



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

August 12, 2016

Mr. Mano Nazar
President and Chief Nuclear Officer
Florida Power and Light Company
P.O. Box 14000
Juno Beach, FL 33408-0420

**SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION - NRC INTEGRATED
INSPECTION REPORT 05000250/2016002, 05000251/2016002**

Dear Mr. Nazar:

On June 30, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Turkey Point Nuclear Generating Station Units 3 and 4. On June 28, 2016, the NRC inspectors discussed the results of this inspection with Mr. Tom Summers and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one self-revealing and two inspector-identified findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements; one of the violations was determined to be Severity Level IV (SL IV) under the traditional enforcement process. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the 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, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC resident inspector at Turkey Point Nuclear Generating Station Units 3 and 4.

If you disagree with a cross-cutting aspect assignment, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II; and the NRC resident inspector at the Turkey Point Nuclear Generating Station Units 3 and 4.

M. Nazar

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In accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding," of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC's Public Document Room or from the Publicly Available Records (PARS) component of the NRC's Agency wide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/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 05000250/2016002, 05000251/2016002,
w/Attachment: Supplemental Information

cc: Distribution via ListServ

M. Nazar

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M. Nazar

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Letter to Mano Nazar from LaDonna B. Suggs dated August 12, 2016

SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION - NRC INTEGRATED
INSPECTION REPORT 05000250/2016002, 05000251/2016002

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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: 05000250/2016002, 05000251/2016002

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

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

Location: 9760 S. W. 344th Street
Homestead, FL 33035

Dates: April 1 to June 30, 2016

Inspectors: T. Hoeg, Senior Resident Inspector
R. Reyes, Senior Resident Inspector
J. Patel, Resident Inspector
A. Sengupta, Reactor Inspector (1R08)
R. Williams, Senior Reactor Inspector (1R08)
T. Fanelli, Senior Reactor Inspector (1R17)
W. Loo, Senior Health Physicist (2RS1)
J. Rivera, Health Physicist (2RS8)

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

Enclosure

SUMMARY

IR 05000250/2016002, 05000251/2016002; 04/01/2016 – 6/30/2016; Turkey Point Nuclear Generating Station, Units 3 and 4; Radiological Hazard Assessment and Exposure Controls, Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications

The report covered a three-month period of inspection by the resident inspectors and specialist inspectors from the Region II office. Two Green and one SL IV non-cited violations were identified. 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," (SDP) dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Components 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 February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

NRC-Identified and Self-Revealing Findings

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

- SL IV. NRC inspectors identified a SL IV, NCV of 10 CFR 50.71(e), "Maintenance of Records, Making of Reports." The licensee failed to include Eagle 21 licensing basis information into the Updated Final Safety Analysis Report (UFSAR). The Eagle 21 licensing basis information was specified in License Amendment (LA) numbers 135 (Unit 3) and 140 (Unit 4). The licensee entered the issue into their corrective action program (CAP) as action request (AR) 2048916 to update the UFSAR with the design and licensing basis for the Eagle 21.

The failure to update the UFSAR was a performance deficiency that was determined to be minor because it did not meet the more than minor screening criteria. Because the issue impacted the NRC's ability to perform its regulatory process, the inspectors evaluated the violation using the traditional enforcement process. The inspectors determined the issue was a SL IV violation because it met violation example 6.1.d.3. The violation represented a failure to update the Final Safety Analysis Report (FSAR) as required by 10 CFR 50.71(e), but the lack of up-to-date information has not resulted in any unacceptable change to the facility or procedures. Cross-cutting aspects are not assigned to traditional enforcement violations. (Section 1R17.1)

- Green. NRC inspectors identified a Green non-cited violation of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for a failure to correct a condition adverse to quality. The licensee identified that the ability to test the Eagle 21 was degraded but failed to take adequate corrective actions to correct the condition. The licensee entered the issue into their CAP as ARs 2023314 and 02145155.

The performance deficiency was determined to be more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the

availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, not using core operating limits report (COLR) specified time-constants in surveillance requirement (SR) tests to demonstrate operability of the Eagle 21 system adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of the Thermal Over-Power (OPΔT) and Thermal Over-Temperature (OTΔT) reactor trip algorithms. The finding was determined to be of very low safety significance (Green) because defense in depth of the reactor protection system (RPS) existed to trip the unit via alternate and diverse means. The inspectors determined the finding was indicative of present licensee performance and was associated with the cross-cutting aspect of human performance, in the area of conservative bias, because individuals failed to evaluate a proposed action to determine if it was safe in order to proceed, rather than unsafe in order to stop (H.14). (Section 1R17.2)

Cornerstone: Occupational Radiation Safety

- Green. A self-revealing, Green, NCV of Technical Specification (TS) 6.12.1, was identified by health physics inspector(s) for the failure to post a high radiation area (HRA). Specifically, on April 6, 2016, the licensee failed to post the area by the exterior wall of the Unit 4 spent fuel pool (SFP) on the Auxiliary Building roof as a HRA.

This performance deficiency was determined to be more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Human Performance, and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, the failure to post and control HRAs can allow workers to enter HRAs without knowledge of the radiological conditions in the area and result in the receipt of unintended occupational exposure. The finding was evaluated using the Occupational Radiation Safety SDP. The finding was not related to the As Low As Reasonably Achievable (ALARA) planning, did not involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. Therefore, the inspectors determined the finding to be of very low safety significance (Green). This finding involved the cross-cutting aspect of Human Performance, Work Management (H.7) because the organization failed to implement its process for planning and controlling access to HRAs on the Auxiliary Building roof when fuel bundle movement were still ongoing. The violation was entered into the licensee's CAP as AR 02123851. (Section 2RS1)

Licensee Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Unit 3 began this inspection period at 100 percent of Rated Thermal Power (RTP) where it remained through the end of this inspection period.

Unit 4 began this inspection period shutdown in Mode 6 during a planned refueling outage (RFO). Unit 4 was restarted on April 27, 2016 and returned to 100 percent of RTP on May 2, 2016. On May 19, 2016, the unit was down powered to 49 percent of RTP to complete repairs to the electro-hydraulic control system of the 4C moisture separator re-heater. The Unit returned to 100 percent of RTP on May 20, 2016, where it remained through the end of this inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

.1 Hurricane and Summer Seasonal Readiness Preparations

a. Inspection Scope

During the months of May and June, the inspectors reviewed and verified the status of licensee actions taken in accordance with their procedural requirements prior to the onset of hurricane season. The inspectors reviewed Turkey Point procedure 0-ADM-116, "Hurricane Season Readiness," for completion. The inspectors performed site walk downs of the systems or areas listed below to determine if the licensee had made the required preparations in accordance with their procedures. Inspectors reviewed AR reports to determine if the licensee was identifying and resolving conditions associated with adverse weather preparedness. This inspection constitutes one AC power systems sample and one seasonal extreme weather conditions sample.

- Switchyard and Startup Transformer (SUT) AC systems (AC Systems Sample)
- Unit 3 and Unit 4 intake cooling water (ICW) structures
- Unit 3 and Unit 4 component cooling water (CCW) systems
- Unit 3 and Unit 4 ICW systems
- Unit 3 and Unit 4 turbine and auxiliary buildings

b. Findings

No findings were identified.

.2 External Flooding Preparations

a. Inspection Scope

During the second calendar year quarter of 2016, the inspectors performed walkdown inspections of Unit 3 and Unit 4 reactor auxiliary buildings, including doors, flood protection barriers, penetrations, and the integrity of the perimeter structure. The inspectors verified the licensee had implemented surveillance procedure 0-SMM-102.1, "Flood Protection Stop Log and Penetration Seal Inspection," to ensure that vulnerabilities had been identified and evaluated by the licensee. In addition, the inspectors walked down the Unit 3 and Unit 4 emergency diesel generators (EDG) and fuel oil tanks, auxiliary feedwater (AFW) pump areas and the turbine buildings. The inspectors also reviewed the applicable UFSAR sections, TS, and other licensing basis documents regarding external flooding and flood protection, including specific plant design features to mitigate the maximum flood level. Work orders (WO) and CAP documents related to actual flooding or water intrusion events over the past year were also reviewed by the inspectors to ensure that the licensee was identifying and resolving severe weather related issues that caused or could cause external flooding of safety related equipment. This inspection constitutes one sample.

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Equipment Walk Downs (Quarterly)

a. Inspection Scope

The inspectors conducted partial alignment verifications of the safety-related systems listed below. The inspections included reviews of plant lineup procedures, operating procedures, and piping and instrumentation drawings (P&ID), 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 three samples.

- 3A EDG while 3B EDG was out of service (OOS)
- B and C AFW trains while the A AFW train was OOS
- 3A and 3B ICW pumps while 3C was OOS

b. Findings

No findings were identified.

