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

August 11, 2017

EA-17-095

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

SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION – NRC INTEGRATED INSPECTION REPORT 05000250/2017002, 05000251/2017002

Dear Mr. Nazar:

On June 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Turkey Point Nuclear Generating Station, Units 3 and 4. On June 30, 2017, the NRC inspectors discussed the results of the inspection with Mr. Brian Stamp, Plant General Manager and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented three findings of very low safety significance (Green) in this report. Two of these findings involved a violation of NRC requirements. The NRC is treating these violations as non-cited violations (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

If you contest the violations or significance of the NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC resident inspector at the Turkey Point Nuclear Generating Station.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555 0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the Turkey Point Nuclear Generating Station.

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

Sincerely,

/RA/

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

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

Enclosure:
IR 05000250/2017002, 05000251/2017002
w/Attachment: Supplemental Information

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DATE	8/10/2017	8/7/2017	8/9/2017	8/7/2017	8/7/2017	8/7/2017
OFFICE	RII/DRS	RII/DRS	RII/DR	EICS	RII/DRP	RII/DRP
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REGION II

Docket Nos:	50-250, 50-251
License Nos:	DPR-31, DPR-41
Report Nos:	05000250/2017002, 05000251/2017002
Licensee:	Florida Power and Light Company (FPL)
Facility:	Turkey Point Nuclear Generating Station, Units 3 & 4
Location:	9760 SW 344th Street Homestead, FL 33035
Dates:	April 1, 2017 through June 30, 2017
Inspectors:	J. Orr, Senior Resident Inspector J. Reyes, Resident Inspector N. Hobbs, Acting Resident Inspector R. Carrion, Senior Reactor Inspector (Section 1R08) A. Butcavage, Reactor Inspector (Section 1R08) T. Morrissey, Senior Resident Inspector, St. Lucie Nuclear Plant (Sections 4OA1 and 4OA3) J. Patel, Reactor Inspector (Section 4OA2.3) A. Wilson, Project Engineer (Section 4OA5.1)
Approved by:	LaDonna B. Suggs, Chief Reactor Projects Branch 3 Division of Reactor Projects

Enclosure

SUMMARY

IR 05000250/2017002, 05000251/2017002; 04/01/2017 – 06/30/2017; Turkey Point Nuclear Generating Station, Units 3 & 4; Inservice Inspection Activities and Problem Identification and Resolution.

The report covered a three-month period of inspection by the resident inspectors, a visiting senior resident inspector and region-based specialist inspectors. One self-revealing and two NRC-identified findings were identified, of very low safety significance. Two of these findings were determined to be non-cited violations (NCV) of NRC requirements. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events and Mitigating Systems

- Green: A self-revealing Green (NCV) of Technical Specification (TS) 6.8.1.a., "Procedures and Programs," was identified for the failure to appropriately implement foreign material exclusion (FME) controls during Thermo-Lag fire barrier modifications. Specifically, maintenance procedure 0-GMP-102.21, "Installation, Modification and Maintenance of Thermo-Lag Fire Barrier System," Rev. 0C, did not include instructions in sufficient detail to prevent foreign material used in the installation of Thermo-Lag fire barriers from entering nearby electrical equipment and was a performance deficiency (PD) which affected the operation of two redundant safety-related battery chargers and caused a high energy arc fault (HEAF) that damaged the 3A 4kV switchgear bus. After the HEAF, the licensee promptly ceased all Thermo-Lag installation activities. The licensee completed a root cause evaluation in Action Request (AR) 2192198 and revised the installation procedure to prevent foreign material from entering nearby electrical equipment.

  The PD was more than minor because it caused both a reactor trip and resulted in the unavailability of the 3A 4kV switchgear bus. The inspectors evaluated the significance of this finding by utilizing IMC 0609 Attachment 4, "Initial Characterization of Findings," and IMC 0609 Appendix A, "The Significance Determination Process for Findings At-Power," and determined the finding's significance could not be screened to Green because it caused both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition. Therefore a detailed risk evaluation was required to complete the significance determination. Based upon the results of the evaluation the finding was considered to be Green, or equivalent to low safety significance. The cross-cutting aspect (CCA) that best corresponds to the root cause as described in IMC 0310, "Aspects Within the Cross-Cutting Areas," was "Resources;" leaders ensure that personnel, equipment, procedures, and other resources are available and adequate to support nuclear safety (H.1). (Section 4OA2.2)

Cornerstone: Mitigating Systems

- Green: A NRC-identified Green finding was identified for the licensee's failure to follow plant procedure O-ADM-016, "Fire Protection Program," Rev. 19. Specifically, the licensee failed to properly implement fire watches following a HEAF on the 3A 4kV switchgear bus.

