Internal Flooding

a. Inspection Scope

The inspectors conducted a walkdown of the 1A HPSI, LPSI, and CS pump flood area located on the -0.5 ft. elevation of the Unit 1 RAB. The walkdown included inspection of the floor drains to ensure they were clear of debris and that the building structures that ensure flood protection were in accordance with design specifications. The inspectors reviewed the Unit 1 Updated Final Safety Analysis Report (UFSAR), Chapter 9.5A, that describes design features that mitigate a Unit 1 RAB internal flood from a severed fire main. The inspectors 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 of the internal flooding inspection.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (IP 71111.07)

a. Inspection Scope

The inspectors interviewed engineering personnel responsible for the Unit 2, 2A and 2B CCW heat exchangers' (HX) monitoring and performance to ensure that HX preventative maintenance was properly implemented. The inspectors observed and assessed the as-found conditions of both HXs when they were opened for inspection during the Unit 2 refueling outage. The inspectors reviewed action requests (ARs) 2187444 and 2190574 that documented the licensee's inspection observations. The inspectors verified the periodic maintenance activities documented in WOs 40421283 and 40421281 were conducted in accordance with licensee procedure 0-PMM-14.01, "Component Cooling Water Heat Exchanger Clean/Repair." The inspectors monitored HX tube cleaning activities and verified the HX was properly cleaned and placed back in service. The inspectors walked down portions of the CCW system for signs of degradation and to assess overall material condition, as well as to monitor system parameters for proper operation. The inspectors verified that significant heat sink issues were being identified and entered into the CAP. This inspection constitutes one sample and completes the annual review for heat sink performance inspection.

b. Findings

No findings were identified.



1R08 Inservice Inspection Activities (71111.08)

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities

From February 27, 2017, through March 9, 2017, the inspectors conducted an onsite review of the implementation of the licensee's inservice inspection (ISI) program for monitoring degradation of the RCS boundary, risk-significant piping and component boundaries, and containment boundaries in Unit 2.

The inspectors either directly observed or reviewed the following non-destructive examinations (NDEs) mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code of Record: 2007 Edition with 2008 Addenda) to evaluate compliance with the ASME Code, Section XI and Section V requirements and, if any indications or defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC approved alternative requirement. The inspectors also reviewed the qualifications of the NDE technicians performing the examinations to determine whether they were current and in compliance with the ASME Code requirements.

- Penetrant Testing (PT), Welded Lug Attachments, SI-2416-352-IA, ASME Code Class 2 (observed)
- Ultrasonic Testing (UT), Pipe to Elbow Weld, RC-124-C, ASME Class 1 (reviewed)

The inspectors reviewed the following welding activities, qualification records, and associated documents in order to evaluate compliance with procedures and the ASME Code, Section XI and Section IX requirements. Specifically, the inspectors reviewed the work order, repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, and NDE reports.

- Component ID CH-331, engineering change (EC) 281771. "Remove Seal Water Injection Piping (Charging) System Components and Replace with Pipe, ASME Code Class 2"
- Component ID I-12-SI-499, EC 283720, "Weld New Spool Pieces in Place, ASME Code Class 2"
- Component ID V03064, EC 279191, "U2, LPSI Flex Connection, ASME Code Class 2"
- Component ID V09826, EC 279191, "U2, AFW-Add Valve 09826 Flex Connection, ASME Code Class 3"

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service; therefore, no NRC review was completed for this inspection procedure attribute. Documents reviewed are listed in the Attachment.

### Pressurized Water Reactor (PWR) Vessel Upper Head Penetration Inspection Activities

The inspectors verified that for the Unit 2 reactor vessel head, a bare metal visual (BMV) examination was required during this outage, in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D).

The inspectors observed examinations in the field of the upper reactor vessel closure head surface in the area of the closure flange. The Inspectors also reviewed samples of the video recordings made during the bare metal visual examination of the reactor vessel upper head penetrations annulus areas for penetration numbers 1, 81, 82, 83, 88, 89, 92, 94 and 95, in conjunction with the NDE Level III reviewer. The final NDE summary report for the head examination including the penetrations noted previously was also reviewed to determine if the examinations were performed in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). Additionally, the inspectors discussed NRC observations made on penetrations associated with the boric acid stains on in-core instrumentation (ICI) nozzle penetrations. This discussion resulted in the licensee entering the identified condition in the corrective action program for corrective measures (AR 2189368).

The licensee did not identify any relevant indications that were accepted for continued service. Additionally, the licensee did not perform any welding repairs to the vessel head penetrations since the beginning of the last Unit 2 refueling outage; therefore, no NRC review was completed for these inspection procedure attributes. Documents reviewed are listed in the Attachment.

### Boric Acid Corrosion Control Inspection Activities

The inspectors reviewed the licensee's boric acid corrosion control (BACC) program activities to determine if the activities were implemented in accordance with the commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants," and applicable industry guidance documents. Specifically, the inspectors performed an onsite records review of procedures and the results of the licensee's containment walkdown inspections performed during the current refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of containment to evaluate compliance with licensee's BACC program requirements, and verified that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACC and corrective action programs. Documents reviewed are listed in the Attachment.

The inspectors reviewed the following engineering evaluations, completed for evidence of boric acid leakage, to determine if the licensee properly applied applicable corrosion rates to the affected components; and properly assessed the effects of corrosion-induced wastage on structural or pressure boundary integrity in accordance with the licensee procedures.

- Boric acid engineering evaluation for CS pump 2A pump seal; and cooler connections, AR 2153065
- Boric acid engineering evaluation for valve V6065, valve bonnet flange connection, AR 2169499
- Boric acid engineering evaluation for CS pump 2B suction strainer flange, AR 2094553

The inspectors reviewed the following condition reports and associated corrective actions related to evidence of boric acid leakage to evaluate if the corrective actions completed were consistent with the requirements of the ASME Code and 10 CFR Part 50, Appendix B, Criterion XVI.

- AR 2153065, CS pump 2A active boric acid leakage at mechanical seal
- AR 2169499, valve V6065 dry brown boric acid on valve body to bonnet flange
- AR 2094553, SS-07-1B inactive discolored boric acid on downstream flange

#### Steam Generator Tube Inspection Activities

The inspectors reviewed the eddy current (EC) examination activities performed in Unit 2 steam generators 2A and 2B during this current refueling outage to verify compliance with the licensee's TS, ASME BPVC Section XI, and Nuclear Energy Institute 97-06, "Steam Generator Program Guidelines."

The inspectors reviewed the scope of the EC examinations, and the implementation of scope expansion criteria, to verify these were consistent with the Electric Power Research Institute (EPRI) "Pressurized Water Reactor Steam Generator Examination Guidelines," Revision 7. The inspectors reviewed documentation for a sample of EC data analysts, probes, and testers to verify that personnel and equipment were qualified to detect the applicable degradation mechanisms in accordance with the EPRI Examination Guidelines. This review included a sample of site-specific examination technique specification sheets (ETSS) to verify that their qualification and site-specific implementation were consistent with Appendix H or I of the EPRI examination guidelines. The inspectors also reviewed a sample of EC data for steam generator tubes 2A-R84C99, 2A-R115C68, 2A-R136C83, 2B-R91C76, 2B-R128C103 and 2B-R135C82, with a qualified data analyst, to confirm that data analysis and equipment configuration were performed in accordance with the applicable ETSS and site-specific analysis guidelines. The inspectors verified that recordable indications were detected and sized in accordance with vendor procedures. Documents reviewed are listed in the Attachment.

The inspectors selected a sample of degradation mechanisms from the Unit 2 "Degradation Assessment report" (i.e. anti-vibration bar wear, wear at V-shaped support pads, and wear at the broached tube support plates in straight sections) and verified that their respective in-situ pressure testing criteria were determined in accordance with the EPRI "Steam Generator Integrity Assessment Guidelines," Revision 3. Additionally, the inspectors reviewed EC indication reports to determine whether tubes with relevant indications were appropriately screened for in-situ pressure testing. The inspectors also compared the latest EC examination results with the last "Condition Monitoring and Operational Assessment" report for Unit 2 to assess the licensee's prediction capability for maximum tube degradation and number of tubes with indications. The inspectors verified that the licensee's evaluation was conservative and that current examination results were bound by the operational assessment projections.

The inspectors assessed the latest EC examination results to verify that new degradation mechanisms, if any, were identified and evaluated before plant startup. The review of EC examination results included the disposition of potential loose part

indications on the steam generator secondary side to verify that corrective actions for evaluating and retrieving loose parts were consistent with the EPRI Guidelines. The inspectors also reviewed a sample of primary-to-secondary leakage data for Unit 2 to confirm that operational leakage in each steam generator remained below the detection or action level threshold during the previous operating cycle.