.2 Equipment Alignment (Semi-annual)

a. Inspection Scope

On May 12, 2016, the inspectors conducted a detailed review of the alignment and material condition of the D52 spare battery to verify its capability to meet its design basis function while the 4B vital battery was OOS for planned maintenance. The inspectors utilized licensee drawing 5610-T-E-1592, "125 VDC Electrical Distribution Drawing," to verify the system alignment was correct. During the walk down, the inspectors verified, as appropriate, that: 1) switches were correctly positioned and did not exhibit abnormal indications that would impact their function; 2) electrical power was available as required; 3) major portions of the system and components were correctly labeled, cooled, and ventilated; 4) cabinets and electrical enclosures appeared functional; 5) essential support systems were operational; 6) ancillary equipment or debris did not interfere with system performance; 7) tagging clearances were appropriate, and; 8) switches were locked as required by the licensee's tag out process. Other items reviewed included the operator workaround list, the temporary modification list, system health reports, system description, and open maintenance WOs. In addition, the inspectors reviewed the licensee's CAP to ensure that the licensee was identifying and resolving associated equipment problems. This inspection constitutes one sample.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Fire Area Walk downs

a. Inspection Scope

The inspectors walked down the following six plant areas 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 10 CFR Part 50, Appendix R. The inspectors routinely reviewed the licensee's fire impairment lists and monitored the associated corrective actions for completion. The inspectors reviewed the 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.

- 4B EDG fuel oil pump room, Fire Zone 136
- 4B EDG diesel tank area, Fire Zone 137
- 4A EDG fuel oil pump room, Fire Zone 141
- 4A EDG diesel tank area, Fire Zone 142

- 4A EDG room, Fire Zone 138
- 4A EDG local control area, Fire Zone 140

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation

a. Inspection Scope

On June 20, 2016, the inspectors observed a fire drill that took place within the station power block turbine building outside the 3B Motor Control Cabinet Room. The drill was observed to evaluate the readiness of the plant fire brigade to fight fires. The inspectors verified that the licensee staff identified deficiencies, openly discussed them in a self-critical manner at the drill debrief meeting, and took appropriate corrective actions as required. Specific attributes evaluated were: (1) proper wearing of fire protective gear and self-contained breathing apparatus; (2) proper use and layout of fire hoses; (3) employment of appropriate fire-fighting techniques; (4) sufficient fire-fighting equipment brought to the scene; (5) effectiveness of command and control; (6) search for victims and propagation of the fire into other plant areas; (7) smoke removal operations; (8) utilization of pre-planned strategies; (9) adherence to the pre-planned drill scenario, and; (10) drill objectives. This inspection constitutes one sample.

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities: From April 4 – 14, 2016, the inspectors conducted an onsite review of the implementation of the licensee's inservice inspection (ISI) program for monitoring degradation of the reactor coolant system (RCS) boundary, risk-significant piping and component boundaries, and containment boundaries in Unit 4.

The inspectors either directly observed or reviewed the following non-destructive examinations (NDEs) mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC) (Code of Record: 2007 Edition/2008 addenda. IWE program in compliance with the 2001 Edition/2003 addenda of the ASME Code – Section XI) to evaluate compliance with the ASME Code, Section XI and Section V requirements, and if any indications or defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code, or an NRC-approved alternative

requirement. The inspectors also reviewed the qualifications of the NDE technicians performing the examinations to determine whether they were current and in compliance with the ASME Code requirements.

- Penetrant Testing (PT), High Head Safety Injection (HHSI) 2-SI-2401-1, Class 2, Report # ISI-PTN-4-2014 (reviewed)
- Ultrasonic Testing (UT), HHSI 2-SI-2401-1, Class 2, Report # ISI-PTN-4-2014 (reviewed)
- UT, Steam Generator (SG) A weld, Class 2, Report # ISI-PTN-4-2016 (observed and reviewed)
- Visual Testing (VT-1), Remote Visual of bottom mounted instrumentation (BMI) nozzle penetrations (N-722-1), Report # ISI-PTN-4-2016 (reviewed)
- PT, WO 4000702-03, Charging Pump Suction Check Valve, Class 2 (reviewed)
- PT, WO 40340662-04, chemical volume control system (CVCS), Excess Letdown thermal relieving check valve, Class 1 (reviewed)
- PT, RCS Pressurizer Surge Line, Class 1, Report # ISI-PTN-4-2016 (observed and reviewed)
- UT, Flow Accelerated Corrosion (FAC), Feedwater Pump 4P1A, Component FP6AE12, Report # CSI-FAC-PTN-4-29R (observed and reviewed)
- UT, FAC, Feedwater IFC-P-7, Location # 21, Report # CSI-FAC-PTN-4-29R (reviewed)
- Visual Testing (VT-1), Containment Liner coating repair, WO 40086333-01 (reviewed)

The inspectors either directly observed or reviewed the following welding activities, qualification records, and associated documents in order to evaluate compliance with procedures and the ASME Code, Section XI and Section IX requirements. Specifically, the inspectors reviewed the WO, repair and replacement plan, welder performance qualification records, and NDE reports.

- WO 4000702-03, Charging Pump Suction Check Valve, Class 2 (reviewed)
- WO 40340662-04, CVCS, Excess Letdown thermal relieving check valve, Class 1 (reviewed)
- WO 4310883-01, CVCS, Weld Fitting Valve 4-950 Steam Supply Valve (RCS), Class 2 (reviewed)

During non-destructive surface and volumetric examinations performed since the previous RFO, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service; therefore, no NRC review was completed for this inspection procedure (IP) attribute.

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities: The inspectors verified that for the Unit 4 vessel head, a bare metal visual examination and a volumetric examination were not required during this outage, in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). The licensee did not identify any relevant indications that were accepted for continued

service. Additionally, the licensee did not perform any welding repairs to the vessel head penetrations since the beginning of the last Unit 4 RFO; therefore, no NRC review was completed for these IP attributes.

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

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

- Boric Acid Engineering Evaluation, AR (AR)-1853955, Active Casing Leak on a 4-A HHSI Pump
- Boric Acid Engineering Evaluation, AR (AR)-1965050, Active Leakage at 4-875A during rover cam inspection
- Boric Acid Engineering Evaluation, AR (AR)-2094717, 4-942J Downstream Swagelock: Active Boric Acid Leak 5-7 dpm

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

- AR 2018899, 4AHH Pump (4P215A) DBA on casing
- AR 1994068, 4E202 Minor Brown Dry Boric Acid Leak on Channel Head Flange
- AR 1962014, Tracking License Renewal Leak Inspection

Steam Generator Tube Inspection Activities

The inspectors reviewed the eddy current (EC) examination activities performed in Unit 4 SGs 1, 2, and 3 during this current RFO to verify compliance with the licensee's TS, ASME BPVC Section XI, and Nuclear Energy Institute 97-06, "Steam Generator Program Guidelines."

The inspectors reviewed the scope of the EC examinations, and the implementation of scope expansion criteria, to verify these were consistent with the Electric Power Research Institute (EPRI) "Pressurized Water Reactor Steam Generator Examination Guidelines," Revision 7. The inspectors reviewed documentation for a sample of EC data analysts, probes, and testers to verify that personnel and equipment were qualified to detect the applicable degradation mechanisms in accordance with the EPRI Examination Guidelines. This review included a sample of site-specific Examination Technique Specification Sheets (ETSSs) to verify that their qualification and site-specific implementation were consistent with Appendix H or I of the EPRI Examination Guidelines. The inspectors also reviewed a sample of EC data from five SGs tubes, with a qualified data analyst, to confirm that data analysis and equipment configuration were performed in accordance with the applicable ETSSs and site-specific analysis guidelines. The inspectors verified that recordable indications were detected and sized in accordance with vendor procedures.

The inspectors selected a sample of degradation mechanisms from the Unit 4 Degradation Assessment report (e.g. anti-vibration bar and tube support plate wear) and verified that their respective in-situ pressure testing criteria were determined in accordance with the EPRI "Steam Generator Integrity Assessment Guidelines," Revision 3. Additionally, the inspectors reviewed EC indication reports to determine whether tubes with relevant indications were appropriately screened for in-situ pressure testing. The inspectors also compared the latest EC examination results with the last Condition Monitoring and Operational Assessment report for Unit 4 to assess the licensee's prediction capability for maximum tube degradation and number of tubes with indications. The inspectors verified that the licensee's evaluation was conservative and that current examination results were bound by the Operational Assessment projections.

The inspectors assessed the latest EC examination results to verify that new degradation mechanisms, if any, were identified and evaluated before plant startup. The review of EC examination results included the disposition of potential loose part indications on the SG secondary side to verify that corrective actions for evaluating and retrieving loose parts were consistent with the EPRI Guidelines. The inspectors also reviewed a sample of primary-to-secondary leakage data for Unit 4 to confirm that operational leakage in each SG remained below the detection or action level threshold during the previous operating cycle.

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

Furthermore, the inspectors interviewed licensee staff and reviewed a sample of inspection results for the inspection conducted in the secondary side internals of SGs 1, 2, and 3, to verify that potential areas of degradation based on site-specific operating experience were inspected, and appropriate corrective actions were taken to address degradation indications.

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

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program

Resident Inspector Quarterly Review

.1 Simulator Observations

a. Inspection Scope

On June 1, 2016, the inspectors assessed licensed operator performance in the plant-specific simulator during a training evolution. The training scenario was started with the unit in Mode 1 at 100 percent of RTP. The simulation included a pressurizer steam space loss of coolant accident (LOCA) followed by a loss of emergency coolant recirculation capability. Emergency procedures used by the crew to safely mitigate the events included 3-EOP-E-0, "Reactor Trip," and 3-EOP-ES-0.1, "Reactor Trip Response." The inspectors determined the training scenario allowed the operators to apply emergency action levels as required in accordance with licensee procedure, 0-EPIP-20101, "Duties of the Emergency Coordinator."