The inspectors determined that the licensee's failure to implement fire detection was a PD. This PD was more than minor because it was associated with the reactor safety mitigating systems cornerstone, and if a fire was not detected in the 3B 4kV switchgear room there was a potential for the B train of equipment to lose function which could have resulted in the unavailability of both the A and B trains of equipment post incident. The finding is not greater than Green because a risk analysis of the PD was performed and determined the risk increase in core damage frequency due to the PD was equivalent to a Green finding of very low safety significance due to the short exposure period. Because site personnel failed to reset fire detectors and implement fire watches in appropriate areas following the incident; and during interviews, inspectors identified that fire drills did not emphasize post incident activities, the inspectors concluded the finding had a CCA in the area of Human Performance associated with the "Training;" the organization provides training and ensures knowledge transfer to maintain a knowledgeable, technically competent workforce and instill nuclear safety values (H.9). (Section 4OA2.3)

Cornerstone: Barrier Integrity

- Green: A NRC-identified Green NCV of 10 CFR 50.55a, "Codes and Standards," was identified for the failure to perform general visual examinations of moisture barrier materials in the reactor containment leak-chase channel test connections in accordance with the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code, Section XI, Subsection IWE. The licensee performed the required examinations in Unit 3 during the April 2017, refueling outage and initiated corrective actions to revise the physical configuration of leak chase areas and review the In-service Inspection (ISI) Plan. This issue has been entered into the licensee's corrective action program as AR 02196637.

  The failure to conduct the required visual examination of all moisture barriers in accordance with the ASME BPV Code requirements was a PD. The PD was more than minor significance per IMC 0612, Appendix B, "Issue Screening," because the current Containment ISI Plan did not adequately implement the ASME BPV Code inspection requirements for the examination of moisture barriers, and if left uncorrected, had the potential to lead to a more significant concern. The finding was of very low safety significance, or Green, per IMC 0609 because it did not, based on inspections performed following discovery, represent an actual open pathway in the physical integrity of the reactor containment. Because the licensee did not effectively evaluate and appropriately implement the ASME BPV Code requirements in the Containment ISI Plan when a reasonable opportunity was available through the licensee's review of NRC Information Notice (IN) 2014-07 and Regulatory Issue Summary (RIS) 2016-07, the inspectors determined the finding had a CCA in the operating experience component of the problem identification and resolution cross-cutting area, in that the organization systematically and effectively collects, evaluates, and implements relevant internal and external operating experience in a timely manner (P.5). (Section 1R08)

  Licensee-Identified Violations

  None

REPORT DETAILS

Summary of Plant Status

Unit 3 began the inspection period defueled during a planned refueling outage, (PT3-29). Unit 3 was restarted on April 25, 2017 and returned to 100 percent of rated thermal power (RTP) on April 30, 2017, where it remained through the end of the inspection period.

Unit 4 began this inspection period at 100 percent of RTP where it remained through the end of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (IP 71111.01)

.1 Summer Readiness of Offsite and Alternate Alternating Current (AC) Power Systems and Seasonal Extreme Weather Preparations

a. Inspection Scope

During the month of 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. Action Request (AR) reports were reviewed to determine if the licensee was identifying and resolving conditions associated with adverse weather preparedness. This inspection constitutes one summer readiness of offsite alternate AC power systems sample and one seasonal extreme weather conditions sample.

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

b. Findings

No findings were identified.

.2 External Flooding Preparations

a. Inspection Scope

The inspectors performed walk down 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 (EDGs) and fuel oil tanks, auxiliary feedwater (AFW) pump areas and the turbine buildings. The inspectors also reviewed the applicable Updated Final Safety Analysis Report (UFSAR) sections, Technical Specifications (TS), and other licensing basis documents regarding external flooding and flood protection, including specific plant design features to mitigate the maximum flood level. Corrective action program (CAP) documents and work orders (WO) 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 lead to external flooding of safety related equipment. This inspection constitutes one external flooding readiness sample.

b. Findings

No findings were identified.

1R04 Equipment Alignment (IP 71111.04)

Partial Equipment Walk Downs (IP 71111.04Q)

a. Inspection Scope

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

- 3B residual heat removal (RHR) pump operating at reactor coolant system (RCS) reduced inventory level for reactor vessel head installation;
- 3A 4 kilovolt (kV) switchgear bus return to service after temporary modification to remove the damaged reactor coil;
- 3B 4kV switchgear bus, 3B EDG, 3B high head safety injection (HHSI) pump, and the 4A and 4B HHSI pumps while the 3A 4kV switchgear bus was out of service; and,
- 3A and 3B HHSI pumps, Unit 3 and 4 refueling water storage tanks, and the 3A, 3B, 4A, and 4B 4kV switchgear rooms while the 4A and 4B HHSI pumps were out of service.

b. Findings

No findings were identified.