The inspectors' review included the implementation of tube repair criteria and repair methods to verify they were consistent with plant TS and industry guidelines. The inspectors verified that the licensee had selected the appropriate tubes for plugging based on the required plugging criteria. The inspectors reviewed the tube-plugging procedure and directly observed tube-plugging activities for tubes 2A-R84C99, 2A-R115C68 and 2A-R136C83, to determine if the licensee installed the tube plugs in accordance with the applicable procedures.

Furthermore, the inspectors interviewed licensee staff and reviewed a sample of inspection results for the inspection conducted in the secondary side internals of steam generators 2A and 2B, to verify that potential areas of degradation based on site-specific operating experience were inspected, and appropriate corrective actions were taken to address degradation indications. This review included the results of foreign object search and retrieval (FOSAR) activities in both steam generators and an evaluation for a potential loose part in the secondary side of steam generator (SG) 2A.

Additionally, the inspectors reviewed documentation and interviewed licensee staff regarding evaluations and corrective actions for the event(s) which led to the deformation of the SG 2B feed ring and its associated supports which occurred during Cycle 21.

#### Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the corrective action program to determine if the licensee had appropriately described the scope of the problem and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements.

This inspection completes one sample under this inspection procedure.

#### b. Findings

No findings were identified.

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

#### .1 Resident Inspector Quarterly Review of Licensed Operator Regualification

##### a. Inspection Scope

On January 19, 2017, the inspectors observed and assessed two licensed operator crews during evaluated emergency plan mini-evaluations on the control room simulator.

The first simulated scenario included a RCS leak which progressed into a small break loss of coolant accident (SBLOCA) that required a manual reactor trip. The RCS leak resulted in an Unusual Event emergency classification and the SBLOCA an Alert emergency classification. The second simulated scenario included a loss of offsite power (LOOP) concurrent with a failure of one of the two EDGs. The event degraded further when the second EDG failed. The LOOP concurrent with one EDG failing resulted in an Alert emergency classification. The LOOP with both EDGs failed resulted in a Site Area Emergency classification. All emergency classifications for both scenarios each required a notification to the State.

Documents reviewed are listed in the Attachment. 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 abnormal and emergency operation procedures, and emergency plan implementing procedures (EPIPs)
- Control board operation and manipulation, including high-risk operator actions
- Oversight and direction provided by supervision, including ability to identify and implement appropriate TS actions, regulatory reporting requirements, and emergency plan classification and notification
- Crew overall performance and interactions
- Effectiveness of the post-evaluation critique

This inspection completes one sample under this inspection procedure.

b. Findings

No findings were identified.

.2 Control Room Observations

a. Inspection Scope

The inspectors observed and assessed licensed operator performance in the 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:

- January 31, 2017, Unit 1 shutdown to investigate 1B2 RCP seal leakage
- February 19-20, 2017, Unit 2 shutdown and cooldown to support a planned refueling outage
- March 23, 2017, Unit 2 startup from SL2-23 refueling outage

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 inspection samples.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (IP 71111.12)

a. Inspection Scope

The inspectors reviewed the performance data and associated ARs for the equipment issues as 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 MR 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 observed some of the corrective maintenance activities. The inspectors attended applicable expert panel meetings and reviewed associated system health reports. The inspectors verified that equipment problems were being identified and entered into the licensee's CAP. Documents reviewed are listed in the Attachment. This inspection constitutes three samples.

- ARs 2169311 and 2145642, Unit 1 failures of B and D trains of wide range nuclear instrumentation,
- AR 2180859, Unit 1 control room air conditioning unit HVA/ACC-3A condenser fans running when unit was secured
- ARs 2148252 and 2182938, Unit 1 RCS system: safety injection loop check valve leakage and 1B2 RCP seal cooler through-wall leakage

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 online risk assessment of the emergent or planned maintenance activities listed below. 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 (NUMARC) 93-01, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants;" and licensee procedure ADM-17.16, "Implementation of the Configuration Risk Management Program." The inspectors also reviewed the effectiveness of the licensee's contingency actions to mitigate increased risk resulting from the degraded equipment or plant conditions necessary to support maintenance. The inspectors interviewed responsible senior reactor operators on-shift, verified actual system configurations, and specifically evaluated results from the online risk monitor (OLRM) or shutdown safety assessment (SSA) for the combinations of OOS risk significant systems, structures and components (SSCs) or plant conditions as listed below. Documents reviewed are listed in the Attachment. This inspection constitutes seven samples.

- Unit 2, OLRM assessment with the 2B EDG OOS for planned testing and 2B CCW pump OOS for planned maintenance
- Unit 1, Yellow SSA with the unit in Mode 5 and the RCS depressurized and drained to a lowered inventory condition to support repair of the 1B2 RCP lower seal heat exchanger
- Unit 2, ORLM assessment with the 2A HPSI and 2A LPSI OOS for planned maintenance and the 2A CS pump OOS for a fitting leak repair
- Unit 2, Yellow SSA with the unit in Mode 5 and the RCS depressurized and drained to a lowered inventory condition to support removal of the reactor vessel head
- Unit 2, Yellow SSA with the unit in Mode 5 and 6 with the RCS depressurized and drained to a mid-loop inventory condition to support installation of the reactor vessel head and the removal of the steam generator nozzle dams/installation of the steam generator manways
- Unit 2, OLRM assessment with 2B emergency core cooling system (ECCS) train OOS during safeguards relay surveillance testing
- Unit 1, OLRM assessment while repairing the 1B start-up transformer (SUT) breaker to the 1B1 6.9kV switchgear

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (IP 71111.15)

a. Inspection Scope

The inspectors reviewed the interim dispositions and operability determinations or functionality assessments of the following ARs 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 verified the operability determinations or functionality assessments were performed in accordance with licensee procedure EN-AA-203-1001, "Operability Determinations and Functionality Assessments." The inspectors reviewed the applicable UFSAR sections, associated supporting documents and procedures, and interviewed plant personnel to assess the adequacy of the interim dispositions. This inspection constitutes six samples.

- AR 2174626, Temporary pressure gauge left installed on 1A LPSI system
- AR 2178538, 1B RCP motor cooler relief valve lifted
- AR 2187670, 1C AFW failed oil sample
- AR 2185934, 2C ICW pump low pump head
- AR 2187298, Incorrect lubrication oil added to 1B CS pump inboard motor bearing
- AR 2191977, 2A LPSI shutdown cooling (SDC) control valve, HCV-3657, failed to open from the control room

b. Findings

Introduction: An NRC-identified Green, non-cited violation (NCV) of TS 6.8.1, "Procedures and Programs," was identified for the licensee's failure to establish, implement, and maintain written procedures covering activities referenced in NRC Regulatory Guide (RG) 1.33, Revision 2, dated February 1978. Specifically, the licensee failed to maintain a plant lubrication manual with the correct lubrication oil specifications for the 1B CS pump motor.

Description: On February 21, 2017, the licensee identified that the lubrication oil sample taken from the inboard motor bearing of the 1B CS had a viscosity of 61.2 centistokes (cSt) which was the lower limit for Rust & Oxidation (R&O) 68 lubrication oil required for the bearing. The issue was documented in the CAP as AR 2187298. The 1B CS pump motor had been replaced in October 2016 with a new type of motor in accordance with engineering change (EC) 285611, "CS Pump 1B Motor Replacement." The EC specified the use of R&O 68 lubrication oil for this bearing versus R&O 32 oil that had been used for the replaced motor. The licensee determined that general maintenance procedure (GMP)-22, "Plant Lubrication Manual," had not been properly updated to reflect this change in lubrication oil requirements, as required by TS 6.8.1 and RG 1.33.

RG 1.33, Section 9.a, "Procedures for Performing Maintenance," states, in part, that maintenance that can affect the performance of safety-related equipment should be properly pre-planned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. GMP-22, "Plant Lubrication Manual," Appendix B, "St. Lucie Plant Unit 1 Equipment Lubrication Manual," Revision 63, is a maintenance procedure that can affect the performance of safety-related equipment and must be maintained in accordance with the requirements of TS 6.8.1 and Regulatory Guide 1.33.

