



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

February 8, 2018

Mr. Mano Nazar  
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Florida Power and Light Co.  
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Juno Beach, FL 33408

**SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION – NUCLEAR  
REGULATORY COMMISSION INTEGRATED INSPECTION REPORT  
05000250/2017004 AND 05000251/2017004**

Dear Mr. Nazar:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Turkey Point Nuclear Generating Station, Units 3 and 4. On January 11, 2018, the NRC inspectors discussed the results of the inspection with Mr. Tom Summers, Southern Regional Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented three findings of very low safety significance (Green) in this report. Two of these findings involved violations of NRC requirements. Further, 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 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 Turkey Point Nuclear Generating Station.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement 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 U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the Turkey Point Nuclear Generating Station.

M. Nazar

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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 in the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

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

Docket Nos.: 50-250, 50-251  
License Nos.: DPR-31, DPR-41

Enclosure:  
IR 05000250/2017004, 05000251/2017004  
w/Attachment: Supplemental Information

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**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos: 50-250, 50-251

License Nos: DPR-31, DPR-41

Report Nos: 05000250/2017004, 05000251/2017004

Licensee: Florida Power and Light Company (FPL)

Facility: Turkey Point Nuclear Generating Station, Units 3 and 4

Location: 9760 SW 344th Street  
Homestead, FL 33035

Dates: October 1 to December 31, 2017

Inspectors: J. Orr, Senior Resident Inspector  
J. Reyes, Resident Inspector  
A. Butcavage, Reactor Inspector (Section 1R08)  
P. Capehart, Senior Operations Engineer (Sections 1R11.3 & 1R11.4)  
M. Donithan, Operations Engineer (Section 1R11.4)  
W. Loo, Senior Health Physicist (Sections 2RS2 & 2RS3)  
J. Panfel, Health Physicist (Section 2RS5)  
J. Rivera, Health Physicist (Sections 2RS1, 2RS4, & 4OA1)  
T. Stephen, Operations Engineer (Section 1R11.4)

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

Enclosure

## SUMMARY

IR 05000250/2017004, 05000251/2017004; 10/01/17 – 12/31/17; Turkey Point Nuclear Generating Station, Units 3 and 4; Post Maintenance Testing, Problem Identification and Resolution, and Followup of Events and Notice of Enforcement Discretion.

The report covered a three-month period of inspection from October 1, 2017, to December 31, 2017. The inspection activities were performed by the resident inspectors and region-based specialist inspectors. One self-revealing and two NRC-identified findings were identified, of very low safety significance. Two of these findings were determined to be NCVs of NRC requirements. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are 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: Initiating Events

- Green: A self-revealing finding (FIN) was identified for failure to ensure the 4B and 4C main feedwater regulating valve (MFRV) control circuits remained free from the effects of water intrusion or condensation in electrical enclosures. Specifically, a hand selector switch (HSS) enclosure for the 4C MFRV redundant positioners was flooded during wind-driven rain and resulted in the 4C MFRV failing closed, lowering 4C steam generator water level, and a subsequent Unit 4 manual reactor trip initiated by control room operators. Engineering Change (EC) 246879 appropriately selected NEMA-4X rated enclosures for the HSSs but associated SPEC-C-065 did not provide critical configuration details for the enclosure installations. Water collected in the 4B and 4C MFRV positioner HSS enclosures because the penetrations were on top of the enclosures and not properly sealed and the bottom of the enclosure did not have a weep hole.

This performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Initiating Events Cornerstone and adversely affected the cornerstone's objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations, because the failure resulted in lowering steam generator water levels and caused control room operators to complete a fast load reduction and manually trip the reactor. In accordance with NRC IMC 0609, Appendix A, "The Significance Determination Process for Findings at Power," the inspectors determined that the issue had very low safety significance because it only caused a reactor trip and did not cause the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Since EC 246879 and associated work orders were completed in 2013, the inspectors determined the finding was not indicative of current licensee performance and was not assigned a cross-cutting aspect. (Section 4OA3)

### Cornerstone: Barrier Integrity

- Green: A NRC-identified NCV of 10 CFR 50.55a, “Codes and Standards,” was identified for the failure to adequately perform a Boiler and Pressure Vessel Code (BPVC) class 1 and 2 replacement activity in accordance with the Turkey Point Plant American Society of Mechanical Engineers (ASME) Section XI Repair/Replacement Program. Specifically, the licensee did not ensure a system leakage test conducted on October 19, 2017, was appropriately evaluated to meet the requirements of ASME Section XI for pre-service leakage testing of a Unit 4 high head safety injection (HHSI) cold leg injection check valve that was replaced on October 15, 2017. This issue was entered into the licensee’s Corrective Action Program (CAP) as ARs 2235484 and 2239149. Corrective actions included documenting a formal bases for current operability via a prompt operability determination and updating work order (WO) documentation to fully comply with ASME BPVC Section XI requirements.

This performance deficiency was determined to be more than minor because an inadequate inservice inspection repair/replacement plan adversely affected the Reactor Coolant System (RCS) Equipment and Barrier Performance attribute of the Barrier Integrity Cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. In accordance with IMC 0609, Appendix A, “The Significance Determination Process for Findings At-Power,” the inspectors determined that the issue had very low safety significance because there was no actual degradation of the RCS boundary. This finding was assigned a cross-cutting aspect in the Procedure Adherence component of the Human Performance cross-cutting area, in that the licensee did not effectively evaluate and appropriately implement the ASME BPVC requirements in the 4-873A Repair/Replacement Plan which were reiterated in licensee administrative procedure 0-ADM-532, ASME Section XI Repair/Replacement Program [H.8]. (Section 1R19)

### Cornerstone: Mitigating Systems

- Green: A NRC-identified NCV of 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action,” was identified for the licensee’s failure to promptly identify and correct an adverse condition to quality that led to continued corrosion and significant scaling and pitting of the Unit 4 component cooling water (CCW) 18-inch headers at the penetration seals from the CCW heat exchanger room to the 10-foot pipeway. This issue was entered into the licensee’s CAP as ARs 2217942, 2227877, 2211843, 2236687, and 2239632. Corrective actions included removing protective boots that were inappropriately installed and not in accordance with design drawings and work order instructions, and were collecting hypersaline water that wetted carbon steel piping.

The performance deficiency was determined to be more than minor because it was associated with the design control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences because corrosion and pipe wastage was ongoing and unmonitored for the Unit 4 CCW headers. In accordance with IMC 0609 Appendix A, “The Significance Determination Process for Findings At-Power,” the inspectors determined the finding to be of very low safety significance because it did not represent an actual loss of function of one or more non-technical specification

trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. The finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Identification, because the licensee failed to identify the adverse condition that allowed corrosion to continue unmonitored [P.1]. (Section 4OA2.4)

#### Licensee-identified Violations

A violation of very low safety significance was identified by the licensee and has been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's CAP. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

## REPORT DETAILS

### Summary of Plant Status

Unit 3 began this inspection period at 100 percent rated thermal power (RTP). On November 20, 2017, operators shut down Unit 3 to enter a forced outage and maintenance technicians replaced the 3C reactor coolant pump seal assembly. Unit 3 was restarted on November 27, 2017, and returned to 100 percent RTP on November 30, 2017, where it remained through the end of this inspection period.

Unit 4 began this inspection period at 100 percent RTP but entered coastdown operations on October 1, 2017. Unit 4 coasted down to 97 percent RTP and was shutdown on October 4, 2017, to begin its 30th refueling outage. Unit 4 was restarted on October 30, 2017 and achieved 100 percent RTP on November 5, 2017. Unit 4 reduced power to 48 percent RTP on November 7, 2017 to repair a steam leak associated with the 4A steam generator feedwater pump. Unit 4 returned to 100 percent RTP on November 10, 2017, where it remained through the end of this inspection period.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

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

##### Partial Equipment Walk Downs (IP 71111.04Q)

#### a. Inspection Scope

The inspectors conducted two partial alignment verifications of the safety-related systems listed below. These inspections included reviews using plant lineup procedures, operating procedures, and piping and instrumentation drawings, which were compared with observed equipment configurations to verify that the critical portions of the systems were correctly aligned to support operability. The inspectors also verified that the licensee had identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers by entering them into the CAP. Documents reviewed are listed in the Attachment. This inspection constitutes two samples.

- Unit 4 residual heat removal (RHR) system with the 4B RHR pump in service for shutdown cooling and Unit 4 in Mode 5; and,
- Unit 4 intake cooling water (ICW) system while the 4B ICW header was out of service for maintenance.

#### b. Findings

No findings were identified.

## 1R05 Fire Protection (IP 71111.05Q)

### Fire Area Walk Downs

#### a. Inspection Scope

The inspectors walked down the plant areas described below to evaluate conditions related to control of transient combustibles, ignition sources, material condition, and operational status of fire protection systems including fire barriers used to prevent fire damage and propagation. The inspectors reviewed these activities using provisions in the licensee's procedure 0-ADM-016, "Fire Protection Plan" and associated fire protection program procedures. The inspectors routinely reviewed the licensee's fire impairment lists and monitored the associated corrective actions for completion. The inspectors reviewed the action request (AR) report database to verify that fire protection problems were being identified and appropriately resolved in the CAP. The inspectors' tours of the selected areas verified the fire protection equipment was installed as shown on the applicable fire plan drawings and appeared functional and ready for usage. This inspection constitutes six samples.

- Unit 3 and Unit 4 "A" and "B" main feedwater pump rooms;
- A, B and C auxiliary feedwater pump room;
- Unit 4 "A" and "B" RHR pump rooms;
- Unit 3 and 4 480V load center rooms;
- 3A 4kV switchgear room; and,
- 4A emergency diesel generator control room and 4A and 4B fuel oil storage tank rooms.

#### b. Findings

No findings were identified.

## 1R06 Flood Protection Measures (IP 71111.06)

#### a. Inspection Scope

The inspectors conducted walkdowns of the following areas subject to internal flooding to ensure that flood protection measures were in accordance with design specifications. The inspectors reviewed the Turkey Point Updated Final Safety Analysis Report (UFSAR), Appendix 5F, "Internal Plant Flooding," which discussed protection of areas containing safety-related equipment that could be affected by internal flooding. Specific plant attributes that were checked included structural integrity, sealing of penetrations, and control of debris. This inspection constitutes one internal flooding sample.

- Unit 3 and Unit 4 high head safety injection pump rooms.

#### b. Findings

No findings were identified.

## 1R08 Inservice Inspection Activities (IP 71111.08)

### a. Inspection Scope

#### Non-Destructive Examination Activities and Welding Activities

From October 9, 2017, through October 13, 2017, the inspectors conducted an onsite review of the implementation of the licensee's inservice inspection (ISI) program for Unit 4. The ISI program was designed to monitor degradation of pressure retaining components in vital system boundaries. The scope of this program included components within the reactor coolant system (RCS) boundary, risk-significant piping boundaries, and containment system boundaries.

#### NDE Activities

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

- Ultrasonic Examination (UT), Pipe to Elbow Weld, 8-RHR-1402-2 (Observed);
- UT, Elbow to Pipe Weld, 10-SI-1403-4 (Observed);
- UT, Elbow to Pipe Weld, 8-RHR-1402-3 (Observed);
- Liquid Penetrant Examination, (PT) Outlet Nozzle to Shell, 4-RHE-A11 (Reviewed);
- PT, Integrally Welded Attachment, 4-RHE-SPA-2-IA, (Reviewed);
- Visual Examination (VT)-2, RHR System 050 System Leakage Pressure Test (Reviewed).

#### MRP-227 Inspections of Reactor Internals Baffle Bolts

The inspectors reviewed documentation to ensure that data analysts, EC probes, and equipment configurations were qualified to detect the existing Turkey Point Unit 4 reactor internals baffle bolt degradation. The inspectors review included review of the Vendor Ultrasonic Test (UT) Procedure for Nondestructive Examination of baffle bolts to ensure that the procedure was consistent with established guidelines and intent of industry inspection guidelines provided by the Electric Power Research Institute Documents MRP-227 and MRP-228. The inspectors also directly observed a sample of UT data acquisition using ZETEC Ultra-Vision technology and verified that random samples of UT signal displays shown in real time on screen graphics and used by analysts met established acceptability requirements for probe to bolt head contact parameters that were provided in plant specific procedures, in order to ensure valid UT response signals were being obtained and analyzed.

### Welding Activities

The inspectors reviewed the following welding packages following their completion activities. The inspectors evaluated these activities for compliance with site procedures and the requirements in Section XI of the ASME Code. Specifically, the inspectors reviewed the work orders, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- WO 40446342-05, Weld FW-1, ASTM A106 GR B Pipe Schedule 40 to ASTM A105 R.F. Flange; and,
- WO 40446342-05, Weld FW-10, ASTM A106 Gr. B Pipe Schedule 40 to ASTM A105 90 Degree Socket Weld Elbow.

The inspectors reviewed the listing of non-destructive surface and volumetric examinations performed during the previous refueling outage. The licensee did not identify any surface examinations or volumetric examinations that were accepted for use as-is. The inspectors performed a document review of AR 02124329 and the associated condition evaluation disposition. AR 02124329 identified a concern resulting from a VT-3 visual inspection of a safety injection system pipe support WR-5 relevant indication associated with pipe support gaps around the pipe to support interface that was evaluated and accepted as is for continued service.

### Reactor Pressure Vessel Upper Head Penetration Inspection Activities

For the Unit 4 reactor vessel head, a bare metal visual examination and volumetric examination were not required this outage pursuant to 10 CFR 50.55a(g)(6)(ii)(D). Therefore, the inspectors performed a field walkdown of the accessible portions of the reactor vessel closure head dome and flange area while the head was on the storage stand to inspect for visible signs of boric acid degradation.

### Boric Acid Corrosion Control Inspection Activities

The inspectors reviewed the licensee's boric acid corrosion control program (BACCP) activities to determine if they were implemented in accordance with program requirements, applicable regulatory requirements, and industry guidance. Specifically, the inspectors performed the following activities:

- Reviewed applicable procedures and the results of the licensee's most recent containment walkdown inspection.
- Interviewed the BACCP owner.
- Conducted an independent walkdown of accessible areas of the Unit 4 RCS piping and containment building.
- Verified that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACCP and the CAP.
- Reviewed engineering evaluations of components with boric acid leakage which verified that minimum wall thickness of those components was maintained.

### Steam Generator Tube Inspection Activities

The inspectors reviewed and discussed the status of the current Unit 4 steam generator maintenance program and reviewed the Degradation and Operational Assessments for Turkey Point Unit 4 Steam Generators at End of Cycle 29 report listed in the document review section. The inspectors verified that no steam generator tube inspection activities were required this refueling outage.

### Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the CAP. The inspectors evaluated 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 Turkey Point plant, which included AR 02226448 associated with recent industry experience on reactor internals baffle bolt evaluations.

This inspection constitutes one in-service inspection activities sample.

### Findings

- b. No findings were identified.

