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

November 10, 2016

Mr. Mano Nazar
President, Nuclear Division and Chief Nuclear Officer
Florida Power & Light Co.
Mail Stop: NT3/JW
15430 Endeavor Drive
Jupiter, FL 33478

SUBJECT: ST. LUCIE PLANT - NRC INTEGRATED INSPECTION REPORT
05000335/2016003 AND 05000389/2016003

Dear Mr. Nazar:

On September 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your St. Lucie Plant Units 1 and 2. On November 8, 2016, the NRC inspectors discussed the results of this inspection with Mr. Costanzo and other members of your staff. The results of this inspections 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. Inspectors documented a licensee-identified violation which was determined to be of very low safety significance in this report. The NRC is treating these violations as a non-cited violations (NCVs) consistent with Section 2.3.2.a of the NRC Enforcement Policy.

If you contest the violations or significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the 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.

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 disagreement, to the Regional Administrator, Region II; and the NRC Resident Inspector at the St. Lucie Plant.

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

Sincerely,

/RA/

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

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

Enclosure:
IR 05000335/2016003 and 05000389/2016003,
w/Attachment: Supplemental Information

cc w/encl.: Distribution via ListServ

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ADAMS: ☒ Yes ACCESSION NUMBER: ML16315A206 ☒ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

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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:	05000335/2016003, 05000389/2016003
Licensee:	Florida Power & Light Company (FP&L)
Facility:	St. Lucie Plant, Units 1 & 2
Location:	6501 South Ocean Drive Jensen Beach, FL 34957
Dates:	July 1, 2016 to September 30, 2016
Inspectors:	T. Morrissey, Senior Resident Inspector S. Roberts, Resident Inspector R. Carrion, Senior Reactor Inspector (Section 1R07) J. Rivera, Health Physicist (Section 2RS1)
Approved by:	LaDonna B. Suggs, Chief Reactor Projects Branch 3 Division of Reactor Projects

Enclosure

SUMMARY

IR 05000335/2016003, 05000389/2016003; 07/01/2016 – 09/30/2016; St. Lucie Nuclear Plant, Units 1 & 2; Follow-up of Events and Notice of Enforcement Discretion

The report covered a three month period of inspection by the resident inspectors and two regional specialist inspectors. One non-cited violation of NRC requirements was identified by the inspectors. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, or Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. 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 August 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 Unit 1 Technical Specification 3.4.6.2 "Reactor Coolant System Leakage" was identified. Specifically, the licensee failed to enter TS 3.4.6.2 Action 'c" for reactor coolant system pressure isolation valve (V3217) when the valve experienced operational seat leakage of approximately 30 gpm during flushing and cooling the shutdown cooling system. Immediate corrective actions were not required since the valve was later determined to be inoperable and repaired. The licensee entered this issue into the licensee's corrective action program.

  The licensee's failure to recognize that gross seat leakage from check valve V3217 indicated of a major problem with valve seat alignment and that higher differential pressure would not help seat the valve was a performance deficiency (PD). The performance deficiency is more than minor because it is associated with the barrier integrity cornerstone attribute of human performance and adversely affected the cornerstone objective of providing reasonable assurance that physical barriers such as the containment, protected the public from radionuclide releases caused by accidents or events. The PD resulted in 46 additional hours of operation with V3217 seat leakage outside of TS acceptance criteria which required the unit to be in cold shutdown. The finding involved the cross-cutting area of human performance and specifically within that area was associated with conservative bias because the operability evaluation did not demonstrate it was safe to proceed with valve V3217 experiencing gross seat leakage [H.14]. (4OA3.3).

Licensee-identified Violations

Violations of very low safety or security significance or Severity Level IV that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). On August 1, 2016, the unit was shut down to Mode 5 (<200°F) in order to repair a leaking seal welded fitting (FE-3311) on the high pressure safety injection (HPSI) system. During the outage, with the unit at normal operating pressure and temperature (NOPT), safety injection (SI) system check valve (V3217) seat leakage was found to be greater than technical specification (TS) requirements. The unit was returned to Mode 5 in accordance with TSs. The reactor coolant system (RCS) was drained to a lowered inventory condition and the valve was repaired. The unit was restarted on August 21, 2016. During power ascension, on the same day the unit automatically tripped from approximately 38 percent RTP when a main generator protective relay actuated opening the main generator output breakers. The licensee determined that the relay had not automatically disarmed when the main generator was synchronized to the grid. The licensee repaired the relay's control circuitry and restarted the unit on August 25, 2016. The unit reached 100 percent RTP on September 1, 2016. On September 26, the unit was shutdown for a planned refueling outage (RFO). The unit was in Mode 6 with the reactor coolant system depressurized at the end of the inspection period.

Unit 2 was at 100 percent RTP during the entire 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 those issues were documented in the corrective action program (CAP). Documents reviewed are listed in the attachment. This inspection constitutes three samples.

- Unit 2, 2B emergency diesel generator (EDG) while 2A EDG was out of service (OOS) for planned maintenance
- Unit 2, 2A Train HPSI while 2B train HPSI was OOS due to planned testing
- Unit 2 2A and 2B auxiliary feed water (AFW) trains while 2C AFW pump was OOS for planned maintenance

b. Findings

No findings were identified.

1R05 Fire Protection (IP 71111.05)

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 and ignition sources, the material condition and operational status of fire protection systems including fire barriers used to prevent fire damage or fire propagation. The inspectors reviewed these activities against provisions in the licensee's procedure AP-1800022, Fire Protection Plan, and 10 CFR Part 50, Appendix R. The licensee's fire impairment lists, updated on an as-needed basis, were routinely reviewed. In addition, the inspectors reviewed the CAP database to verify that fire protection problems were being identified and appropriately resolved. Documents reviewed are listed in the attachment. This inspection constitutes five samples. The following areas were inspected:

- Unit 1, reactor auxiliary building (RAB) 43' elevation heating and ventilation room
- Unit 1, fuel handling building (FHB) new fuel storage area
- Unit 2, 2A and 2B EDG rooms
- Unit 1, vital battery rooms
- Unit 2, control room and associated heating, ventilation and air conditioning (HVAC) room

b. Findings

No findings were identified.

1R06 Flood Protection Measures (IP 71111.06)

Internal Flooding

a. Inspection Scope

The inspectors conducted a walkdown of the 2A and 2B trains of low pressure safety injection (LPSI), HPSI, and containment spray which included checks of building structure drainage sumps to ensure that flood protection measures were in accordance with design specifications. The inspectors reviewed Unit 2 Updated Final Safety Analysis Report (UFSAR), Section 3.4, Water Level (Flood) Design, UFSAR Table 3.2-1, Design Classification of Systems, Structures, and Components (SSC) and Chapter 9.5A, Section 3.0 that describes the emergency core cooling system (ECCS) room flooding analysis. The inspectors also reviewed plant procedures that discussed the protection of areas containing safety-related equipment that may be affected by internal flooding. Specific plant attributes that were checked included

structural integrity, sealing of penetrations, control of debris, and operability of sump pump systems. This inspection constitutes one sample.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors interviewed plant personnel and reviewed operability determinations, completed surveillances, associated calculations, and inspection results associated with the listed heat exchangers that were directly cooled by the intake cooling water (ICW) system or the component cooling water (CCW) system (i.e., a closed loop cooling water system) to verify that heat exchanger deficiencies, potential common cause problems, or heat sink performance problems that could result in initiating events or affect multiple heat exchangers in mitigating systems were being identified, evaluated, and resolved. The inspectors selected the heat exchangers for review based on their risk significance in the licensee's probabilistic risk analysis and their safety-related mitigating system support functions.

- Unit 1 CCW heat exchanger 1B (directly cooled by the ICW system)
- Unit 2 CCW heat exchanger 2A (directly cooled by the ICW system)
- Unit 2 CCW heat exchanger 2B (directly cooled by the ICW system)
- Unit 1 HPSI pump cooler 1B (cooled by the CCW system)
- Unit 2 fuel pool heat exchanger 2A (cooled by the CCW system)

For the referenced CCW heat exchangers, the inspectors determined whether inspection/cleaning methods, maintenance, and monitoring of biotic fouling and macro-fouling programs were adequate to ensure proper heat transfer.

The inspectors also reviewed the methods and results of heat exchanger performance inspections. The inspectors determined whether: the methods used to inspect and clean the heat exchangers were consistent with identified as-found conditions and expected degradation trends, and industry standards; the licensee's inspection and cleaning activities had established acceptance criteria consistent with industry standards; and the as-found results were recorded, evaluated, and appropriately dispositioned so that the as-left condition was acceptable.