During this simulator observation, the simulator board configurations were compared with actual plant control board configurations to verify recent plant changes or modifications were reflected. The inspectors specifically evaluated the following attributes related to the training evolution:

- 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 TS actions and emergency plan classification and notification
- Crew overall performance and interactions
- Evaluator's control of the scenario and post scenario evaluation of crew performance

This inspection constitutes one sample.

b. Findings

No findings were identified.

.2 Control Room Observations

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:

On April 27, 2016, the inspectors performed a focused observation on Unit 4 during a reactor startup per procedure 4-GOP-301, "Hot Standby to Power Operations." The inspectors reviewed the expected critical boron concentration calculation and the control rod pull sequence plan used during the observed reactor startup. The inspectors reviewed the recorded reactor startup physics data to ensure it was as calculated by the licensee reactor engineering staff.

On May 31, 2016, the inspectors performed a focused observation on Unit 4 control room during a planned turbine load reduction per 4-NOP-089, "Auxiliary Feedwater Testing." The inspectors observed the pre-evolution operating crew brief and control of the secondary turbine generator while lowering turbine output.

On June 15, 2016, the inspectors did a focused observation on Unit 3 consisting of a RCS primary water dilution per 0-OP-046, Enclosure 6, "Chemical Volume Control System Boron Concentration Control." Specifically, the inspectors observed the reactor operators performing the pre-job brief per 0-ADM-200, Attachment 7, "Planned Reactivity Manipulations for Maintaining Steady State Plant Conditions," and verified the operators complied with the applicable procedure during the evolution.

The inspectors focused on the following conduct of operations attributes:

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

This inspection constitutes three samples.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's activities to meet 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 focused on maintenance rule scoping, characterization of maintenance problems and failed components, risk significance, determination of a(1) or a(2) performance criteria classification, corrective actions, and the appropriateness of established performance goals and monitoring criteria. The inspectors also interviewed responsible engineers and observed or reviewed corrective maintenance activities. The inspectors verified that problems were being identified and appropriately entered into the licensee CAP. The inspectors used the licensee maintenance rule data base, system health reports, maintenance rule unavailability status reports, and the CAP as sources of information on tracking and resolution of issues. This inspection constitutes two samples.

- AR 02108256, 3B Emergency Containment Cooler Failure
- AR 02132204, Unit 3 Rod Control Failure

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

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," Revision 3; and procedures O-ADM-068, "Work Week Management," WM-AA-1000, "Work Activity Risk Management," and O-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. This inspection constitutes five samples.

- Train I AFW and 4C SUT OOS
- Unit 3 Power Operated Relief Valve (PORV) 455C Block Valve Closed
- Train II AFW OOS
- 3B HHSI Pump OOS
- 4B EDG and 4B HHSI Pump OOS

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

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 evaluations of 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 ARs to verify that the licensee was routinely identifying and correcting any deficiencies associated with operability evaluations. This inspection constitutes five samples.

- AR 02125663, 4B EDG Starting Air Solenoid Valve Failure
- AR 02128095, 4A CCW Heat Exchanger Thermal Performance Reduced Margin
- AR 02138147, C AFW Pump Steam Supply Valve Packing Leak
- AR 02130248, Unit 3 Pressurizer Cycling Heaters Failure
- AR 02131318, Unit 3 Pressurizer PORV Leaking

b. Findings

No findings were identified.

1R17. Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (71111.17T)

i. (Closed) Unresolved Item (URI) 5000250, 251/2015007-02, Potential departure from the Eagle 21 design basis

a. Inspection Scope

On March 17, 2015, the NRC issued inspection report 05000250/2015007 and 05000251/2015007 (ADAMS Accession Number ML15077A138), which included a URI associated with a potential departure from the Eagle 21 design basis. The URI was opened to determine if the associated performance deficiency was more than minor.

The inspectors reviewed additional information about the licensing basis for the Eagle 21 License Amendment (LA) dated April 23, 1991. The team also reviewed the licensee's responses to the URI and additional information they provided. Documents reviewed are listed in the attachment. This URI is closed.

b. Findings

- .1 Introduction: The NRC identified an SL IV, NCV of 10 CFR 50.71(e), "Maintenance of Records, Making of Reports." The licensee failed to include Eagle 21 licensing basis information into the UFSAR. The Eagle 21 licensing basis information was specified in LA numbers 135 (Unit 3) and 140 (Unit 4).

Description: The licensee requested a LA by letter L-90-68A (ML9009250084), dated September 13, 1990, to amend the Turkey Point TS to include specifications for an Eagle 21 safety system. The Eagle 21 was a computerized digital safety system. To support an affirmative safety conclusion, the licensee submitted supplemental technological quality information by letter L-91-010 (ML9101090132), dated January 4, 1991. The design basis for the technological quality was outlined in topical report "Westinghouse Commercial Atomic Power (WCAP)-12374 (Eagle-21 Micro Processor Based Process Protection System for Turkey Point Units 3 and 4)." The staff used this supplemental information to reach affirmative safety conclusions about the design and issued the LA and attached Safety Evaluation Report (SER) on April 23, 1991 (ML9104260259). In the LA, license condition 1.A listed the supplement (L-91-010) as confirmation of compliance with the standards and requirements of the Atomic Energy Act of 1954, as amended, and the Commission's rules and regulations set forth in 10 CFR Chapter I. This made the supplemental information specified by WCAP-12374 the Eagle 21 licensing basis. The NRC found that compliance with the criteria, processes, and methods described in the WCAP-12374 Section 6.2 "Applicable Standards," and the quality standards identified in Appendix A were acceptable for complying with the Commission's regulations for promoting high functional reliability and design quality for the use of digital computers in safety systems of nuclear power plants. The licensee failed to incorporate this licensing basis in the UFSAR, and thus failed to incorporate the specific safety criteria and specifications for the digitally based Eagle 21 into the plant designs. The WCAP specified the following quality standards as the Eagle 21 licensing basis:

- A. Institute of Electrical and Electronic Engineers (IEEE) Std. 279-1971, "Criteria for Protection Systems for Nuclear Power Generating Stations"
- B. IEEE Std. 603-1980 "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations"
- C. Regulatory Guide (RG) 1.153, December, 1985 "Criteria for Power, Instrumentation, and Control Portions of Safety Systems" – RG 1.153 endorses the guidance IEEE Std. 603-1980.
- D. American National Standards Institute (ANSI)/IEEE-ANS-7-4.3.2 1982 "Application Criteria for Programmable Digital Computer Systems In Safety Systems of Nuclear Power Generating Stations" – ANSI/IEEE-ANS-7-4.3.2 1982 expands and amplifies the requirements IEEE Std. 603-1980.

- E. RG 1.152, November 1985 “Criteria For Programmable Digital Computer System Software In Safety-Related Systems in Nuclear Plants” – RG 1.152 endorses the guidance of ANSI/IEEE-ANSI-7-4.3.2’
- F. IEEE Std 729-1983, “Standard Glossary of Software Engineering Terminology”
- G. IEEE Std 730-1981, “Standard for Software Quality Assurance Plans”
- H. IEEE Std 828-1983, “Standard for Software Configuration Management Plans”
- I. IEEE Std 829-1983, “Standard for Software Test Documentation”
- J. IEEE Std 830-1984, “Guide to Software Requirements Specification”
- K. National Bureau of Standards (NBS) Special Publication 500-75 (February 1981), “Validation, Verification and Testing of Computer Software”
- L. NBS Special Publication 500-93 (September 1982), “Software Validation, Verification, Testing Technique and Tool Reference Guide”
- M. NBS Special Publication 500-98 (November 1982), “Planning for Software Validation, Verification and Testing”

Analysis: The NRC determined this violation was associated with a minor Reactor Oversight Process (ROP) performance deficiency. Cross-cutting aspects are not assigned to traditional enforcement violations. The violation was dispositioned using the traditional enforcement process because the issue impacted the NRC’s ability to perform its regulatory process. The inspector used the NRC Enforcement Policy, Subsection 6.1 “Reactor Operations,” Revised February 4, 2015, and determined it was an SL IV violation. The violation represented a failure to update the FSAR as required by 10 CFR 50.71(e), but the lack of up-to-date information had not resulted in any unacceptable change to the facility or procedures.

Enforcement: Title 10 CFR 50.71(e), “Maintenance of Records, Making of Reports,” stated, in part, the licensee shall periodically update the FSAR originally submitted as part of the application for the operating license to ensure that the information included in the report contains the latest material developed. Contrary to the above, since April 1991, the licensee has failed to update the UFSAR originally submitted as part of the application for the operating license to ensure that the information included in the report contained the latest material developed. Specifically, the licensee failed to update the UFSAR to reflect the Eagle 21 safety system criteria specified by WCAP-12374. The licensee’s planned corrective actions included updating the UFSAR to address the design and licensing basis for the Eagle 21. Because this violation was of relatively inappreciable potential safety consequence and it was entered into the licensee’s CAP as AR 2048916, this violation was being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000250, 251/2016002-01, Failure to Update the Final Safety Analysis Report with Applicable Safety System Criteria)

- .2 Introduction: The NRC identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, “Corrective Action,” for a failure to correct a condition adverse to quality. The licensee identified that the ability to test the Eagle 21 was degraded, but failed to take adequate corrective actions to correct the condition.