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

### .1 Resident Inspector Quarterly Review (IP 71111.11Q)

#### Simulator Observations

##### a. Inspection Scope

On November 16, 2017, the inspectors assessed licensed operator performance in the plant-specific simulator during a quarterly emergency preparedness drill. The simulator portion of the drill was evaluated by Operations Department managers, senior nuclear training operations instructors, and Emergency Preparedness Department staff personnel. The drill scenario included an event near the 3B component cooling water (CCW) pump with damage to safety related structures, systems and components (SSCs) located in the immediate area. Subsequently, control room operators were required to respond to a reactor anticipated transient without a scram event in conjunction with a series of failures of other safety-related SSCs and required operators to enter several emergency operating procedures.

During the simulator observation, simulator board configurations were compared with actual plant control board configurations to ensure fidelity with recent plant changes or modifications. The inspectors specifically evaluated the following attributes related to operating crew performance and the licensee evaluation:

- Clarity and formality of communication;
- Ability to take timely action to safely control the unit;
- Prioritization, interpretation, and verification of alarms;

- Correct use and implementation of off-normal and emergency operating procedures and emergency plan implementing procedures;
- Control board operation and manipulation, including high-risk operator actions;
- Oversight and direction provided by shift supervisor, including ability to identify and implement appropriate Technical Specification (TS) actions and emergency plan classification and notification;
- Crew overall performance and interactions; and,
- Evaluator's control of the scenario and post scenario evaluation of crew performance.

This inspection constitutes one resident review of licensed operator requalification sample.

b. Findings

No findings were identified.

.2 Control Room Observations (IP 71111.11Q)

a. Inspection Scope

The inspectors performed daily assessments of licensed operators in the control room during their performance of routine operations. These observations included daily surveillance testing and log keeping, response to alarms, communications, shift turnovers, and coordination of plant activities. These observations were conducted to verify operator compliance with station operating guidelines, such as use of procedures, control and manipulation of components, and communications.

The inspectors also performed the following focused control room observations during reactivity manipulations and Mode changes. These observations were conducted to verify operator compliance with station operating protocols as described in licensee procedure OP-AA-100-100, "Conduct of Operations." 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 procedure place keeping and narrative logs; and,
- Supervision of activities, including risk and reactivity management.

Specifically, the inspectors performed the following focused control room observations:

- October 3, 2017; operations during a Unit 4 planned downpower and manual reactor trip in accordance with general operating procedure 4-GOP-103, "Power Operation To Hot Standby," and emergency operating procedure 4-EOP-E-0, "Reactor Trip or Safety Injection," to enter Mode 3 and begin the 30th Unit 4 refueling outage;

- October 4, 2017; operations during Unit 4 plant cooldown in Mode 3 in accordance with 4-GOP-305, "Hot Standby to Cold Shutdown;"
- October 4, 2017; operations during Unit 4 solid plant pressure and temperature control in accordance with normal operating procedure 4-NOP-041.02, "Pressurizer Operation;"
- October 19, 2017; operations during Unit 3 troubleshooting for an unexpected decrease in main condenser vacuum and entry into off-normal operating procedure 3-ONOP-014, "Main Condenser Loss of Vacuum;"
- October 30, 2017; operations during the Unit 4 startup after the 30th Unit 4 refueling outage including the reactor startup and low power physics testing in accordance with 4-GOP-301, "Hot Standby to Power Operation;"
- October 31, 2017; observations during Unit 4 reactivity manipulations associated with operations surveillance procedure 4-OSP-089.1, "Turbine Generator Over-speed Trip Test;" and,
- November 20, 2017; observations during a Unit 3 emergent fast load reduction and manual reactor trip in accordance with 3-GOP-100, "Fast Load Reduction," in response to degrading conditions associated with the 3C reactor coolant pump (RCP) upper 3<sup>rd</sup> stage seal.

This inspection constitutes seven control room observations samples.

b. Findings

No findings were identified.

.3 Annual Review of Licensee Requalification Examination Results (IP 71111.11A)

a. Inspection Scope

On January 10, 2018, the licensee completed all the annual requalification operating examinations required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results," of IP 71111.11.

This inspection constitutes one annual licensed operator requalification sample.

b. Findings

No findings were identified.

.4 Biennial Requalification Examination Results (IP 71111.11B)

a. Inspection Scope

The inspectors reviewed the facility operating history and associated documents in preparation for this inspection. During the week of August 28, 2017, the inspectors reviewed documentation associated with the licensee's operator requalification program

biennial written examinations. The activity performed by the inspectors was done to assess the effectiveness of the facility licensee in implementing requalification requirements identified in 10 CFR Part 55, "Operators' Licenses." The evaluations were also performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Requalification Program." Documentation reviewed included two biennial written examinations. The records were inspected using the criteria listed in Inspection Procedure 71111.11. Documents reviewed during the inspection are documented in the Attachment.

The sample constitutes one biennial licensed operator equal sample and is now complete. The remainder of this sample was previously inspected and documented in the third quarter integrated inspection report (05000250, 251/2017003).

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (IP 71111.12Q)

Routine Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the following equipment problems and periodic evaluation reports 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 procedure ER-AA-100-2002, "Maintenance Rule Program Administration." The inspectors' efforts focused on maintenance rule scoping, characterization of maintenance problems and failed components, risk-significance, determination of a(1) 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 verified that equipment problems were being identified and entered into the CAP. The inspectors used licensee maintenance rule database, system health reports, and the CAP as sources of information on tracking and resolution of issues. This inspection constitutes two samples.

- AR 2224218 4C main feedwater regulating valve (MFRV) failure and manual reactor trip during Hurricane Irma; and,
- AR 2234772, (a)(1) evaluation of 4A SGFP recirculation to condenser vent valve 4-20-147.

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 and control room inspections of the licensee's 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 procedures WM-AA-203, "Online Scheduling Process," WM-AA-100-1000, "Work Activity Risk Management," and 0-ADM-225, "On Line Risk Assessment and Management." The inspectors also reviewed the effectiveness of the licensee's contingency actions to mitigate increased risk resulting from the degraded equipment and the licensee assessment of aggregate risk using procedure OP-AA-104-1007, "Online Aggregate Risk." The inspectors discussed the on-line risk monitor (OLRM) results with the control room operators and verified all applicable out-of-service equipment was included in the OLRM calculation. The inspectors evaluated the following risk assessments, which consisted of four inspection samples during the inspection period:

- Unit 3 OLRM and Unit 4 (in mode 5) shut down risk assessment while the 4A emergency diesel generator (EDG) was out of service (OOS) and the Unit 4 steam generators were operating on the A standby steam generator feed pump, the RCS was solid at 350 psig, and decay heat removal was being provided by two trains of RHR;
- Unit 3 OLRM and Unit 4 defueled with the 4A safety-related 4kV switchgear, 4C diesel instrument air compressor and 3A CCW heat exchanger OOS;
- Unit 3 and Unit 4 OLRM with 4B CCW heat exchanger, C auxiliary feedwater (AFW) pump, and E232/V76 electrical equipment room heating ventilation and air-conditioning (HVAC) OOS; and,
- Unit 3 and Unit 4 OLRM with the 4A intake cooling water header, 3CD instrument air compressor, 4A boric acid transfer pump, and the 4A steam generator feed pump OOS.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (IP 71111.15)

a. Inspection Scope

The inspectors evaluated the technical adequacy of the licensee evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred for the operability evaluations described in the ARs listed below. The inspectors reviewed applicable sections of the UFSAR to determine if the system or component remained available to perform its intended function. In addition, when applicable, the inspectors reviewed

compensatory measures implemented to verify that the affected equipment remained capable of performing its intended design function. The inspectors also reviewed a sampling of condition reports to verify that the licensee was routinely identifying and correcting any deficiencies associated with operability evaluations. This inspection constitutes four samples.

- AR 2231287, Corroded CCW piping under the fuel transfer canal – 4B RCP cooling;
- AR 2113436, Potential Part 21 – Masterpact NT & NW breaker fail to close;
- AR 2233253, Unit 4 resident inspector walk down of containment; and,
- AR 02236229, Unit 4 intake cooling water pit structural support corrosion.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing (IP 71111.19)

a. Inspection Scope

For the post maintenance tests and associated work orders (WO) 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 operable. The inspectors verified that the requirements in licensee procedure MA-AA-203-1000, "Maintenance Testing," were incorporated into the test requirements. The inspectors reviewed the following WOs which consisted of four inspection samples:

- WOs 40564021, 40564032, 40486713, and 40564033, Main steam code safety valves as-found and as-left pressure set data for valves RV-1401, 1405, 1406 and 1410 respectively;
- WO 40448989, Check valve 4-873A high head safety injection (HHSI) cold leg injection check valve replacement;
- WO 40470367 PCV-4-455C pressurizer power-operated relief valve (PORV) overhaul & WO 40490380 PCV-4-4886 pressurizer PORV replacement; and,
- WO 40470639, Unit 4 rod stepping and rod drop tests.

b. Findings

Introduction: A Green NRC-identified NCV of 10 CFR 50.55a, "Codes and Standards," was identified for the failure to adequately perform a BPVC class 1 and 2 replacement activity in accordance with the Turkey Point Plant ASME Section XI Repair/Replacement Program. Specifically, the licensee did not ensure a system leakage test conducted on October 19, 2017, was appropriately evaluated to meet the requirements of ASME Section XI for pre-service leakage testing of a Unit 4 HHSI cold leg injection check valve that was replaced on October 15, 2017.

Description: During the 2017 fall refueling outage for Turkey Point Unit 4 (PT4-30), the licensee replaced check valve 4-873A because it was suspected of back leakage in January 2016. 4-873A was a two-inch check valve that had a safety function to open for HHSI and to close for RCS integrity. 4-873A was additionally an isolation boundary for

the A RCS accumulator. The A RCS accumulator shared a common injection line with HHSI to the A RCS cold leg. 4-873A was at the boundary for ASME code class 1 and class 2 systems, i.e., the upstream weld was ASME code class 2 and the downstream weld was ASME code class 1.

The licensee provided detailed WO instructions, an ASME repair/replacement plan, and post-maintenance testing requirements in WO 40448989 under several task assignments. The ASME repair/replacement plan was included in WO 40448989-01 and specified that a system leak test be conducted after the weld replacement. WO 40448989-03 was titled 4-873A: PMT Mode 3 and provided procedure 4-OSP-062.4, Safety Injection System – Full Flow Test, as instructions to perform the post-weld system leakage test. The inspectors noted that although the title of the task inferred the post maintenance test or post-weld system leakage test be conducted in Mode 3, 4-OSP-062.4 procedurally required Mode 6 conditions with the reactor vessel head removed and the reactor refueling cavity flooded. The inspectors also noted that in Mode 6, the system conditions at the replacement welds would be at a significantly reduced pressure and temperature compared to Mode 3. Mode 3 was defined in technical specification Table 1.2, Operational Modes, as greater than or equal to an average coolant temperature of 350°F. TS 3.4.9.1 established the requirements of RCS temperature and pressure in accordance with limit lines shown on graphs represented in Figure 3.4-2 for heatup and Figure 3.4-3 for cooldown. At or above an RCS temperature of 350°F, RCS pressure was permitted to be from 0 psig to less than 2735 psig. The 2735 psig RCS upper pressure limit was established by TS 2.1.2. Unit 4 entered Mode 3 at 0421 on October 28, 2017, and control room operators established RCS pressure at a nominal 2235 psig at about 1129 on October 28, 2017. WO 40448989-03 and 4-OSP-062.4 was completed in Mode 6 at 1350 on October 19, 2017. The pressure and temperatures at the welds were not recorded for the VT2 visual examination. The VT2 visual examination record sheet instead recorded the 4A HHSI pump discharge pressure at 940 psig. The inspectors noted that the licensee did not determine nor document in the repair/replacement plan an acceptable system pressure to be established at the 4-873A weld locations during the system leakage test and associated VT2 visual examination.

On November 7, 2017, the inspectors questioned the licensee in regards to its compliance with IWA-4540, Pressure Testing of Classes 1, 2, and 3 Items, for the pre-service testing of the replaced check valve 4-873A. IWA-4540 stated, in part, unless exempted by IWA 4540(b), repair/replacement activities performed by welding on a pressure-retaining boundary shall include a hydrostatic or system leakage test in accordance with IWA-5000, prior to, or as part of, returning to service. IWA-5000, System Pressure Tests, IWA-5212 Pressure and Temperature stated, in part, system leakage tests and system hydrostatic tests shall be conducted at the pressure and temperature specified in IWB-5000, IWC-5000, and IWD-5000.

For code class 1 components such as the downstream weld of 4-873A; IWB-5000 System Pressure Tests, IWB-5220 System Leakage Test, IWB-5221 Pressure states, in part, that the system leakage test shall be conducted at a pressure not less than the pressure corresponding to 100% rated reactor power. The 100% rated reactor power for Turkey Point Unit 4 was 2235 psig. The licensee agreed that the system leakage test performed on October 19, 2017, for the code class 1 weld was significantly less than 2235 psig. However, the licensee offered that an examination of the welds did occur during conduct of 0-OSP-041.26, Containment Visual Leak Inspection. 0-OSP-041.26,

Containment Visual Leak Inspection was completed on October 28, 2017, after control room operators established RCS pressure and temperature at normal operating conditions. The licensee offered that the conduct of the examinations met the requirements of an acceptable VT2 visual examination for the code class 1 weld. However, because downstream check valve 4-875A to the A RCS cold leg necessarily prevents full RCS pressure from existing at the 4-873A downstream weld, the licensee invoked Code Case N-731 for portions of class 1 systems that are continuously pressurized during an operating cycle by a statically-pressurized passive safety injection system (i.e. RCS accumulators). Code Case N-731 allowed and the NRC approved its use, that the pressure associated with a statically-pressurized passive safety injection system of a pressurized water reactor may be used in lieu of the requirements of IWB-5221(a) (i.e. class 1 system leakage test pressure requirements). The inspectors agreed N-731 was appropriate for the class 1 weld associated with 4-873A but was not previously included in the repair/replacement plan and was not invoked until the inspectors questioned the acceptability of the licensee's repair/replacement plan. The inspectors noted that licensee administrative procedure 0-ADM-532, ASME Section XI Repair/Replacement Program, step 4.3.6.A. required, in part, that a repair/replacement plan include the applicable Cases of Section XI.