For the CCW heat exchangers, the inspectors reviewed the methods and results of heat exchanger inspection/cleaning to verify that performance was maintained in accordance with the system design basis. This was accomplished by determining whether the inspection/cleaning methodology, frequency, acceptance criteria, and results were adequate to confirm the heat transfer capability and detect degradation prior to loss of heat removal capabilities below design basis values. In addition, the inspectors reviewed the results of the performance test used to establish the current inspection/cleaning frequency to verify that the test methodology, conditions, and acceptance criteria were consistent with accepted industry practices. The inspectors

also verified that the performance test results were correctly applied to the evaluation of heat transfer capability under design basis conditions.

For the Unit 1 HPSI pump cooler 1B and the Unit 2 fuel pool heat exchanger 2A, the inspectors determined whether the condition and operation of the heat exchanger were consistent with design assumptions as described in the UFSAR. Where applicable, the inspectors reviewed records of heat exchanger eddy current testing and tube plugging to assess structural integrity and verify that the number of plugged tubes was within pre-established limits based on capacity and heat transfer assumptions. The inspectors reviewed operating procedures to determine whether the licensee established adequate controls and operational limits to prevent heat exchanger degradation due to excessive flow-induced vibration during operation. The inspectors also reviewed system health reports to determine whether the licensee's chemical treatment programs for corrosion control were effective in preventing system degradation.

In addition to the selected heat exchangers and cooler, the inspectors reviewed a sample of heat sink inspection attributes as described in the paragraphs below to verify that the performance of the ultimate heat sink (UHS) and its subcomponents was adequate to ensure availability and accessibility to the in-plant cooling water systems.

The inspectors reviewed inspection records and conducted a walkdown of the barrier wall (dam structure) separating Big Mud Creek (i.e., the UHS) and the intake canal to verify that the licensee had established a program to identify degradation and loss of structural integrity. This included a review of records for structural and diver inspections to verify that the licensee was monitoring the integrity and performance of the heat sink and that appropriate corrective actions were implemented. During the walkdown, the inspectors determined whether vegetation present along the slopes was maintained to prevent adverse effects on the function of the UHS. In addition, the inspectors reviewed design basis information and bathymetric surveys of Big Mud Creek to determine whether sufficient reservoir capacity was available to perform its design basis function.

For a sample of buried and inaccessible piping, the inspectors reviewed the licensee's pipe inspection and monitoring program to determine whether structural integrity was ensured and that any leakage or degradation was appropriately identified and dispositioned. Specifically, the inspectors reviewed inspection records and corrective action documents for buried sections of piping. The inspectors also reviewed historical data of through-wall pipe leakage in the ICW system to identify any adverse trends and to verify that adequate corrective actions were implemented.

The heat sink inspection sample also included a system walkdown of the Units 1 and 2 ICW system intake structures and the Units 1 and 2 CCW heat exchangers to assess the material condition and functionality of accessible structures and components such as strainers, pumps, instrumentation, and component supports. In addition, the inspectors interviewed plant staff and reviewed inspection records of visual inspections of the intake structure to determine whether pump bay silt accumulation was monitored, trended, and maintained at an acceptable level. During the walkdown, the inspectors interviewed plant staff to assess the operation of the

ICW system and UHS, including monitoring, trending, and control of macro-fouling to prevent clogging.

In addition, the inspectors reviewed corrective action documents related to the ICW system and heat sink performance issues to determine whether the licensee had an appropriate threshold for identifying issues and to evaluate the effectiveness of the corrective actions. Documents reviewed are included in the attachment.

The inspectors completed the required four samples (5 heat exchangers and 1 heat sink) specified in Inspection Procedure (IP) 71111.07 for the triennial basis.

b. Findings

No findings were identified.

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

.1 Resident Inspector Quarterly Review

a. Inspection Scope

On July 5, 2016, the inspectors observed and assessed an evaluated licensed operator simulator scenario during continuing training on the control room simulator. The simulated scenario included a loss of a condensate pump, loss of power from an auxiliary transformer when its breaker opened, a manual reactor trip, a stuck open pressurizer pilot-operated relief valve (PORV), and a total loss of AFW. The stuck open PORV resulted in an Alert classification and notification to the State.

On August 29, 2016, the inspectors observed and assessed an evaluated simulator scenario during an annual exam on the control room simulator. The simulated scenario included a main feed water pump leak, steam generator tube rupture exceeding the capacity of the charging pumps, a manual reactor trip, two control element assemblies (CEAs) failing to fully insert on the reactor trip, and a steam generator safety valve failing to shut. The steam generator tube rupture resulted in an Alert classification and 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
- 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 constitutes two samples.

b. Findings

No findings were identified.

.2 Control Room Observations

a. Inspection Scope

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

- August 1, 2016, Unit 1 rapid down power and reactor shut down to complete repairs on SI system flow element FE-3311 pipe weld
- August 21, 2016, Unit 1 startup , Mode 1 to 10 percent RTP
- September 26, 2016, Unit 1 shutdown and cooldown to support planned 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 completes three samples.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (IP 71111.12Q)

a. Inspection Scope

The inspectors reviewed the performance data and associated ARs for the one system listed below to verify that the licensee's maintenance efforts met the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and licensee administrative procedure ADM-

17-08, “Implementation of 10 CFR 50.65, The Maintenance Rule (MR)”. The inspectors focused on maintenance rule scoping, characterization of maintenance problems and failed components, risk significance, determination of MR a(1) and a(2) classification, corrective actions, and the appropriateness of established performance goals and monitoring criteria. The inspectors also interviewed responsible engineers and reviewed some of the corrective maintenance activities. The inspectors 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. The inspectors reviewed quality control aspects associated with the repair of SI flow element FE-3311. The inspectors verified proper parts were installed, foreign material exclusion closeouts were properly completed and weld travelers were properly authorized by a weld engineer and an authorized nuclear inservice inspector (ANII). Documents reviewed are listed in the attachment. This inspection constitutes one sample and is credited towards the required quality control sample.

- Unit 1 HPSI system MR a(1), (AR 2147078, FE-3311 (flow element for HPSI loop 1A2) fitting leak and AR 2148252, SI loop 1A2 check valve V3217 leakage)

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

a. Inspection Scope

The inspectors completed in-office reviews, plant walkdowns, and control room inspections of the licensee’s on-line and shutdown risk assessment of emergent or planned maintenance activities. The inspectors verified the licensee’s risk assessment and risk management activities using the requirements of 10 CFR 50.65(a)(4), the recommendations of Nuclear Management and Resource Council 93-01, “Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants”, and licensee procedures ADM-17.16, “Implementation of the Configuration Risk Management Program” and ADM-09.23, “Outage Risk Assessment and Control.” The inspectors also reviewed the effectiveness of the licensee’s contingency actions to mitigate increased risk resulting from the degraded equipment. The inspectors interviewed responsible senior reactor operators on-shift, verified actual system configurations, and specifically evaluated results from the online risk monitor (OLRM) for the combinations of OOS risk significant SSCs listed below. Documents reviewed are listed in the attachment. This inspection constitutes six samples.

- Unit 1 Green shutdown safety assessment (SSA) with the unit in Mode 5 and a freeze seal established to support repair of a SI flow element FE-3311 pipe connection
- 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 safety injection system check valve V3217
- Unit 2, Green OLRM assessment with 2A LPSI, 2A containment spray and 2C charging pumps OOS for planned maintenance
- Unit 1, Yellow OLRM assessment with 1A CCW pump OOS for planned pump motor replacement and A train ECCS OOS for surveillance testing

- Unit 2, Yellow OLRM assessment with 2A ECCS and containment spray trains OOS to support planned valve testing
- Unit 1, Yellow SSA with the unit in Mode 5 and 6 and the RCS depressurized and drained to a lowered inventory condition to support refueling activities

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (IP 71111.15)

.1 Quarterly Review

a. Inspection Scope

The inspectors reviewed the following action requests (ARs) interim dispositions and operability determinations or functionality assessments to ensure that they were properly supported and the affected SSCs remained available to perform their safety function with no increase in risk. The inspectors reviewed the applicable UFSAR, and associated supporting documents and procedures, and interviewed plant personnel to assess the adequacy of the interim disposition. This inspection constitutes six samples.