Because the licensee failed to update GMP-22, R&O 32 lubrication oil had been added to the inboard bearing reservoir for the new motor after each sampling evolution. The oils are compatible; however, the addition of the lower viscosity R&O 32 oil resulted in a lower viscosity of the combined oils in the bearing. The immediate operability determination (IOD) found that the 1B CS pump was operable but nonconforming since the bearing oil viscosity was in band but at its lower limit of its required viscosity (61.2 cSt). Corrective actions included revising GMP-22 to specify the use of R&O 68 lubrication oil and draining/refilling the bearing reservoir with R&O 68 at the next quarterly run of the pump.

The inspectors reviewed the IOD (AR 2187298) and questioned the licensee whether the viscosity of the lubrication oil in the inboard bearing was within specification for R&O 68 lubrication oil. The viscosity of the sample was at its lower limit; however, the



licensee overlooked the fact that additional lower viscosity R&O 32 had been added to make up for the oil drained for sampling. The licensee agreed with the inspector that adding lower viscosity oil after sampling would result in the oil viscosity being low and out of specification. On February 23, 2017 at 1215 hours, the licensee declared the 1B CS pump inoperable and drained the inboard bearing reservoir. A sample of the drained oil was determined to have a viscosity of 47 cSt. The licensee refilled the inboard bearing reservoir with R&O 68 lubrication oil and the CS pump was declared operable at 2021 hours that same day. The inspectors determined that the 1B CS pump had been declared inoperable for approximately 56.5 hours. The inspectors' concerns and the licensee's failure to recognize the bearing oil viscosity was outside the allowed viscosity range for R&O 68 lubrication oil was placed in the licensee's CAP as AR 2188073. Although this issue was initially identified by the licensee, the inspectors identified inadequacies in the licensee's evaluation of this issue. Specifically, the licensee failed to recognize that the 1B CS pump motor inboard bearing lubrication oil viscosity was lower than that specified by the motor vendor and could result in the inoperability of the pump; therefore, this issue is being treated as NRC-identified.

Analysis: The licensee's failure to correctly specify the 1B CS pump motor inboard bearing lubrication requirements in licensee general maintenance procedure GMP-22 was a performance deficiency (PD). The PD was more than minor because it was associated with the procedure quality attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the inadequate procedure resulted in adding the incorrect lubrication oil to the 1B CS pump motor bearing, causing the pump to be declared inoperable for approximately 56.5 hours.

Using Inspection Manual Chapter (IMC) 0609, Attachment 4, "Significance Determination Process, Initial Characterization of Findings," dated October 7, 2016, the finding was determined to affect the Mitigating Systems Cornerstone. Inspectors used IMC 0609, Appendix A, "Significance Determination Process (SDP) for Findings At-Power," Exhibit 2 – "Mitigating Systems Screening Questions" dated June 19, 2012, to further evaluate this finding. The finding screened as Green because the inspectors answered "NO" to the four questions in Section A of Exhibit 2. This finding did not represent an actual loss of function of at least a single train for greater than its TS allowed outage time or two separate safety systems out-of-service for greater than its TS allowed outage time.

The finding involved the cross-cutting area of human performance, in the aspect of avoid complacency (H.12), in that the individuals involved with the procedure revision did not implement appropriate error reduction tools to ensure the procedure was appropriately changed to reflect the new lubrication oil requirement.

Enforcement: TS 6.8.1, Procedures and Programs, requires, in part, that written procedures be maintained covering activities referenced in RG 1.33. Contrary to TS 6.8.1 and RG 1.33, Section 9.a, from October 2016 until February 21, 2017 the 1B CS pump motor inboard bearing lubricant type was incorrectly specified as required by EC 285611. As a result, incorrect lube oil was added to the inboard bearing of the 1B CS pump motor on several occasions, which eventually exceeded the oil viscosity lower limit on February 21, 2017, and resulted in the 1B CS pump being declared inoperable. Since the licensee has returned the 1B CS pump to an operable status with the correct

lubrication oil and has entered this issue into its CAP as AR 2188073, and because the finding is of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC's Enforcement Policy. (NCV 05000335/2017001-01, Inadequate Procedure Results in Adding an Incorrect Lubrication Oil to the 1B CS Motor Inboard Bearing)

1R18 Plant Modifications (IP 71111.18)

a. Inspection Scope

The inspectors reviewed the procedural change listed below. The documents reviewed included EC 283744 "RCP 1B2 Replacement Motor Installation" referenced to support Procedure Change Request (PCR) 2180029 for 1-AOP-01.09B2, allowing the operation of 1B2 RCP stator temperature above the original 340F. The inspectors reviewed 10 CFR 50.59 screenings and evaluations and verified that the modification had not affected system operability and availability, associated plant drawings, and discussed the changes with licensee personnel to verify the procedural modification would not adversely affect interfacing systems and that the modification was consistent with the vendor's recommendations. This inspection constitutes one sample.

- 1-AOP-01.09B2, "1B2 Reactor Coolant Pump," Revision 11

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. This inspection constitutes six samples.

- WO 40358558 – Unit 2 AFW actuation system (AFAS) channel C power supply failure
- WO 40513306 – Unit 1 RCP 1B2 lower seal cavity flange and pump cooler leak
- WO 40196137 – Unit 2, replace 2B LPSI pump and motor
- WO 40520631 – Unit 1 control element assembly (CEA) 60 power supply replacement
- WO 40524297 – Unit 2 Repair LPSI SDC control valve HCV-3657
- WO 40507849 – Unit 2 CEA 45 power switch replacement

b. Findings

No findings were identified.

## 1R20 Refueling and Other Outage Activities (IP 71111.20)

### .1 Unit 1 Maintenance Outage: Repair RCP 1B2 Seal Cooler Heat Exchanger

#### a. Inspection Scope

On January 30, 2017, Unit 1 was shutdown to investigate and repair the cause of elevated 1B2 RCP stator temperatures along with a rise of RCS unidentified leakage. After the unit was shut down, the licensee identified a through-wall leak on the return tubing from the 1B2 RCP seal cooler heat exchanger. The leakage was determined to be RCS boundary leakage and the unit was cooled down to Mode 5 (<200°F) as required by TS. The RCS was then depressurized and drained to a lowered inventory condition in order to implement repairs. The defect was removed and the heat exchanger weld was repaired. The unit was restarted on February 7, 2017 and reached 100 percent RTP on February 8, 2017. Documents reviewed are listed in the Attachment.

#### Outage Planning, Control and Risk Assessment

The inspectors reviewed the licensee's outage risk control plan and schedule to verify that the licensee had appropriately considered risk, industry experience, and previous site-specific problems.

#### Monitoring of Shutdown Activities

The inspectors observed portions of the cooldown process to verify that TS cooldown restrictions were followed. The inspectors conducted a containment walkdown after the shutdown to assess the condition of the systems within containment that were inaccessible with the unit at power. The inspectors performed walkdowns of important systems and components used for decay heat removal from the reactor core during the shutdown period including the ICW and the CCW systems.

#### Outage Activities

The inspectors examined outage activities to verify that they were conducted in accordance with TSs, licensee procedures, and the licensee's outage risk control plan. Some of the more significant inspection activities accomplished by the inspectors were as follows:

- Verified operability of RCS pressure, level, flow, and temperature instruments during various modes of operation
- Verified electrical systems availability and alignment
- Verified shutdown cooling system operation
- Evaluated implementation of reactivity controls
- Examined containment foreign material exclusion controls put in place for the limited work inside containment

### Heat-up, Mode Transition, and Reactor Startup Activities

The inspectors examined selected TSs, license conditions, license commitments and verified administrative prerequisites were being met prior to mode changes. The inspectors also verified containment integrity was properly established. The inspectors performed a containment closeout inspection prior to reactor plant startup. The inspectors witnessed portions of the RCS heat up, reactor startup, and power ascension. On February 7, 2017, the inspectors verified that startup activities were performed in accordance with licensee general operating procedure 1-GOP-201, Reactor Plant Startup – Mode 2 to Mode 1.

This inspection constitutes one outage sample.

#### b. Findings

No findings were identified.

### .2 Unit 2 Refueling Outage SL2-23

#### a. Inspection Scope

##### Outage Planning, Control and Risk Assessment

Unit 2 was shut down for a planned refueling outage on February 20, 2017. The inspectors reviewed the licensee's outage risk control plan and verified that the licensee had appropriately considered risk, industry experience, and previous site-specific problems. The inspectors also reviewed the outage work schedule for Operations, Maintenance, and the Fire Brigade to confirm the licensee had scheduled covered workers such that the minimum days off for individuals working on outage activities was in compliance with 10 CFR 26.205(d)(4) and (5).