1R05 Fire Protection (IP 71111.05)

.1 Fire Area Walk Downs (IP 71111.05Q)

a. Inspection Scope

The inspectors walked down the following 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 and compared them to the requirements in licensee procedure 0-ADM-016, "Fire Protection Program." The inspectors routinely reviewed the licensee's fire impairment lists and monitored the associated corrective actions for completion. The inspectors reviewed the action request 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 use. This inspection constitutes four quarterly samples. The following areas were inspected:

- Unit 3 and Unit 4 standby steam generator feedwater pump areas;
- Cable spread room;
- Unit 3 and Unit 4 charging pump rooms; and,
- Unit 3 and Unit 4 HHSI pump rooms.

b. Findings

No findings were identified.

.2 Fire Protection – Drill Observation (IP 71111.05A)

a. Inspection Scope

On May 16, 2017, the inspectors observed a fire drill that took place within the Unit 3 condensate polisher building. 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 annual sample.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (IP 71111.06)

a. Inspection Scope

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

- Unit 3 and Unit 4 Component Cooling Water Pump and Heat Exchanger Rooms

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) Activities (71111.08)

a. Inspection Scope

Non-Destructive Examination (NDE) Activities and Welding Activities

From March 31, 2017 through April 7, 2017, the inspectors conducted a review of the implementation of the licensee's ISI Program for monitoring degradation of the reactor coolant system, steam generator tubes, boric acid corrosion control program, risk-significant piping and components, corrective action reports, and a sample of the containment system moisture barrier seals.

The inspectors reviewed records of the following NDEs mandated by the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (BPV) Code (Code of Record: 2007 Edition with 2008 Addenda) to evaluate compliance with the ASME Code Section XI and Section V requirements and, if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC approved alternative requirement.

- Ultrasonic Examination (UT), Weld 14-FWA-2301-21, Main Feedwater System, Loop "A", Class 2 (reviewed)
- Visual Examination (VT) -1, Component 3-SGB-I-IRS, Inside Radius Steam Generator B Primary Side (reviewed)
- VT-1, Component 3-SGB-O-IRS, Inside Radius Steam Generator B Primary Side (reviewed)

The inspectors reviewed the following pressure boundary weld NDE reports to evaluate if the licensee applied appropriate acceptance criteria required by ASME Code Section XI. In addition, the inspectors reviewed the welding procedure specification, welder qualifications, welding material certification and supporting weld procedure qualification records, to evaluate if the weld procedure was qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- Liquid Penetrant (PT) Examination, Weld FW-11, Component Cooling System, Component 3-711B, ASME Class 3 (reviewed)
- PT Examination, Weld FW-1, FW-2 and FW8, Component Cooling System, Component 3-711B ASME Class 3 (reviewed)
- PT Examination, Weld FW-3, FW-4, FW5 and 6, Component Cooling System, Component 3-711B ASME Class 3 (reviewed)
- PT Examination, Weld FW-7, FW-9 and FW 10, Component Cooling System, Component 3-711B ASME Class 3 (reviewed)

Inspectors also reviewed a sample of the visual examination results recorded for the Turkey Point 45th year tendon surveillance program for the Unit 3 containment which was part of ASME Section XI, Subsection IWL inspections. The sample tendon results are listed in the Documents Reviewed section. The review included the results for the tendon end cap removal and inspection for water intrusion; anchorage condition; bearing plate inspection; end cap conditions; and grease replacement.

The licensee confirmed that during non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any recordable indications that were accepted for continued service. Therefore, no NRC review was completed for this inspection procedure attribute.

In addition, the inspectors independently walked down the moisture barrier seal and containment liner leak chase connections between the containment inner shell plate and floor at the 14 foot (ft) elevation for signs of degradation. The inspectors also reviewed the associated evaluation generated by the licensee via Action Request (AR) 286323-01 for compliance with paragraph IWE-3510 of Section XI.

Reactor Pressure Vessel Upper Head Penetration Inspection Activities

For the Unit 3 reactor vessel head, a bare metal visual examination and volumetric examination were not required this outage pursuant to 10 CFR 50.55a(g)(6)(ii)(D). Therefore, the inspectors reviewed the final report records of the last visual examination conducted during the 2014 refuel outage on the Unit 3 reactor vessel head penetrations, to evaluate if the activities were conducted in accordance with the requirements of the ASME Code Case and 10 CFR 50.55a(g)(6)(ii)(D).