- AR 2145969, Unit 1 B train reactor protection system startup rate bistable set point reduction
- AR 2149663, Unit 1 V3217 damaged bonnet stud and nut
- AR 2149500, Unit 2 MV-09-11 stroke time unsatisfactory
- AR 2151208, Unit 1 feedwater check valve V9280 seat leakage
- AR 2148252, Unit 1 V3217 seat leakage
- AR 2156314, Unit 2 ICW piping through wall leak

b. Findings

No findings were identified.

.2 Annual Review: Operator Workarounds

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the process used to identify, document, track, and resolve operator workarounds (OWAs) as described in procedure OP-AA-108-1000, "Operator Challenge Program Management," to verify the licensee was identifying workarounds at an appropriate threshold and entering them into the CAP. Daily plant and equipment status logs, and degraded instrument logs, were reviewed to identify any potential sources of unidentified OWAs. The inspectors also attended a monthly operator challenges review board meeting. The inspectors reviewed the one OWA identified by the licensee associated with Unit 1 main turbine gland steam high pressure bypass valve operation. The inspectors determined that this OWA did not affect mitigating equipment. This inspection constitutes one sample.

b. Findings and Observations

No findings were identified.

1R18 Plant Modifications (IP 71111.18)

a. Inspection Scope

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

- EC 287161, V3217 (check valve for safety injection tank 1A2 outlet to loop 1A2), machining the valve body bushing bore diameter and replacing both disk arm bushings with larger diameter bushings of a different material.

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 five samples. Documents reviewed are listed in the attachment.

- WO 40480885 Unit 1 wide range B nuclear instrument (NI) failed
- WO 40482264 Unit 1 CEA-1 upper coil replacement
- WO 40482142 Unit 1 SI flow element FE-3311 leak repair
- WO 40483748 Unit 1 SI check valve V3217 repair
- WO 38025181, Unit 1 1A CCW pump motor replacement

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (IP 71111.20)

.1 Unit 2 Forced Outage: Repair Safety Injection System Flow Element FE-3311 leak and Safety Injection Check Valve V3217

a. Inspection Scope

On August 1, 2016, the licensee identified a leaking weld on the piping connection to safety injection system flow element FE-3311 located in the RAB. The leakage was initially determined to be RCS pressure boundary leakage and the unit was shut down and cooled down to Mode 5 (<200°F) in accordance with TSs in order to implement repairs. The licensee later determined that the leaking connection was a threaded connection with a seal weld and therefore the leakage was not RCS pressure boundary leakage. During the outage, the upper gripper coil for CEA-1 was also replaced. During the restoration of the unit to NOPT, SI system loop 1A2 check valve seat leakage was found to be greater than allowed by TSs. The unit was returned to Mode 5 in accordance with TSs. The reactor coolant system was drained to a lowered inventory condition and the valve was repaired. The unit was restarted on August 21, 2016. This inspection constitutes one sample. 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 are 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.

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 forced outage.

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 August 21, 2016, 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.

b. Findings

No findings were identified.

.2 Unit 1 Refueling Outage SL1-27

a. Inspection Scope

Outage Planning, Control and Risk Assessment

Unit 1 was shut down for a planned refueling outage on September 26, 2016. 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) SL1-27 meetings including the outage command center (OCC) morning meetings, operations team meetings, and schedule performance update meetings. The inspectors examined the licensee implementation of shutdown safety assessments (SSAs) during SL1-27 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 reactor containment building (RCB) after the unit was shut down to determine whether any components were impacted by previously unidentified RCS leakage. The RCB, including the RCB sump, was inspected for any damage incurred during the operating cycle.

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:

- 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 Condition

The inspectors reviewed the planned activities associated with a period of lowered RCS inventory established in order to remove the reactor vessel head. The inspectors verified the licensee had controls in place to govern lower inventory conditions. The inspectors verified that the necessary instrumentation and means of adding inventory to the RCS were available.

Containment Closure

The inspectors evaluated the licensee's ability to close the containment equipment, personnel, and emergency hatches in a timely manner per procedure 1-GMM-68.02, "Emergency Closure of Containment Penetrations, Personnel Hatch, and Equipment Hatches."

Corrective Action Program

The inspectors reviewed ARs generated during SL1-27 to evaluate the licensee's threshold for initiating ARs.

This inspection constitutes a partial inspection sample. Additional SL1-27 RFO inspection activities and the completed inspection sample will be documented in the 2016-004 quarterly report.

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 the systems were capable of performing their intended safety functions and their operational readiness. In addition, the inspectors evaluated the effect of the testing activities on the plant to ensure that conditions were adequately addressed by the licensee staff and that after completion of the testing activities, equipment was returned to standby alignment required for the system to perform its safety function. The inspectors verified that surveillance issues were documented in the CAP. This inspection constitutes four inspection samples.

Surveillance Tests:

- 1-OSP-59.01B, 1B EDG Monthly Surveillance
- 2-SMI-63.02, RPS - Monthly Functional Test - Channel A, Unit 2
- 1-OSP-03.31B, Ultrasonic testing (UT) valuation of B Train ECCS Monitored Locations, Unit 1
- CY-SL-104-2001, Unit 2, 2A purification filter outlet IX inlet sample (RCS sample)

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (IP 71114.06)

Emergency Preparedness Drills

a. Inspection Scope

On July 5, 2016, the inspectors observed and assessed a licenced operator crew's performance during an evaluated licensed operator continued training scenario using the control room simulator. The simulated scenario included a loss of a condensate pump, loss of power from an auxiliary transformer when its breaker opened, a manual reactor trip, a stuck open pressurizer PORV, and a total loss of AFW. The stuck open PORV resulted in an Alert classification and notification to the State. The simulated scenario included assessing classification of the emergency event and completing notifications to the State and NRC.

In addition, on July 27, 2016, the inspectors observed the control room simulator, technical support center, emergency operating facility staff during an emergency preparedness drill of the site emergency response organization to verify the licensee

was properly classifying emergency events, completing the required notifications, and making appropriate protective action recommendations. The scenario included a site security event, a rapid down power of both units, a failure of the reactor to trip when the turbine tripped, a loss of a 4160 volt electrical bus, and a loss of coolant accident. Conditions degraded to a point where the licensee declared a Notice of Unusual Event, an Alert, and later a Site Area Emergency.

During both inspections, the inspectors assessed the licensee's actions to verify that emergency classifications and notifications were made in accordance with licensee emergency plan implementing procedures (EPIPs) and 10 CFR 50.72 requirements. The inspectors specifically verified the Notice of Unusual Event, Alert, and Site Area Emergency classifications and notifications were in accordance with licensee procedures EPIP-01, "Classification of Emergencies" and EPIP-02, "Duties and Responsibilities of the Emergency Coordinator." For the emergency preparedness drill, the inspectors observed whether the initial activation of the emergency response centers was timely and as specified in the licensee's emergency plan. The inspectors verified that licensee identified critique items and any drill/training weaknesses were captured in the CAP.

This inspection constitute one sample of an observation of an emergency preparedness drill and one sample associated with a simulator-based licensed operator requalification training evolution.

b. Findings

No findings were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Control

a. Inspection Scope

Hazard Assessment and Instructions to Workers During facility tours, the inspectors directly observed radiological postings and container labeling for areas established within the radiologically controlled area (RCA) of the Unit 1 (U1) and Unit 2 (U2) auxiliary buildings, radioactive waste processing and storage areas, spent fuel pools, hot tool shop, and the outdoor dry waste storage area. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. The inspectors reviewed survey records for several plant areas including surveys for airborne radioactivity, gamma surveys with a range of dose rate gradients, surveys for alpha-emitters and other hard-to-detect radionuclides. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. The inspectors attended pre-job briefings and reviewed Radiation Work Permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers.

Control of Radioactive Material The inspectors observed surveys of material and personnel being released from the RCA using small article monitor, personnel contamination monitor, and portal monitor instruments. The inspectors discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

Hazard Control The inspectors evaluated access controls and barrier effectiveness for selected High Radiation Area (HRA), Locked High Radiation Area (LHRA), and Very High Radiation Area (VHRA) locations and discussed changes to procedural guidance for LHRA and VHRA controls with Radiation Protection (RP) supervisors. The inspectors reviewed implementation of controls for the storage of irradiated material within the spent fuel pool. Established radiological controls, including airborne controls and electronic dosimeter alarm setpoints, were evaluated for select U1 Refueling Outage (RFO) 27 tasks, U1 August 2016 forced outage to repair a safety injection check valve, and U2 September 2016 at-power containment entry to troubleshoot a leak in the oil collection tank area. In addition, the inspectors reviewed licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations. The inspectors also reviewed the use of personnel dosimetry including extremity dosimetry and multibadging in high dose rate gradients.