Description: In 2012, an Extended Power Uprate (EPU) increased the thermal power of the Unit 3 and Unit 4 reactor cores substantially. In June 2012, as part of the EPU, the licensee approved vendor changes to the Eagle 21 programming for OPΔT and OTΔT

reactor trip algorithms. On June 6, 2012, during testing to verify the new Eagle 21 programming, the four specified Surveillance Requirement (SR) tests for the OPΔT and OTΔT trips failed to actuate. On June 7, 2012, the licensee issued a severity level 3 condition adverse to quality AR1773821 for the failure. On June 7, 2012, the licensee conferred with the vendor then issued and implemented WO 4016772901. The vendor instructed the licensee to replace certain OPΔT and OTΔT COLR parameters with zeros (Tau (T) 6 and T7). This allowed the algorithms to complete the SR tests. Re-installing the COLR parameters caused the SR tests to fail again. The zeros effectively bypassed the programming defects introduced by the EPU changes. Placing zeros in T6 and T7 bypassed those portions of the new program that processed the COLR algorithms. After completing the SR tests with zeros, the licensee restored T6 and T7 with the required COLR parameters and declared the channels operable. The licensee incorporated this process into their SR test procedures as a permanent change at the direction of the vendor.

The EPU software changes introduced a programming defect that prevented SR testing with the Eagle 21 platform. The inspectors reviewed the licensing basis for the Eagle 21 that was specified in WCAP-12374 "Eagle-21 Micro Processor Based Process Protection System for Turkey Point Units 3 and 4," to determine the applicable requirements for the system. For the safety system criteria, the WCAP specified IEEE 603-1980 "IEEE Standard Criteria for Safety Systems for Nuclear Power Generating Stations," as the licensing basis.

The criteria specified in IEEE 603-1980, Section 5.7, "Capability for Test and Calibration," required, in part, that the capability for testing of safety system equipment shall duplicate, as closely as practicable, the performance of the safety function, which in this case were the OPΔT and OTΔT channel trips. Furthermore, the TS SR 4.3.1.1 stated that each Reactor Trip System instrumentation channel and interlock and the automatic trip logic shall be demonstrated OPERABLE by the performance of the Reactor Trip System Instrumentation SR specified in Table 4.3-1. Table 4.3-1 specified several SR tests, including channel trip and time response tests, to verify the operability of the OPΔT and OTΔT channel trips. The IEEE and SR required that the trip algorithms must duplicate, as closely as practicable, the performance of the safety functions to verify the operability of the channel trips for TS 3/4.3.1. For operability, the OPΔT and OTΔT algorithms required the use of parameters that are determined by the COLR.

To determine what happened, the inspectors assessed the vendor verification and validation (V&V) report for the programming changes (WCAP-12858 Supplement 1 Revision 2, "Turkey Point Units 3 and 4 Eagle 21 Process Protection System Replacement Hardware Verification and Validation Report"). The report indicated that the required full system V&V and regression testing was not performed for either the Eagle 21 tester subsystem that was used for surveillance tests, nor for the Eagle 21 man machine interface subsystem that checks and loads parameters. The licensing basis (WCAP-12374) V&V plan outlined in Appendix A required full system V&V and regression testing, including testing with these subsystems. The implementing quality standards that specified the requirements for V&V tools and techniques described the details of these requirements in NBS Special Publication 500-75, NBS Special Publication 500-93, and NBS Special Publication 500-98. In addition, the inspectors

could not identify that the licensee prescribed the detailed requirements for the operation and maintenance phase for the use of digital systems as outlined in these quality standards. The inspectors determined this was not in accordance with the stipulation in the V&V plan to afford these subsystems the highest level of confidence when incorporating changes and modifications to the software.

The inspectors determined that after the Eagle 21 computer program changed the SR tests failed to actuate as required. The licensee identified this, in AR 1773821, as a condition adverse to quality that was an unforeseen result of programming changes but failed to correct the nonconformance to ensure compliance with TS 3/4.3.1 and IEEE 603-1980. In addition, the inspectors determined that allowing known programming defects to persist in a digital safety system was not in accordance with the Eagle 21 licensing basis for V&V. Further, because the vendor did not perform full system V&V and regression tests, the licensee could not demonstrate that other unforeseen defects were not present that could prevent the Eagle 21 from performing its safety function. The licensee performed a prompt operability determination and determined the systems were operable.

Analysis: The licensee's failure to correct nonconformances with requirements in the Class 1E Eagle 21 system was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, not using COLR specified time-constant SR tests to demonstrate operability of the Eagle 21 system adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of the OPΔT and OTΔT reactor trip algorithms. The inspectors used IMC 0609, Att. 4, "Initial Characterization of Findings," issued June 19, 2012, for Mitigating Systems, and IMC 0609, App. A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012, and determined the finding required a detailed risk evaluation because it affected the likelihood of a single RPS trip signal to initiate a reactor scram. A Senior Reactor Analyst evaluated the increase in core damage frequency (CDF) due to the OPΔT and OTΔT trips not responding in a prompt manner to a demand. The analyst multiplied the frequency of events (where OPΔT and OTΔT trips are the primary defense) against the remaining mitigation from other reactor trip functions, as well as the human error probability of operators not taking action to trip the plant. For a year of time exposure, the channels being non-functional was an increase in CDF of 1.0E-8/year (Green). The risk increase was very low because defense in depth of the RPS to cause a trip via alternate and diverse means existed. The inspectors determined the finding was indicative of present licensee performance and was associated with the cross-cutting aspect of human performance, in the area of conservative bias, because individuals failed to evaluate a proposed action to determine if it was safe in order to proceed, rather than unsafe in order to stop (H14).

Enforcement: Title 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," stated, in part, that measures shall be established to ensure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are corrected. Contrary to the above, since June 7,

2012, the licensee failed to establish measures to ensure that a condition adverse to quality, the nonconformance in the Class 1E Eagle 21 system that was responsible for inadequate surveillance tests, was corrected. Because this violation was of very low safety significance (Green), and the condition was entered into the licensee's CAP as ARs 2023314 and 02145155, this violation was being treated as an NCV consistent with Section 2.3.2 of the NRC Enforcement Policy. (NCV 05000250, 251/2016002-02, Failure to Correct Conditions Adverse to Quality Associated with the Eagle 21 System)

1R18 Plant Modifications

Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed permanent plant modifications, including the 10 CFR 50.59 screening and technical evaluation, to verify that the modifications had not affected system operability or availability. The inspectors reviewed associated plant drawings, design analyses, and UFSAR documents impacted by this modification, and discussed the changes with licensee personnel to verify that the modifications were consistent with WOs and associated documents. The inspectors observed portions of the modification and surrounding area to determine if conditions resulted in any potential unsafe conditions not described in the engineering change documentation. Additionally, the inspectors reviewed and verified that any conditions associated with the modification were identified and entered into the CAP. This inspection constitutes two samples.

- EC 286032, Switchyard Digital Relay Replacements
- EC 246859, Turbine Generator Woodward Governor Overspeed Protection Modification

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed post maintenance tests and associated WOs and 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 0-ADM-737, "Post Maintenance Testing," were incorporated into the test requirements. This inspection constitutes six samples.

- WO 40365364, 4B Containment Spray Pump Motor Replacement
- WO 40273327, 4A Reactor Coolant Pump (RCP) Shaft Seal Replacement

- WO 40361761, 4B RCP Shaft Seal Replacement
- WO 40361762, 4C RCP Shaft Seal Replacement
- WO 40378032, AFW Motor Operated Valve Static Test
- WO 39020250, AFW Motor Operated Valve Overhaul

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

.1 Unit 4 Refueling Outage PT4-29

a. Inspection Scope

Outage Planning, Control and Risk Assessment

During daily outage planning activities by the licensee, the inspectors reviewed the risk reduction methodology employed by the licensee during RFO PT4-29 meetings including outage control center (OCC) morning meetings, operations daily team meetings, and schedule performance update meetings. The inspectors examined the licensee implementation of shutdown safety assessments during PT4-29 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. In addition, the inspectors regularly monitored outage planning and control activities in the OCC, and interviewed responsible OCC management personnel during the outage to ensure system, structure, and component configurations and work scope were consistent with TS requirements, site procedures, and outage risk controls.

Monitoring of Shutdown Activities

The inspectors performed walk downs of important systems and components used for residual heat removal (RHR) from the reactor core and SFP during the shutdown period including the ICW system, CCW system, and SFP cooling system.

Outage Activities

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

- Walked down selected safety-related equipment clearance orders
- Verified operability of RCS pressure, level, flow, and temperature instruments during various modes of operation
- Verified electrical systems availability and alignment
- Verified shutdown cooling system and SFP cooling system operation

- Evaluated implementation of reactivity controls
- Reviewed control of containment penetrations
- Examined foreign material exclusion (FME) controls put in place inside containment (e.g., around the refueling cavity, near sensitive equipment and RCS breaches) and around the SFP
- Verified workers fatigue rule was properly managed

Refueling Activities and Containment Closure

The inspectors witnessed selected fuel handling operations being performed in accordance with TS and applicable operating procedures from the main control room and refueling bridge inside the containment 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 PT4-29 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 (QA) daily surveillances of outage activities.