The inspectors also performed a field walkdown of the accessible portions of the reactor vessel closure head dome and flange area while the head was on the storage stand. Inspectors reviewed the following ARs associated with the reactor vessel closure head to evaluate that corrective actions and follow-up activities were appropriately addressed.

- AR 2093963, Water Spray Out of Reactor Vessel Level Monitoring System Column Number 59
- AR 2193248, U-3 RX Head 3T237, Inactive Boric Acid around RX Head Studs

Boric Acid Corrosion Control (BACC) Inspection Activities

The inspectors performed an independent walk down of portions of the RCS which recently received a licensee boric acid walk down and evaluated if the licensee's BACC

visual examinations emphasized locations where boric acid leaks could cause degradation of safety-significant components.

The inspectors also reviewed the following licensee evaluations of RCS components with boric acid deposits to evaluate if degraded components were documented in the corrective action system. The inspectors also evaluated the corrective actions and performed field inspections for selected RCS components, and evaluated the as found conditions against the component ASME Code Section XI requirements and/or NRC approved alternatives.

- AR 2181810, MOV-3-872, Active Boric Acid Leakage at Valve Packing
- AR 2192917, CV-3-311, Inactive Brown Dry Boric Acid at Valve Packing

The inspectors reviewed the following 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 Section XI and 10 CFR Part 50, Appendix B, Criterion XVI.

- AR 2196560, LT-3-460, Inactive, Minor, Dry, Boric Acid on Swagelok Cap in Containment
- AR 2196644, RCP "C", Cold Leg Penetration Area, Water Dripping on Snubber 3-1069
- AR 2192917, Charging to Pressurizer Auxiliary Spray Control Valve

Steam Generator (SG) Tube Inspection Activities

The inspectors reviewed the Unit 3 eddy current (EC) examination activities in SGs A, B, and C to evaluate the inspection activities against the licensee's TS; NRC commitments; ASME Section XI; and Nuclear Energy Institute (NEI) 97-06, "Steam Generator Program Guidelines." The inspectors reviewed the scope of the EC examinations to verify that it included the applicable potential areas of tube degradation. The inspectors also verified that appropriate inspection scope expansion criteria were planned based on inspection results. In addition, the inspectors reviewed EC examination status reports to ensure that all tubes with relevant indications were appropriately screened for in-situ pressure testing. Based on the EC examination results, no new degradation mechanisms were identified, no EC scope expansion was required, and none of the SG tubes examined met the criteria for in-situ pressure testing.

The inspectors reviewed the last Condition Monitoring and Operational Assessment report to assess the licensee's prediction capability for maximum tube degradation. The inspectors' review also included the licensee's repair criteria and repair process to ensure that they were consistent with plant TS and industry guidelines. This included direct observation of stabilization and tube plugging activities in SG C (tube location 12/44). The inspectors also reviewed the primary-to-secondary leakage (e.g., SG tube leakage) history for the last operating cycle. The inspectors noted that primary-to-secondary leakage was below the detection threshold during the previous operating cycle; none had been detected.

In addition, the inspectors reviewed documentation to ensure that data analysts, EC probes, and equipment configurations were qualified to detect the existing and potential SG tube degradation mechanisms. The inspectors' review included a sample of site-specific Examination Technique Specification Sheets (ETSSs) to ensure that their qualification was consistent with Appendix H or I of the Electric Power Research Institute (EPRI), "Pressurized Water Reactor Steam Generator Examination Guidelines," Revision 7. The inspectors also directly observed a sample of EC data acquisition in SG A (Hot Leg side) using +Point and 3-Coil/+Point probes.

The inspectors also reviewed a sample of EC data with a qualified data analyst to confirm that data analysis was performed in accordance with the applicable ETSSs and site-specific analysis guidelines. The inspectors verified that the equipment configuration was consistent with the essential parameters of the applicable technique. The inspectors also verified that recordable indications were detected and sized in accordance with vendor procedures. As part of the EC data review, the inspectors verified that any EC indications on each selected tube were consistent with historical data relative to the number of indications, location, and size. The sample of EC data selected for review is listed below:

Steam Generator	Tube Row/Column	Eddy Current Probe	Indication Type
3C	R12/C44	Bobbin	PLP
3C	R33/C32	Bobbin	AVB Wear

Identification and Resolution of Problems

The inspectors reviewed a sample of ISI-related issues entered into the corrective action program. The inspectors evaluated if the licensee had appropriately described the scope of the problem and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant.