Code Case N-731 was not applicable for the upstream weld of 4-873A because it was a code class 2 weld. Code Case N-731 was specifically an inquiry and reply for alternative code class 1 system leakage test pressure requirements. Additionally, check valve operation of 4-873A necessarily precluded RCS accumulator pressure from existing at the upstream weld. For code class 2 components, such as the upstream weld of 4-873A; IWC-5000 System Pressure Tests, IWC-5220 System Leakage Test, IWC-5221 Pressure stated in part that the system leakage test shall be conducted at the system pressure obtained while the system, or portion of system, was in service performing its normal operating function or at the system pressure developed during a test conducted to verify system operability. 4-873A was only in service during an abnormal condition, (i.e. HHSI actuation). Additionally 4-873A was not in service during quarterly in-service testing of the Unit 4 HHSI pumps because they are operated and aligned to a test line isolated from 4-873A. Because the replacement welds were not adequately instrumented during the full flow test using the 4A HHSI pump in Mode 6, the licensee subsequently calculated that the upstream weld was subjected to about 587 psig during the conduct of the VT2 visual examination. The inspectors concluded that 587 psig was sufficient for the VT2 visual examination because: ASME Section XI Interpretation XI-1-95-54 for Section XI, IWA-5000, IWC-5000, IWD-5000; Required System Pressure Tests replied Yes to the question: Is it the Owner's responsibility to determine the test pressure when performing a system leakage test? The inspectors concluded the licensee had not previously evaluated or appropriately instrumented and determined the test pressure at the code class 2 weld replacement during the VT2 visual examination. The inspectors noted that licensee administrative procedure 0-ADM-532, ASME Section XI Repair/Replacement Program, step 4.3.6.C.(4) required, in part, that a repair/replacement plan document the applicable examination, test, and acceptance criteria to be used to verify acceptability. The licensee did not document the acceptability of using 4-OSP-062.4, Safety Injection System – Full Flow Test while in Mode 6 to adequately pressurize the 4-873A upstream weld for a VT2 visual examination, and did not measure system pressure near the 4-873A welds. The licensee entered these issues into its CAP as ARs 2235484 and 2239149.

Analysis: The failure to ensure the repair/replacement plan included Code Case N-731, as required by 10 CFR 50.55a(g)(4), and to document the acceptance criteria for pressure during a system leakage test and associated VT2 visual examination of 4-873A replacement welds, was a performance deficiency (PD). The inspectors determined that the PD was more than minor per IMC 0612, Appendix B, "Issue Screening," because an inadequate inservice inspection repair/replacement plan adversely affected the RCS Equipment and Barrier Performance attribute of the Barrier Integrity Cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events.

The inspectors used IMC 0609, Appendix A, "The Significance Determination Process (SDP) For Findings At-Power". RCS boundary issues that are not pressurized-thermal shock issues are evaluated under the initiating events cornerstone (see Barrier Integrity, page 4 of IMC 0609, Appendix A.). Therefore, evaluating under the initiating events cornerstone, the inspectors determined that the finding was of very low safety significance (Green) because there was no actual degradation of the RCS boundary (Exhibit 1, Step A.2. of IMC 0609, Appendix A).

The inspectors reviewed this PD for cross-cutting aspects as required by IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. The finding was determined to be reflective of present licensee performance in 2017, in that the licensee did not effectively evaluate and appropriately implement the ASME BPVC requirements in the 4-873A Repair/Replacement Plan which were reiterated in licensee administrative procedure 0-ADM-532, ASME Section XI Repair/Replacement Program. This finding was assigned a cross-cutting aspect in the Procedure Adherence component of the Human Performance cross-cutting area, in that it states individuals follow processes, procedures, and work instructions (H.8).

Enforcement: 10 CFR 50.55a(g)(4) required, in part, that throughout the service life of a boiling or pressurized water reactor facility, components classified as ASME Code Class 1, 2, and 3 must meet the requirements set forth in Section XI of the ASME Code. The ASME BPVC of record for Turkey Point Unit 4 was the 2007 Edition through the 2008 Addenda. Section XI, IWA-4150 Repair/Replacement Program and Plan, in part, stated (a) Repair/replacement activities shall be completed in accordance with the Repair/Replacement Program. The licensee's Repair/Replacement Program was, in part, administrative procedure 0-ADM-532, ASME Section XI Repair/Replacement Program. 0-ADM-532, in part, stated: 1) (step 4.3.6.A.) that a repair/replacement plan shall include the applicable Cases of Section XI; and, 2) (step 4.3.6.C.(4)) that a repair/replacement plan, when applicable to the specific repair/replacement activity, shall document the applicable examination, test, and acceptance criteria to be used to verify acceptability. Contrary to this, a repair/replacement plan to replace 4-873A was documented in WO 40448989-01 and reviewed for use on October 6, 2017. Post-weld pressure testing was completed in accordance with WO 40448989-03 on October 19, 2017, but the repair replacement plan did not include an applicable Case of Section XI and it did not document an acceptable system pressure to be established at the replacement welds during the VT2 visual examination. This finding was entered into the licensee's CAP as ARs 2235484 and 2239149. Immediate corrective actions included documenting a formal basis for current operability via a prompt operability determination

and updating WO documentation to fully comply with ASME BPVC Section XI requirements. This violation is being treated as a NCV consistent with Section 2.3.2.a of the Enforcement Policy. NCV 050000251/2017004-01, "Failure to Perform an Adequate ASME BPVC Section XI Repair/Replacement Plan for a Code Class 1 and 2 Replacement."

1R20 Refueling and Other Outage Activities (IP 71111.20)

.1 Unit 4 Refueling Outage (T4R30)

a. Inspection Scope

On October 4, 2017, Unit 4 began its 30th planned refueling outage. Outage T4R30 completed on October 31, 2017. The inspectors attended various outage meetings including outage control center (OCC) and operations turnover meetings. The inspectors regularly monitored outage control activities to ensure system, structure, and component configurations, and work scope were consistent with TS requirements, site procedures, and outage risk controls.

Outage Planning, Control and Risk Assessment

The inspectors examined the licensee implementation of shutdown safety assessments during T4R30 in accordance with administrative procedure ADM-051, "Outage Risk Assessment and Control," to verify if a defense-in-depth concept was in place to ensure safe operations and avoid unnecessary risk. The inspectors regularly monitored outage planning and control activities in the outage control center, as well as work activities authorized from the work control center and main control room, and interviewed responsible outage control center management personnel and licensed operators during the outage to ensure SSC configurations, and work scope were consistent with TS requirements, site procedures, and outage risk controls.

Monitoring of Shutdown Activities

The inspectors performed walkdowns of important systems and components used for RHR from the reactor core and spent fuel pit (SFP) cooling during the shutdown period including the ICW system, CCW system, RHR system and SFP cooling system.

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 and SFP 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) and around the SFP;
- Verified fatigue rule was properly managed.

### Refueling Activities and Containment Closure

The inspectors witnessed selected fuel handling operations being performed in accordance with TSs and applicable operating procedures from the main control room, the refueling bridge inside the containment building, and the fuel handling bridge in the SFP building. 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 in a timely manner per procedure 0-ADM-051, "Outage Risk Assessment and Control."

### Corrective Action Program

The inspectors reviewed ARs generated during T4R30 to evaluate the licensee's threshold for initiating ARs. The inspectors reviewed ARs to verify priorities, Mode holds, and significance levels were assigned as required. Resolution and implementation of corrective actions of several ARs were also reviewed for completeness. The inspectors routinely reviewed the results of quality assurance daily surveillances of outage activities as documented in the CAP.

This inspection constitutes one complete sample.

#### b. Findings

No findings were identified.

### .2 Unit 3 Forced Outage – 3C RCP Seal Replacement (T3FO-RCP3C)

#### a. Inspection Scope

On November 20, 2017, the licensee entered a forced maintenance outage, T3FO-RCP3C, to replace the 3C RCP seal assembly. On November 19, 2017, control room operators identified a degrading trend associated with the 3C RCP seal operating parameters. Specifically its controlled bleed-off (CBO) temperature was identified at the 160°F limit previously established in an adverse condition monitoring plan. On November 20, 2017, the CBO temperature increased to 221°F and the upper third stage seal differential pressure reduced significantly. Control room operators entered 3-ONOP-041.1, RCP Off-Normal Condition and promptly initiated a fast load reduction on Unit 3 in response to the degrading 3C RCP seal parameters and subsequently shutdown the reactor and entered Mode 3. Mode 5 was entered on November 21, 2017, and the licensee replaced the entire 3C RCP seal assembly during T3FO-RCP3C.

The inspectors attended various outage meetings including OCC and operations turnover meetings. The inspectors regularly monitored outage control activities to ensure system, structure, and component configurations, and work scope were consistent with TS requirements, site procedures, and outage risk controls.

### Outage Planning, Control and Risk Assessment

The inspectors examined the licensee implementation of shutdown safety assessments during T3FO-RCP3C in accordance with administrative procedure ADM-051, "Outage Risk Assessment and Control," to verify if a defense-in-depth concept was in place to ensure safe operations and avoid unnecessary risk. The inspectors regularly monitored outage planning and control activities in the outage control center, as well as work activities authorized from the work control center and main control room, and interviewed responsible outage control center management personnel and licensed operators during the outage to ensure SSC configurations, and work scope were consistent with TS requirements, site procedures, and outage risk controls.

### Monitoring of Shutdown Activities

The inspectors performed walkdowns of important systems and components used for RHR from the reactor core cooling during the shutdown period including the ICW system, CCW system, and RHR system.

### 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; and,
- Reviewed control of containment penetrations;

### Containment Closure

The inspectors evaluated the licensee's ability to close the containment equipment, personnel, and emergency hatches in a timely manner per procedure 0-ADM-051, "Outage Risk Assessment and Control."

### Corrective Action Program

The inspectors reviewed ARs generated during T3FO-RCP3C to evaluate the licensee's threshold for initiating ARs. The inspectors reviewed ARs to verify priorities, Mode holds, and significance levels were assigned as required. Resolution and implementation of corrective actions of several ARs were also reviewed for completeness. The inspectors routinely reviewed the results of quality assurance daily surveillances of outage activities as documented in the CAP.

T3FO-RCP3C was a non-refueling outage, the inspectors performed applicable non-refueling related sections of IP 7111.20 and this inspection constitutes one sample.

b. Findings

No findings were identified.

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

The inspectors either reviewed or observed the following surveillance tests to verify that the tests met the TS requirements, the UFSAR description, the licensee's procedural requirements, and demonstrated the systems were capable of performing their intended safety functions and operational readiness. In addition, the inspectors evaluated the effect of the testing activities on the plant to ensure that conditions were adequately addressed by the licensee staff and that after completion of the testing activities, equipment was returned to the status required for the system to perform its safety function. The inspectors verified that any surveillance deficiencies were documented in the licensee's CAP. This inspection constitutes one containment isolation valve leak rate, and two surveillance test samples as follows:

Containment Isolation Valve Leak Rate Test:

- 4-OSP-051.5, Local Leak Rate Tests, for penetration 19A, containment spray, WO 40470343-01.

Surveillance Tests:

- 4-OSP-203.1, Train A Engineered Safeguards Integrated Test, Section 7.2, WO 40478568; and,
- 4-OP-041.8, Filling and Venting the Reactor Coolant System (Section 5.3).

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (IP 71114.06)a. Inspection Scope

On November 16, 2017, the inspectors observed and assessed a licensed operator crew's performance during a quarterly emergency preparedness drill in the control room simulator. The simulated scenario included assessing classification of the emergency events and completing notifications to State of Florida, Miami-Dade County, and Monroe County authorities and the NRC. 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 licensed operator requal training sample.

b. Findings

No findings were identified.

2. RADIATION SAFETY (RS)

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

2RS1 Radiological Hazard Assessment and Exposure Controls (IP 71124.01)

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 4 (U4) containment building, Unit 3 (U3) and U4 auxiliary buildings, U3 and U4 spent fuel pools (SFPs), the Independent Spent Fuel Storage Installation (ISFSI), and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCAs. 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, and pre-job surveys for upcoming tasks. 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 reviewed equipment sensitivity, alarm setpoints, and release program guidance. 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 (ED) alarm setpoints, were evaluated for selected U4 refueling outage (PT4-30) tasks. 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 multi-badging 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. Jobs observed included U4 pressurizer valve maintenance and fuel movement in high radiation and contaminated areas. 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 CAP documents 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: RP activities were evaluated against the requirements of Updated Final Safety Analysis Report (UFSAR) Chapter 11, Technical Specifications (TS) Sections 6.8 and 6.12, 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. This inspection constitutes seven total samples under IP 71124.01.

b. Findings

No findings were identified.

2RS2 Occupational As Low As Is Reasonably Achievable (ALARA) Planning and Controls (IP 71124.02)

a. Inspection Scope

Work Planning and Exposure Tracking: The inspectors reviewed work activities and their collective exposure estimates for the PT4-30 refueling outage. The inspectors reviewed ALARA planning packages for activities related to the following high collective exposure tasks: Reactor Coolant Pump Maintenance; Refuel Floor Activities; and Sump Work activities. For the selected tasks, the inspectors reviewed established dose goals and discussed assumptions regarding the bases for the current estimates with responsible ALARA planners. The inspectors evaluated the incorporation of exposure reduction initiatives and operating experience, including historical post-job reviews, into RWP requirements. Day-to-day collective dose data for the selected tasks were compared with established dose estimates and evaluated against procedural criteria (work-in-progress review limits) for additional ALARA review. Where applicable, the inspectors discussed changes to established estimates with ALARA planners and evaluated them against work scope changes or unanticipated elevated dose rates.

Source Term Reduction and Control: The inspectors reviewed the collective exposure three-year rolling average from 2014 – 2016. The inspectors evaluated historical dose rate trends for reactor coolant system piping and compared them to the PT4-30 refueling outage. Source term reduction initiatives, including cobalt reduction and zinc injection, were reviewed and discussed with RP staff. The inspectors also reviewed temporary shielding packages for the PT4-30 refueling outage.

Radiation Worker Performance: As part of Inspection Procedure (IP) 71124.01, the inspectors observed pre-job ALARA briefings and radiation worker performance for various HRA jobs in the auxiliary building and containment. While observing job tasks, the inspectors evaluated the use of remote technologies to reduce dose including teledosimetry and remote visual monitoring.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with ALARA program implementation. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: ALARA program activities were evaluated against the requirements of UFSAR Chapter 11, TS Section 6.8 and 6.12, 10 CFR Part 20, and approved licensee procedures. Documents and records reviewed are listed in the Attachment. This inspection constitutes five total samples under IP 71124.02.

b. Findings

No findings were identified.

2RS3 In-Plant Airborne Radioactivity Control and Mitigation (IP 71124.03)

a. Inspection Scope

Engineering Controls: The inspectors reviewed the use of temporary and permanent engineering controls to mitigate airborne radioactivity during the PT4-30 refueling outage. The inspectors observed the use of portable air filtration units for work in contaminated areas of the RCA and reviewed filtration unit testing certificates. The inspectors evaluated the effectiveness of continuous air monitors to provide indication of increasing airborne levels and the placement of air samplers in work area "breathing zones," accounting for alpha-emitting nuclides inclusion in setpoint determination.

Respiratory Protection Equipment: The inspectors reviewed the use of respiratory protection devices to limit the intake of radioactive material. This included review of devices used for routine tasks and devices stored for use in emergency situations. The inspectors reviewed ALARA evaluations for the use of respiratory protection performed since the last inspection. Selected Self-Contained Breathing Apparatus (SCBA) units and negative pressure respirators (NPR) staged for routine and emergency use in the Main Control Room and other locations were inspected for material condition, SCBA bottle air pressure, number of units, and number of spare masks and availability of air bottles. The inspectors reviewed maintenance records for selected SCBA units for the past two years and evaluated SCBA and NPR compliance with National Institute for Occupational Safety and Health certification requirements. The inspectors also reviewed records of air quality testing for supplied-air devices and SCBA bottles.