This inspection sample was counted in the previous quarter's inspection report samples.

b. Findings

No findings were identified.

1R22 Surveillance Testing

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 of 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 six samples.

Containment Isolation Valve Leak Rate Tests:

- 4-OSP-051.1, Penetration 14 Leak Rate Test for Valves 200A, 200B, and 200C

Surveillance Test:

- 0-NC2P-041.1, RCS Chemistry Sample

In-Service Tests:

- 4-OSP-046.20, 4B Boric Acid Pump Comprehensive Test (IST)
- 4-OSP-030.9, Component Cooling Water System Flow Balance (IST)
- 4-OSP-041.7, RCS Heatup and Cooldown Temperature Verification Test (IST)

RCS Leak Detection Test:

- 3-OSP-041.5, Unit 3 Reactor Coolant System Leak Rate Calculation

b. Findings

No findings were identified.

2. RADIATION SAFETY (RS)

Cornerstones: Occupational Radiation Safety (OS) and Public Radiation Safety (PS)

2RS1 Radiological Hazard Assessment and Exposure Controlsa. Inspection Scope

Hazard Assessment and Instructions to Workers: During facility tours, the inspectors directly observed labeling of radioactive material (RAM) and postings for radiation areas, HRAs, locked HRAs (LHRAs), and airborne radioactivity areas established within the radiologically controlled area (RCA) of the Unit 4 (U4) Containment Building, Auxiliary Building, the Independent Spent Fuel Storage Installation, and radioactive waste 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 alpha emitters, airborne radioactivity, gamma surveys with a range of dose rate gradients, 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. For selected Unit 4 RFO jobs, 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.

Contamination and Radioactive Material Control: The inspectors observed the release of potentially contaminated items from the RCA and contaminated areas to include U4 containment and equipment hatch, Auxiliary Building, Material Release Building, and the RCA Entrance Building. The inspectors also reviewed the procedural requirements for, and equipment used to perform, the radiation surveys for release to include large and

small article monitors, hand and foot monitors, friskers, and portal monitors. During plant walk downs, the inspectors evaluated RAM storage areas and containers, including satellite RCAs and yard areas, assessing material condition, posting/labeling, and control of materials/areas. In addition, the inspectors reviewed the sealed source inventory and verified labeling, storage conditions, and leak testing of selected sources.

Radiological Hazards Control and Work Coverage: The inspectors evaluated licensee performance in controlling worker access to radiologically significant areas and monitoring jobs in-progress during the week of the onsite inspection associated with the U4 RFO. The inspectors also reviewed the procedural guidance for multi and extremity badging. For HRA tasks involving significant dose rate gradients, the inspectors evaluated the use and placement of whole body and extremity dosimetry to monitor worker exposure to include activities associated with the under vessel insulation installation. The inspectors reviewed selected U4 RFO RWPs for use in airborne areas, ensuring the prescribed controls were appropriate for the conditions as identified in radiological surveys and air samples. Electronic Dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results for Containment and Auxiliary Building activities.

Risk Significant High Radiation Areas and Very High Radiation Area Controls: The inspectors evaluated access barrier effectiveness for selected LHRA and Very HRA (VHRA) locations. Changes to procedural guidance for LHRA and VHRA controls were discussed with Radiation Protection (RP) supervisors. During plant walk downs of the U4 Containment and Auxiliary Buildings, the inspectors verified the posting/locking of LHRAs/VHRAs. Established radiological controls (including airborne controls) were evaluated for selected tasks including work in U4 Containment Building HRAs, and radwaste processing and storage. In addition, licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations were reviewed and discussed.

Radiation Worker Performance and RP Technician (RPT) Proficiency: The inspectors observed radiation worker performance through direct observation associated with U4 RFO activities. Jobs observed included refueling, under vessel insulation installation, and cavity decontamination activities in the U4 Containment and Auxiliary Buildings in HRAs and contaminated areas. The inspectors also observed RPTs providing pre-job/RWP briefings, releasing material from various RCA exit points, and providing field coverage of jobs. Occupational workers' adherence to selected RWPs and RPT proficiency in providing job coverage were evaluated through direct observations of selected U4 RFO activities and interviews with cognizant licensee staff. ED alarm set points and worker stay times were evaluated against area radiation survey results for reviewed RWPs.

Problem Identification and Resolution: The inspectors reviewed CAP documents associated with radiological hazard assessment and exposure control. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the issues in accordance with licensee procedures. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

Radiation protection activities were evaluated against the requirements of UFSAR Section 11; TS Sections 6.8, Procedures and Programs, and 6.12, HRA; 10 CFR Parts 19 and 20; Regulatory Guide 8.38, Control of Access to High and Very High Radiation Areas in Nuclear Power Plants; 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 reviewed are listed in the attachment.

The inspectors completed the required seven (7) samples specified in IP 71124.01.

b. Findings

Introduction: A self-revealing, Green, NCV of TS 6.12.1, was identified for the failure to post a HRA. Specifically, on April 6, 2016, the licensee failed to post the area by the exterior wall of the Unit 4 SFP on the Auxiliary Building roof as a HRA.

Description: On April 6, 2016, a worker walking on the Auxiliary Building roof next to the exterior wall of the U4 SFP received an electronic dosimeter (ED) alarm of 105 millirem per hour (mrem/hr) and the area was not posted as a HRA. The licensee's followup investigation identified that the area had been down posted by Radiation Protection to a Radiation Area. During U4 refueling operations the area by the exterior wall of the U4 SFP on the Auxiliary Building roof was posted as a Locked HRA in preparation for movement of fuel. A misunderstanding of the outage schedule by Radiation Protection led to the down posting of the area to a Radiation Area before fuel movement was complete. At the time the worker was walking past the exterior wall of the U4 SFP RP identified dose rates ranging from 30 to 300 mrem/hr in the area.

Analysis: The failure to post a HRA with dose rates greater than 100 mrem/hr, as required by TS 6.12.1, was a performance deficiency. This performance deficiency was determined to be more than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Human Performance and adversely affected the cornerstone objective ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, failure to post and control HRAs can allow workers to enter HRAs without knowledge of the radiological conditions in the area and receive unintended occupational exposure. The finding was evaluated using the Occupational Radiation Safety SDP. The finding was not related to the ALARA planning, did not involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. Therefore, the inspectors determined the finding to be of very low safety significance (Green). This finding involved the cross-cutting aspect of Human Performance, Work Management (H.7) because the organization failed to implement its process for planning and controlling access to HRAs on the Auxiliary Building roof when fuel bundle movement were still ongoing.

Enforcement: TS 6.12.1, requires, in part, that each HRA in which the intensity of radiation is greater than 100 mrem/hr but equal to or less than 1,000 mrem/hr at 10 centimeters from the radiation source or from any surface which the radiation penetrates

shall be barricaded and conspicuously posted as a HRA, and entrance thereto shall be controlled by requiring issuance of a RWP. Contrary to the above, on April 6, 2016, the licensee failed to post the area by the exterior wall of the U4 SFP on the Auxiliary Building roof as a HRA, which contained dose rates up to 300 mrem/hr. Specifically, a worker walking on the Auxiliary Building roof next to the exterior wall of the U4 SFP received an ED alarm indicating the worker had entered a radiation field greater than 100 mrem/hr that was not posted as a HRA, and the worker was not on an RWP that allowed access to HRAs. This violation was being treated as an NCV, consistent with Section 2.3.2 of the Enforcement Policy. The violation was entered into the licensee's CAP as AR no. 02123851 (NCV 05000250, 251/2016002-03, Failure to Post a High Radiation Area).

2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

a. Inspection Scope

Waste Processing and Characterization: During inspector walk-downs, accessible sections of the liquid and solid radwaste processing systems were assessed for material condition and conformance with system design diagrams. Inspected equipment included storage tanks, transfer piping, resin dewatering and packaging components, and abandoned radwaste processing equipment. The inspectors discussed component function, processing system changes, and radwaste program implementation with licensee staff.

The inspectors reviewed the 2014 Annual Radioactive Effluent Report and radionuclide characterizations from 2015 - 2016 for selected waste streams. For Primary Resin and Dry Active Waste (DAW), the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined QA comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing and concentration averaging methodology were evaluated and discussed with radwaste staff. The inspectors also reviewed the licensee's process for monitoring changes in waste stream isotopic mixtures.

Radioactive Material Storage: During walk-downs of indoor and outdoor radioactive material storage areas, the inspectors observed the physical condition and labeling of storage containers and the posting of Radioactive Material Areas. The inspectors also reviewed licensee procedural guidance for storage and monitoring of radioactive material.

Transportation: The inspectors evaluated shipping records for consistency with licensee procedures and compliance with NRC and Department of Transportation (DOT) regulations. The inspectors reviewed emergency response information, DOT shipping package classification, waste classification, radiation survey results, and container handling methodology. The inspectors also observed shipment preparations for a DAW package and evaluated technician performance and knowledge of DOT requirements.

Problem Identification and Resolution: The inspectors reviewed CAP documents associated with radioactive waste processing, handling, storage, and transportation. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the issues in accordance with licensee procedures.

Radwaste processing, radioactive material handling, and transportation activities were reviewed against the guidance and requirements contained in the licensee's Process Control Program, UFSAR Chapter 11, 10 CFR Part 20, 10 CFR Part 61, 10 CFR Part 71, the Branch Technical Position on Waste Classification (1983), and NUREG-1608, Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects, and approved licensee procedures. Documents reviewed are listed in the attachment.