The inspectors reviewed the risk reduction methodology employed by the licensee during various daily refueling outage (RFO) SL2-23 meetings including the outage command center (OCC) morning meetings, operations team meetings, and schedule performance update meetings. The inspectors examined the licensee implementation of SSA during SL2-23 in accordance with licensee procedure OM-AA-101-1000, "Shutdown Risk Management," to verify whether a defense in depth concept was in place to ensure safe operations and avoid unnecessary risk. In addition, the inspectors regularly monitored OCC activities, and interviewed responsible OCC management, to ensure system, structure, and component configurations and work scope were consistent with TS requirements, site procedures, and outage risk controls. Documents reviewed are listed in the Attachment.

##### Monitoring of Shutdown Activities

The inspectors monitored RCS cooldown rates to verify they met TS requirements. The inspectors walked down the RCB after the unit was shut down to determine whether any components were impacted by unidentified RCS leakage during the operating cycle. The RCB, including the RCB sump, was inspected for any debris or degradation experienced during the operating cycle.

### Outage Activities

The inspectors examined outage activities to verify that they were conducted in accordance with TS, licensee procedures, and the licensee's outage risk control plan. Some of the more significant inspection activities accomplished by the inspectors were as follows:

- Walked down selected safety-related equipment clearance orders
- Verified operability of RCS pressure, level, flow, and temperature instruments during various modes of operation
- Verified electrical systems availability and alignment
- Verified shutdown cooling system operation
- Evaluated implementation of reactivity controls
- Reviewed control of containment penetrations
- Examined foreign material exclusion controls put in place inside containment (e.g., around the refueling cavity, near sensitive equipment and RCS breaches)
- Verified worker fatigue was properly managed

### Lowered Inventory and mid-loop Conditions

The inspectors reviewed the planned activities associated with one period of lowered RCS inventory established in order to remove the reactor vessel head and one period of RCS mid-loop established to re-install the reactor vessel head and remove the SG nozzle dams. The inspectors verified the licensee had controls in place to govern the lowered inventory and mid-loop conditions. The inspectors verified that the necessary instrumentation and means of adding inventory to the RCS were available.

### Fatigue Management Activities

The inspectors verified the licensee had scheduled covered personnel such that the minimum days off for individuals working on outage activities were in compliance with 10 CFR 26.205(d)(4) and (5). There were no waiver requests, self-declarations or fatigue assessments completed during the outage.

### Refueling Activities and Containment Closure

The inspectors witnessed selected fuel handling operations being performed according to TS and applicable operating procedures from the main control room, the spent fuel pool (SFP), and the refueling cavity inside containment. The inspectors also examined licensee activities to control and track the position of each fuel assembly. The inspectors evaluated the licensee's ability to close the containment equipment, personnel, and emergency hatches promptly per procedure 2-GMM-68.02, "Emergency Closure of Containment Penetrations, Personnel Hatch, and Equipment Hatches."

### Heat-up, Mode Transition, and Reactor Startup Activities

The inspectors examined selected TS, license conditions, and license commitments, and verified administrative prerequisites were being met prior to mode changes. The inspectors also reviewed measured RCS leakage rates, and verified containment integrity was properly established. The inspectors performed a containment sump

closeout inspection prior to reactor plant startup and conducted a containment walkdown prior to restarting the unit. The results of low power physics testing were discussed with reactor engineering and operations personnel to ensure that the core operating limit parameters were consistent with the design. The inspectors witnessed portions of the RCS heat up, reactor startup, and power ascension in accordance with the following plant procedures:

- 2-PTP-81, "Reload Startup Physics Testing"
- 2-PTP-91, "Unit 1 Initial Criticality Following Refueling"
- 2-GOP-302, "Reactor Startup Mode 3 to Mode 2"

#### Corrective Action Program

The inspectors reviewed ARs generated during SL2-23 to evaluate the licensee's threshold for initiating ARs.

This inspection constitutes one refueling outage sample.

#### 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 the tests demonstrated operational readiness, and that systems were capable of performing their intended safety functions. In addition, the inspectors evaluated the effect of the testing activities on the plant to ensure conditions were adequately addressed by the licensee staff, and 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. Documents reviewed are listed in the Attachment. This inspection constitutes seven total samples in the categories listed below.

#### In-Service Tests:

- 1-OSP-07.04B, 1B Containment Spray Pump Code Run

#### Routine Surveillance Tests:

- 2-SMI-69.02, Engineered Safeguards Actuation System – Channel Functional Test
- 2-OSP-59.01A, 2A Emergency Diesel Generator Monthly Surveillance
- 0-SME-66.04, Inspection of the Reactor Trip Switchgear (RTSG) Breakers (Unit 1)
- 0-OSP-37.01, Emergency Cooling Water Canal – Periodic Test

Reactor Coolant System (RCS) Leakage Detection Surveillance:

- 1-OSP-01.03, RCS Inventory Balance

Containment Isolation Valve Surveillance:

- 2-OSP-68.02, "Local Leak Rate" (Penetration 42, reactor cavity sump discharge valve)

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Evaluationa. Inspection Scope

The inspectors evaluated the adequacy of the licensee's methods for testing and maintaining the alert and notification system in accordance with NRC Inspection Procedure 71114, Attachment 02, "Alert and Notification System Evaluation." The applicable planning standard, 10 CFR Part 50.47 (b) (5), and its related 10 CFR Part 50, Appendix E requirements were used as reference criteria. The criteria contained in NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, were also used as a reference.

The inspectors reviewed various documents, which are listed in the Attachment, and interviewed personnel responsible for system performance. This inspection activity satisfied one inspection sample for the alert and notification system on a biennial basis.

b. Findings

No findings were identified.

1EP3 Emergency Response Organization Staffing and Augmentation Systema. Inspection Scope

The inspectors reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The qualification records of key position ERO personnel were reviewed to ensure all ERO qualifications were current. A sample of problems identified from augmentation drills or system tests performed since the last inspection was reviewed to assess the effectiveness of corrective actions. The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 03, "Emergency Response Organization Staffing and Augmentation System." The applicable planning standard, 10 CFR 50.47(b)(2), and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspectors reviewed various documents, which are listed in the Attachment. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

b. Findings

No findings were identified.

1EP4 Emergency Action Level (EAL) and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, no changes were made to the Radiological Emergency Plan, no changes were made to the EALs and several changes were made to the implementing procedures. The licensee determined that, in accordance with 10 CFR 50.54(q), the Radiological Emergency Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspectors reviewed these changes to evaluate for potential reductions in the effectiveness of the plan; however, this review was not documented in a safety evaluation report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety.

The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 04, "Emergency Action Level and Emergency Plan Changes." The applicable planning standards of 10 CFR 50.47(b), and its related requirements in 10 CFR 50, Appendix E were used as reference criteria. The inspectors reviewed various documents that are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

b. Findings

No findings were identified.

1EP5 Maintenance of Emergency Preparedness

a. Inspection Scope

The inspectors reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues, the completeness and effectiveness of corrective actions, and to determine if issues were recurring. The licensee's post-event action reports, self-assessments, and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their emergency preparedness program. Inspectors reviewed the licensee's 10 CFR 50.54(q) change process, personnel training, and selected screenings and evaluations to assess adequacy. The inspectors toured facilities and reviewed equipment and facility maintenance records to assess the licensee's adequacy in maintaining associated facilities and equipment. The inspectors evaluated the capabilities of selected radiation monitoring instrumentation to adequately support EAL declarations.



The inspection was conducted in accordance with NRC Inspection Procedure 71114, Attachment 05, "Maintenance of Emergency Preparedness." The applicable planning standards, related 10 CFR 50, Appendix E requirements, and 10 CFR 50.54(q) and (t) were used as reference criteria. The inspectors reviewed various documents, which are listed in the Attachment. This inspection activity satisfied one inspection sample for the maintenance of emergency preparedness on a biennial basis.

b. Findings

No findings were identified.

1EP6 Drill Evaluation

Emergency Preparedness Training Evolution

a. Inspection Scope

On January 19, 2017, the inspectors observed and assessed licensed operator crews' performance during several short evaluated licensed operator continued training scenarios using the control room simulator. The simulated scenarios included assessing classification of the emergency events and completing notifications to the State. The inspectors assessed the licensee's actions to verify that emergency classifications and notifications were timely and made in accordance with the licensee emergency plan implementing procedures and 10 CFR 50.72 requirements. This inspection constitutes one sample of simulator training evolution observations.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (IP 71151)

.1 Cornerstone: Initiating Events

a. Inspection Scope

The inspectors reviewed licensee submittals for the performance indicators (PIs) listed below for the period of January 1, 2016 through December 31, 2016, to verify the accuracy of the PI data reported during that period. Performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedure ADM-25.02, "NRC Performance Indicators," were used to check the reporting for each data element. The inspectors checked operator logs, plant status reports, condition reports, system health reports, and PI data sheets to verify that the licensee had identified the required data, as applicable. The inspectors interviewed licensee personnel associated with PI data collection, evaluation, and distribution.