This inspection constitutes one sample and completes the required ISI activity.

b. Findings

Introduction: A Green NRC-identified non-cited violation (NCV) of 10 CFR 50.55a, "Codes and Standards," was identified for the failure to perform 100 percent general visual examinations of all moisture barrier materials in the reactor containment leak-chase channel test connections in accordance with the ASME BPV Code, Section XI, Subsection IWE.

Description: During the 2017 spring refueling outage for Turkey Point Unit 3 (PT3-29), the inspectors performed a containment walk down inspection and identified a concern for two leak chase locations on the 14 ft elevation of containment. It was observed that two liner plate air test connections were exposed in a floor recess area that was flooded with water. Per drawing 5610-C164, these test connections were to be grouted into the floor after the initial tests were completed.

Upon further review, the inspectors determined that the licensee had not performed 100 percent general visual examinations of the leak-chase channel test connections as required by ASME Section XI, Table IWE 2500-1. Beginning with the 1998 Edition with the 2000 Addenda, Section XI of the ASME BPV Code, Subsection IWE, Table IWE-2500-1, Category E-A, "Containment Surfaces," Item E1.30, "Moisture Barriers," specifically required a general visual examination of 100 percent of moisture barriers every inspection period. The general visual examination shall include moisture barrier materials intended to prevent intrusion of moisture against inaccessible areas of the pressure retaining metal containment shell or liner at concrete-to-metal interfaces and at metal-to-metal interfaces which were not seal-welded. The two test connections identified by the inspectors were not included in the licensee's visual examination.

On May 5, 2014, the NRC issued Information Notice (IN) 2014-07, "Degradation of Leak-Chase Channel Systems for Floor Welds of Metal Containment Shell and Concrete Containment Metallic Liner." The IN discussed the applicability of the ASME BPV Code to the leak-chase channel system. Additionally, on May 9, 2016, the NRC issued Regulatory Information Summary (RIS) 2016-07, "Containment Shell or Liner Moisture Barrier Inspection," to reiterate the NRC staff's position in regard to inservice inspection requirements for moisture barrier materials. The licensee documented their review and assessment in the corrective action program.

Analysis: The failure to perform general visual examinations of moisture barrier material in the reactor containment leak-chase channel test connections in accordance with the ASME BPV Code, Section XI, Subsection IWE was a performance deficiency (PD). The inspectors determined that the PD was of more than minor significance per IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, because the current Containment ISI Plan did not adequately implement the ASME BPV Code requirements for the examination of all moisture barriers and, if left uncorrected, had the potential to lead to a more significant concern. Specifically, the Containment ISI Plan directed the licensee to perform moisture barrier examinations however, the plan failed to include the entire required scope as defined by ASME Section XI Code, Table IWE-2500-1, Item Number E1.30. The omission of the inspections at several leak chase test connections subjected the leak chase test connection stand pipes to a water-filled environment in the floor recess areas of containment. The water-filled recess location could lead to barrier degradation in the leak-chase channel test connection itself or degradation of inaccessible portions of the containment metal liner welds.

The inspectors used IMC 0609, Attachment 4, "Initial Characterization of Findings," dated October 7, 2016, and determined that the finding was associated with the Barrier Integrity Cornerstone because it involved potential degradation of the reactor containment metal liner. Based on IMC 0609, Appendix A, "The Significance Determination Process (SDP) For Findings At-Power," "Exhibit 3 – Barrier Integrity Screening Questions," dated June 19, 2012, the inspectors determined that the finding was of very low safety significance (Green) because it did not represent an actual open pathway in the physical integrity of the reactor containment and did not involve an actual reduction in function of hydrogen igniters in the reactor containment.

The inspectors reviewed this PD for cross-cutting aspects as required by IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. The finding was determined to be reflective of present licensee performance in 2017, in that the licensee did not effectively evaluate and appropriately implement the ASME BPV Code

requirements in the Containment ISI Plan when a reasonable opportunity was available through the review of NRC IN 2014-07 and RIS 2016-07. Therefore, the finding was assigned a cross-cutting aspect in the "Operating Experience" component of the Problem Identification and Resolution cross-cutting area, in that the organization systematically and effectively collects, evaluates, and implements relevant internal and external operating experience in a timely manner, (P.5).

Enforcement: Title 10 of the *Code of Federal Regulations* (CFR) 50.55a(b), "Codes and Standards," stated, in part, that systems and components of boiling and pressurized water-cooled nuclear power reactors must meet the applicable requirements of the ASME BPV Code, subject to the conditions in 10 CFR 50.55a(b)(2). The 1998 Edition with the 2000 Addenda of ASME BPV Code, Section XI, Subsection IWE, through the latest edition and addenda incorporated by reference in paragraph 10 CFR 50.55a(a) (i.e. 2007 Edition with 2008 Addenda) required examination of moisture barriers in metal containments. Specifically, Table IWE-2500-1, Category E-A, "Containment Surfaces," Item E1.30, "Moisture Barriers," required a general visual examination of 100 percent of moisture barriers intended to prevent intrusion of moisture against inaccessible areas of the pressure retaining metal containment shell every inspection period.