The inspectors discussed training for various types of respiratory protection devices with licensee staff and interviewed radworkers and control room operators on use of the devices including SCBA bottle change-out and use of corrective lens inserts. The inspectors reviewed respirator qualification records (including medical qualifications) for several Main

Control Room operators and emergency responder personnel. In addition, inspectors evaluated qualifications for individuals responsible for testing and repairing SCBA vital components.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with airborne controls and respiratory protection activities. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria: Radiation protection program activities associated with airborne radioactivity monitoring and controls were evaluated against details and requirements documented in the UFSAR Chapters 9 and 11; TS Sections 3/4.9.9, Containment Ventilation System, 3/4.9.13, Radiation Monitoring, and 6.8.1, Procedures and Programs; 10 CFR Part 20; Regulatory Guide (RG) 8.15, "Acceptable Programs for Respiratory Protection" and approved licensee procedures. Documents and records reviewed are listed in the Attachment. This inspection constitutes four total samples under IP 71124.03.

b. Findings

No findings were identified.

2RS4 Occupational Dose Assessment (IP 71124.04)

a. Inspection Scope

Source Term Characterization: The inspectors reviewed the plant radiation characterization (including gamma, beta, alpha, and neutron) being monitored and verified the use of scaling factors to account for hard-to-detect radionuclides in internal dose assessments.

External Dosimetry: The inspectors reviewed National Voluntary Laboratory Accreditation Program (NVLAP) certification data for the licensee's Thermoluminescent Dosimeter (TLD) processor for the current year for Ionizing Radiation Dosimetry. The inspectors observed and evaluated onsite storage of TLDs. Comparisons between ED and TLD results, including correction factors, were reviewed and discussed. The inspectors also evaluated licensee procedures for unusual dosimetry occurrences. ED alarm logs were reviewed as part of Inspection Procedure 71124.01.

Internal Dosimetry: The inspectors reviewed and discussed the in vivo bioassay program with the licensee. Inspectors reviewed procedures that addressed methods for determining internal or external contamination, releasing contaminated individuals, and the assignment of dose. The inspectors evaluated the licensee's program for in vitro monitoring. The inspectors also reviewed contamination logs and evaluated events with the potential for internal dose.

Special Dosimetric Situations: The inspectors reviewed select records for declared pregnant workers (DPWs) since November 2015, and reviewed guidance for monitoring and instructing DPWs. Inspectors reviewed the licensee's program for monitoring external dose in areas of expected dose rate gradients, including the use of multi-badging and extremity dosimetry. The inspectors evaluated the licensee's neutron

dosimetry program including instrumentation used to perform neutron surveys. In addition, the inspectors reviewed the licensee's program for evaluation of shallow dose equivalent (SDE). The inspectors also reviewed contamination logs and evaluated events with the potential for SDE.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with occupational dose assessment, including self-assessments. The inspectors evaluated the licensee's ability to identify and resolve issues.

Inspection Criteria: The licensee's occupational dose assessment activities were evaluated against the requirements of UFSAR Chapter 11; TS Section 6.8; 10 CFR Parts 19 and 20; and approved licensee procedures. Documents and records reviewed are listed in the Attachment. This inspection constitutes five total samples under IP 71124.04.

b. Findings

No findings were identified.

2RS5 Radiation Monitoring Instrumentation (IP 71124.05)

a. Inspection Scope

The inspectors reviewed the licensee's radiation monitoring instrumentation programs to verify the accuracy and operability of radiation monitoring instruments used to monitor areas, materials, and workers to ensure a radiologically safe work environment during normal operations and under postulated accident conditions.

Walkdowns and Observations: During tours of the site areas, the inspectors observed installed radiation detection equipment including the following instrument types: area radiation monitors (ARMs), personnel contamination monitors (PCMs), small article monitors (SAMs), and portal monitors (PMs). The inspectors observed the calibration status, physical location, material condition and compared technical specifications for this equipment with UFSAR requirements. In addition, the inspectors observed the calibration status and functional checks of selected in-service portable instruments and discussed the bases for established frequencies and source ranges with RP staff personnel. The inspectors reviewed periodic source check records for compliance with plant procedures and manufacturer's recommendation for selected instruments and observed the material condition of sources used.

Calibration and Testing Program: The inspectors reviewed calibration data for selected ARMs, PCMs, PMs, SAMs, and laboratory instruments as well as the last calibration and methodology for the whole body counter. The inspectors reviewed calibration data, methodology used, and source certification for the containment high range monitor and selected portable radiation survey instruments. The current output values for the portable instrument calibrator and the instrument certifications used to develop them were reviewed by the inspectors. The inspectors reviewed the licensee's process for investigating instruments that are removed from service for calibration or response

check failures and discussed specific instrument failures with plant staff. In addition, the inspectors reviewed 10 CFR Part 61 data to determine if sources used in the maintenance of the licensee's radiation detection instrumentation were representative of radiation hazards in the plant and scaled appropriately for "hard to detect" nuclides.

Problem Identification and Resolution: The inspectors reviewed and discussed selected CAP documents associated with radiological instrumentation. The inspectors evaluated the licensee's ability to identify and resolve issues.

Inspection Criteria: Operability and reliability of selected radiation detection instruments were reviewed against details documented in the following: 10 CFR Part 20; NUREG-0737, "Clarification of TMI Action Plan Requirements;" UFSAR Chapters 11 and 12, TS Section 3, and applicable licensee procedures. Documents and records reviewed are listed in the Attachment. This inspection constitutes three total samples under IP 71124.05.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification (IP 71151)

.1 Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors reviewed licensee submittals for the Unit 3 and Unit 4 mitigating system performance indicators (PIs) listed below for the period October 1, 2016, through September 30, 2017, to verify the accuracy of the PI data reported during that period. PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedure 0-ADM-032, "NRC Performance Indicators Turkey Point," were used to check the reporting for each data element. The inspectors checked operator logs, plant status reports, condition reports, system health reports, and PI data sheets to verify that the licensee had identified the required data, as applicable. The inspectors interviewed licensee personnel associated with performance indicator data collection, evaluation, and distribution. This inspection constitutes two samples for each PI for a combined ten total samples. The Unit 3 and Unit 4 PIs reviewed are listed below:

- Emergency AC power system;
- Residual heat removal system;
- Heat removal system;
- High pressure injection system; and
- Cooling water systems.

b. Findings

No findings were identified.

.2 Radiation Safety Cornerstone

a. Inspection Scope

Occupational Radiation Safety Cornerstone: The inspectors reviewed the Occupational Exposure Control Effectiveness PI results for the Occupational Radiation Safety Cornerstone from October 2016 through June 2017. For the assessment period, the inspectors reviewed electronic dosimeter alarm logs and CAP documents related to controls for exposure significant areas. Documents reviewed are listed in the Attachment. This inspection constitutes one sample.

Public Radiation Safety Cornerstone: The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from October 2016 through June 2017. For the assessment period, the inspectors reviewed cumulative and projected doses to the public contained in liquid and gaseous release permits and CAP documents related to Radiological Effluent Technical Specifications/ODCM issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed are listed in the Attachment. This inspection constitutes one sample.

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, "Identification and Resolution of Problems," and to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a screening of items entered daily into the licensee's CAP. This review was accomplished by reviewing daily printed summaries of 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 occurred.

b. Findings

No findings were identified.

.2 Semi-Annual Trend Review: Programmatic Weaknesses in the Identification and Resolution of Corrosion-Related Issues on Safety-Related Systems, Structures and Components

a. Inspection Scope

The inspectors performed a review of the licensee's electronic CAP database and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review focused on repetitive equipment issues,

but also considered plant status reviews, plant tours, licensee trending efforts, and the results of daily inspector CAP item screenings discussed in section 4OA2.1. The inspectors' initial review nominally considered the six month period of April 2017 through September 2017, although some examples expanded beyond those dates when the scope of the issue warranted.

In addition to other WOs and ARs, the inspectors' trend review included ARs associated with the following recent external corrosion-related issues:

- ARs 02218430 and 02218437 related to an NRC-identified license renewal aging management procedure violation, NCV 05000250, 251/2017007-07, Failure to Identify ICW Pipe Corrosion;
- ARs 2223132, and 2223433 related to an NRC-identified corrective action violation, NCV 05000250/2017003-01, Failure to Identify CCW Pipe Corrosion;
- ARs 2211843, 2236687, and 1981540 related to an NRC-identified corrective action violation that is documented in section 4OA2.4 of this report, NCV 05000251/2017004-02, "Failure To Identify and Correct a Deficient CCW Penetration Seal Configuration that Exacerbates External Piping Corrosion Conditions;
- AR 2192543 related to NRC identified corrosion issues in the Unit 3 and Unit 4 ICW valve pits;
- ARs 2236229 and 2236292 related to the licensee's coatings task force identification of corrosion issues in the ICW valve pits; and,
- AR 2238511 related to the Unit 3 EDG prompt operability determination of the diesel fuel-oil transfer piping identified with significant corrosion.

This inspection constitutes one semi-annual trend sample.

b. Findings and Observations

No findings were identified. The inspectors identified an adverse trend related to identification and resolution of corrosion-related issues on the ICW and CCW SSCs. The licensee acknowledged the adverse trend and initiated ARs 2232526, "Adverse Trend in ICW and CCW Corrosion;" 2232527, "Corrosion Control Program Weakness;" and 2233262, "Turkey Point Nuclear Plant (PTN) Coating Program Task Force."

With respect to contribution to core damage frequency, the ICW and CCW are high risk- significant systems with the highest initiating event importance of 18 and 17 percent, and the highest system risk importance of 20 and 18 percent, respectively. Portions of the ICW and CCW SSCs were exposed to the outside environment and other portions of the systems were within buildings that are not climate controlled. At the intake structure the ICW SSCs were also exposed to hypersaline water spray from the cooling canal system. In 2017, the inspectors completed detailed system walkdown inspections for the ICW and CCW systems in the first and third quarters respectively, and those inspections were documented in NRC integrated inspection reports, 05000250, 251/2017001 (Agency Document Access and Management System (ADAMS) Accession No. ML17131A318), and 05000250, 251/2017003 (ADAMS Accession No. ML17313B131). During the inspections, corrosion-related issues were identified by the inspectors and entered into the licensee's CAP for dispositioning. The issues included corrosion on piping, structural supports, and valve actuators. Separately, during the 2017 NRC design basis assurance inspection that ended on

August 18, 2017, the team identified corrosion-related issues on ICW and CCW SSCs. Those issues were entered into the licensee's CAP for dispositioning and were documented in NRC inspection report 05000250, 251/2017007 (ADAMS Accession No. ML17277A837). In the fourth quarter of 2017, the inspectors identified additional corrosion-related issues during inspections on ICW and CCW systems and those issues were also entered into the CAP. Three NRC-identified violations were identified related to ICW and CCW SSCs. Each violation related to the licensee's failure to identify corrosion-related issues in the ICW or CCW SSCs.

The inspectors concluded that the licensee was not adequately identifying and resolving corrosion-related issues associated the ICW and CCW SSCs. The licensee agreed and entered the adverse trend into its CAP as AR 2232526. Corrective actions included chartering a Turkey Point Coatings Task Force. On November 14 and 15, 2017, the Turkey Point Coatings Task force walked down the Unit 3 and 4 ICW valve pits as part of the corrective action inspections assigned to the task force. The task force identified numerous corrosion issues on the ICW system, which included recent issues that were identified by the inspectors. ARs 2236229 and 2236292 were written to address the corrosion issues identified by the task force in the ICW valve pits. The immediate operability determination on the ICW system concluded there was "reasonable assurance that system piping was OPERABLE with some degradation." A prompt operability determination (POD) was scheduled to complete within three days. After additional inspections, including non-destructive examinations were completed, the POD concluded that the ICW systems were operable with reduced design margin. Corrective actions to address these issues were assigned high priority.

The licensee's investigation on the adverse trend identified programmatic issues with the Turkey Point corrosion control program. Since these issues were programmatic; identification, control and resolution of corrosion-related issues were not isolated to the ICW and CCW systems alone, rather, the issues potentially extended to other safety-related SSCs. The licensee found that various corrosion control procedures were not adequately being implemented, including corporate level programs, and system engineers were not identifying corrosion-related issues at the right threshold, believing other programs would address the corrosion issues. Additionally, other plant personnel such as operators and maintenance technicians were not identifying corrosion-related issues, also believing these issues were being addressed by other programs. As an interim corrective action the licensee immediately convened a coatings task force to identify, document, and evaluate corrosion issues within the power block. The team members included civil engineers, a FPL coating specialist, maintenance technicians, and FPL corporate and onsite managers. The task force charter included an objective "to establish the proper command and control to ensure the coatings program at PTN was operating at the desired level of proficiency." The initial priority was to complete detailed walk-down inspections on high-risk significant and safety-related SSCs, identify and evaluate corrosion-related issues, and prioritize corrective actions. During the inspection period the task force completed walk-downs on the ICW, CCW, and EDG systems. The priority of the remaining systems were to be scheduled according to risk significance. Numerous ARs were initiated resulting from the system walkdowns and

some included PODs to verify safety-related SSCs remained operable. However, no corrosion-related issues were identified that resulted in safety-related SSCs being inoperable.

Long-term corrective actions being developed to address the programmatic corrosion control issues included:

- Perform needs analysis to determine if training was required to re-sensitize engineering personnel and other departments to corrosion issues;
- Improve wash-down of CCW rooms during CCW heat exchanger cleaning and basket strainer cleaning activities;
- Enhance and update Turkey Point procedure 0-GPM-102.4, "Protective Coating Maintenance Program," to include best practices from the St. Lucie Nuclear Plant and add engineering as a responsible organization to perform the Coatings Maintenance Program at Turkey Point;
- Convert St. Lucie's administrative program, ADM-17.40, "Corrosion Monitoring and Action Program" to a procedure applicable to Turkey Point;
- Conduct information sharing within the System Engineering Department to reinforce expectations of corrosion identification and aging management visual inspections; and,
- Clarify roles and responsibilities and corrosion work orders prioritization improvements with respect to coatings and corrosion via applicable coating program procedures.

At the completion of the inspection period, the licensee's investigations and development of corrective actions to address the programmatic issues with identification and resolution of corrosion-related issues were not completed. However, the inspectors assessed that the licensee had developed an understanding of the programmatic weaknesses; interim corrective actions addressed the immediate corrosion-related system issues on the safety-related SSCs that had been walked down by the coating's task force; and management's focus on priorities and expediency in addressing the corrosion control programmatic issues were appropriate. A significant amount of walkdown inspections on safety-related SSCs remained to be completed by the licensee and the final schedule to complete the inspections was not yet available.