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

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

This inspection constitutes six total PI samples.

b. Findings

No findings were identified.

.2 Emergency Preparedness Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals relative to the PIs listed below for the period January 1, 2016, through December 31, 2016. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 7, was used to confirm the reporting basis for each data element.

- Drill/Exercise Performance (DEP)
- Emergency Response Organization (ERO) Readiness
- Alert and Notification System (ANS) Reliability

For the specified review period, the inspectors examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspectors verified the accuracy of the PI for ERO drill and exercise performance through review of a sample of drill and event records. The inspectors reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspectors verified the accuracy of the PI for alert and notification system reliability through review of a sample of the licensee's records of periodic system tests. The inspectors also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment. This inspection satisfied three inspection samples for PI verification on an annual basis.

b. Findings

No findings were identified

4OA2 Identification and Resolution of Problems (IP 71152)

.1 Routine 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 followup, the inspectors performed a screening of items entered daily into the licensee's CAP. This review was accomplished by reviewing daily printed summaries of ARs and by reviewing the licensee's electronic AR database. Additionally, RCS unidentified leakage was checked on a daily basis to verify no substantive or unexplained changes.

b. Findings

No findings were identified.

.2 Annual Sample: 2B Charging pump failed to start

a. Inspection Scope

The inspectors selected AR 2188070, which documented the 2B charging pump's failure to start for a more in-depth review of the circumstances and the proposed corrective actions that followed. The inspectors reviewed the equipment apparent cause evaluation report to ensure that the licensee performed an appropriate evaluation, and specified and prioritized corrective actions in accordance with their CAP. The inspectors evaluated the AR in accordance with the requirements of the licensee's CAP as specified in licensee procedure PI-AA-104-1000, "Condition Reporting." This inspection constitutes one sample.

b. Findings and Observations

No findings were identified. The inspectors found that the apparent cause evaluation for this issue was comprehensive and thorough. The inspectors determined that the corrective actions completed were appropriate to address the identified cause. During the investigation, the licensee identified another potential cause that could lead to the same event. Appropriate corrective actions were also completed to address this vulnerability.

4OA5 Other Activities

(CLOSED) Temporary Instruction (TI) 2515/192, "Inspection of the Licensee's Interim Compensatory Measures Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems."

a. Inspection Scope

The objective of this performance based Temporary Instruction is to verify implementation of interim compensatory measures associated with an open phase condition design vulnerability in electric power system for operating reactors. The inspectors conducted an inspection to determine if the licensee had implemented the following interim compensatory measures. These compensatory measures are to remain in place until permanent automatic detection and protection schemes are installed and declared operable for open phase condition design vulnerability. The inspectors verified the following:

- The licensee identified and discussed with plant staff the lessons-learned from the open phase condition events at U.S. operating plants including the Byron Station

open phase condition and its consequences. This included conducting operator training for promptly diagnosing, recognizing consequences, and responding to an open phase condition.

- The licensee updated plant operating procedures to help operators promptly diagnose and respond to open phase conditions on off-site power sources credited for safe shutdown of the plant.
- The licensee established and implemented periodic walkdown activities to inspect switchyard equipment such as insulators, disconnect switches, transmission lines, and transformer connections associated with the offsite power circuits to detect a visible open phase condition.
- The licensee ensured that routine maintenance and testing activities on switchyard components have been implemented and maintained. As part of the maintenance and testing activities, the licensee assessed and managed plant risk in accordance with 10 CFR 50.65(a)(4) requirements.

b. Findings

No findings were identified.

4OA6 Meetings

Exit Meeting Summary

On January 27, 2016, the Emergency Preparedness inspectors presented their inspection results to Mr. DeBoer, Site Director, and other members of the staff. Inspectors also performed a final re-exit on February 6, 2017 with Mr. DeBoer. The inspectors confirmed that proprietary information was not provided or reviewed during the inspection.

On March 9, 2017, the regional specialists inspectors presented their inspection results to Mr. DeBoer, Site Director, and other members of the licensee staff. The inspectors confirmed that all proprietary information reviewed during the inspection was returned and that none of the potential report input discussed was considered proprietary.

On April, 13 2017, the resident inspectors presented their inspection results to Mr. DeBoer and other members of the licensee staff. 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:**

R. Bailey, Performance Analyst  
R. Baird, Training Manager  
G. Bowen, Emergency Preparedness Manager  
D. Cecchett, Licensing Engineer  
J. Couture, Sr. Emergency Preparedness Coordinator  
D. DeBoer, Site Director  
J. Francis, Health Physics Manager  
K. Frehafer, Licensing Engineer  
S. Gebo, Communications Supervisor  
M. Haskin, Projects Site Manager  
M. Jones, Engineering Director  
W. Parks, Operations Director  
R. Pitts, Maintenance Director  
P. Polfleit, Corporate Emergency Preparedness Manager  
F. Pollack Assistant Operations Manager - Line  
R. Sciscente, Licensing Engineer  
M. Snyder, Licensing Manager  
K. Stone, Chemistry Manager  
T. Spillman, Assistant Operations Manager – Training  
T. Summers, Southern Region Vice President  
A. Wier, Emergency Preparedness Coordinator

#### **NRC Personnel:**

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

### **LIST OF ITEMS OPENED AND CLOSED**

#### **Opened and Closed**

05000335/2017001-01	NCV	Inadequate Procedure Results in Adding an Incorrect Lubrication Oil to the 1B CS Motor Inboard Bearing (Section 1R15)
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#### **Closed**

2515/192	TI	Inspection of the Licensee's Interim Compensatory Measures Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems. (Section 4OA5)
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## LIST OF DOCUMENTS REVIEWED

### **Section 1R04: Equipment Alignment**

1-NOP-03.11, High Pressure Safety Injection Initial Alignment  
2-NOP-03.11, High Pressure Safety Injection Initial Alignment  
1-NOP-09.11, Auxiliary Feedwater System Initial Alignment  
2-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

### **Section 1R06 Flood Protection Measures**

8770-G-701, Electrical Manhole and Handhole Drainage System  
1-AOP-24.01, RAB Flooding  
WO 40436547, ESFAS Sump LS-06-1B Calibration  
WO 40433992, ESFAS Sump LS-06-1A Calibration  
1-PMI-06.28A, LS-06-1A, 1A ECCS Room Sump Level Switch Calibration  
1-PMI-06.28B, LS-06-1B, 1B ECCS Room Sump Level Switch Calibration

### **Section 1R08 Inservice Inspection Activities**

#### Procedures:

03-1275284, AREVA Field Procedure for Remote Rolled Plugging Utilizing Plugging Control Box, Rev. 022  
2-AOP-09.02, Abnormal Operating Procedure: Auxiliary Feedwater, Rev. 9  
ENG-CSI 2.3, Steam Generator Integrity Program Administration, Rev. 34  
ER-AP-121, Steam Generator Integrity, Rev. 4  
NDE 4.15, Component Support & Inspection Visual Examination (VE) ASME Section XI Code Case N-722-1 and N-729-1, Rev. 4

#### Calculations:

32-9221153-005, Calculation Summary Sheet: Stress Analysis of St. Lucie Feedwater Bracket Repair, Rev. 005  
PSL-0FJS-09-002, St Lucie 1&2, Replacement Reactor Vessel Head Surface Area Calculation for Visual Examinations per Code Case N-729-1, 1/26/09

#### Work Orders/Work Requests:

40332381-23, EC 281771, Remove Seal Water Injection Piping (Charging), 10/13/15  
40379791-01, EC 283720 Weld 12-SI-459 New Spool Piece in Place, (Flaw in 2B2 SIT Discharge Header Piping), 4/18/15  
40292101-11, EC 279191 U2 LPSI Flex Connection, Install Valve 03064/Discharge Connection, 10/3/15  
40292099-03, EC279191, U-2 AFW - Add Valve 9826 Flex Connection, 9/17/15

#### Condition Reports:

CR2189989, "Loss of Air Supply Pressure during Tube Plugging," dated 3/8/2017

Action Requests:

AR 2189368, (NRC Identified) "Procedures Inadequate for Boric Acid Cleanup on RX Head," 3/10/2017  
 AR 2165558, "MRP-2016-035 Reactor Vessel Internals-Control rod Guide Tube (CRGT) Guide Cards Emergent Industry Issue Summary," 10/26/2016  
 AR 2074651, Metallic Containment Side Moisture Barrier Degradation, 9/17/2015  
 AR 2188803, (NRC Identified) V3148 Inactive Boric Acid Leak on at Packing, 3/1/2017  
 AR 2160420, Clearance Exceeded on Support BF-2-3 Evaluation, 10/13/2016

NDE Examiner Qualifications:

AREVA Certificate of Personnel Qualification, ET IIA-QDA (Colado), dated February 13, 2015  
 AREVA Certificate of Personnel Qualification, ET IIIA-QDA (Koscielny), dated October 2, 2014  
 AREVA Certificate of Vision Examination (Colado), dated January 30, 2017  
 AREVA Certificate of Vision Examination (Koscielny), dated January 30, 2017  
 AREVA Certificate of Vision Examination (Bryant), dated September 1, 2016  
 AREVA Certificate of Vision Examination (Duvall), dated August 8, 2016  
 Curtiss-Wright Personnel Certification Summary Record: ET IIA (Tan), dated November 21, 2014  
 Curtiss-Wright Personnel Certification Summary Record: PT Level II (Kimmen), dated February 8, 2017  
 Curtiss-Wright Personnel Certification Summary Record: PT Level II (Langston), dated February 9, 2017  
 Curtiss-Wright Vision Examination Certification (Tan), dated October 11, 2016  
 Curtiss-Wright Vision Examination Certification (Langston), dated January 6, 2017  
 Curtiss-Wright Vision Examination Certification (Kimmen), dated September 28, 2016  
 Curtiss-Wright Vision Examination Certification (Kilpela), dated July 21, 2016  
 Curtiss-Wright Vision Examination Certification (Saugabay), dated September 28, 2016  
 MoreTech Certificate of Personnel Qualification, ET III-QDA (Fuller), dated 12-09-13  
 MoreTech Certificate of Personnel Qualification, ET III-QDA (Webb), dated 06/26/13  
 MoreTech Certificate of Vision Examination (Fuller), dated 06/08/16  
 MoreTech Certificate of Vision Examination (Fuller), dated 11/14/16  
 NDE Technology, Inc. Personnel Certification Summary: ET IIIA-QDA (Beehner), dated 09/07/16  
 NDE Technology, Inc. Personnel Vision Certification (Beehner), dated 09/07/2016  
 Performance Demonstration Initiative (PDI)-UT-1, EPRI Program Qualifications, (Kilpela), 5/5/14  
 Performance Demonstration Initiative (PDI)-UT-2, EPRI Program Qualifications, (Kilpela), 5/5/14  
 Performance Demonstration Initiative (PDI)-UT-1, EPRI Program Qualifications, (Shaugabay), 9/16/16  
 Performance Demonstration Initiative (PDI)-UT-2, EPRI Program Qualifications, (Shaugabay), 9/16/16

Miscellaneous Documents:

180-9268494, St Lucie 2, L2R23 Outage, Reactor Vessel Bare Metal Visual Examination Results, 3/2/2017  
 11956.4, Eddy Current Examination Technique Specification Sheet, Rev. 2  
 13901.1, Eddy Current Examination Technique Specification Sheet, Rev. 1  
 27902.1, Eddy Current Examination Technique Specification Sheet, Rev. 2  
 27906.1, Eddy Current Examination Technique Specification Sheet, Rev. 1  
 AIM 15058866-2Q-3, Condition Monitoring and Operational Assessment for the St. Lucie Unit 2 Steam Generators based on Eddy Current Examination, End of Cycle 21, September 2015, Rev. 0

AIM 160810116-2-1, Degradation Assessment for St. Lucie Unit 2 Steam Generators for End of Cycle 22 (February 2017 Outage), Rev. 0  
 ASME Section XI Pressure Test Form, for Work Order # 40292101, 10/16/15  
 ASME Section XI Pressure Test Form, for Work Order # 40292099, 10/22/15  
 Calibration Data Sheet, Summary # 033900, Weld RC-124-3, Pipe to Elbow, 3/14/17  
 EC284822, Equivalent Design Package Form: 2B Steam Generator Support Brackets, Rev. 5  
 Liquid Penetrant Test NDE 3.5 Results, for work order 40292099-13, 8/12/15  
 Liquid Penetrant Test NDE 3.5 Results, for work order 40292101-11, 10/3/15  
 NRC "Safety Evaluation By the Office of Nuclear Reactor Regulation Relief request No.11 Regarding Examination of Reactor Closure Vessel Head Penetrations and Welds, St Lucie Plant Unit No. 2, Florida Power and Light Company, Docket Number 50-335," November 1, 2016  
 PT-17-001, Liquid Penetrant Examination Report for Component ID SI-2418-352-IA, 03/03/2017 Relief Request No. 11, St Lucie Unit-2, Fourth Inspection Interval Relief Request, Rev. 0  
 VH-10386, AREVA Certificate of Calibration: Eddy Current Tester, MIZ-80 (S/N 045), dated 07/21/2016  
 VH-10394, AREVA Certificate of Calibration: Eddy Current Tester, MIZ-80 (S/N 059), dated 07/21/2016  
 VH-10558, AREVA Certificate of Calibration: Eddy Current Tester, MIZ-80 (S/N 084), dated 07/20/2016  
 VH-10561, AREVA Certificate of Calibration: Eddy Current Tester, MIZ-80 (S/N 087), dated 07/13/2016  
 Welding Procedure Specification (WPS)-24, GTAW/SMAW Manual, Rev. 5  
 Welding Procedure Specification (WPS)-43, GTAW Manual, Rev. 12  
 Weld Traveler 02007-014652, Weld 02009, 10/13/15  
 Weld Number 2007, Liquid Penetrant Checklist, 10/28/15  
 Weld Traveler 02000-014410, Weld ID. 02000, 4/16/15  
 Weld Number 02000, Liquid Penetrant Checklist, 9/3/15

**Section 1R11: Licensed Operator Requalification Program and Licensed Operator Performance**

2-EOP-01, Standard Post Trip Actions  
 2-EOP-03, Loss of Coolant Accident LOCA  
 2-EOP-09, Loss of Offsite Power/Loss of Forced Circulation LOOP/LOFC  
 2-EOP-10, Station Blackout SBO  
 2-AOP-01.08, RCS Leakage Abnormal Operation  
 2-AOP-22.01, Rapid Down power  
 EPIP-01, Classification of Emergencies  
 EPIP-02, Duties and Responsibilities of the Emergency Coordinator

**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

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

OP-AA-104-1007, Online Aggregate Risk  
 WCG-016, Online Work Management  
 OM-AA-101-1000, Shutdown Risk Management



**Section 1R18: Plant Modifications**

1-AOP-01.09B2, 1B2 Reactor Coolant Pump

**Section 1R20: Refueling and Other Outage Activities**

ADM-09.23, Shutdown Safety Assessment

1-GMM-68.02, Emergency Closure of Containment Penetrations, Personnel Hatch, and Equipment Hatches

1-NOP-03.05, Shutdown Cooling

1-NOP-01.03, Draining RCS

1-NOP-01.05, Filling and Venting RCS

1-NOP-02.02, Charging and Letdown

AP-0010145, Shutdown Cooling Controls

1-GOP-123, Turbine Shutdown – Full Load To Zero Load

1-GOP-305, Reactor Plant Cooldown – Hot Standby To Cold Shutdown

2-GOP-365, Refueling Sequence Guidelines

2-NOP-67.02, Spent Fuel Handling Machine Operation

2-NOP-67.04, Refueling Machine Operation

0-NOP-67.05, Refueling Operation

2-GMM-68.02, Emergency Closure of Containment Penetrations, Personnel Hatch, and Equipment Hatches

2-NOP-03.05, Shutdown Cooling

2-NOP-01.03, Draining RCS

2-NOP-01.04, RCS Reduced Inventory and Mid-Loop Operation

2-NOP-01.05, Filling and Venting RCS

2-NOP-02.02, Charging and Letdown

**Section 1R22: Surveillance Testing**

ADM-29.02, ASME Code Testing of Pumps and Valves

**Section 1EP2: Alert and Notification System Evaluation****Procedures and Reports**

EP-SR-102-1000, Nuclear Division Florida Alert & Notification System Guideline, Rev. 4