The inspectors completed the required six (6) samples specified in IP 71124.08.

b. Findings

No findings were identified.

4OA1 Performance Indicator Verification (IP 71151)

.1 Barrier Integrity Cornerstone

a. Inspection Scope

The inspectors reviewed licensee submittals for the Unit 3 and Unit 4 performance indicators (PI) listed below for the period April 1, 2015, through March 31, 2016, to verify the accuracy of the PI data reported during that period. Performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedure 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, ARs, 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 four samples.

- Unit 3 RCS leakage
- Unit 4 RCS leakage
- Unit 3 RCS activity
- Unit 4 RCS activity

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (IP 71152)

.1 Daily Review

a. Inspection Scope

As required by IP 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.

b. Findings

No findings were identified.

.2 Annual Sample: Potential Radiological Release

a. Inspection Scope

The inspectors selected AR 02130891, "Potential Radiological Release," for a more in-depth review of the circumstances and the corrective actions that followed. The AR report was reviewed to ensure that an appropriate evaluation was performed and corrective actions were specified and prioritized in accordance with the licensee's program. Other attributes checked included disposition of operability and resolution of the problem including cause determination, past operability determination, and corrective actions. The inspectors interviewed plant personnel and evaluated the AR in accordance with the requirements of the licensee's corrective actions process as specified in licensee's procedures PI-AA-204, "Condition Identification and Screening Process," and PI-AA-205, "Condition Evaluation and Corrective Action." This inspection constitutes one sample.

b. Findings and Observations

No findings were identified. The licensee identified four corrosion holes in the Unit 3 Purge Exhaust piping on the Auxiliary Building Roof with gas flows exiting the ducting without containment purge fans running. The licensee's evaluation concluded the containment purge duct design was not airtight and gas flows were due to aux building exhaust fans. The Offsite Dose Calculation Manual (ODCM) calculation of the gaseous effluent monitor alarm and trip setpoints accounted for all effluent sources and included a 0.1 factor that allowed for unmonitored gas releases due to any leakage. To ensure alarm setpoints were not exceeded, the site conservatively set the alarms lower than the ODCM methodology. Even though there was a leak it was well below any setpoints and therefore had no adverse impact.

The licensee evaluated the unmonitored release by utilizing a bounding calculation performed for a prior engineering change. The unmonitored release of approximately 5.81% (3600 CFM/ 62000 CFM) is within the factor 0.1 included in the ODCM alarm setpoints to account for unmonitored release due to leakage. Therefore, the leakage rate is acceptable with adequate margin to continue operation. The licensee generated WO 40290860 to repair the exhaust duct.

.3 Semi-Annual Trend

a. Inspection Scope

The inspectors performed a review of the licensee's records including ARs, CAP health reports, apparent cause evaluation reports, and various corrective action review board reports to assess an adverse trend identified by the licensee in the quality of their causal analysis evaluations. The inspectors reviewed ARs that identified adverse trends associated with expired transient combustible permits in AR 02128326. The inspectors evaluated the effectiveness of the licensee's corrective actions and the significance of the problems including attributes such as accurate documentation, reportability, corrective actions, and problem resolution. This inspection constitutes one sample.

b. Findings and Observations

No findings were identified. The licensee determined that the common cause for expired transient combustibles was due to diligence of personnel who introduce transient combustibles into the power block. The inspectors noted that corrective actions included additional oversight from Fire Protection and Work Control Center personnel of permit owners for the status of their permits as well as an update to Procedure 0-ADM-016.1 which requires workers to continuously attend to combustibles without a permit. The inspectors did not identify any additional trends beside those observed by the licensee's trending activities.

4OA6 Meetings

The resident inspectors presented the inspection results to Mr. Summers and other members of licensee management on June 28, 2016. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary information. The licensee did not identify any proprietary information.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

A. Katz, Projects Manager
B. Stamp, Operations Director
C. Cashwell, Training Manager
C. Domingos, Plant General Manager
D. Slivon, Inservice Inspection
D. Sluszka, Work Controls Manager
E. Korkowski, FPL SG Program Owner
F. Banks, Nuclear Oversight Manager
W. Hinson, Radiation Protection Manager
G. Alexander, Engineering
G. Melin, Operations Manager
J. Pallin, Engineering Director
K. Ohara, Emergency Preparedness Manager
M. Guth, Licensing Manager
O. Hanek, Licensing Engineer
O. Hernandez, Security Manager
P. Czaya, Licensing
S. Mihalakea, Licensing
T. Summers, Site Vice-President

NRC Personnel:

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

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000250, 251/2016002-01	NCV	Failure to Update the Final Safety Analysis Report with Applicable Safety System Criteria (Section 1R17.1)
05000250, 251/2016002-02	NCV	Failure to Correct Conditions Adverse to Quality Associated with the Eagle 21 System (Section 1R17.2)
05000250, 251/2016002-03	NCV	Failure to Post a High Radiation Area (Section 2RS1)

Closed

05000250, 251/2015007-02	URI	Potential departure from the Eagle 21 design basis (Section 1R17)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather

0-ONOP-103.3, Severe Weather Preparations

Section 1R04: Equipment Alignment

4-NOP-022, Emergency Diesel Generator Fuel Oil System

4-NOP-023, Emergency Diesel Generator

P&ID 5610-M-3075, Auxiliary Feedwater (AFW) System Turbine Drive for AFW Pumps

P&ID 5613-M-3022, Emergency Diesel Engine and Oil System

Section 1R05: Fire Protection

0-ONOP-016.10, Pre-Fire Plan Guidelines and Safe Shutdown Manual Actions

Section 1R08: Procedures

03-9252849, Turkey Point Units 3 & 4 Eddy Current Data Analysis Guidelines, Spring 2016, Rev. 3

03-1275284, Field Procedure for Remote Rolled Plugging Utilizing the LAN SAP Box, Rev. 20

51-5029214-013, Qualified Eddy Current Techniques for Turkey Point (PTN) Units 3 & 4, Rev. 13

54-ISI-400-021, Multi-Frequency Eddy Current Examination of Tubing, Rev. 21

ENG-CSI-XCI-100, External Corrosion Monitoring Program for Insulated Piping for PSL & PTN License Renewal, Rev. 1

ER-AA-208, Dissimilar Metal (DM) Weld Surface Condition Assessment Process, Rev. 0

ER-AA-111-1000, Flow Accelerated Corrosion Activities, Rev. 0

ER-AP-116, Boric Acid Corrosion Control, Rev. 0

NDE3.3, Liquid Penetrant Examination, Rev. 14

NDE4.3, Visual Examination (VT-3), Rev. 12

NDE4.7, Visual Examination (VT-1/3), Rev. 4

NDE5.1, Ultrasonic Examination of Pressure Vessel Welds, Rev. 13

NDE5.4, Ultrasonic Examination of Austenitic Piping, Rev. 21

NDE5.18, Ultrasonic Thickness Measurement, Rev. 8

NDE5.26, PDI Generic Procedure for the Manual UT through-wall and length sizing of indications in RPV welds

O-ADM-046, Control of Welding Special Processes, Rev. 3

O-ADM-563, Reactor Vessel Internals Aging Management Program, Rev. 1

O-ADM-537, Boric Acid Corrosion Control Program, Rev. 11

O-ADM-563, Reactor Vessel Internals Aging Management Program, Rev. 1

PI-AA-104-1000, Corrective Action, Rev. 6

Self-Assessments:

AR 01858601, ISI, FAC Quick Hit Self Assessment, March 2013

AR 02107881, NRC ISI Inspection Quick Hit Self Assessment, February 2016

AR 01842350, Boric Acid Program Self Assessment, July 2013

AR 01837244, Boric Acid Program Self Assessment, August 2013

AR 1771920, Welding Self Assessment, May 2012

AIM 15118969-2-1, Degradation Assessment for Turkey Point Unit 3 and Turkey Point Unit 4 Steam Generators, Update for Turkey Point Unit 4 End-of-Cycle 28 (March 2016 Outage), Rev. 1

PTN-ENG-SESJ-013-021, Condition Monitoring and Preliminary Operational Assessment for Turkey Point Unit 4 Steam Generators for November 2012 Inspection, Rev. 0

Work Orders/Work Requests:

4000702-03, Penetrant Testing (PT), Charging Pump Suction Check Valve, Class 2
 40340662-04, Penetrant Testing (PT), CVCS, Excess Letdown thermal relieving check valve, Class 1
 40086333-01, Visual Testing (VT-1), Containment Liner coating repair
 4000702-03, Charging Pump Suction Check Valve, Class 2
 40340662-04, CVCS, Excess Letdown thermal relieving check valve, Class 1
 4310883-01, CVCS, Weld Fitting Valve 4-950 Steam Supply Valve(RCS), Class 2

ARs Generated from this Inspection:

AR2124115, ISI Inspector Observation-License Renewal Program
 AR2124111, ISI Inspector Observation-2016 U4 RFO IP71111.08
 AR2124109, ISI Inspector Observation-2016 U4 RFO IWL Program
 AR2124105, ISI Inspector Observation-2016 U4 RFO weld
 AR2121914, Indian Point RV Baffle Bolt Inspection Results
 AR2119318, Inpo Event Report Level 3016-06 Issued