### .3 Annual Sample: Inoperable Auxiliary Feedwater Train-1 Due to a Loose Power Supply Connector

#### a. Inspection Scope

The inspectors selected AR 2183245, "Board Walk-Down Identified HIC Controller in Manual," for a more in-depth review of the circumstances and the corrective actions that followed. The AR provided a past operability review (POR) and described entrance into an unplanned 72-hour TS shutdown action statement due to an inoperable train of the AFW system. The inspectors reviewed the timeline of the troubleshooting activities and associated operability assessments, specifically, from the time of discovery and for the next three days, the licensee had twice incorrectly declared the AFW train as operable before identifying on the third attempt the actual cause of the inoperability and taking corrective actions to return the AFW system to operable status. The inspectors interviewed operations, engineering and maintenance department personnel involved in

the troubleshooting and AR disposition and implementation of the corrective actions. The inspectors reviewed procedure MA-AA-100-1011, "Equipment Troubleshooting," to determine if this procedure was adequately utilized. The inspectors reviewed the ARs and WO history on the AFW system, including the flow controller power supply connector, to determine if this issue had been previously addressed. Additionally, the AR was reviewed to ensure that appropriate evaluations were performed and corrective actions were specified and prioritized in accordance with the licensee's program. Other attributes assessed included problem resolution, cause determination and corrective actions. The inspectors evaluated the condition report in accordance with the requirements of the licensee's corrective actions process as specified in procedure PI-AA-104-1000, "Condition Reporting."

This inspection constitutes one annual problem identification and resolution (PI&R) follow-up sample.

b. Observations and Findings

The Turkey Point AFW system was a shared system between Units 3 and 4 and was the third most risk-significant contributor to core damage frequency at 15 percent. On February 1, 2017, at 1354 hours the Unit 3 train-1 of AFW was declared inoperable and Unit 3 entered an unplanned 72-hour shut down action statement when control room operators identified flow controller HIC-3-1457A in Manual control and at 89 percent flow demand. At the time of discovery, a reactor operator was walking down control boards and identified the controller was not in the standby operable alignment. The flow controller's operable alignment was in Automatic control and at 100 percent flow demand. At the onset of an AFW actuation, the controller automatically opened to 100 percent flow demand to provide emergency feedwater to the Unit 3B steam generator. At the time of discovery, maintenance technicians were performing troubleshooting on unrelated instrument cables in the same cabinet that housed cables and components for the AFW control loop. The licensee believed the cable testing caused electromagnetic interference (EMI) and disrupted the AFW controller circuit and caused HIC-3-1457A to transfer from Automatic to Manual and at 89 percent demand. Maintenance technicians backed out of the work and removed all their test cables and equipment. Operators placed the controller back in Automatic at 100 percent demand, and AFW train-1 was declared operable. On February 1, 2017, at 1939 hours, an AFW train-1 operability test was completed satisfactorily and the licensee believed the test results confirmed the AFW system was operable.

On February 2, 2017, at 1444 hours, maintenance technicians and engineers returned to the cabinet and investigated the AFW cabling and circuitry. The technicians discovered a loose power supply connector that provided power to HIC-3-1457A. The connector was fully reseated. However, immediately when the connector was reseated, power to the controller was momentarily lost and the controller transferred from Automatic to Manual and flow demand went to 20 percent. Unit 3 entered a 72-hour action statement for the inoperable AFW train-1. The licensee concluded that the loose connector was the cause of the February 1, 2017, event and not circuit issues resulting from EMI as initially believed. Control room operators placed HIC-3-1457A back to Automatic and 100 percent demand and AFW train-1 was declared operable. On February 2, 2017, at 2140 hours, an AFW train-1 surveillance test was completed and the results were

satisfactory. The licensee concluded that the surveillance test confirmed the AFW system was operable. However, despite the satisfactory surveillance test, the licensee initiated an equipment clearance order and work order to complete additional troubleshooting on the connector.

On February 3, 2017, at 1613 hours, maintenance technicians re-entered the cabinet to complete inspections on the power supply connector. The licensee entered the AFW train-1, 72-hour TS action statement to execute the equipment clearance order for troubleshooting the controller connector. Maintenance technicians slightly agitated the power supply connector and the flow controller lost power and transferred to Manual control. The licensee discovered that the +15 Volts, -15 Volts and neutral male spade connectors were very loose. The connecting screws were not tightly torqued. Once the screws were torqued the male spade connectors were inserted into the female side connectors and the controller was placed in Automatic at 100 percent demand. On February 3, 2017, at 2025 hours, the licensee performed an AFW train-1 surveillance as a post maintenance test and obtained satisfactory results and declared the AFW train-1 operable.

The circuit diagram for HIC-3-1457A confirmed that when HIC-3-1457A lost power, it would transfer from Automatic to Manual and the flow demand setting would be indeterminate. The licensee determined based on troubleshooting and maintenance activities that there was no assurance that during a seismic event that an improperly torqued connector would provide continuous power to HIC-3-1457A. Consequently, the licensee retracted the two previous operability statements that were made prior to identifying the loose spade screws. The POR concluded that AFW train-1 was inoperable for 54.5 hours. The inspectors noted that this was significantly more inoperability time than the 6 hours total that had been documented on the control room logs for the three day period.

The inspectors noted that the licensee did not effectively utilize the equipment troubleshooting procedure, MA-AA-100-1011. MA-AA-100-1011 required a "Level 1" troubleshooting plan with 24/7 coverage for issues of high risk resulting in a condition of TS non-compliance, as was the case for this AFW 72-hour shutdown action statement. In the review of the POR, the inspectors noted that some of the facts surrounding the troubleshooting and actions as occurred on February 2, 2017, were not correctly documented. Specifically, the inspectors identified through interviews and control room log reviews that the licensee completed some troubleshooting on February 2, 2017, and that the AFW system had been declared inoperable when the connector issue was identified on February 2, 2017, as well; this was not stated in the POR. The licensee wrote AR 2243302 to correct the POR and clarify the troubleshooting activities and AFW inoperability that occurred on February 2, 2017. In reviewing the maintenance history of the controller as described in the POR, the inspectors found that some ARs, WOs and modifications were not documented in a manner that could be independently verified. The author of the AR was not available and the licensee could not recreate the actual verbatim computer history review that was completed as documented on the AR, (i.e. key words, components part numbers, actual database, search criteria, beginning and end dates, engineering modifications package numbers, etc.). Being able to verify the maintenance history review was relevant because the licensee used the result of the

history review to conclude that the AFW TS allowed outage time had not been exceeded and therefore this issue was not reportable to the NRC. The licensee wrote AR 2240098 to address this issue and planned to revise the POR procedure to provide clear description on how to document search information and the criteria used.

Although the licensee did not exceed the allowed outage time of the 72-hour TS action statement, the inspectors judged that the licensee's troubleshooting efforts to promptly identify the failure and correct the issue that was causing the inoperability of the Unit 3 AFW train-1 was not commensurate with that of a high risk-significant system with a 72-hour shutdown action statement and lacked timeliness and troubleshooting rigor. Specifically, this issue was not technically complicated and the licensee did not provide adequate priority to the WO so that maintenance personnel could continue the troubleshooting activities more expeditiously. A licensee-identified violation associated with the AFW controller power connector corrective actions is documented in Section 4OA7 of this report.

.4 Annual Sample: Failure to Identify and Correct a Deficient CCW Penetration Seal Configuration that Exacerbates External Piping Corrosion Conditions

a. Inspection Scope

The inspectors performed an in-depth review of the licensee's evaluations and corrective actions associated with AR 2197080. AR 2197080 was originated April 7, 2017, and documented corrosion that was identified on the same date for the Unit 3 CCW B eighteen-inch return header. The corrosion was on a pipe section inside a penetration from the auxiliary building 10-foot elevation pipeway to the CCW heat exchanger room floor at the 18-foot elevation. The pipe section was normally inaccessible for viewing because a fire and flood penetration seal covered the pipe section. The pipe section was made accessible for viewing during WO 40335614 which was intended to rework all the Unit 3 CCW eighteen-inch header fire and flood penetration seals. The seal rework was a corrective action from AR 1981540 which was originated on July 31, 2014, for heavily corroded CCW header piping identified below the seals in the auxiliary building 10 foot pipeway.

The inspector assessed the licensee's problem identification threshold, technical analyses, extent of condition reviews, compensatory actions, and the prioritization and timeliness of corrective actions to determine whether the licensee was appropriately identifying, characterizing, and correcting problems associated with this issue. The inspector compared the actions taken to the requirements of FPL's CAP and 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action. In addition, the inspector reviewed documentation associated with this issue and interviewed engineering personnel to assess the effectiveness of the implemented corrective actions and the actions planned to complete full resolution of the issue.

This inspection constitutes one annual PI&R follow-up sample.

b Observations and Findings

Introduction: The NRC identified a Green NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to promptly identify and correct an adverse condition to quality that led to continued corrosion and significant scaling and pitting of the Unit 4 CCW 18-inch headers at the penetration seals from the CCW heat exchanger room to the 10-foot pipeway.

Description: The Unit 3 and Unit 4 CCW return and supply 18-inch headers penetrated the CCW room floors with nearly identical pipe and penetration seal configurations. The penetration seal configuration was controlled by drawing 5610-A-178, sheet 2M, "Detail 18-CCW Boot and Fiber Seal (Walls and Floors)." The pipe sections within the fire and flood penetration seals have on occasion been subject to water intrusion. The source of the water intrusion included operational leaks and draining and cleaning the tube side of the CCW heat exchangers. The tube side of the CCW heat exchangers was supplied by the intake cooling water system. The intake cooling water system was supplied by the cooling canal system and had a hypersaline concentration and was corrosive to carbon steel piping. A protective boot that was the most outer layer to the fire and flood penetration seal was upgraded and installed on the Unit 3 and Unit 4 penetration seals in 2010. The upgraded protective boot was a fiberglass reinforced silicone fabric and was installed and sealed to the pipe and floor with a combination of stainless steel cinch clamps and silicone adhesive to provide an enhanced seal configuration that was less likely to be violated by the intrusion of water. The boot was also sealed at pipe and floor interfaces with a heavy bead of silicone caulk.

Despite installing upgraded protective boots in 2010, the licensee identified on July 31, 2014, that the Unit 3 CCW 18-inch header piping in the penetration location of the 10-foot pipeway of the auxiliary building was heavily corroded. The licensee initiated AR 1981540 to document the Unit 3 CCW piping condition. The condition of the piping was evaluated with quantitative NDE. The licensee evaluated the structural integrity of the pipe as acceptable based on NDE results, structural integrity calculations, and that the corrosion was external. Corrective actions were intended to reapply a protective coating to the pipe and rework the penetration seals in WO 40335614. The corrective actions were intended for the Unit 3 fall refuel outage in 2015 but occurred in the spring refuel outage in 2017.

The inspectors also noted on August 20, 2015, that the licensee initiated AR 2068417 for similar conditions identified in the Unit 4 10-foot pipeway that were identified in AR 1981540 for Unit 3. The conditions were evaluated as not as significant as the Unit 3 identified corrosion. Similarly, corrective actions were intended by the licensee to reapply a protective coating to the pipe and rework the penetration seals in the Unit 4 spring refuel outage in 2016. The inspectors noted that work order 40410454 was in the planning stage and it was not worked in the fall 2017 refuel outage.

On June 22, 2017, the inspectors walked down the Unit 3 fire and flood seals after completion of WO 40335614. The inspectors identified for all four Unit 3 CCW 18-inch header pipes that the outer fiberglass reinforced silicone fabric, or boot, intended to maintain the fire and flood penetration seals dry, was not installed in accordance with installation drawing 5610-A-178, sheet 2M, "Detail 18-CCW Boot and Fiber Seal (Walls and Floors)." The end of the fabric was secured to a sheet metal sleeve surrounding the ceramic fire seal blanket and should have been secured to the CCW heat exchanger

room floor. In the identified condition the penetration seals were subject to water intrusion. The licensee initiated AR 2211843 to repair the seals and promptly initiated compensatory measures in the form of roving fire watches for the degraded fire protection seal. The licensee evaluated the condition and determined that the degraded seals were bounded by the external flood hazard analysis.

On October 25, 2017, the inspectors walked down the 10-foot pipeway to observe the condition of the Unit 3 and Unit 4 CCW headers from below the penetration seals. The inspectors identified that the Unit 4 penetration seals were incorrectly booted at the ceiling. A boot at the ceiling trapped water and corrosive chemicals that penetrated from the CCW heat exchanger rooms such as the hypersaline ICW water from operational leaks or maintenance activities. The inspectors observed that the Unit 4 boots were retaining stagnant water. The Unit 3 CCW headers did not include boots at the ceiling in the 10-foot pipeway. The licensee initiated AR2236687 and concluded the Unit 4 CCW headers, as well as the Unit 3 CCW headers, were incorrectly booted at the 10-foot pipeway ceiling during modification activities in 2010, but the Unit 3 CCW header penetration seals were removed and not rebooted at the ceiling during the spring 2017 outage. The licensee removed the Unit 4 CCW header penetration seal boots at the 10-foot pipeway ceiling with work order 40530424. The deepest pit measured on the Unit 4 CCW headers was 0.125-inch and the licensee concluded the degraded but operable condition was bounded by the structural integrity evaluation and prompt operability determination completed for Unit 3 in AR 1981540.

The inspectors determined that the licensee should have identified in July 2014 when AR 1981540 was being investigated and evaluated for significant Unit 3 CCW header corrosion that seal boots at the 10-foot pipeway ceiling were creating an adverse condition and a potential to collect stagnant water and corrosive chemicals. A similar opportunity occurred in August 2015 when AR 2068417 was being investigated and evaluated for significant Unit 4 CCW header corrosion at the penetration seal locations.

The inspectors also noted that 0-SFP-016.1, "Fire Barrier Penetration Seal Inspection," and 0-ADM-016, "Fire Protection Program," since 2010, included procedure requirements to partially remove floor penetration seals for both the Units 3 and 4 CCW 18-inch headers and inspect underlying pipe surfaces for degradation at least once every 18 months. However these partial penetration seal inspections for Unit 4 had not occurred since 2010 and for Unit 3 did not occur between 2010 and 2017.

Although structural integrity for Unit 3 and Unit 4 CCW 18-inch header pipe sections in the floor penetration locations have been maintained, the inspectors concluded that the licensee was not effective in maintaining the Unit 3 and Unit 4 CCW heat exchanger 18-inch pipe sections dry and free from the effects and corrosion initiated by hypersaline water. The licensee entered these issues and observations into its CAP as ARs 2217942, 2227877, 2211843, 2236687, and 2239632.

Analysis: The inspectors determined that the failure to promptly identify and correct a condition adverse to quality, as required by 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for an incorrect penetration seal configuration on the Unit 4 CCW headers at the 10-foot auxiliary building pipeway ceiling was a performance deficiency. The performance deficiency was determined to be more-than-minor because it was associated with the design control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective of ensuring the reliability of systems that

respond to initiating events to prevent undesirable consequences. Specifically, corrosion and pipe wastage was ongoing and unmonitored for the Unit 4 CCW headers because penetration boots at the 10-foot auxiliary pipe way ceiling were collecting hypersaline water and this condition affected the reliability of the CCW system. The inspectors used IMC 0609, Att. 4, "Initial Characterization of Findings," for mitigating systems, and IMC 0609 App. A, "The Significance Determination Process for Findings At-Power," and determined the finding to be of very low safety significance (Green) because it did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. Specifically, the licensee performed an evaluation of piping thickness at the corroded locations and determined that remaining wall thickness did not challenge minimum wall thickness limits for structural integrity.

The finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Identification, because the licensee failed to implement the CAP with a low enough threshold to identify the adverse condition that allowed corrosion to continue unmonitored. Prior opportunities for the licensee to identify the incorrect penetration seal configuration occurred in AR 1981540 originated on July 31, 2014, and AR 2068417 originated on August 20, 2015. While the dates for identification include references beyond the nominal three year period for cross-cutting assignment the recent actions taken by the licensee indicate the cross-cutting assignment is still relevant to current licensee performance. [P.1].

Enforcement: 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," stated, in part that conditions adverse to quality, such as deficiencies and deviations, are promptly identified and corrected. Contrary to the above, during review of significant corrosion on 4 CCW piping in the penetration seal locations from the CCW heat exchangers rooms to the 10-foot pipeway on July 31, 2014, and August 20, 2015, respectively, FPL design and system engineers did not identify that the penetration seals were not installed in accordance with design requirements, (i.e. installation drawing 5610-A-178, sheet 2M, "Detail 18-CCW Boot and Fiber Seal (Walls and Floors)), and inappropriately included a penetration boot at the ceiling that was collecting hypersaline water from the CCW heat exchanger room. The deficient condition was corrected on Unit 4 when WO 40530424 was completed on December 7, 2017. This finding was entered into the licensee's CAP as ARs 2236687 and 2239632. This violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC's Enforcement Policy. NCV 05000251/2017004-02, "Failure to Identify and Correct a Deficient CCW Penetration Seal Configuration that Exacerbates External Piping Corrosion Conditions."

#### 40A3 Followup of Events and Notice of Enforcement Discretion (IP 71153)

(Closed) Licensee Event Report (LER) 05000251/2017-001-00, Manual Reactor Trip Due to Lowering Steam Generator Level Caused by Loss of Flow Regulating Valve Positioner Control

##### a. Inspection Scope

On September 10, 2017, Unit 4 was manually tripped from 88 percent RTP due to lowering level in steam generator C. The reactor plant systems responded as designed and the operators stabilized the plant in Mode 3. At the time of the event, the Turkey

Point site was experiencing high winds with rain associated with Hurricane Irma. The inspectors reviewed the LER to verify its accuracy, completeness, and associated corrective actions taken or planned. The inspectors also reviewed the licensee's root cause evaluation for this event documented in AR 2224218. The event followup for the manual reactor trip on September 10, 2017, was discussed in Section 4OA3 of NRC Inspection Report 05000250/2017003, 05000251/2017003, (ADAMS Accession No. ML17313B131). The review of LER 05000251/2017-001-00 constitutes completion of one event follow-up inspection sample. This LER is closed.

b. Findings

Introduction: A Green self-revealing finding (FIN) was identified for failure to ensure the 4B and 4C main feedwater regulating valve (MFRV) control circuits remained free from the effects of water intrusion or condensation in electrical enclosures.

Description: On September 10, 2017, Unit 4 was at 100 percent RTP and was experiencing wind driven rain from tropical storm force winds of Hurricane Irma. The Unit 4 MFRVs were housed in an area that included a roof but the area was only partially walled. Wind driven rain wetted the main feedwater (MFW) control circuits which were designed for outdoor application. Control room operators noted anomalies in the 4B and 4C steam generator water level controls and placed the backup feedwater controllers in service. In response to lowering steam generator water levels, control room operators entered 4-GOP-100, "Fast Load Reduction," and reduced reactor power to about 88 percent RTP. At 1855, control room operators manually tripped Unit 4 from 88 percent RTP due to lowering level in 4C steam generator and an unresponsive failed closed 4C MFRV. The reactor was stabilized in Mode 3 with auxiliary feedwater which actuated as expected on low level in the 4C steam generator. Auxiliary feedwater was secured and steam generator water levels were maintained with the MFW system in operation and steam generator water level controlled by the bypass feedwater regulating valves.

The licensee initiated AR 2224218 to document the MFRV issues that led to the fast load reduction and subsequent manual reactor trip. AR 2224218 included assignments to complete an equipment investigation, a root cause evaluation, and subsequent corrective actions.

The equipment investigation determined that hand selector switches (HSSs) associated with the 4B and 4C MFRV positioners were wetted and in the case of the 4C MFRV, HSS-4-498D, electrical conductors corroded from moisture intrusion. The water entered each NEMA 4X HSS enclosure from a single flexible conduit fitting installed on the top.

A root cause evaluation identified latent issues, from 2013, with engineering change (EC) 246879 and associated work orders that installed redundant positioners and a HSS for each MFRV. The HSSs were appropriately enclosed in a NEMA-4X rated enclosure. NEMA-4X rated enclosures were primarily intended for outdoor use and offered a superior level of protection from corrosion and extreme environments. However, EC 246879 did not: 1) provide clear direction to drill weep holes at the bottom of the installed HSS enclosures; 2) preferentially locate the conduit penetration at the bottom or side of the enclosure; and 3) ensure a sealant was applied to the conduit penetration. The licensee in its root cause evaluation documented that specification, SPEC-C-065, "Conduit Sealing to Prevent Water Intrusion, Turkey Point Units 3 & 4," Rev. 1, did not provide these three critical configuration details for insuring against water intrusion or

condensation in electrical enclosures. Corrective actions in AR 2224218 included an extent of condition walkdown to identify and correct outdoor electrical enclosures for safety significant equipment that do not have a bottom weep hole and revised appropriate design specifications and drawings to include explicit directions in the installation of conduit onto electrical enclosures, applying sealant, and to install weep holes.

Analysis: The failure to ensure the 4B and 4C MFRV feedwater control circuits remained free from the effects of water intrusion or condensation in electrical enclosures was a performance deficiency. EC 246879 appropriately selected NEMA-4X rated enclosures, however SPEC-C-065 did not provide critical configuration details for the enclosure installations. Water collected in the 4B and 4C MFRV positioner HSS enclosures because the penetrations were on top of the enclosures and not properly sealed and the bottom of the enclosure did not have a weep hole.

The PD was determined to be more than minor because it was associated with the design control attribute of the Initiating Events Cornerstone and adversely affected the cornerstone's objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations, because the failure resulted in lowering steam generator water levels and caused control room operators to complete a fast load reduction and manually trip the reactor. In accordance with NRC IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings at-Power," the inspectors determined that the issue had very low safety significance (Green) because it only caused a reactor trip and did not cause the loss of mitigating equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Since EC 246879 and associated work orders were completed in 2013, the inspectors determined the finding was not indicative of current licensee performance and was not assigned a cross-cutting aspect.

Enforcement: Because the MFRV redundant positioner HSSs were not safety-related, the inspectors did not identify a violation of regulatory requirements associated with this finding. FIN 05000251/2017004-03, "Inadequate Installation of Outdoor Use Electrical Enclosures Results in Manual Reactor Trip."

#### 4OA5 Other Activities

##### .1 Contingency Plans for Licensee Strikes and Lockouts (IP 92709)

###### a. Inspection Scope

The union contract covering operations, maintenance and radiological protection personnel expired at midnight on October 31, 2017. As required by IP 92709, this inspection was implemented a few weeks prior to the contract expiration date to allow sufficient time to resolve any discrepancies identified in the licensee's contingency plan. The inspectors reviewed licensee "2017 Work Stoppage Contingency Plan." The new union contract was approved prior to October 31, 2017. No contingency plans were implemented. This inspection constitutes one sample

###### b. Findings

No findings were identified.

.2 Independent Spent Fuel Storage Facility Walk down (IP 60855.1)

a. Inspection Scope

On November 27, 2017, the inspectors conducted a walkdown of the independent spent fuel storage installation (ISFSI) protected 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 and security controls to the ISFSI area to be satisfactory. This inspection constitutes one sample.

b. Findings

No findings were identified.

4OA6 Meetings

Exit Meeting Summary

An exit meeting was conducted on August 31, 2017, by operator licensing inspectors to discuss the findings of this inspection. The inspectors confirmed that no proprietary information was reviewed during this inspection.

On October 13, 2017, the ISI inspectors presented the inspection results of the inservice inspection activities to Mr. T. Summers, Regional Vice-President, and other members of the licensee staff. The inspectors confirmed that all proprietary information reviewed during the inspection was returned or would be destroyed following report completion.

On October 20, 2017, the health physicist inspectors discussed the results of radiation safety inspection with licensee staff. The inspectors noted that any proprietary information that had been reviewed would be handled accordingly.

On January 11, 2018, the resident inspectors presented their inspection results to Mr. T. Summers, Southern Regional Vice President, and other members of licensee management. 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 violation of very low safety significance (Green) was identified by the licensee and was a violation of NRC requirements which met the criteria of the NRC Enforcement Policy for being dispositioned as an NCV. 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, required, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, are promptly identified and corrected. Contrary to the above, on February 1, 2017, after discovering that the AFW train-1 flow controller to the 3B steam generator was inoperable, the licensee failed to identify and correct the failure that caused the inoperability and incorrectly declared the flow controller operable. Similarly on February 2, 2017, after failure of the same flow

controller during troubleshooting, the licensee failed to identify and correct the cause of the flow controller inoperability and again incorrectly declared the flow controller as operable. On February 3, 2017, the licensee identified the cause of the failure and corrected it by completing maintenance on the electrical connector providing reliable power to the flow controller. The licensee subsequently declared the AFW train-1 operable and retracted the previous two operability declarations. Consequently, the AFW system train-1 was not able to automatically provide the required emergency feedwater to the 3B steam generator on an AFW actuation demand and was inoperable for 54.5 hours from the time of discovery on February 1, 2017.

The inspectors characterized the safety significance of the issue utilizing IMC 0609, Attachment 4, "Initial Characterization of Findings," and determined the issue affected the Mitigating Systems cornerstone. IMC 0609 Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," Exhibit 2 was used to further evaluate this finding which screened as Green because the finding did not represent an actual loss of function of at least a single Train for greater than its Technical Specification allowed outage time or two separate safety systems out-of-service for greater than its Technical Specification allowed outage time. This issue was entered into the licensee's CAP as AR 2183245.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee Personnel:**

T. Summers, Southern Regional Vice President  
B. Stamp, Plant General Manager  
G. Alexander, Fleet Programs Supervisor  
K. Arsenault, Nuclear Engineering Analyst  
M. Blue, ASME BPVC Section XI Program Owner  
C. Cashwell, Training Manager  
M. Guth, Licensing Manager  
J. Hamm, Engineering Director  
O. Hanek, Licensing Engineer  
O. Hernandez, Security Manager  
R. Hess, Assistant Operations Manager, Support  
G. Melin, Operations Director  
S. Mihalakea, Licensing Engineer  
E. Neville, Assistant Operations Manager, Shift Operations  
William Hinson, Radiation Protection Manager  
K. O'Hare, Emergency Preparedness Manager  
A. Richmond, Site Manager for Unit 4 Core Baffle Former Bolts Inspection (Areva)  
D. Slivon, Nuclear Engineering Analyst Principal/ NDE Level III  
J. Timm, ISI Principle Level III, (Curtiss-Wright)

#### **NRC Personnel:**

L. Pressley, Senior Project Engineer  
R. Taylor, Senior Project Engineer  
A. Wilson, Project Engineer

## LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

### Opened and Closed

05000251/2017004-01	NCV	Failure to Perform an Adequate ASME BPVC Section XI Repair/Replacement Plan for a Code Class 1 and 2 Replacement (Section 1R19)
05000251/2017004-02	NCV	Failure to Identify and Correct a Deficient CCW Penetration Seal Configuration that Exacerbates External Piping Corrosion Conditions (Section 4OA2.4)
05000251/2017004-03	FIN	Inadequate Installation of Outdoor Use Electrical Enclosures Results in Manual Reactor Trip (Section 4OA3)

### Closed

05000251/2017-001-00	LER	Manual Reactor Trip Due to Lowering Steam Generator Level Caused by Loss of Flow Regulating Valve Positioner Control (Section 4OA3)
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## LIST OF DOCUMENTS REVIEWED

### **Section 1R05: Fire Protection**

0-ADM-016.1, Transient Combustible and Flammable Substances Program  
0-ONOP-016.10, Pre-Fire Plan Guidelines and Safe Shutdown Manual Actions

### **Section 1R08: In-service Inspection Activities**

#### Procedures

0-ADM-523, AASME Section XI Pressure Tests for Quality Group A, B&C Systems-Components, Rev. 3E  
0-ADM-537, Turkey Point Boric Acid Corrosion Control Program, Rev. 12  
0-OSP-207.2, Visual Leak Inspection of Systems Outside Containment, Rev. 9  
0-OSP-041.26, Turkey Point Plant, Operations Surveillance Procedure, Containment Visual Leak Inspection, Rev 9A  
4-OSP-045.1, Turkey Point Unit 4, Operations Surveillance Procedure, ASME Section XI Quality Group "A" Bolting Examination, Rev. 3  
54-ISI-370-006, Areva Inc. Nondestructive Examination Procedure, Remote Underwater Visual Examination of Westinghouse and Combustion Engineering Reactor Pressure Vessel Internals for Pressurized Water Reactors in Accordance with MRP-228 (Inspection Standard for PWR Internals), 2/17/17  
54-ISI-902-004, Areva NP Nondestructive Examination Procedure, Ultrasonic Examination of slotted Hex (Type C) and round Head (Type D) baffle Bolts, 8/21/17  
51-9244793-003, Technical Justification for Slotted External Hex © and Round Head (DS/DL) Baffle Bolts, 9/6/2017  
ER-AP-116, NEXTERa Nuclear Fleet, Program Description, Boric Acid Corrosion Control, Rev. 1  
ER-AP-116-1000, NEXTERa Nuclear Fleet, Administrative Procedure, Boric Acid Corrosion Control Program, Rev. 0  
NDE 3.5, Manual Examination Procedure, Component, Support & Inspection, Liquid Penetrant Examination In Accordance With Construction Codes, Revision 4  
NDE 5.4, NDE Manual Examination Procedure, Component, Support & Inspection, Ultrasonic Examination of Austenitic Piping Welds, Rev. 22  
NRC Generic Letter 88-05, Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary Components in PWR Plants, 3/17/85  
MA-AA-1000, NEXTERa Nuclear Fleet Administrative Procedure, Plant Leak Management Procedure, Rev. 12  
Welding Procedure Specification (WPS) 89, Rev. 5

#### Drawings

EC285556-P-001, Pre-Fabrication of Upstream 2 Inch Piping, EC 285556, WO 40446342-05, Rev. 0  
5614-M-3062, FPL, Turkey Point Unit-4, Safety Injection System, Rev. 23  
5614-M-3064, FPL, Turkey Point Unit-4, Safety Injection Accumulator System Inside Containment, Rev. 35