FEMA-43 Report, Public Alert and Notification System for the St. Lucie Plant, February 1985

Siren System Availability Test Procedure, No. 6.80.01, Rev. L

Siren Maintenance Procedure, No. 6.80.02, Rev. I

Master Siren Control System Maintenance Procedure, No. 6.80.05, Rev. D

WPS-3000 High Power Voice & Siren System Installation & Operation Manual, May 1988

**Records and Data**

2015 St. Lucie Siren System Availability Test Records

2016 St. Lucie Siren System Availability Test Records

**Corrective Action Documents (Action Requests)**

02074672, Siren-59 failed bi-weekly test

02091063, PSL siren 29 failed bi-weekly test

02136166, PSL siren S-61 test failure

02168515, PSL Siren S-88 test failure

**Section 1EP3: Emergency Response Organization Staffing and Augmentation System****Procedures**

St. Lucie Plant Radiological Emergency Plan, Rev. 64

EPIP-03, Emergency Response Organization Notification/Staff Augmentation, Rev. 27  
 EPIP-05, Activation and Operation of the Operational Support Center, Rev. 36  
 EPIP-06, Activation and Operation of the Emergency Operations Facility, Rev. 46  
 EPIP-12, Maintaining Emergency Preparedness – Radiological Emergency Plan Training,  
 Rev. 34

#### Records and Data

ERO augmentation drill records 2015/2016  
 Emergency Response Organization current roster  
 Selected employee training records  
 St. Lucie Station On-Shift Staffing Analysis, Rev. 0  
 After Hours Phone Tests, 2016

#### Corrective Action Documents

02017060, Emergency response position changes in the OSC  
 02021903, PSL ERO Staffing Challenges  
 02025915, Training and qualification of Emergency Responders  
 02026635, PSL ERO qual/curriculum removed without EP approval  
 02033322, Control room shift communicator books with outdated procedure revision  
 02033665, PSL Key positions less than 3  
 02035354, PSL Key ERO position less than minimum  
 02046366, JIC/Media Center did not meet drill objective  
 02048126, ERO EOF Relief Staffing objective not met  
 02052015, PSL ERO duty positions failed to respond to ERO call test  
 02095805, ERO off hours call out difficulty  
 02097327, JIC missing critical staffing positions  
 02105258, PSL Drill Paging System Delay  
 02112875, 2016 PSL Exercise Player Activation  
 02129351, Control room shift communicator failure on the simulator  
 02129414, Operations Support Center Emergency Plan Activation Response  
 02145741, ERO alignment documents are far out of date  
 02157666, Non responders to 711 ERO call  
 02182216, NRC EP inspection 2017 Shift Communicator staffing review

#### **Section 1EP4: Emergency Action Level and Emergency Plan Changes**

##### Procedures

St. Lucie Plant Radiological Emergency Plan, Rev. 64  
 EN-AA-203-1201, 10 CFR Applicability and 10 CFR 50.59 Screening Reviews, Rev. 9  
 EP-AA-100-1007, Evaluation of Changes to the Emergency Plan, Supporting Documents and  
 Equipment [10 CFR 50.54(Q)], Rev. 3  
 EPG-01, Emergency Preparedness Assessment & Performance Monitoring, Rev. 19  
 EPG-03, Review & Revision of Emergency Preparedness Documents, Rev. 23  
 EPIP-08, Off-Site Notifications & Protective Action Recommendations, Rev. 41  
 Emergency Action Levels - Hot Basis, Rev. 2  
 Emergency Action Levels - Cold Basis, Rev. 2

##### Change Packages

10 CFR 50.54(q) Screening Form for EP Function Assessment, dated 2/22/16  
 10 CFR 50.54(q) Evaluation Form for EP Function Assessment, dated 2/22/16  
 10 CFR 50.54(q) Screening Form for EPIP-02 Rev. 41, dated 10/26/16  
 10 CFR 50.54(q) Screening Form for EPIP-08 Rev. 40, dated 2/15/16

Corrective Action Documents

02021286, Revise RAD EAL DBD to remove reference to PC-11 & Eberline  
 02090518, NRC submittal of EPIP not timely  
 02182170, NRC EP inspection 2017 10 CFR 50.54(q) not performed  
 02182209, NRC EP inspection 2017 PSL E-Plan not maintained

**Section 1EP5: Maintenance of Emergency Preparedness**Procedures

St. Lucie Plant Radiological Emergency Plan, Rev. 64  
 ADM-09.22, Equipment Out of Service, Rev. 21  
 EP-AA-101, Nuclear Division Drill and Exercise Program, Rev. 1  
 EP-AA-101-1000, Nuclear Division Drill and Exercise Procedure, Rev. 14  
 EP-AA-101-1007, Evaluation of Changes to the Emergency Plan, Supporting Documents and Equipment [10 CFR 50.54(Q)], Rev. 3  
 EP-AA-105, Maintaining Equipment Important to Emergency Preparedness, Rev. 4  
 EP-AA-1000-101-10001, Nuclear Division Drill and Exercise Objectives and Demonstration Criteria, Rev. 4  
 EPIP-04, Activation and Operation of the Technical Support Center, Rev. 51  
 EPIP-05, Activation and Operation of the Operations Support Center, Rev. 36  
 EPIP-06, Activation and Operation of the Emergency Operations Facility, Rev. 46  
 EPIP-13, Maintaining Emergency Preparedness – Emergency Exercises, Drills, Tests and Evaluations, Rev. 24  
 PI-AA-101, Assessment and Improvement Programs, Rev. 22  
 PI-AA-101-1001, Level 1 Core Business Assessments, Rev. 12  
 PI-AA-104-1000, Condition Reporting, Rev. 12  
 RP-SL-105-1005, Emergency Equipment, Rev. 5

Records and Data

2016 Agreement Letters with local governmental agencies/medical service providers  
 2016 Emergency Preparedness Exercise Report, dated 3/9/16  
 Critique Package for NOUE for Loss of Off-site Power (Actual Event), dated 8/21/16  
 Emergency Preparedness Quarterly Training Drill Reports, May 2015 – December 2016  
 Level 1 Core Business Assessment Report – WANO Evaluation Response, dated 11/10/16  
 Level 1 Core Business Assessment Report – NRC IP 71114.03, dated 12/18/16  
 Level 1 Core Business Assessment Report – NRC IP 71114.05, dated 11/8/16  
 Level 1 Core Business Assessment Report – NRC IP 71114.04, dated 12/13/16  
 Level 1 Core Business Assessment Report – NRC IPs 71151 & 71114.02, dated 12/16/16  
 PSL-15-008, St. Lucie Nuclear Oversight Report – Emergency Preparedness, Dated 08/12/15  
 PSL-16-005, St. Lucie Nuclear Oversight Report – Emergency Preparedness, Dated 08/10/16  
 Saint Lucie Nuclear Power Plant 2016 Population Update Analysis, dated 9/21/16  
 Self-Assessment of Preparation for NRC Inspection, dated 1/29/16  
 WO 40358967, HVE-8A Lubricate/Inspect, dated 1/13/16  
 WO 40388131, U1/RE 26-36, Refueling Area Radiation Monitor, Dated 10/24/16  
 WO 4040576701, Stack Exhaust Channel Calibration, dated 9/7/16  
 WO 40412680, U1/RSC-26-4-1, FHB Stack Radiation Monitor, LPU Internal Fault, dated 2/22/16  
 WO 40417235, U1/DRP-25-10A not fully closed, dated 1/13/17

Corrective Action Documents

02019667, U2 ECCS “A” Low Range Gas Monitor is reading low  
 02021326, EP Annual Brief not scheduled