Contrary to the above, after the May 5, 2014 issue date of NRC IN 2014-07, when given the opportunity during outages, the licensee failed to perform general visual examinations of 100 percent of moisture barrier material intended to prevent intrusion of moisture through the leak-chase channel test connections to inaccessible areas of the pressure retaining metal containment shell. Specifically, the licensee failed to include all of the leak chase channel test connections required by Code for visual examination in the scope of the ISI Program. As corrective action, in April 2017, the licensee completed a containment walkdown of Turkey Point Unit 3, and visual examination of similar type floor recess leak-chase test connections during the refueling outage, in accordance with the Code. The visual examination did not identify significant degradation or indications of moisture intrusion into the test connections. The containment integrity of Unit 3 was demonstrated by performing the required inspections on the leak chase ports under review which demonstrated that the boundary of the leak chase connection was intact. Unit 4 applicability was also considered by the licensee. Previous walkdown inspections, documented in AR 1964311, were performed for Unit 4 which found no issues. However, the licensee had scheduled verification inspection of those walk-downs to occur during the October 2017 refueling outage.

Because this finding is of very low safety significance and has been entered into the licensee's corrective action program as AR 2196637, this violation is being treated as an NCV consistent with Section 2.3.2.a of the Enforcement Policy, dated November 1, 2016. NCV 05000250/2017002-01, "Failure to Perform 100 Percent General Visual Examinations of Containment Moisture Barriers Associated with Containment Liner Leak Chase Test Connections."

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

.1 Simulator Observation (IP 71111.11Q)

a. Inspection Scope

On June 26, 2017, the inspectors assessed licensed operator performance in the plant-specific simulator during an initial licensed operator training evaluation. The training was evaluated by a licensed reactor operator and a senior nuclear training operations instructor. The scenario required control room operators to respond to a loss of a load center, initiate a reactor trip due to a loss of all charging pumps, and transition to post-loss of coolant accident cooldown and depressurization.

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

- Clarity and formality of communication;
- Ability to take timely action to safely control the unit;
- Prioritization, interpretation, and verification of alarms;
- Correct use and implementation of off-normal and emergency operating procedures and emergency plan implementing procedures;
- Control board operation and manipulation, including high-risk operator actions;
- Oversight and direction provided by shift supervisor, including ability to identify and implement appropriate TS actions and emergency plan classification and notification;
- Crew overall performance and interactions; and,
- Evaluator's control of the scenario and post scenario evaluation of crew performance.

This inspection constitutes one sample.

b. Findings

No findings were identified.

.2 Control Room Observations (IP 71111.11Q)

a. Inspection Scope

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

The inspectors also performed focused control room observations during periods of heightened activity or risk and verified operator compliance with station operating procedures and protocol and decorum as described in licensee procedure OP-AA-100-1000, "Conduct of Operations." The inspectors focused on the following attributes as appropriate:

- Operator compliance and use of procedures;
- Control board manipulations;

- Communication between crew members;
- Use and interpretation of plant instruments, indications and alarms;
- Use of human error prevention techniques;
- Documentation of activities, including initials and sign-offs in procedures; and,
- Supervision of activities including risk and reactivity management.

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

- April 11, 2017; control room operators drained the Unit 3 RCS to below the reactor vessel head (RVH) flange in preparation for RVH flange installation;
- April 13, 2017; control room operators conducted Unit 3 solid water RCS plant operations in Mode 5, started reactor coolant pumps, and vented the RCS;
- April 23, 2017; control room operators heated up the Unit 3 RCS in Mode 3 to normal operating temperature and pressure. Operators additionally responded to a loss of the McGregor Substation and entered 0-ONOP-002, "McGregor Substation Malfunction," during a heavy rain storm; and,
- April 25 – 26, 2017; control room operators conducted a Unit 3 reactor startup and completed low power physics testing.

This inspection constitutes four samples.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (IP 71111.12Q)

Routine Maintenance Effectiveness Inspection

a. Inspection Scope

The inspectors reviewed the following equipment problems and periodic evaluation reports to verify that the licensee's maintenance efforts met the requirements of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," and licensee procedure ER-AA-100-2002, "Maintenance Rule Program Administration." The inspectors focused on maintenance rule (MR) 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 attended the MR expert panel meetings and observed the engineering presentations on the systems changing MR status. The inspectors verified that equipment problems were being identified and appropriately entered into the licensee's CAP. The inspectors used the licensee MR database, system health reports, MR unavailability status reports, and the CAP as sources of information on tracking and resolution of issues. This inspection constitutes one routine maintenance effectiveness sample.