Radiation Worker Performance and RP Technician Proficiency Occupational workers' adherence to selected RWPs and RP technician proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. The inspector observed HRA and LHRA briefs for decontamination workers, scaffolders, electricians, and workers in the U1 reactor cavity. Jobs observed included the U1 Liquid Level Probe Removal in a LHRA. The inspectors also evaluated worker responses to dose and dose rate alarms during selected work activities.

Problem Identification and Resolution The inspectors reviewed and assessed condition reports associated with radiological hazard assessment and control. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with licensee procedures. The inspectors also reviewed recent self-assessment results.

Inspection Criteria Radiation protection activities were evaluated against the requirements of UFSAR Chapter 12, Technical Specifications (TS) Sections 6.8 and 12, 10 CFR Parts 19 and 20, and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, "Control of Radioactively Contaminated Material". Documents and records reviewed are listed in the Attachment.

The inspectors completed the required seven samples specified in Inspection Procedure (IP) 71124.01.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (IP 71151)

Mitigating Systems

a. Inspection Scope

The inspectors checked licensee submittals for the performance indicators (PIs) listed below for the period July 1, 2015 through June 30, 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," and licensee procedures ADM-25.02, "NRC Performance Indicators," were used to check the reporting for each data element. The inspectors checked operator logs, plant status reports, condition reports, system health reports, and PI data sheets to verify that the licensee had identified the required data, as applicable. The inspectors interviewed licensee personnel associated with performance indicator data collection, evaluation, and distribution.

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

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (IP 71152)

.1 Daily Review

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," and to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a screening of items entered daily into the licensee's CAP. This review was accomplished by reviewing daily printed summaries of action requests and by reviewing the licensee's electronic 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: Unit 1 Dropped Control Element Assemblies (CEAs)

a. Inspection Scope

The inspectors selected AR 2098891, "CEA-53 Unexpectedly Dropped into the Core," and AR 2119250, "CEA-2 Dropped into the Core during Power Switch Replacement," for a more in-depth reviews of the circumstances and the corrective actions that

followed. The inspectors reviewed the AR reports to ensure that the licensee performed an appropriate evaluation, and specified and prioritized corrective actions in accordance with its program. Other attributes checked included disposition of operability and resolution of the problem, including cause determination, past operability determination, and corrective actions. The inspectors interviewed plant personnel and evaluated the ARs in accordance with the requirements of the licensee's corrective actions process as specified in licensee's procedure PI-AA-104-1000, "Condition Reporting." This inspection constitutes one sample.

b. Findings and Observations

No findings were identified. The licensee's equipment apparent cause evaluation for the unexpected dropping of CEA-53 into the core on December 21, 2015 determined that the upper gripper power switch experienced an electrical phase-to-phase short between the control circuit and the 240 VAC input. The power switch was sent to a vendor for analysis. The vendor identified silver migration from a soldered resistor connection. The silver migration reduced the gap between the resistor soldered connection and a circuit board mounting screw head with a 240 VAC input voltage and resulted in the phase-to-phase short. Corrective actions included cleaning the circuit boards of any silver migration and replacing the metal standoffs at the mounting screws with nylon standoffs. The nylon standoffs removed the 240 VAC potential from the mounting screws.

On March 22, 2016, during corrective actions to replace the upper gripper power switches with power switches that had been cleaned and provided with nylon standoffs, CEA-2 dropped in the core while placing it on the hold bus. Initial troubleshooting determined that the CEA-2 hold bus selector switch was most likely the cause of the CEA drop. Prior to restoring CEA-2 to its group position, its upper gripper coil power switch was replaced and CEA-2 was restored to its group position. To preclude the possibility of dropping another CEA, maintenance activities to troubleshoot the CEA-2 hold bus selector switch and completion of the replacement of the last three upper gripper coil power switches were deferred to the Fall 2016 outage.

On August 1, 2016, Unit 1 was shutdown to repair a leaking connection to SI flow element FE-3311. During the unit shutdown, the remaining upper gripper coil power switches were replaced. Licensee troubleshooting also determined that the CEA-2 hold bus selector switch had a high resistance connection of the neutral wire. The licensee removed, cleaned, and reinstalled the wires to the selector switch and verified the resistance across the electrical connections was satisfactory. Additional corrective actions planned include performing inspections, cleaning and completing resistive measurement checks of all the remaining CEA hold bus selector switches during the Fall 2016 Unit 1 RFO.

The inspectors determined that the licensee's evaluations and corrective actions associated with these CEA drop events were appropriate and timely.

.3 Annual Sample: V3217, SI Loop 1A2 Check Valve, Back Leakage during Shutdown Cooling Flush

a. Inspection Scope

The inspectors selected AR 2148252, “Back Leakage during Shutdown Cooling Flush,” for a more in-depth review of the circumstances and the proposed corrective actions that followed. The inspectors reviewed the root cause evaluation (RCE) and observed the associated correction action review board to ensure that the licensee performed an appropriate evaluation and specified and prioritized corrective actions in accordance with its program. The inspectors interviewed plant personnel and evaluated the condition report in accordance with the requirements of the licensee’s corrective actions process as specified in licensee’s procedure PI-AA-104-1000, “Condition Reporting.” This inspection constitutes one sample.

b. Observations

Unit 1 SI loop 1A2 check valve, V3217, had experienced minor seat leakage since 2011. The licensee was unable to correct the seat leakage during valve maintenance during RFOs (SL1-24) in 2011 and (SL1-25) in 2013. Valve maintenance planned during RFO (SL1-26) in 2015 was cancelled and valve replacement was scheduled for RFO (SL1-27) in 2016. Throughout this period, the licensee determined the leakage past V3217 was less than the TS requirement of 1 gpm. As a result of chronic leakage problems with V3217, the upstream SI piping had been maintained near RCS system pressures since 2011. Under these conditions V3217 was closed by gravity alone with little or no differential pressure across the seat. The licensee’s RCE determined that the seat and disc of V3217 were susceptible to wear if differential pressure on the valve is not maintained. The licensee had not recognized the significance of this phenomena, and did not incorporate this into the maintenance planning. In addition, the licensee determined that the valve was reassembled incorrectly during maintenance performed during RFO SL1-25 in 2013. The valve bushings were installed backwards and no spacers were installed. This improper restoration of the valve resulted in accelerating the wear of the valve’s internal components during operation and resulted in increased seat leakage. In March 2014, the licensee’s Nuclear Oversight department determined that licensee procedure, 0-GMM-80.22, “Swing Check Valve Inspections,” lacked sufficient detail to ensure that the disassembly, inspection, repair, and reassembly, inspection, repair, and reassembly activities were completed in a consistent, high quality manner to preclude external leakage from those valves, rework, radiation dose, and out of service time. As part of the corrective actions, licensee procedure 0-GMM-80.22 was replaced by procedure 1-GMM-80.41,” Atwood & Morrill 12” Swing Check Valves,” which is specific to check valves such as V3217. Although the licensee did determine that inadequate procedures were used in previous maintenance activities, the licensee made no plans to perform inspections of any completed work, only to utilize the more specific procedure in future maintenance activities. Valve performance would be monitored during periodic surveillance testing. In August 2016, V3217 was determined to be inoperable due to leakage greater than that allowed by TS. The unit was placed in Mode 5 for V3217 investigation and repair.

The inspectors determined that the licensee had no reason to believe there was any significant maintenance deficiency with V3217, prior to V3217 being declared inoperable. Since 2011, valve V3217 seat leakage was within the requirements set by TSs as well as the current operating experience for these types of check valves. The inspectors determined that the licensee conducted a proper evaluation and timely disposition of operability, considered extent of condition, and identified the root

and contributing causes of the problem. The inspectors determined that the corrective actions were appropriately focused to correct the problem, and scheduled completion of corrective actions were timely manner commensurate with the safety significance of the issue.

c. Findings

No findings were identified. A licensee identified violation addressing the incorrect assembly of V3217 is documented in Section 4OA7 of this report.