02021412, All NRC (FTS) phones out of service in TSC  
 02021755, Roll Up of NRC Observations during 2015 Inspection  
 02032130, FHB Exhaust fails testing on low flow  
 02032353, FHB Equipment room exhaust fan would not start  
 02032373, FP HVE-16A Inlet Damper is failed open  
 02033564, Fuel pool HVE-16 filter train rust chip buildup  
 02035363, EP 1<sup>st</sup> quarter TRC/ERO planning meeting not scheduled  
 02036547, Failed Performance Indicator for inaccurate Notification Form  
 02043834, EOF Bull Pen AC unit failing  
 02044361, EOF fax machines have chronic phone line connect issues  
 02045836, PSL 2<sup>nd</sup> Quarter EP Drill Scenario different from validation  
 02045906, May 5<sup>th</sup> Drill issues with TSC  
 02046366, JIC did not meet drill objective  
 02048126, EOF ERO staffing objective  
 02051723, 1-AOP-99.02 bypasses the use of the EAL tables  
 02057304, EOOS Log entry EP flags  
 02064866, Jenson Beach causeway round about work  
 02070114, 2015 3<sup>rd</sup> Quarter drill, TSC prompted to do dose assessment  
 02070264, ERDS time stamp data inaccurate  
 02070285, PSL 3<sup>rd</sup> quarter EP drill scenario varied from expected  
 02070286, PSL 3<sup>rd</sup> quarter EP drill EOF dose assessment not as validated  
 02070375, ERDS data update frequency  
 02071594, 3<sup>rd</sup> Quarter drill performance failure  
 02095805, ERO off hours call out deficiencies  
 02096758, NRC beige phones found with no dial tone  
 02096765, ECCS train displays at EOF faulty for dose assessment  
 02096853, PSL 4<sup>th</sup> quarter 2015 EP drill simulator critique issue  
 02097914, PSL 4<sup>th</sup> quarter 2016 EP drill performance opportunity  
 02113039, 2016 EP graded exercise – player on controller radio channel  
 02113051, ERDS displayed values questioned during drill  
 02113058, 2016 Graded Exercise – TSC Supervisor needed prompting  
 02114028, NRC RSCL phone line in TSC not working  
 02114415, NRC comments from EP NRC Inspection  
 02115419, Declining performance of ERO response during call-out tests  
 02126917, Inappropriate questioning by NOS evaluator during drill  
 02126957, PSL 2<sup>nd</sup> quarter emergency drill Alert notification  
 02127975, PSL 2<sup>nd</sup> quarter EP drill Alert notification  
 02152996, LOOP NOUE Notification Review  
 02161390, Hurricane Mathew after action roll-up  
 02181476, NRC EP Inspection 2017 – Inventory deficiency  
 02181807, NRC EP Inspection 2017 – LOA not listed in PSL E-Plan

### **Section 40A1: Performance Indicator Verification**

#### Procedures

ADM-25-02, NRC Performance Indicators, Rev. 34

EPIP-13, Maintaining Emergency Preparedness – Emergency Exercises, Drills, Tests and Evaluations, Rev. 24

PI-AA-104-1000, Condition Reporting, Rev. 12

#### Records and Data

DEP opportunities documentation for 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> quarters 2016

Siren test data for 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> quarters 2016

Drill and exercise participation records of ERO personnel for 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> quarters 2016

Corrective Action Documents

02036547, Failed Performance Indicator for inaccurate information on Notification Form

02074672, Siren-59 failed bi-weekly test

02084882, LMS training record mistake led to EP NRC PI inaccuracy 3Q15

02091063, PSL siren 29 failed bi-weekly test

02100267, Emergency Preparedness Performance Indicators issue

02126957, Actual contact time different than annotated on Notification Form

02136166, PSL siren S-61 test failure

02143169, Simulator clocks can contribute to HU errors on E-Plan DEP

02168515, PSL Siren S-88 test failure

02181804, NRC EP Inspection 2017 – Observation during DEP opportunity

**Section 40A5: Other Activities**

Documents

Test report PSL-RJW-27229, Perform Therovision Inspections of PSL Switchyard and Plant, dated March 6, 2017

Nuclear Plant Switchyard weekly Inspection report results from January 3, 2017 to March 7, 2017

U1/U2 January 2017 quarterly switchyard walkdown results

Operations training power point PSL OPS 0702502 Seg 16C “Main Power Distribution”

Operations training power point “Open Phase Phenomenon When in Backfeed”

0-NOP-99.02, Watchstation General Inspection Guidelines

Operations Standing Order OPS-119, “Loss of Single Phase Voltage for the Unit 1 Startup Transformers”

Operations Department Shift Order dated February 2, 2017

Corrective Action Documents

2003759, NRC Commitments – NEI Open Phase Initiative

2173905, NRC TI 2515/192 OPC Inspection Readiness Assessment

## LIST OF ACRONYMS

ADAMS	NRC's Agency-wide Documents Access and Management System
ADM	Administrative Procedure
AFAS	AFW Actuation System
AFW	Auxiliary Feedwater
ALARA	As Low as Reasonably Achievable
AOP	Abnormal Operating Procedure
AR	Action Request
ARERR	Annual Radiological Effluent Release Report
AC	Alternating Current
ACE	Apparent Cause Evaluation
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
BMV	Bare Metal Visual
CAP	Corrective Action Program
CCW	Component Cooling Water
CEA	Control Element Assembly
CFR	Code of Federal Regulations
CS	Containment Spray
cSt	Centistokes (unit of viscosity)
DAW	Dry Active Waste
DFS	Debris Filter System
DOT	Department of Transportation
DP	Differential Pressure
CWP	Circulating Water Pump
DOT	Department of Transportation
EAL	Emergency Action Level
EC	Engineering Change or Eddy Current
ECCS	Emergency Core Cooling System
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EOF	Emergency Operations Facility
EP	Emergency Preparedness
EPIP	Emergency Plan Implementing Procedure
EPRI	Electric Power Research Institute
ERO	Emergency Response Organization
ETSS	Examination Technique Specification Sheets
FCV	Flow Control Valve
FHB	Fuel Handling Building
FOSAR	Foreign Object Search and Retrieval
FPL	Florida Power and Light
FS	Fire System
Ft	Foot
GME	General Maintenance Electrical
GMM	General Maintenance Mechanical
GOP	General Operating Procedure
GMP	General Maintenance Procedure

HCV	Hydraulic Control Valve
HP	Health Physics
HPSI	High Pressure Safety Injection
HRA	High Radiation Area
HVAC	Heating, Ventilation and Air Conditioning
HX	Heat Exchanger
I&C	Instrumentation & Controls
ICI	In-core Instrumentation
IMC	Inspection Manual Chapter
ICW	Intake Cooling Water
IOD	Immediate Operability Determination
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
ISI	Inservice Inspection
LIP	Local Intense precipitation
LIV	Licensee-Identified Violation
LER	Licensee Event Report
LLRT	Local Leak Rate Test
LOCA	Loss of Coolant Accident
LOOP	Loss of Offsite Power
LP	Low Pressure
LPSI	Low Pressure Safety Injection
MH	Man Hole
MPFF	Maintenance Preventable Functional Failure
MR	Maintenance Rule (10 CFR 50.65)
mRem	Millirem
MSR	Moisture Separator Reheater
MV	Motor Valve
NCV	Non-Cited Violation
NDE	Non-destructive Examination
NEI	Nuclear Energy Institute
NLO	Non-Licensed Operator
NOP	Normal Operating Pressure
NRC	Nuclear Regulatory Commission
NUMARC	Nuclear Management and Resource Council
OCC	Outage Command Center
ODCM	Offsite Dose Calculation Manual
OLRM	Online Risk Monitor
OOS	Out of Service
OSP	Operations Surveillance Procedure
PARS	Publically Available Record
PCR	Procedure Change Request
PD	Performance Deficiency
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PMI	Preventative Maintenance I&C
PME	Preventative Maintenance Electrical
PMM	Preventative Maintenance Mechanical
PMT	Post-Maintenance Test
PSL	Plant St. Lucie
PT	Penetrant Testing

PWR	Pressurized Water Reactor
R&O	Rust & Oxidation
RAB	Reactor Auxiliary Building
RCA	Radiological Control Area
RCB	Reactor Containment Building
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
Rem	Roentgen Equivalent Man (i.e. dose of radiation)
REMP	Radiological Environmental Monitoring Program
RFO	Refueling Outage
RG	Regulatory Guide
RP	Radiation Protection
RPS	Reactor Protection System
RTP	Rated Thermal Power
RTSG	Reactor Trip Switchgear
RWP	Radiation Work Permit
SBLOCA	Small Break LOCA
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
SFP	Spent Fuel Pool
SG	Steam Generator
SL	St. Lucie
SME	Surveillance Maintenance Electrical
SMI	Surveillance Maintenance I&C
SSA	Shutdown Safety Assessment
SSC	Systems, Structures, and Components
SUT	Start-up Transformer
TAW	Tampa Armature Works
TI	Temporary Instruction
TS	Technical Specifications
TSC	Technical Support Center
TSSR	Technical Specifications Surveillance Requirement
VPI	Valve Position Indication
UFSAR	Updated Final Safety Analysis Report
UT	Ultra Sonic Testing
WANO	World Association of Nuclear Operators
WMT	Waste Monitor Tank
WO	Work Order
WR	Work Request