- ARs 2201692, 2202453, and 2202704, B Auxiliary Feedwater Pump Packing Issues

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors completed in-office reviews and control room inspections of the licensee's risk assessment of emergent or planned maintenance activities. The inspectors verified the licensee's risk assessment and risk management activities using the requirements of 10 CFR 50.65(a)(4); the recommendations of Nuclear Management and Resource Council 93-01, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," Revision 4A; 0-ADM-225, "On Line Risk Assessment and Management;" and 0-ADM-051, "Outage Risk Assessment and Control." The inspectors also reviewed the effectiveness of the licensee's contingency actions to mitigate increased risk resulting from 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 (OOS) equipment was included in the OLRM calculation. The inspectors evaluated the following risk assessments during the inspection period, which constitutes four inspection samples:

- Unit 3 shut down risk assessment and Unit 4 on-line risk assessment while the 3A 4 kV switchgear was OOS;
- Unit 3 and Unit 4 on-line risk assessment while the 4A and 4B HHSI pumps were OOS;
- Unit 3 and Unit 4 on-line risk assessment while the 3C CCW pump was OOS; and,
- Unit 3 and Unit 4 on-line risk assessment while the 3C CCW pump and 4A ICW pump were OOS.

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

The inspectors evaluated the technical adequacy of the licensee evaluations to ensure that TS operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred for the operability evaluations described in the ARs listed below. The inspectors reviewed applicable sections of the UFSAR to determine if the system or component remained available to perform its intended function. In addition, the inspectors reviewed compensatory measures were implemented when applicable, to verify that the affected equipment remained capable of performing its intended design function. The inspectors also reviewed a sampling of condition reports to verify that the licensee was routinely

identifying and correcting any deficiencies associated with operability evaluations. This inspection constitutes five samples.

- AR 2196867, MOV-3-862A, refuel water storage tank suction valve to 3A and 3B RHR pumps tripped thermal overloads during motor operated valve (MOV) testing;
- AR 2197290, 3A and 3B RHR pumps failed inservice full flow test;
- AR 2188196, 3B EDG exceeded surveillance voltage acceptance criteria during mini-load reject test;
- AR 2201419, 2200858 and 2200859, Plant Nuclear Safety Committee disposition of boric acid accumulation on core exit thermocouples identification numbers 51 and 55; and,
- AR 2200878, 'C' reactor coolant pump boric acid leak evaluation.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing (IP 71111.19)

a. Inspection Scope

For the post-maintenance tests and associated WOs listed below, the inspectors reviewed the test procedures and either witnessed the testing or reviewed test records to determine whether the scope of testing adequately verified that the work performed was correctly completed and demonstrated that the affected equipment was operable. The inspectors verified that the requirements in licensee procedure MA-AA-203-1000, "Maintenance Testing," were incorporated into the test requirements. The inspectors reviewed the following WOs which consisted of six inspection samples:

- WO 40460564-02, AFPD-3-012, B steam generator, train 2, AFW discharge check valve, disassemble, inspect, and overhaul;
- WO 40437746, 4A ICW pump motor inspection and electrical testing;
- WO 40519613-01; 3C CCW pump bearing replacement;
- WO 40431974 and 40431975, RHR Train A and B comprehensive test after performing maintenance on check valves 3-876A, 3-753A and 3-753B;
- WO 40148522, 40034136-01, 40034139 and 40432330, Main steam code safety valves RV-3-1400, RV-3-1403, RV-3-1405 and RV-3-1413, disassemble, refurbish, test and install;
- WO 40454793, 3A containment spray pump after motor replacement and temporary modification to adjust motor vibration frequency.

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities (IP 71111.20)

Unit 3 Refueling Outage (PT3-29)

a. Inspection Scope

Outage Planning, Control and Risk Assessment

The inspectors examined the licensee implementation of shutdown safety assessments during the Unit 3 refueling outage (PT3-29) 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. The inspectors regularly monitored outage planning and control activities in the outage control center, as well as work activities authorized from the work control center and main control room, and interviewed responsible outage control center management personnel and licensed operators during the outage to ensure system, structure, and component (SSC) 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 RHR from the reactor core and spent fuel pit (SFP) cooling during the shutdown period including the ICW system, CCW system, RHR system and SFP cooling system.