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

.1 Unit 1 Shut Down due to RCS Pressure Boundary Leakage

a. Inspection Scope

On August 1, 2016, with Unit 1 operating at approximately 100 percent RTP, the licensee identified an approximately 300 drops per minute leak from a weld associated with safety injection system flow element FE-3311. The licensee initially characterized this leakage as RCS pressure boundary leakage and implemented a TS required shut down and RSC cooldown to Mode 5 (<200°F) (TS 3.4.6.2, Action (a)). The licensee determined through review of drawings and later validated during the repair that the leaking weld was a seal weld for a threaded fitting connection and therefore the leakage was not RCS pressure boundary leakage. The inspectors discussed this issue with the engineering personnel involved with the investigation and reviewed the drawings associated with this mechanical seal welded joint and reviewed pictures of the disassembled mechanical joint to verify the leakage was not pressure boundary leakage. The inspectors monitored repair activities and determined that the crack in the seal weld had not propagated through the pipe fitting and that all leakage had been through the threaded connection. Documents reviewed are listed in the attachment. The inspectors monitored the licensee's shutdown and cooldown activities as documented in sections 1R11 and 1R20 of this report.

b. Findings

No findings were identified.

.2 Unit 1 Tripped Due to Main Generator Inadvertent Energization Lockout Relay Actuation

a. Inspection Scope

On August 21, 2016, at 19:26 hours, St. Lucie Unit 1 experienced a reactor trip at approximately 38 percent RTP and a loss of offsite power from the switchyard to both trains of the 4160 VAC engineered safeguards (ES) buses and to the non-safety 6900 VAC buses. The reactor trip was caused by the actuation of the main generator inadvertent energization lockout relay which caused the main generator output and the auxiliary transformer feeder breakers to the plant's switch gear to open. As a result, the four Reactor Coolant Pumps (RCP) were deenergized. Both the 1A and 1B EDGs started on demand and powered their respective safety related 4160 VAC

bus. The licensee declared an Unusual Event due to the loss of all offsite power for greater than 15 minutes. Offsite power to the switchyard remained available during the event, and at 20:36 hours, restoration of offsite power to St. Lucie Unit 1 was completed. The Unusual Event was terminated at 21:25 hrs. Decay heat removal was accomplished through natural circulation with stable conditions using auxiliary feedwater and steam generator atmospheric dump valves until 1A2 and 1B2 RCP's were restored at 23:30 hours. St. Lucie Unit 1 exited emergency operating procedures at 23:33 hours on August 21, 2016. This issue was documented in the CAP as AR 2151217.

The inspectors were notified of the event and responded to the plant to assess plant conditions. The inspectors toured the Unit 1 turbine building and observed Unit 1 control room activities following the shutdown and transition to hot standby. The inspectors reviewed control room chronological logs, control room indications, post trip procedures, and interviewed control room operators to verify that operating restrictions and procedural requirements were met and to determine if any complications occurred during the trip and reactor plant shutdown. The inspectors verified the event was properly characterized and timely notifications were made to the NRC and state/local governments. The inspectors observed control room operator communications, procedure place keeping, and control room annunciator responses by the reactor operators at the control boards. The inspectors reviewed documentation and operator actions associated with licensee procedures 1-EOP-01, "Standard Post Trip Actions," 1-EOP-09, "Loss of Offsite Power/Loss of Forced Circulation LOOP/LOFC" and EPIP-01, "Classification of Emergencies." The reactor was restarted on August 25, 2016 and reached 100 percent RTP on September 1, 2016.

b. Findings

No findings were identified.

.3 (Closed) Licensee Event Report (LER) 0500335/2016-002, "Safety Injection Check Valve Leakage Exceeding Technical Specification Limits and Allowed Outage Time Resulting in Operation Prohibited by Technical Specifications"

a. Inspection Scope

On August 5, 2016, during restart of Unit 1, operators observed excessive leakage past RCS isolation check valve V3217 during system flushes. The licensee made the decision to test the valve to quantify its seat leakage after the RCS reached NOPT. On August 7, 2016, with the unit at NOPT, the licensee was unable to quantify V3217 seat leakage due to the inability to create a differential pressure across V3217, caused by excessive seat leakage. The valve was declared inoperable in accordance with TSs. The unit was placed in cold shutdown to complete valve repairs. The licensee determined the seat leakage was caused by inadequate maintenance. The inspectors' reviewed the root cause associated with this event as documented in Section 4OA2.3. A licensee-identified finding associated with inadequate work procedures was also documented in Section 4OA7. This LER is closed.

b. Findings

Introduction: A NRC-identified Green non-cited violations (NCV) of Unit 1 Technical Specification (TS) 3.4.6.2 “Reactor Coolant System Leakage” was identified. Specifically, the licensee failed to enter TS 3.4.6.2 Action ‘c” for reactor coolant system (RCS) pressure isolation valve (V3217) when the valve experienced operational seat leakage of approximately 30 gpm during flushing and cooling the shutdown cooling system.

Description:
On August 5, 2016, at 17:28 hours, with Unit 1 in Mode 4 (567 psia), operators noticed an unexpected drop in pressurizer level during a planned flush of the shutdown cooling (SDC) system header. The SDC flush procedure lined up the 1A containment spray pump (discharge pressure 288 psig) to the SDC header and back to the refueling water tank (RWT). This alignment should not have directly communicated with the RCS. Lowering pressurizer level was coincident with opening valve HCV-3618, “SI Loop 1A2 Check Valve Leakage Isolation” and indicative of a leak path from the RCS. Operators isolated the leak path by shutting HCV-3618. Pressurizer level dropped approximately 3 percent during the period that HCV-3618 was open which corresponded to an estimated 30 gpm back leakage through 1A2 RCS loop pressure isolation check valve V3217. No noticeable seat leakage was noted from the other three PIV check valves (RCS loops 1A1, 1B1, and 1B2) during the flushes of those headers.

The licensee reviewed TS 3.4.6.2. “Reactor Coolant System Leakage,” which required RCS operational leakage for each RCS pressure isolation valve (PIV) listed to be as specified in Table 3.4.6-1. Note “a” of this table, stated in part, that leakage rates less than or equal to 1.0 gpm were acceptable and leakage rates greater than 5.0 gpm were unacceptable. Additional acceptance criteria was specified for leakage rates between 1.0 and 5.0 gpm. The licensee entered the issue in the CAP as AR 2148252.

Procedure EN-AA-203-1001, “Operability Determinations/ Functionality Assessments,” Revision 22, was the licensee’s implementing procedure for determining operability and functionality of SSCs. EN-AA-203-1001, Section 4.3, step 4, stated in part: “If at any time the SM [shift manager] does not have a reasonable expectation (see definition in Section 2.0, Step 32) that the affected SSC was operable, then the SM shall declare the SSC inoperable and enter the required TS action.” Section 2, Step 32, stated in part, “The supporting basis for the reasonable expectation of SSC operability should provide a high degree of confidence that the SSCs remain operable. It should be noted that the standard of “reasonable expectation” was a high standard, and that there was no such thing as an indeterminate state of operability; an SSC was either operable or inoperable.”

The four RCS loop pressure isolation check valves had a history of minor leakage past their seats as the plant was pressurized. The licensee monitored pressure indication on the upstream side of the valves and compared it to RCS pressure on the downstream side of the valves. Once normal operating pressure and temperature (NOPT) was reached, the piping on the upstream side of all leaking check valves was lined up to lower the trapped pressure. Historically, any check valve leakage was

determined to be zero indicated by a stable upstream side pressure or very low (<1 gpm) leakage based on a low rate of pressurization.

The licensee determined that V3217 was operable but degraded because the SDC flush had not established differential pressure conditions similar to those experienced during testing at NOPT. In addition, the licensee believed that the valve had not experienced significant degradation since its last successful surveillance test. The licensee utilized TS surveillance requirement (SR) 4.4.6.2.3 that stated that the provision of Specification 4.0.4 is not applicable for entry into Modes 3 or 4. This provision allowed completion of the PIV surveillance after entering Modes 3 or 4. The station relied on in-house operating experience which showed that PIV check valves have improved seating capability with a larger differential pressure across the valve.

Based on the above, the licensee made the decision to continue plant pressurization and heat up and to perform leak testing of V3217 once NOPT was reached. On August 7, 2016, with the unit at NOPT, V3217 was tested. The licensee was unable to establish a differential pressure across valve V3217 due to the seat leakage. At 16:00 hours, valve V3217 was declared inoperable and TS 3.4.6.2, action “c”, was entered requiring the unit to be in cold shutdown (Mode 5 (<200 ^{o}F)) within the following 30 hours. Mode 5 was entered at 20:03 hours on August 8, 2016. The licensee determined that valve V3217 had been inoperable for approximately 82 hours from the time the unit entered Mode 4 on August 5, 2016 (09:43 hours) until the unit entered Mode 5 on August 8, 2016 (20:03 hours). The licensee repaired valve V3217 and restarted the unit on August 25, 2016.