#### Corrective Actions

Action Request (AR) 02232228, CRDH 55 4T237, Boric Acid Leakage Down core Exit Thermocouple Column to Reactor Head, 10/24/17  
AR 02124329, ASME Section XI Support WR-5, Clearance Gap Out of Tolerance, 4/10/16

AR 02177653, FCV-4-113A Repeat Active Boric Acid Leak at Packing, 1/3/17  
 AR 02178255, Valve 4-202B Active Boric Acid Leak at Packing, 1/6/17  
 AR 022264448, Fleet Review of Prairie Island Baffle Bolt Non-Cited Violation, Operating Experience, 9/24/17  
 AR 02229327, Indication of Corrosion on U4 Liner Plate at 14 Ft. Elevation, 10/12/17  
 AR 02229699, Foreign Material found on U-4 core Plate, 10/11/17  
 AR 02230060, Lead Blankets Tied to Snubber SN-4-1057 in Pressurizer Cubicle discovered during NRC walk-down, 10/12/17  
 AR 02230160, Inactive Boric Acid Leak at Valve 4-941W discovered during NRC walk-down, 10/13/17  
 AR 02231145, PTN-4, MRP-227 Baffle Bolt Inspection Results and Analysis, 10/18/17  
 AR 02232228, CRDH 55, 4T237, Boric Acid Leakage Down Core Exit Thermocouple Column to Reactor Head, 10/25/17  
 AR 02231669, Clearance on Support 8081-H-001-09 Out of Tolerance, 10/20/17

#### NDE Personnel Certifications

Areva, Certificate of Personnel Qualification, PDI Demonstration IAW Section V Article 14 for Reactor Internals Bolting, D. Langenfield  
 Areva, Certificate of Personnel Qualification, Visual Examination (VT) D. Mostashari, R. Sheffield, R. Whitehill  
 Areva, Certificate of Vision Examination, D. Mostashari, R. Sheffield, R. Whitehill  
 Areva, Certificate of Personnel Qualification, MRP-228 Training, M. Bauer, N. Bauman, T. Baune, S. Breiholz, M. Clemmons, P. Clemmons  
 Areva, Certificate of Vision Examination, M. Bauer, N. Bauman, T. Baune, S. Breiholz, M. Clemmons, P. Clemmons  
 Curtiss-Wright, Personnel Certification Statement, Ultrasonic Testing (UT), B. Muirhead  
 Curtiss-Wright, Certification of Visual Acuity Color Vision, B. Muirhead, P. Kunze  
 Curtiss-Wright, Personnel Certification Statement, Liquid Penetrant Testing, P. Kunze  
 FPL, Certificate of NDE Personnel Qualification, Visual Examination VT-2, K. Arsenault  
 FPL, NDE Personnel Vision Examination, K. Arsenault

#### Other Documents

04-RHR-5017-L-01, ASME XI System Leakage Test Record, RHR System 050/RHR, 10/12/17  
 51-92447930993, Areva Inc. Engineering Information Record, Technical Justification for Slotted External Hex © and Round Head (Ds/DI) Baffle Bolts, 9/6/17  
 5610-000-DB-003, Turkey Point Units 3 and 4m Containment Isolation Features, Component Design Requirements, Penetration No. 17, Rev. 11  
 AR 2228449, Evaluation of Through-wall Weld Failure at Fitting of Valve 4-941M, 10/10/17  
 Areva Letter, Turkey Point Unit-4, Baffle Bolt Examination Results Summary, 10/18/17  
 EPRI-Materials Reliability Program (MRP) 2017-011, Transmittal of NEI-03-08 "Needed" Interim Guidance Regarding Baffle Former Bolt Inspections for U.S. PWR plants as defined in Westinghouse Nuclear Safety Advisory Letter (NSAL) 16-01, 3/23/17  
 Florida Power and Light, NDE 3.2, Visual Examination VT-2 Conducted During System Pressure Tests, Rev. 12  
 Florida Power & Light (FPL), Nuclear Engineering Department, Fleet Programs Engineering Inspection Section, Fifth Inservice Inspection Interval Program Plan for Turkey Point Nuclear Power Plants Unit 3 and 4, Rev. 1  
 FPL Liquid Penetrant (PT) Checklist for Work Order 40446342-05, Data Sheet 17-163, 9/5/17  
 FPL PT Checklist for Work Order 40446342-05, Data Sheet 17-164, 9/5/17  
 FPL PT Checklist for Work Order 40563848-01, Data Sheet 17-258, 10/22/17  
 FPL Checklist for Work Order 40563848-01, Data Sheet 17-260, 10/22/17

PTN-ENG-SESJ-17-011, Review of Degradation and Operational Assessments for Turkey Point Unit-4 Steam Generators at End of Cycle 29, Rev. 0

PTN4-UT-17-003, UT Examination Pipe to Elbow Weld Report, 8-RHR-1402-2, 10/18/17

PTN4-UT-17-005, UT Examination Elbow to Pipe Weld Report, 8-RHR-1402-2, 10/18/17

PTN4-UT-17-010, UT Examination Elbow to Pipe Weld Report, 10-SI-1403-4, 10/18/17

Nextera Energy Work Order, 40563848, 4-941M Possible Through Wall Leak, Heavy Boric Acid, 10/31/17

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Valve 4-491W, System 050, Unit-4, Boric Acid Leak Screening, 10/13/17

Welder Qualification Records, C. Olivero, E. Duchene, D. Padgett, M. Vaughn

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Westinghouse NSAL-16-1, Baffle Former Bolts, 7/15/16

Work Order 40446342-05, Unique Weld Traveler for FW-1, 9/14/17

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### **Section 1R11: Licensed Operator Regualification Program and Licensed Operator Performance**

#### **Procedures**

0-ADM-211, Emergency and Off-Normal Operating Procedure Usage

0-OSP-028.8, Shutdown Margin Calculation

3-EOP-E-0, Reactor Trip or Safety Injection

4-EOP-E-0, Reactor Trip or Safety Injection

4-GOP-103, Power Operations to Hot Standby

4-NOP-041.02, Pressurizer Operation

4-OSP-041.7, Reactor Coolant System Heat-up and Cooldown Temperature Verification

4-OSP-089.1, Turbine Generator Overspeed Trip Test

TR-AA-220-1004, Licensed Operator Continuing Training Annual Operating and Biennial

#### **Written Exams, Revision 2.**

TR-AA-230-1000, SAT Process, Revision 0.

#### **Biennial Written Regualification Examinations**

PTN OPS LOC17 SRO EXM1.

PTN OPS LOC17 SRO EXM2.

### **Section 1R13: Maintenance Risk Assessment & Emergent Work Control**

0-ADM-051, Outage Risk Assessment and Control

### **Section 1R15: Operability Determinations and Functionality Assessments**

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

WO 40431981

WO 40453282

### **Section 1R19: Post Maintenance Testing**

4-OSP-062.4, Safety Injection System – Full Flow Test

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NWS Technologies Certificate of Conformance# 17-177 for Main steam code safety valve  
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NWS Technologies Certificate of Conformance# 17-373 for Main steam code safety valve  
RV-1410  
AR 2235484

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

0-ADM-051, Outage Risk Assessment and Control  
0-ADM-215, Operations Surveillance Tracking  
0-OSP-028.8, Shutdown Margin Calculation  
0-OSP-040.19, Low Power Physics Testing  
4-GOP-305, Hot Standby to Cold Shutdown  
4-NOP-041.02, Pressurizer Operation  
4-NOP-041.07, Draining the Reactor Coolant System  
4-OSP-041.7, Reactor Coolant System Heatup and Cooldown Temperature Verification  
4-SMM-050.01, Containment Recirculation Strainer Inspection  
4-SMM-051.03, Containment Closeout Inspection  
4-SMM-068.01, Containment Sump pH Control Baskets  
PTN-ENG-SEFJ-17-003, Turkey Point Unit 4 Cycle 30 Nuclear Design Report (Operational  
Data), Rev. 0  
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**1R22: Surveillance Testing**

0-ADM-531, Containment Leakage Rate Testing Program

**Section 2RS1: Radiological Hazard Assessment and Exposure Controls**

Procedures, Guidance Documents and Manuals

0-ADM-605, Control of Radioactive Material, Rev. 5A  
0-HPA-001, Radiation Work Permit Initiation and Termination, Rev. 4B  
0-HPS-025.2, Posting and Survey Requirements for Fuel Movement, Rev. 8  
3 and 4-OP-047, CVCS Charging and Letdown, Rev. 26  
RP-AA-100-1002, Radiation Worker Instructions and Responsibilities, Rev. 6  
RP-AA-102-1000, Alpha Monitoring, Rev. 3  
RP-AA-102-1001, Area Radiological Surveys, Rev. 4  
RP-AA-103-1001, Posting Requirements for Radiological Hazards, Rev. 4  
RP-AA-103-1002, High Radiation Area Controls, Rev. 6  
RP-AA-107-1003, Unconditional and Conditional Release of Material, Rev. 4  
RP-AA-107-1004, Procedure for Radioactive Source Controls and Leak Checking, Rev. 0  
RP-TP-101-1003, Personnel Contamination Monitoring and Decontamination, Rev. 3  
RP-TP-102-1002, Hard to Detect Radionuclides and Contamination Controls, Rev. 1  
RP-TP-107-1001, Storage of Highly Radioactive Material in the Reactor Cavity or Spent Fuel  
Pool, Rev. 1

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Air Calculation Sheet, U4 RCB 58' Rx Head Stand, 10/8/17  
Air Calculation Sheet, U4 RCB 58' Top of PZR, 10/17/17

HP Radioactive Source Inventory Report, 4/14/17  
 RP-AA-103-1002-F12, LHRA In Service Key Box Log, 5/2/17  
 RWP No. 17-4010, Seal Table and Flux Mapper System Work (Bulk Work), Rev. 0  
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 Survey No. PTN-M-20160525-1, U4 Charging Pump - 4A Breech/Discovery, 5/25/16  
 Survey No. PTN-M-20160622-7, Unit 4 CTMT Hatch Test, 6/22/16  
 Survey No. PTN-M-20170309-3, U3 10' Pipeway Monthly Survey, 3/9/17  
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 Survey No. PTN-M-20170922-9, ISFSI Pad Semi-Annual, 9/22/17  
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 Survey No. PTN-M-20171003-7, U-4 Equipment Hatch, 10/3/17  
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 Survey No. PTN-M-20171003-14, U4 CTMT 30'6" Initial Entry, 10/4/17  
 Survey No. PTN-M-20171003-17, Unit 4 RCB A S/G Platform Initial Entry, 10/4/17  
 Survey No. PTN-M-20171003-18, Unit 4 Initial Entry Downpost Survey Top of Pressurizer,  
 10/4/17  
 Survey No. PTN-M-20171003-20, Unit 4 Initial Entry Survey Top Rx Head, 10/4/17  
 Survey No. PTN-M-20171004-5, U4 CTMT Seal Table Initial Entry, 10/4/17  
 Survey No. PTN-M-20171004-6, U-4 CTMT Initial Survey 58', 10/4/17  
 Survey No. PTN-M-20171004-7, U-4 Rx Cavity Initial Entry Upper RX Head Inspection, 10/4/17  
 Survey No. PTN-M-20171007-7, Unit 4 RCB General Area Survey 58', 10/7/17  
 Survey No. PTN-M-20171008-2, U-4 CTMT Seal Table Retract Thimbles, 10/7/17  
 Survey No. PTN-M-20171008-34, 1-4-RCB-58' RX Head Stand, 10/8/17  
 Survey No. PTN-M-20171013-38, Unit 4 RCB Top of Pressurizer, 10/13/17  
 Survey No. PTN-M-20171017-30, U4 Fuel Movement Aux Roof Posting Change, 10/17/17  
 Survey No. PTN-M-20171017-31, Unit 4 RCB 14' Fuel Movement Verification Survey, 10/17/17  
 Survey No. PTN-M-20171017-37, PZR Relief VL, 10/17/17  
 Survey No. PTN-M-20171013-50, U4 Charging Pump Room, 10/13/17  
 Survey PTN-M-20171017-29, Unit 4 Transfer Tube Verification for Fuel Movement,  
 10/17/17  
 Survey No. PTN-M-20171017-30, U4 Fuel Movement Aux Roof Posting Change, 10/17/17  
 Survey No. PTN-M-20171017-31, Unit 4 RCB 14' Fuel Movement Verification Survey,  
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 Survey PTN-M-20171017-32, 4-FUELMOVE RHR 10' Dose Rate Verification During Fuel  
 Movement, 10/17/17  
 Turkey Point Plant Environmental and Radiation Controlled Area Radiation Levels Results Log,  
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 AR 02124157  
 AR 02129004  
 AR 02134706  
 AR 02139763  
 AR 02156045  
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AR 02193892  
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 Level 1 Core Business Assessment Report Guideline, Radiological Survey Review, 7/19/17  
 Level 2 Independent Assessment Report, PT3-29 Radworker Practices, 4/3/17  
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### **Section 2RS2: ALARA**

#### Procedures, Guidance Documents, and Manuals

0-ADM-605, Control of Radioactive Material, Rev. No. 5A  
 0-HPA-001, Radiation Work Permit Initiation and Termination, Rev. No. 4B  
 0-HPA-072, Installation, Control, and Removal of Permanent and Temporary Shielding, Rev. No. 4  
 0-HPA-073, Hot Spot Tracking and Reduction Program, Rev. No. 2  
 0-NCOP-001.1, Primary Chemistry Control During Shutdown, Rev. No. 3  
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 PI-AA-02, Self-Assessment, Rev. No. 0  
 PI-AA-104-1000, Corrective Action, Rev. No. 14  
 RP-AA-104, ALARA Program, Rev. No. 06  
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4R30 Post Crud Burst Cleanup Prediction Graph, Undated  
 2017 ALARA Shielding Log  
 Current Dose History Document for 2016 and 2017, Undated  
 Hot Spot Control Log, 1<sup>st</sup> Quarter 2016 – 3<sup>rd</sup> Quarter 2017  
 Pre-Job ALARA Review, ALARA Package Nos.: 2017-001, U3R29 Refueling Activities including Ultra-Sonic Fuel Cleaning, Rev. 0, 03/31/17 and 04/13/17; 2017-002, Steam Generator Primary Side Work: Eddy current testing of all three S/Gs including manway removal/replacement, RP surveys and job coverage, shield door installation/removal, QC inspections, and nozzle cover installation and removal, Rev. 0, 03/30/17, 04/03/17, and 04/27/17; 2017-003, Steam Generators Secondary Side, Generator Bundle Flush, Sludge Lance and FOSAR (including scaffolding) during the U3 refueling outage, work is for all three steam generators, Rev. 0; 2017-004, U3 PZR Heater Replacement, Rev. 0, 04/04/17, 04/17/17, and 04/18/17; 2017-007, Reactor Coolant Pump Seal Removal, Inspection and Installation including all support work and PMs, Rev. 0, 03/29/17, 04/13/17, and 04/26/17; 2017-009, U4R30 Refueling Activities including Ultra-Sonic Fuel Cleaning, Rev. 0, 10/02/17; 2017-013, Reactor Coolant Pump Maintenance: “A” and “B” Reactor Coolant Pump Seal Replacements, “A”, “B”, “C” Grounding Brush Installation, “A” Motor Replacement, Inspections

including all support work and PMs, Rev. 0, 09/21/17; and 2017-014, U4 Reactor Sump – non-Legacy Boric Acid Work, Rev. 0, 09/21/17