ARs:

AR1853955, Active Casing Leak on a 4 A HHSI Pump
 AR1965050, Active Leakage at 4-875A during rover cam inspection
 AR2094717, 4-942J Downstream Swagelock:Active Boric Acid Leak 5-7 dpm
 AR 2018899, 4AHH Pump (4P215A) DBA on casing
 AR1994068, 4E202 Minor Brown Dry Boric Acid Leak on Channel Head Flange
 AR1962014, Tracking License Renewal Leak Inspection
 AR2002586, License Renewal SSMP Inspection of Piping Under Insulation
 AR2009404, License Renewal Issues
 AR1771977, Welding Control Program Succession Planning
 AR1771980, Secondary Engineering Programs-Gaps to Excellence
 AR1771932, Less than Adequate Communication of Using NAMS
 AR2103779, Lost Weld Travelers for WO40354812-01
 AR2002586, License Renewal SSMP Inspection of Piping Under Insulation
 AR2123227, ASME Section XI-Liner Discoloration, Rust and Flaking Paint
 AR2092853, Lack of Timely Submittal of LAR for Snubber Tech Spec
 AR1984462, QH Readiness for NRC TI-2515/189 Snubber Inspection
 AR2010443, Incorrect Filler Metal Weld
 AR2024069, Fleet Steam Generator Program Self-assessment
 AR2124483, Documentation of Foreign Material Removed from 4C S/G

Welder Quals:

Record of Welder Performance Qualification Test – C.W. Crocker, A. Green, E. Duchene, M. Sauto, and M. Wheeler

Visual Acuity Exam Record:

T. Moore, S. Vitro, B. Langston, K. Jones, D. Garcia, M. Wheeler, W. Weidner, I. Medina, M. Shoemaker, J. Noble, C. Popp, B. Thompson, and T. Thompson

Certificate of Qualification for Non-destructive Examinations Examiner:

T. Moore, S. Vitro, B. Langston, K. Jones, D. Garcia, M. Wheeler, W. Weidner, I. Medina, M. Shoemaker, J. Noble, C. Popp, B. Thompson, and T. Thompson

Miscellaneous Documents:

180-9230236-000, Turkey Point Unit 4, PTN4-28 Reference Outage Reactor Vessel 10 year ISI MRP Internals Visual Examination

51-5029214-013, Qualified Eddy Current Techniques for Turkey Point (PTN) Units 3 & 4

15-038, Turkey Point Unit 4 Refueling Outage TP4-29 SG Examination Scope, Rev. 2

51-9231400-000, Florida Power and Light Turkey Point Unit 4, EOC 27 Secondary Side Visual Inspection and FOSAR Final Report November 2014

2nd Interval-IWE-PTN-3/4-Program Plan, March 2009, Rev. 0

5th Interval-ISI-PTN-3/4-Program Plan, January 2015, Rev. 0

AES 07126688-1Q-1, Structural Limit Evaluation for Steam Generator Tube Degradation at Turkey Point and St. Lucie Nuclear Plants

AIM 15118969-2-1, Degradation Assessment for Turkey Point Unit 3 and Turkey Point Unit 4 Steam Generators, Update for Turkey Point Unit 4 End-of-Cycle 28 (March 2016 Outage), Rev. 1

CSI-NDE-99-051, Steam Generator Secondary Side Integrity Plan, Rev. 15

Certificate of Personnel Qualification for Examiners: L. Black, L. Cooper, L. Hover, W. McMillan, W. Sumrall, H. Abendanio, D. Black, R. Emery, C. Fuller, L. Raper, D. Rayburn, D. Wadzinski, J. Zevchak

Examination Technique Specification Sheets, Rev. 0: ETSS-1, ETSS-2, ETSS-3, ETSS-4

ENG-CSI 2.3, Steam Generator Integrity Program Administration, Rev. 32

ENG-CSI 2.2, Planning and Reporting Results of Steam Generator Tubing Examinations, Rev. 44

ER-AP-121, Steam Generator Integrity, Rev. 2

Health Report, Boric Acid Corrosion, Q1-2016

L-2015-055, License Amendment Request 242 Changes to Snubber Surveillance Requirements, April 2016

PTN/PSC-TO-N1075-501, Tendon Selection and Predicted Forces for the 40th Year IWL Containment Tendon Surveillance

Report# REP-1076-510, Final Report for the 40th Year Tendon Surveillance at Turkey Point, March 2013

WCAP-17475-NP, Component Inspection Details Supporting Aging Management of Reactor Internals at Turkey Point 4, Rev. 0

Welding Procedure Specification (WPS) 43, Rev. 12

Welding Procedure Qualification Record (PQR) N334, Rev. 0; N140, Rev. 6; N334, Rev. 0; 8-8-3, Rev. 0; 8-8-4, Rev. 0

Section 1R11: Licensed Operator Requalification Process

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

TR-AA-230-1007, Conduct of Simulator Training and Evaluation

Section 1R15: Operability Evaluations

0-ADM-213, Technical Specification Related Equipment Out of Service Logbook
0-ADM-226, Operability Screening and ARs
EN-AA-203-1001, Operability Determinations and Assessments

Section 1R18: Plant Modifications

EC 246859, Unit 4 Turbine Control System
EC 286032, Switchyard Relay Modification

Section 1R19: Post Maintenance Testing

0-ADM-737, Post Maintenance Testing
MA-AA-203-1000, Maintenance Functional Testing

Section 1R20: Refueling and Other Outage Activities

0-ADM-009, Containment Closeout Inspection
MA-AA-101-1000, Foreign Material Exclusion Procedure

Section 1R21: Component Design Bases Inspection

Calculations

PTN-BFSI-13-002, PTN Unit 3/4-Over Power/Over Temperature DT set Case Scaling-
Procedures 3/4-PMI-041.6-8

Modifications

EC-246974, Extended Power Uprate – Turkey Point Unit 4 – Main Steam Pressure Lead/Lag
and Eagle 21 Changes

Corrective Action Documents Written Due to this Inspection

AR 1773821
AR 1773857
AR 1774197
AR 1839314
AR 1840585

Work Orders

40071137-01
40071137-17
40071137-18
40071137-19
40071137-20
40071137-21
40087769-13
40087769-19
40087769-21
40087769-29
40087769-30

Miscellaneous

Letter License Amendment Request, "Resistance Temperature Detector Bypass Elimination Project," dated September 13, 1990, (ML9009250084)
 Letter, "Resistance Temperature Detector Bypass Elimination Project," dated January 4, 1991 (ML9101090132)
 Letter, License Amendment and Safety Evaluation, "Turkey Point Units 3 and 4 -Issuance of Amendments Re: Removal of RTD Bypass Manifold (Tac Nos. 77633 And 77634) (ML9104260259)
 EN-AA-203-1001-F04_002_2 IOD Eagle 21 NAMS AR Operability Notes Worksheet
 FPL Reply to NRC Questions Regarding Eagle 21 Modification
 WCAP-12858 Supplement 1 Revision 2, "Turkey Point Units 3 and 4 Eagle 21 Process Protection System Replacement Hardware Verification And Validation Report
 WCAP-12374/5, "Eagle-21 Micro Processor Based Process Protection System for Turkey Point Units 3 and 4"
 FCN-FPL0-40536A, "Eagle 21 Process Protection System- Field Change Notice (FCN) for the Eagle 21 Tuning Constants Change and Software Modifications"

Section 2RS01: Radiological Hazard Assessment and Exposure ControlsProcedures and Guidance Documents

0-ADM-023, Inventory Control and Accounting of Radioactive Sources, Rev. No. 4
 0-ADM-605, Control of Radioactive Material, Rev. No. 4
 0-HPA-001, Radiation Work Permit Initiation and Termination, Rev. No. 4
 0-HPS-021.3, Radiological Controlled Area Exit for Personnel, Rev. No. 6A
 0-HPS-025.2, Posting and Survey Requirements for Fuel Movement, Rev. No. 5
 0-HPS-027.1, Work Controls in Hot Particle Areas, Rev. No. 0D
 0-HPS-053.6, Postings and Controls for Resin Transfers, Rev. No. 2
 0-HPS-055, Steam Generator Radiation Protection Work Controls, Rev. No. 0C
 0-HPS-096.1, Decontamination of Tools, Equipment and Areas, Rev. Approval Date: 10/02/07
 0-HPS-106, Survey & Posting Guidelines for Plant Evolutions, Rev. 5
 PI-AA-01, Corrective Action Program and Condition Reporting, Rev. No. 3
 PI-AA-100, Condition Assessment and Response, Rev. No. 8
 PI-AA-104-1000, Corrective Action, Rev. No. 8
 RP-AA-100, Radiation Protection Administrative Program, Rev. No. 3
 RP-AA-100-1001, Radiation Protection Conduct of Operations Guideline, Rev. No. 3
 RP-AA-100-1002, Radiation Worker Instructions and Responsibilities, Rev. No. 2
 RP-AA-102-1000, Alpha Monitoring, Rev. 2
 RP-AA-102-1001, Area Radiological Surveys, Rev. No. 1
 RP-AA-103-1001, Posting Requirements for Radiological Hazards, Rev. 3
 RP-AA-103-1002, High Radiation Area Controls, Rev. No. 4
 RP-AA-107, Radioactive Material Control Program, Rev. 0
 RP-AA-107-1003, Unconditional and Conditional Release of Material, Rev. 1
 RP-SR-103-1008, Remote Monitoring, Rev. 6
 RP-TP-101-1003, Personnel Contamination Monitoring and Decontamination, Rev. No. 1
 RP-TP-102-1001, Radiological Air Sample Assay, Rev. No. 4
 RP-TP-102-1002, Hard to Detect Radionuclides and Contamination Controls, Rev. No. 1
 RP-TP-103-3001, ISFSI Radiological Controls, Rev. No. 3
 RP-TP-107-1001, Storage of Highly Radioactive Material in the Reactor Cavity or Spent Fuel Pool, Rev. No. 1