NRC American Society of Mechanical Engineers (ASME) code experts determined that a failure of a check valve to develop any differential pressure with substantial reverse flow would indicate a major problem with valve seat alignment. In this case, V3217 should have been declared inoperable when it experienced seat leakage of approximately 30 gpm during the system flush. The reason a differential pressure did not develop across V3217 was due to this substantial leakage. The inspectors determined that the failure to declare V3217 inoperable on August 5, 2016 resulted in approximately 46 additional hours of operation with PIV leakage that exceeded the TS acceptance criteria.

Inspectors concluded the operability evaluation did not demonstrate a high degree of confidence that V3217 remained operable. The pressure of the RCS during the flush should have been high enough to seat the valve, however a differential pressure across the valve was not established due to the 30 gpm seat leakage. In addition, the licensee could not provide an example of PIVs that experienced substantial seat leakage during similar flushes that were later determined to meet TS seat leakage acceptance criteria when tested at NOPT.

Analysis:
The licensee’s failure to recognize that gross seat leakage from check valve V3217 indicated of a major problem with valve seat alignment and that higher differential pressure would not help seat the valve was a performance deficiency (PD). The performance deficiency is more than minor because it is associated with the barrier integrity cornerstone attribute of human performance and adversely affected the cornerstone objective of providing reasonable assurance that physical barriers such as the containment, protected the public from radionuclide releases caused by

accidents or events. The PD resulted in 46 additional hours of operation with V3217 seat leakage outside of TS acceptance criteria which required the unit to be in cold shutdown.

The inspectors characterized the safety significance of the issue utilizing the at-power Significant Determination Process (SDP) since the shutdown unit was not on residual heat removal for the approximately 46 hours from August 5, 2016 (17:28 hours) when check valve V3217 should have been declared inoperable to when it was actually declared inoperable on August 7, 2016 (16:00 hours). Using Manual Chapter 0609.04, "Significance Determination Process Initial Characterization of Findings," Table 2, dated June 19, 2012, the finding was determined to affect the barriers cornerstone due to leakage past an isolation valve that can contribute to an intersystem loss of coolant accident (ISLOCA). Manual Chapter 0609 Appendix A, "The significance determination process (SDP) for Findings At-Power," Exhibit 3 "Barrier Integrity Screening Questions" dated June 19, 2012, was used to further evaluate this finding. The finding screened as Green because the finding represented neither an actual open pathway in the physical integrity of the reactor containment and does not involve an actual reduction in the function of the hydrogen igniters in the reactor containment.

The finding involved the cross-cutting area of human performance and specifically within that area was associated with conservative bias, in that individuals use decision making-practices that emphasize prudent choices over those that are simply allowable, because the operability evaluation did not demonstrate it was safe to proceed, rather than unsafe in order to stop, with valve V3217 experiencing gross seat leakage [H.14].

Enforcement:
Unit 1 Technical Specification 3.4.6.2 "Reactor Coolant System Leakage," stated RCS operational leakage for each RCS pressure isolation valve listed as specified in Table 3.4.6-1, which included valve V3217. Note "a" of this table, stated in part, that leakage rates less than or equal to 1.0 gpm were acceptable and leakage rates greater than 5.0 gpm were unacceptable. TS 3.4.6.2, Action "c" stated, in part, that with any RCS PIV leakage greater than the limit required that the leakage be reduced to within limits within 4 hours or be in hot standby within 6 hours and in cold shutdown within the following 30 hrs. Contrary to TS 3.4.6.2, the licensee did not enter Action "c" on August 5, 2016, for RCS PIV (V3217) when the valve experienced operational seat leakage of approximately 30 gpm during flushing and cooling the shutdown cooling system. As a result, TS 3.4.6.2.e, Action "c" that required the unit to be in cold shutdown within 30 hours was not met and the licensee continued with contained RCS leakage beyond what was allowed. The licensee later determined the valve was inoperable and returned the unit to Mode 5 and repaired the valve. Because this violation was of very low safety significance and was entered into the licensee's CAP as AR 2159628, this violation is being treated as a NCV consistent with section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000335/2016003-01, "Reactor Coolant System Leakage Technical Specification Violation")

4OA5 Other Activities

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

a. Inspection Scope

The inspectors conducted a walk down of the ISFSI controlled access fenced-in cask area per Inspection Procedure 60855.1, “Operation of an ISFSI at Operating Plants.” The inspectors observed each cask building temperature indicator and passive ventilation system to be free of any obstruction allowing natural draft convection decay heat removal through the air inlet and air outlet openings. The inspectors observed associated cask building structures to be structurally intact and radiation protection access controls to the ISFSI area to be functional. The inspectors verified that operations personnel were walking down the ISFSI twice daily and a physical inventory had been conducted on all spent fuel stored in the ISFSI at least every 12 months. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

4OA6 Meetings

Exit Meeting Summary

The resident inspectors presented the inspection results to Mr. Costanzo and other members of licensee management on November 8, 2016. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary information. The licensee did not identify any proprietary information.

4OA7 Licensee-Identified Violations

The following licensee identified violation of NRC requirements was determined to be of very low safety significance (Green) and met the NRC Enforcement Policy criteria for being dispositioned as a Non-cited Violation.

Licensee identified violation (LIV) - T.S.6.8.1 requires written procedures be established, implemented, and maintained covering applicable procedures recommended in Appendix “A” of Regulatory Guide 1.33, Rev 2, 1978. Appendix A, Section 9, “Procedures for Performing Maintenance”, states, in part, that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to this, Unit 1 Pressure Isolation Valve (PIV) V3217 was rebuilt in October 2013, using Licensee procedure 0-GMM-80.22, “Swing Check Valve Inspections”. 0-GMM-80.22 did not provide specific detail to ensure consistency and first time work quality and directly resulted in V3217 being reassembled incorrectly. Specifically the disc arm bushings were installed backwards, as well as no spacers in the bushing bores. The period of concern was from the achievement of Mode 4 on August 5, 2016 at 09:43 hours, to declaration of entry into the TS action statement and entry into Mode 5 on August 4, 2016 at 20:03 hours, resulting in 82 hours of operation with V3217 seat leakage outside of TS acceptance criteria. The inspectors characterized the safety significance of the issue utilizing Manual Chapter 0609.04, “Significance Determination Process Initial Characterization of Findings,” and determined the issue

affected the barriers cornerstone due to leakage past an isolation valve. Manual Chapter 0609 Appendix A, “The significance determination process (SDP) for Findings At-Power,” Exhibit 3 was used to further evaluate this finding which screened as Green because the finding represented neither an actual open pathway in the physical integrity of the reactor containment and does not involve an actual reduction in the function of the hydrogen igniters in the reactor containment. This issue has been entered into the licensee’s CAP as AR 2148252.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMAITON

KEY POINTS OF CONTACT

Licensee personnel:
R. Baird, Training Site Manager
J. Brady, Acting Nuclear Quality Assurance Manager
C. Costanzo, Site Vice President
D. Cecchett, Licensing Engineer
A. Day, Radiation Protection Manager
K. Frehafer, Licensing Engineer
M. Haskin, Projects Site Manager
M. Jones, Engineering Director
A. Day, Acting Health Physics Manager
W. Parks, Operations Director
D. Pitts, Maintenance Director
B. Robinson, Radiation Protection Supervisor
R. Sciscente, Licensing Engineer
M. Snyder, Licensing Manager
C. Spenser, Chemistry Manager
K. Stone, Performance Improvement Manager
C. Workman, Security Manager
R. Wright, Plant General Manager

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

LIST OF ITEMS OPENED AND CLOSED

Opened and Closed

050000335/2016003-01	NCV	Reactor Coolant System Leakage Technical Specification Violation (4OA3.3)

Closed

50000335/2016-002-00	LER	Safety Injection Check Valve Leakage Exceeding Technical Specification Limits and Allowed Outage Time Resulting in Operation Prohibited by Technical Specifications (Section 4OA3.3)

LIST OF DOCUMENTS REVIEWED

Section 1R04 Equipment Alignment
2-NOP-59.01B, 2B Emergency Diesel Generator Standby Alignment
2-NOP-59.02B, 2B Emergency Diesel Generator Operations
2-NOP-03.11, High Pressure Safety Injection System Initial Alignment
2-NOP-09.11, Auxiliary Feedwater System Initial Alignment
2-NOP-09.02, Auxiliary Feedwater System Operation