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Radiation Work Permit (RWP) No. 17-0300, U3 14' and 30'06" Power Entry – Inspect and Troubleshoot Valves and Components including Boric Acid Inspection and Cleaning, Rev. 02

RWP No. 17-4008. Cavity Drain Valves - Flanges and Drain Hoses, Rev. 00

RWP No. 17-4016. Pressurizer Valves – Repack/Remove/Repair/ Replace Valves, Flanges and all Support Work, Rev. 00

Radiation Protection Work Plan, PTN-2017, U3R29 PZR Heater Project, 12/14/16

Standard Map Survey Report, Survey # PTN-M-20171019-2, 3-RCB-30/U3Containment30\_6 Elevation/U3 Containment, 10/18/17

TEDE ALARA Assessment, RWP Nos.: 17-4100 Task 1, Task Description: Cavity Seal Ring Removal, 09/19/17; 17-4100 Task 3, Task Description: Removal and Decon of Reactor Head O-Ring, 09/19/17; 17-4100 Task 6, Task Description: Installation and Removal of Insta-Cote, 09/19/17; and 17-4100 Task 7, Task Description: Blind Flange Work, 09/19/17

Temporary Shielding Request (TSR) No. 2017-03, U3 RCB, 14' Elevation, Cavity Drain Valves, 04/14/17

TSR No. 2017-12, U3 RCB, PSV-3-455A, 04/12/17

TSR No. 2017-16, RCB14': A, B, & C S/G Eddy Current Platforms, 04/14/17

TSR No. 2017-40, U4 RCB, 14' Elevation, Cavity Drain Valves, Install Temporary Pb Shielding (blankets) on pipes and valves in the area to include valves 4-12-001, 4-12-002 and 4-12-003, Rev. 1, 08/28/17

TSR No. 2017-49, U4 RCB, PCV-4-455A Shielding, Rev. 1, 09/01/17

TSR No. 2017-50, U4 RCB, PCV-4-455B Shielding, Rev. 1, 09/01/17

TSR No. 2017-65, U4 RCB, 14' Elevation, Custom Tungsten Shield on 4-941R, 08/28/17

Turkey Point Nuclear Plant 5-Year ALARA Plan 2017-2022, Rev. 0, 11/16/16

Turkey Point Nuclear Plant ALARA Review Board Meeting Minutes, 06/28/17, 08/02/17, 08/18/17, 08/21/17, 09/21/17, 10/04/17 and 10/18/17

Turkey Point Unit 4 Refueling Outage 28 Gamma Scan Report, 12/02/14

Unit 4 Crud Burst Clean Up, Co-58 Historical Comparison, Undated

#### CAP Documents

AR 02122575  
 AR 02125404  
 AR 02161729  
 AR 02165799  
 AR 02180829  
 AR 02181788  
 AR 02187366  
 AR 02190771  
 AR 02196865  
 AR 02209561  
 AR 02213241

Turkey Point Radiation Protection PT4-29 Outage Assessment, 04/06/16

### **Section 2RS3: In-Plant Airborne Radioactivity Control and Mitigation**

#### Procedures, Guidance Documents, and Manuals

0-ADM-041, PTN Respiratory Protection Plan, Rev. No. 9  
 0-ADM-605, Control of Radioactive Material, Rev. 4  
 0-HPA-028, High Efficiency Particulate Air (HEPA) Filtration Ventilation Systems in the Radiation Controlled Area, Rev. No. 3  
 0-HPS-061.2, Air Pak Bottle Charging, Rev. No. 6  
 0-HPS-062.2, Use of the Self-Contained Breathing Apparatus, Rev. No. 1B  
 0-HPS-063.2, Maintenance and Accountability of Respiratory Protection Equipment, Rev. No. 8  
 0-HPS-063.4, Selection and Issuance of Respiratory Protection Equipment, Rev. No. 5  
 0-HPS-065.2, Operation and Maintenance of the Respirator Fit-Test System, Rev. No. 6  
 0-HPS-090, Inventory of Radiation Protection Emergency Equipment, Rev. No. 6  
 0-HPT-013.1, Calibration and Operation of the Radeco Air Samplers, Rev. No. 2  
 PI-AA-01, Corrective Action Program and Condition Reporting, Rev. No. 4  
 PI-AA-02, Self-Assessment, Rev. No. 0  
 PI-AA-104-1000, Corrective Action, Rev. No. 14  
 RP-AA-102-1000, Alpha Monitoring, Rev. No. 3  
 RP-AA-102-1001, Area Radiological Surveys, Rev. No. 4  
 RP-AA-104-1000, ALARA Implementing Procedure, Rev. No. 12  
 RP-AA-106, Respiratory Protection Program, Rev. No. 0  
 RP-SR-105-6003, MSA Escort Elf Personnel Air Sampling Pump Use and Calibration, Rev. No. 4  
 RP-TP-102-1001, Radiological Air Sample Assay, Rev. No. 4A  
 RP-TP-105-7001, Eberline AMS-4 Air Monitor Operation and Calibration, Rev. No. 0  
 SAF-AD-011, Testing for Grade D Breathing Air, Rev. No. 6

#### Records and Data

Controlled Settings – Eberline AMS4, Electronics Unit S/N: 1087, Calibration Dates: 05/22/15 and 11/01/16  
 Fisher Safety, Hydro Cylinder Test Results, Cylinders: 357412, 04/04/17; 357444, 04/04/17; and 358124, 04/04/17  
 HP-7:30, F&J Model LV-1 Low Volume Air Sampler Calibration Record, HPI # 884, S/N: 000929, 03/28/16 and 03/17/17  
 HP-90, SCBA Inventory, Inspection, and Repair Record, Rev. 2, 01/04/17 – 06/28/17  
 Scott Authorized Service Center Certificates for selected vendor employees, Dated 06/13/18 and 07/14/17  
 Scott Safety, Posi3 USB Test Results, Functional Test, Regulators: 89200101, 09/22/15 and 07/26/17; 89200251, 09/23/15 and 07/25/17; and 89200257, 09/24/15 and 07/25/17  
 SENTINEL, SEN0027, Instrument Response Checklist: AV2000, MSA Millenium, SCBA Bottle, and SCBA Pak Monthly Inspections; MSA Millenium 6 Month Face Piece Functional Tests; SCBA Pack Biannual Regulator MFR Bench Test; AV2000 Annual Inventory, 07/07/17 – 08/16/17  
 Standard Map Survey Report, Survey # PTN-M-20171019-2, 3-RCB-30/U3Containment30\_6 Elevation/U3 Containment, 10/18/17  
 TRI Air Testing, Inc., Laboratory Report, Compressed Air/Gas Quality Testing, Bauer Compressed Air System, Analysis Results, Report Nos. 280569-0, 07/13/16; and 306533-0, 06/19/17  
 Unitech Services Group, Filter Particle Test Results, HEPA Unit Type: HEPA, HEPA S/N: 005, 06/24/15 and 08/23/16

CAP Documents

AR 02110814  
 AR 02111381  
 AR 02178441  
 AR 02216271

**Section 2RS4: Occupational Dose Assessment**Procedures, Guidance Documents, and Manuals

0-HPS-026.2, Response Protocols for Whole Body Counting and Personnel Contamination Monitoring, Rev. 3A  
 0-HPA-030, Personnel Monitoring of External Dose, Rev. 3C  
 0-HPA-031.1, Whole Body Dosimetry Issue, Rev. 6  
 0-HPA-031.2, Multibadge Exposure Monitoring, Rev. 0C  
 RP-AA-101, Personnel Monitoring Program, Rev. 3  
 RP-AA-101-2004, Method for Monitoring and Assigning Effective Dose Equivalent (EDE) for High Dose Gradient Work, Rev. 6  
 RP-TP-101-1000, Exposure Investigations, Rev. 0B  
 RP-TP-101-1005, Internal Dose Assessment, Rev. 1

Records and Data

NP-906, Administrative Radiation Exposure Limits and Prenatal Radiation Exposure Policy, Rev. 3  
 NVLAP Certificate of Accreditation and Scope of Accreditation, Effective 7/1/17 - 6/30/18  
 WBC Nuclide Libraries NAIPKLCT.NLB (NaI Peak Locate) and STDNPPNA.NLB (Basic NaI NPP), 10/17/17  
 QA 1000 File, PTN Station DLR Results for 1/1/16 through 6/30/16  
 QA 1000 File, PTN Station DLR Results for 1/1/17 through 6/30/17

CAP Documents

AR 02122082  
 AR 02122310  
 AR 02123759  
 AR 02127119  
 AR 02156045  
 AR 02230684  
 PTN 16-002, Turkey Point Nuclear Oversight Report, Radiological Protection & Radwaste, 5/10/16

**Section 2RS5: Radiation Monitoring Instrumentation**Procedures, Guidance Documents, and Manuals

0-ADM-117, Equipment Important to Emergency Response, Rev. 12  
 0-HPT-072, Calibration and Operation of Canberra Personnel Monitors, Rev. 5  
 0-HPT-018, Calibration of Survey Instruments, Rev. 4  
 0-HPT-011.2, Certification and Operation of the Shepherd Model 89 Shielded Range Calibrator, Rev. 2  
 0-HPT-014.11, Calibration and Operation of the APEX Gamma Spectroscopy Counting System, Rev. 3B

0-HPT-010, Radiation Protection Instrument Plan, Rev. 8A  
 RP-TP-105-3001, Operation and Calibration of the Cronos-4 and Cronos-11 Contamination Monitors, Rev. 6  
 RP-TP-105-3007, Operation and Calibration of the GEM-5 Gamma Exit Monitor, Rev. 5

#### Records and Data

Cal848-8, Model 848-8 Field Calibrator Data Sheet, 8/30/90  
 Calibration of the Canberra "Fastscan 1" WBC System, Detector #13000003, 10/18/16  
 Calibration of the Canberra Extended Fastscan WBC System, Detector #97-7040, 10/19/16  
 Certificate of Calibration, Beta Standard Sources, #F3-369, #F3-370, #F3-371, 07/17/2008  
 Work Order 40306605, R-1420, Control Room ARM Calibration, 03/2015  
 Work Order 40431727, T.S. RAD-6311 A/B Cont HI Range ARMS CAL Per 3-PMI-066.3, 04/2017  
 Work Order 40281374, T.S. RAD-6311 A/B Cont HI Range ARMS CAL Per 3-PMI-066.3, 11/2015  
 Work Order 40350804, T.S. RAD-6311 A/B Cont HI Range ARMS CAL Per 3-PMI-066.3, 04/2016  
 HP-7:5.4, CRONOS Calibration Record for #1006-037, 06/14/2017  
 HP-7W, Ludlum 2200 Calibration Record for #287147, 08/21/2017  
 HP-52, Health Physics Instrument Receipt Inspection and Calibration Form, APS-1/NRD #1617, 03/16/2017  
 GEM-5 Calibration Certificate for #1107-084, 05/01/2017  
 Canberra Personnel Monitor Calibration Data Sheet Argos 5AB Serial #1107-086, 02/27/2017  
 System Health Report, U3 and U4, Q3-2017  
 Calibration of the Count Room MCA System, Detector Two, 08/2017  
 Radiation Detection Instrument Calibration and Maintenance Record, Telepole #6603-087, 03/06/2017; L-177 #171643, 01/26/17; L-9-3 #322712, 04/26/2017  
 HP-7-21, Shepard Model 89 Shielded Range Calibrator Certification Form, 02/2016 and 02/2017  
 HP-7-27, Model 848-8 Victoreen Field Calibrator Certification Record, 01/2016

#### CAP Documents

AR 02124181  
 AR 02214568  
 AR 02228145  
 AR 02163543  
 AR 02097196  
 AR 02126373  
 AR 02113948  
 AR 02108393  
 PTN 16-002, Turkey Point Nuclear Oversight Report, Radiological Protection & Radwaste, 5/10/16

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

##### Procedures, Guidance Documents, and Manuals

0-ADM-032, NRC Performance Indicators Turkey Point, Rev. 8

Records and Data

0-ADM-032, Attachment 17, Occupational Exposure Control Effectiveness, 4<sup>th</sup> quarter 2016, 1<sup>st</sup> quarter 2017, and 2<sup>nd</sup> quarter 2017

0-ADM-032, Attachment 18, RETS/ODCM Radiological Effluent Occurrences, 4<sup>th</sup> quarter 2016, 1<sup>st</sup> quarter 2017, and 2<sup>nd</sup> quarter 2017

Dose and Dose Rate Alarm Logs, December 2016 - September 2017

OpenEMS Liquid and Gas Status Summary Reports, December 2016 - June 2017

**Section 40A2: Problem Identification and Resolution**

5610-A-178, Sheet 2E, Detail M-15 Boot and Fiber Seal (Walls & Floors)

5610-A-178, Sheet 2M, Detail 18-CCW Boot and Fiber Seal (Walls and Floors)

Maintenance Support Package 04-099, Modification of the Fire Protection Seals

WO 40438845

**Section 40A3: Followup of Events and Notices of Enforcement Discretion**

AR 2224212

AR 2224222

AR 2224224

## LIST OF ACRONYMS

AFW	Auxiliary Feedwater
AR	Action Request
ASME	American Society of Mechanical Engineers
BACCP	Boric Acid Corrosion Control Program
CAP	Corrective Action Program
CBO	Controlled Bleed-Off
CCW	Component Cooling Water
CFR	Code of Federal Regulations
EC	Engineering Change
EDG	Emergency Diesel Generator
EMI	Electromagnetic Interference
EOP	Emergency Operating Procedure
FIN	Finding
FPL	Florida Power & Light Company
HHSI	High Head Safety Injection
HSS	Hand Selector Switch
HVAC	Heating Ventilation and Air-Conditioning
ICW	Intake Cooling Water
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
ISI	Inservice Inspection
LER	Licensee Event Report
MFRV	Main Feedwater Regulating Valve
MFW	Main Feedwater
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NRC	Nuclear Regulatory Commission
OCC	Outage Control Center
OLRM	Online Risk Monitor
OOS	Out of Service
PD	Performance Deficiency
PI	Performance Indicator
POD	Prompt Operability Determination
POR	Past Operability Review
PORV	Power-Operated Relief Valve
PT	Liquid Penetrant Examination
PTN	Turkey Point Nuclear Plant
RCS	Reactor Coolant System
RHR	Residual Heat Removal
RTP	Rated Thermal Power
SDP	Significance Determination Process
SSC	Structure, System, or Component
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Examination
VT	Visual Examination
WO	Work Order