Records and Data

Air Calculation Sheets, U-4 RCB Equipment Hatch, Routine, General Area, 04/18/16; and U4 RCB Upper RX Cavity, Routine, General Area, 04/18/16

Annual NSTS Inventory Reconciliation Report, 01/25/16

Attachment 2, Spent Fuel Pool Inventory (Page 1 of 1), Unit 3, RP-TP-107-1001, Storage of Highly Radioactive Material in the Reactor Cavity or Spent Fuel Pool, Rev. No. 1, 12/07/12

Attachment 2, Spent Fuel Pool Inventory (Page 1 of 1), Unit 4, RP-TP-107-1001, Storage of Highly Radioactive Material in the Reactor Cavity or Spent Fuel Pool, Rev. No. 1, 12/30/14

Attachment 8 (Page 1 of 1), Unit 4 Fuel Movement Area Down Posting Checklist, 0-HPS-025.2, Posting and Survey Requirements for Fuel Movement, Rev. No. 5, 04/17/16

Exposure Investigation Report, HP-12.6 Log No. 16-028, Event Type 3, DAD S/N 079645, 04/17/16

HP Radioactive Source Inventory Report, 10/27/15 and 04/18/16

Radiation Work Permit (RWP) Number (No.) 16-4018, 4A, 4B, 4C RCP Motor and Seal Replacement, Rev. 01

RWP No. 16-4024, BMI Topside Support Work, Rev. 01

RWP No. 16-4100, Lower Cavity Work – Including Decon, RP Surveys, Installation and Removal of Lower Cavity Ladder, Blind Flange and LLRT – Removal, LLRT and Replacement of Fuel Transfer Tube Blind Flange, Rev. 06

RWP No. 16-4203, Non High Radiation Area – Engineering Activities – Including Snubbers, ISI, Erosion/Corrosion, Bolt and Joint, FAC, LLRT's associated with ISI and all Support Work, Rev. 00

Shuffle Data Sheet, Unit 4 Visual Inspection, Ultrasonic Cleaning & Insert Shuffle, Pages 2 and 3 of 18, 04/06/16

Standard Map Survey Report (SMSR), Survey Nos. PTN-M-20150918-6, 0-ISFSI/ISFSI_SemiAnnual_PAD, 09/18/15; and PTN-M-20160321-4, 0-SFSI/ISFSI_SemiAnnual_PAD, 03/21/16

SMSR Survey No. PTN-M-20160406-40, 4-Fuel Move/4AuxRoofFuelMove, 04/06/16

SMSR, Survey No. PTN-M-20160407-3, 4-Fuel Move/4AuxRoofFuelMove, 04/07/16

SMSR, Survey No. PTN-M-20160418-1, 4-RCB-14/Unit 4 Reactor Sump/U4 RCB/RX Sump, 04/18/16

SMSR, Survey No. PTN-M-20160418-10, 4-RCB-58/U4RXCavity, 04/18/16

SMSR, Survey No. PTN-M-20160418-30, 4-RAB-18/U4Equipment Hatch, 04/18/16

SMSR, Survey No. PTN-M-20160420-14, 4-RCB-58/U4RxCavity, 04/20/16

Turkey Point Plant, Environmental and Radiation Controlled Area, Radiation Levels Results Log, HP-55A, Rev. 8, 02/15/16

Unit 3 Spent Fuel Pool, Status of Cells with Trash Baskets and with Loose Trash, 03/27/14

Unit 4 Spent Fuel Pool, Status of Cells with Trash Baskets and with Loose Trash, Undated

CAP Documents

AR 02091280
 AR 02092439
 AR 02121997
 AR 02123851
 AR 02126214
 AR 02014655

Section 2RS8: Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation**Procedures and Guidance Documents**

0-ADM-220, Abandoned Equipment Program, 11/20/08
0-ADM-605, Control of Radioactive Material, Rev. 4
0-HPS-040.5, 10 CFR61 Compliance and Radioactive Waste/Material Shipment Classification and Characterization, 06/22/10
0-HPA-045, Process Control Program, Rev. 0
0-NCOP-502, DTS Media Dewatering, 5/20/10
0-NCOP-506, Operation of the Primary Fillhead and Resin Liner, 7/22/09
PI-AA-104-1000, Corrective Action, Rev. 8
RP-AA-107-1002, Requirements for Radioactive Materials Stored Outdoors, Rev. 2
RP-AA-108-1002, Shipment of Radioactive Material, Rev. 5
RP-AA-108-1003, Radioactive Materials Surveys for Shipment, Rev. 2
RP-AA-108-1004, Packaging Radioactive Materials for Shipment, Rev. 0

Records and Data

10 CFR61 Analysis for 2016 DAW, 6/27/14 and 4/13/16
10 CFR61 Analysis for Primary Resin Liner 643598-20, 11/14/14
Annual Radiological Effluent Release Report, January 2014 - December 2014
Outdoor Container Inspection Log, 3/27/16
Radioactive Material Shipment M-15-001, LSA-II, Fuel Handling Tools, 1/26/15
Radioactive Material Shipment M-15-056, LSA-II, AREVA Tools, 11/16/15
Radioactive Material Shipment M-16-017, LSA-II, DAW, 3/24/16
Radioactive Material Shipment M-16-027, LSA-II, Laundry, 4/20/16
Radioactive Waste Shipment W-15-013, LSA-II, DAW, 6/3/15

CAP Documents

AR 02027771
AR 02042429
AR 02076359
AR 02126606
AR 02126609

Section 4OA1: Performance Indicator Verification

0-ADM-032, NRC Performance Indicators Turkey Point, Rev. 5

LIST OF ACRONYMS

AFW	Auxiliary Feedwater
ALARA	As Low as Reasonably Achievable
ANSI	American National Standards Institute
AR	Action Request
ASME	American Society of Mechanical Engineers
BACC	Boric Acid Corrosion Control
BMI	Bottom Mounted Instrumentation
BMV	Bare Metal Visual
BPVC	Boiler and Pressure Vessel Code
CAP	Corrective Action Program
CCW	Component Cooling Water
CDF	Core Damage Frequency
CFR	Code of Federal Regulations
COLR	Core Operating Limits Report
CVCS	Chemical Volume Control System
DAW	Dry Active Waste
DOT	Department of Transportation
EC	Eddy Current
EDG	Emergency Diesel Generator
EPRI	Electric Power Research Institute
EPU	Extended Power Uprate
ETSS	Examination Technique Specification Sheets
FAC	Flow Accelerated Corrosion
FME	Foreign Material Exclusion
FSAR	Final Safety Analysis Report
GOP	General Operating Procedure
HHSI	High Head Safety Injection
HRA	High Radiation Area
ICW	Intake Cooling Water
IEEE	Institute of Electrical and Electronic Engineers
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISI	Inservice Inspection
IST	Inservice Testing
LA	License Amendment
LCO	Limiting Condition of Operation
LER	Licensee Event Report
LHRA	Locked High Radiation Area
LOCA	Loss of Coolant Accident
NAP	Nuclear Administrative Procedure
NBS	National Bureau of Standards
NCV	Noncited Violation
NDE	Non-Destructive Examination
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OCC	Outage Control Center
ODCM	Offsite Dose Calculation Manual

OE	Operating Experience
OLRM	On-line Risk Monitor
ONOP	Off Normal Operating Procedure
OOS	Out of Service
OPΔT	Thermal Over-Power
OSP	Operations Surveillance Procedure
OTΔT	Thermal Over-Temperature
P&ID	Piping and Instrumentation Drawing
PI	Performance Indicator
PORV	Power Operated Relief Valve
PT	Penetrant Testing
PW	Primary Water
QA	Quality Assurance
RAM	Radioactive Material
RCA	Radiologically Controlled Area
RCE	Root Cause Evaluation
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RFO	Refueling Outage
RG	Regulatory Guide
RHR	Residual Heat Removal
ROP	Reactor Oversight Process
RP	Radiation Protection
RPS	Reactor Protection System
RPT	Radiation Protection Technician
RTP	Rated Thermal Power
RS	Radiation Safety
RWP	Radiation Work Permit
SDP	Significance Determination Process
SER	Safety Evaluation Report
SFP	Spent Fuel Pool
SG	Steam Generator
SGISI	Steam Generator Inservice Inspection
SI	Safety Injection
SL	Severity Level
SR	Surveillance Requirement
SUT	Startup Transformer
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
UT	Ultrasonic Testing
V&V	Verification and Validation
VHRA	Very High Radiation Area
VT	Visual Testing
WCAP	Westinghouse Commercial Atomic Power
WO	Work Order