Section 1R05 Fire Protection
ADM-0005728, Fire Protection Training, Qualification and Requalification
ADM-1800022, Fire Protection Plan
AP-1-1800023, Unit 1 Fire Fighting Strategies
AP-2-1800023, Unit 2 Fire Fighting Strategies

Section 1R06 Flood Protection Measures
1-AOP-24.01, RAB Flooding
1-ARP-01-R00, Control Room Panel R RTGB-106
2998-G-889 – Unit 2 RAB Plumbing and Drainage Drawing
AR's 1932648, 1941159, 1932155 – Site and RAB Flooding

Section 1R07: Heat Sink Performance

Action Requests (ARs)
AR 01643753, HPSI Pump 1B DBA at Pump Seals
AR 01729594, 2B CCW HX As-Found Condition
AR 01792897, 2B CCW HX SL2-20 As-Found Inspection Trend Report
AR 01799356, As-Found Condition of the 2A CCW Based On 100% ECT
AR 01808190, Degraded Floor Embeds Adjacent to 1B HPSI Pump
AR 01878051-01, Engineering Evaluation of ICW 1C Pump Through-Wall Leak
AR 01909404, 1B CCW Heat Exchanger - SL1-25 Inspection Results
AR 01910000, As-Found Condition of the 1B CCW Based on 100% ECT
AR 01911638, DFS 2a1 Backwash Function Degraded, Mis-Positioned Backwash MOV
AR 01937045, HCV-14-11A1 Seal Cooler Valve Failed Close
AR 01946359, 2B CCW Heat Exchanger - SL2-21 Inspection Results
AR 01947255, As-Found Condition of the 2B CCW Based on 100% ECT
AR 01952042, 2A CCW Heat Exchanger - SL2-21 Inspection Results
AR 01952566, As-Found Condition of 2A CCW Based on 100% ECT
AR 01971511, INPO Event Report (IER) L4 14-31, Analysis of Vibration Induced Leaks
AR 01986508, ICW Leak on 1C ICW Pump Discharge Elbow
AR 02011424, Cracked Weld at Joint CW-197 TO CW-98 Saltwater Leak
AR 02027841, 2B CCW HX: Unplanned Maintenance Revealed Three Leaking Tubes
AR 02034138, Through-Wall Leak on B ICW Header
AR 02035690, 1B HPSI Pump Full Flow Test Delayed
AR 02040694, 2C ICW Pump Discharge Pipe Leak
AR 02041255, Repair Water Hammer Damage
AR 02046545, Remove and Send Failed Tubes (3) for Metallurgy Analysis
AR 02051684, Outboard Motor Oil Level Low
AR 02054828, 1A1 Traveling Screen Thermal Overload Trip
AR 02072686, 2B CCW HX Macro-Fouling

AR 02073273, 2B CCW 100% Eddy Current Testing Examination Results
AR 02074761, 2A CCW Heat Exchanger - SL2-22 Inspection Results
AR 02075997, 2A CCW 100% Eddy Current Testing Examination Results
AR 02088555, Leak on ICW Header Upstream of TCV-14-4B
AR 02088846, 1B2 Traveling Screen Fails to Start.
AR 02095630, 2B1 Debris Filter System Is Not Operating
AR 02117470, Unit 1 1B CCW Heat Exchanger Mid-Cycle Condition
AR 02127914, 2B CCW / ICW HX CMM Inspection Results
AR 02129410, Unit 2 2A CCW Heat Exchanger Mid-Cycle Condition

Procedures
0-GMM-12.01, High Pressure Hydro-Blasting of Heat Exchanger Tubes and Associated Equipment, Revision 9
0-PMM-14.01, Component Cooling Water Heat Exchanger Clean / Repair, Revision 10
1-NOP-14.02, Component Cooling Water System Operation, Revision 57
1-OSP-99.08A, A Train Quarterly Non Check Valve Cycle Test, Revision 11
2-NOP-14.02, Component Cooling Water System Operation, Revision 44

Work Orders (WOs)
WO 40020544 01, CCW HX 2B: Clean and Inspect
WO 40066634 01, CCW HX 2B: Clean/Inspect/ECT Test
WO 40159791 01, CCW HX 1B: Open/Close, Clean, Inspect, ECT
WO 40200479 01, CCW HX 2A: Clean/Inspect/ECT Test
WO 40200481 01, CCW HX 2B: Clean/Inspect/ECT Test
WO 40364591 01, CCW HX 2B: Clean/Inspect/ECT Test
WO 40416814 01, 1B CCW HX: Mid-Cycle Inspection of Inlet/Contingent
WO 40416940 01, 2A CCW HX: Mid-Cycle Inspection and Cleaning
WO 40416941 01, 2B CCW HX: Mid-Cycle Inspection and Cleaning

Calculations
129154-C-P-0088, Revision 1, Unit 2 Hydraulic Transient Analysis of the Intake Cooling Water System
129154 P 0074, Rev 0, Unit 1 Hydraulic Transient Analysis of the Intake Cooling Water System
CN-OA-09-10, CCW/ICW System Temperature Response for St. Lucie Unit 1 EPU

Other Documents
Bathymetric Survey, Big Mud Creek, South Hutchinson Island, St. Lucie County, Florida, by Morgan and Eklund, Inc., dated February 28, 2011
Bathymetric Survey, Big Mud Creek, South Hutchinson Island, St. Lucie County, Florida, by Morgan and Eklund, Inc., dated December 14, 2014
Bathymetric Survey of the St. Lucie Nuclear Power Plant Intake and Discharge Canals, by Morgan and Eklund, Inc., dated March 2, 2011
CCW Heat Exchanger Cleaning and ECT Maintenance History (2013 – 2016)
Flowserve Report on Unit 1 and 2 HPSI Pump Seal Operation without Cooling Water, dated April 3, 2013
Proto-Power Corporation Calculation 08-185, Test Data Evaluation and Uncertainty Analysis for the CCW Heat Exchangers, Revision A
PSL-ENG-SEMS-98-069, Request for Additional Information Regarding Generic Letter 96-06:

Assurance of Equipment Operability and Containment Integrity during Design-Basis Accident Conditions, Revision 0
SCEG-019, System and Component Engineering Walkdown Program, Revision 18
St. Lucie Unit 1 CCW System Chemistry Analysis Data from January 2013 to June 2016
St. Lucie Unit 2 CCW System Chemistry Analysis Data from January 2013 to June 2016
Topographic and Hydrographic Survey of the St. Lucie Nuclear Power Plant Intake and Discharge Canals, by Morgan and Eklund, Inc., dated May1, 2014

Section 1R11 Licensed Operator Requalification Program and Licensed Operator Performance
2-EOP-01, Standard Post Trip Actions
2-EOP-03, Loss of Coolant Accident
2-EOP-04, Steam Generator Tube Rupture SGTR
EPIP-01, Classification of Emergencies
EPIP-02, Duties and Responsibilities of the Emergency Coordinator.
1-EOP-01, Standard Post Trip Actions
1-GOP-201, Reactor Plant Startup - Mode 2 - Mode 1
1-GOP-305, Reactor Plant Cooldown- Hot Standby to Cold Shutdown
1-AOP-22.01, Rapid Downpower
EPIP-01, Classification of Emergencies
EPIP-02, Duties and Responsibilities of the Emergency Coordinator.
1-GOP-123, Turbine Shutdown - Full Load to Zero Load

Section 1R12 Maintenance Effectiveness
ER-AA-100-2002, Maintenance Rule Program Administration
SCEG-004, Guideline for Maintenance Rule Scoping, Risk Significant Determination, and Expert Panel Activities
WO 40482142, U1, FE-3311 Found Leaking

Section 1R13 Maintenance Risk Assessments and Emergent Work Control
OP-AA-104-1007, Online Aggregate Risk
WCG-016, Online Work Management

Section 1R15 Operability Determinations and Functionality Assessments
EN-AA-203-1001, Operability Determinations and Functionality Assessments

Section 1R19 Post Maintenance Testing
ADM-78.01, Post Maintenance Testing

Section 2RS1: Radiological Hazard Assessment and Exposure Controls

Procedures, Guidance Documents and Manuals
ADM-05.03, Radiation Work Permits, Rev. 11
HP-43, Control Inventory and Leak Testing of Radioactive Sources, Rev. 23
HP-116, Electronic Dosimeter Program, Rev. 24
HPP-1, Preparing Radiation Work Permits, Rev. 39
PI-AA-104-1000, Condition Reporting, Rev. 11
RP-AA-100-1002, Radiation Worker Instruction and Responsibilities, Rev. 4
RP-AA-102-1000, Alpha Monitoring, Rev. 2
RP-AA-102-1001, Area Radiological Surveys, Rev. 2
RP-AA-103-1002, High Radiation Area Controls, Rev. 6

RP-AA-107-1003, Unconditional and Conditional Release of Material, Rev. 2
RP-SL-101-1003, Personnel Contamination Monitoring and Decontamination, Rev. 1
RP-SL-102-2000, Air Sampling, Rev. 5
RP-SL-103-2005, RP Controls of Spent Fuel Pool Non-SNM, Rev. 2
RP-SL-103-2006, Radiation Protection Outage Activities, Rev. 10

Records and Data
2015 St. Lucie Dry Active Waste 10 CFR Part 61 Analysis, 9/7/15
Air Sample No. 151-0811, U1 RAB 19.5, 7/2/15
Air Sample No. 161-0214, U1 RCB Bowl, 8/15/16
Air Sample No. 161-0303, U1 RAB 19.5 Elevation, 9/7/16
Air Sample No. 161-0425, U1 RCB 62' EL, PZR Manway Removal, 9/28/16
Form HP-43.1, Source Leak Test and Inventory Form, 1/19/16 and 7/7/16
HPP-02.5, SAM-12 Calibration Form, SN 149, 8/15/16
NSTS 2015 Annual Inventory Reconciliation, 1/20/15
NSTS 2016 Annual Inventory Reconciliation, 1/19/16
RWP No. 15-3304, Operations related activities in the RCB during shutdown, Rev. 01
RWP No. 16-1011, Liquid Level Probe ((HJTC) Remove / Install, Rev. 00
RWP No. 16-1410, Unit 1 RCB, 62', Top of Pressurizer, Rev. 00
RWP No. 16-1628, (Unit 1 RAB Forced Outage) Decon / Inspect / Disassemble (Reassemble):
V3217 Disc, Internals, Rev. 00
RWP No. 16-3801, (Unit 2) Operational Anomaly (Quick Entry): Inspections / Walkdowns / Troubleshooting, Rev. 00
RP-SL-103-2005, U1 and U2 Spent Fuel Pool Non-SNM Debris Canister Log Sheet, 7/15/16 and 9/7/16
RP-SL-103-2005, U1 and U2 Spent Fuel Pool Non-SNM Item Inventory Log Sheet, 7/15/16 and
9/7/16
Survey No. PSL-M-20150702-12, HPS-45 CVCS Filter Change
Survey No. PSL-M-20150930-7, U2 B LPSI Job Coverage FCV 3301, 9/30/15
Survey No. PSL-M-20150930-27, U2 RAB 5' El FCV 3301, 9/30/15
Survey No. PSL-M-20151003-16, U2 B LPSI Updated Dose Rates, 10/3/15
Survey No. PSL-M-20151003-31, U2 B LPSI Updated Dose Rates Hot Spot Verification, 10/3/15
Survey No. PSL-M-20151006-10, HPS-209 U2 RCB Shiftly Routine Survey 18' & 23', 10/6/15
Survey No. PSL-M-20151006-24, Investigative Survey for Dose Rate Alarm 10/6/15, U2 RCB Lower Level 18' & 23', 10/6/15
Survey No. PSL-M-20160812-14, HPS-532 U1 RCB V-3217 Post Decon/Inspection, 8/12/16
Survey No. PSL-M-20160915-7, HPS-210 Unit RCB 45' Ops to Close V-3537, 9/15/16
Survey No. PSL-M-20160907-17, HPS-45 CVCS Filter Change, 9/7/16
Survey No. PSL-M-20160929-24, Removal PZR Manway, 9/28/16
Survey No. PSL-M-20160729-13, Ion Exchangers and Valve Gallery 19.5', 7/29/16
Survey No. PSL-M-20160816-12, Ion Exchangers and Valve Gallery 19.5', 8/16/16

Corrective Action Program (CAP) Documents
AR 02038477
AR 02058322
AR 02077726
AR 02078520

AR 02078586
AR 02079410
AR 02081544
AR 02081841
AR 02150332
CR 02109757
Quick Hit / Department Assessment Report, Electronic Dosimeter Alarm Roll-Up, 12/15/15
Quick Hit Self-Assessment Report No. 2134745, Radiation Worker Behaviors, 6/17/16

Section 1R20 Refueling and Other Outage Activities
1-GOP-123, Turbine Shutdown – Full Load to Zero Load
1-GOP-305, Reactor Plant Cooldown – Hot Standby to Cold Shutdown
1-EOP-01, Standard Post Trip Actions
1-EOP-02, Reactor Trip Recovery
OP-AA-1000 Conduct of Infrequently Performed Tests or Evolutions

Section 4OA3: Follow-up of Events and Notices of Enforcement Discretion
Drawing 8770-8719
Drawing 8770-B-124, SH. SI-52
AR 2147078, FE-3311 leaking 300 drops per minute
0030119, Post Trip Review

Section 4OA5: Other Activities
0010439 Physical Inventory of Nuclear Fuel Storage Areas (completed March 3, 2016)
Associate Nuclear Plant Operator (ANPO) Operator Rounds Database (ISFSI)

LIST OF ACRONYMS

ADAMS	NRC's Agency-wide Documents Access and Management System
ADM	Administrative Procedure
AFW	Auxiliary Feedwater
ALARA	As Low as Reasonably Achievable
ANII	Authorized Nuclear Inservice Inspector
AOP	Abnormal Operating Procedure
AP	Administrative Procedure
AR	Action Request
AC	Alternating Current
ACE	Apparent Cause Evaluation
ASME	American Society of Mechanical Engineers
CAP	Corrective Action Program
CCW	Component Cooling Water
CEA	Control Element Assembly
CFR	Code of Federal Regulations
CLB	Current Licensing Basis
CWP	Circulating Water Pump
DP	Differential Pressure
DOT	Department of Transportation
EC	Engineering Change
ECCS	Emergency Core Cooling System
ED	Electronic Dosimeter
EDG	Emergency Diesel Generator
EOF	Emergency Operations Facility
EP	Emergency Preparedness
EPIP	Emergency Plan Implementing Procedure
ERO	Emergency Response Organization
ES	Engineered Safeguards
FCV	Flow Control Valve
FE	Flow Element
FHB	Fuel Handling Building
FPL	Florida Power and Light
FS	Fire System
Ft	Foot
GOP	General Operating Procedure
HP	Health Physics
HPSI	High Pressure Safety Injection
HRA	High Radiation Area
HVAC	Heating, Ventilation and Air Conditioning
HX	Heat Exchanger
ICW	Intake Cooling Water
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
ISLOCA	Intersystem Loss of Coolant Accident
LIV	Licensee-Identified Violation
LER	Licensee Event Report
LHRA	Locked High Radiation Area

LLRT	Local Leak Rate Test
LOCA	Loss of Coolant Accident
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
NEI	Nuclear Energy Institute
NI	Nuclear Instrument
NLO	Non-Licensed Operator
NOPT	Normal Operating Pressure and Temperature
NRC	Nuclear Regulatory Commission
NUMARC	Nuclear Management and Resource Council
OCC	Outage Command Center
OE	Operation Experience
OLRM	Online Risk Monitor
OOS	Out of Service
OSP	Operations Surveillance Procedure
OWA	Operator Work Arounds
PARS	Publically Available Record
PD	Performance Deficiency
PI	Performance Indicator
PI&R	Problem Identification and Resolution
PIV	Pressure Isolation Valve
PMT	Post-Maintenance Test
PORV	Pilot Operated Relief Valve
PSL	Plant St. Lucie
PWR	Pressurized Water Reactor
RAB	Reactor Auxiliary Building
RCA	Radiological Control Area
RCB	Reactor Containment Building
RCE	Root Cause Evaluation
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
RWP	Radiation Work Permit
RWT	Refueling Water Tank
SCBA	Self-Contained Breathing Apparatus
SDC	Shutdown Cooling
SDP	Significance Determination Process
SI	Safety Injection

SR	Surveillance Requirement
SSA	Shutdown Safety Assessment
SSC	Systems, Structures, and Components
SUT	Start-up Transformer
TAW	Tampa Armature Works
TI	Temporary Instruction
TSs	Technical Specifications
TSC	Technical Support Center
TSSR	Technical Specifications Surveillance Requirement
U1	Unit 1
U2	Unit 2
UHS	Ultimate Heat Sink
VAC	Voltage Alternating Current
UFSAR	Updated Final Safety Analysis Report
VHRA	Very High Radiation Area
WO	Work Order