Outage Activities

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

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

Refueling Activities and Containment Closure

The inspectors witnessed selected fuel handling operations being performed in accordance with TSs and applicable operating procedures from the main control room, the refueling bridge inside the containment building, and the fuel handling bridge in the SFP building. The inspectors also examined licensee activities to control and track the position of each fuel assembly. The inspectors evaluated the licensee's ability to close the containment equipment, personnel, and emergency hatches in a timely manner per procedure 0-ADM-051, "Outage Risk Assessment and Control."

Corrective Action Program

The inspectors reviewed ARs generated during PT3-29 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 daily surveillances of outage activities as documented in the CAP.

This inspection completes one sample that was that was partially documented in NRC Inspection Report 2017001 (ADAMS Accession No. ML17131A318).

b. Findings

No findings were identified.

1R22 Surveillance Testing (IP 71111.22)

a. Inspection Scope

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

Containment Isolation Valve Leak Rate Tests:

- 3-OSP-051.5, Local Leak Rate Tests (section 7.7 for penetration number 7).

Surveillance Tests:

- 3-OSP-203.2, Engineered Safeguards Integrated Test, Section 7.3 Loss of Off-Site Power Coincident with Safety Injection;
- 3-OSP-023.1, Diesel Generator Operability Test (3A EDG normal start);
- 3-OSP-041.1, Reactor Coolant System Leak Rate Calculation;
- 0-OSP-051.5, Core Mapping Following Core Loading; and,
- 0-OSP-040.19, Low Power Physics Testing.

Inservice Tests:

- 3-OSP-075.6, AFW Train 1 Backup Nitrogen Test (A AFW pump); and,
- 3-OSP-075.7, AFW Train 2 Backup Nitrogen Test (B and C pumps).

b. Findings

No findings were identified.

4OA1 Performance Indicator Verification (IP 71151)

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, 2016, through March 31, 2017, 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 reviewed control room operator narrative logs, chemistry technician narrative logs, surveillance results for RCS leakage and activity, plant status reports, condition reports, and PI data sheets to verify that the licensee had identified the required data, as applicable. The inspectors interviewed licensee personnel associated with performance indicator data collection, evaluation, and distribution. This inspection constitutes two samples in each PI area, or four samples total.

- Unit 3 reactor coolant system (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 Inspection Procedure 71152, "Identification and Resolution of Problems," and to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a screening of items entered daily into the licensee's CAP. This review was accomplished by reviewing daily printed summaries of ARs and by reviewing the licensee's electronic AR database. Additionally RCS unidentified leakage was checked on a daily basis to verify no substantive or unexplained changes occurred.

b. Findings

No findings were identified.

.2 Annual Sample: Follow-up of Unresolved Items (URI) Related to Foreign Material Exclusion

(Closed) URI 05000250/2017001-02 Failure of Vital Battery Chargers Due to Conductive Dust / Particulate Foreign Material Exclusion and,
URI 05000250, 251/2017008-03, Potential Failure to Implement Adequate Foreign Material Exclusion Controls

a. Inspection Scope

On March 18, 2017, control room operators at Turkey Point declared an Alert based on Emergency Action Level H.A.2 – Fire or Explosion affecting plant safety systems. As a result of this event the NRC launched a Special Inspection. The results of the special inspection were documented in NRC reactive inspection report 05000250, 05000251/2017008 (ADAMS Accession No. ML17132A258). URI 05000250, 05000251/2017008-03, "Potential Failure to Implement Adequate Foreign Material Exclusion Controls" was opened to further review the environment created during the installation of the Thermo-Lag in 3A 4kV switchgear room.

On February 2, 2017, the 3A2 vital battery charger input breaker and motor control center (MCC) supply breaker tripped. Inspectors performed an in-depth review of the battery charger trips and documented their results in NRC Inspection Report 05000250, 05000251/2017001 (ADAMS Accession No. ML17131A318). URI 05000250/2017001-02 "Failure of Vital Battery Chargers Due to Conductive Dust / Particulate Foreign Material Exclusion," was initiated to further review and determine if there were any common causes between the battery charger trips and the 3A 4kV switchgear bus arc flash and to determine if this issue of concern constituted a violation.

As part of follow-up for the URI's documented in the Inspection Report listed above the inspectors interviewed plant personnel and reviewed the root cause evaluations documented in AR 02192198 for the 3A 4kV switchgear bus fault that occurred on March 18, 2017, and further reviewed the equipment apparent cause evaluation on the battery charger issues documented in AR 2183537.

This inspection constitutes one sample and closes URI's 05000250/2017001-02 and 05000250, 251/2017008-03.

b. Findings

Introduction: A self-revealing Green NCV of TS 6.8.1.a., "Procedures and Programs," was identified for the failure to implement foreign material exclusion (FME) controls. Specifically, the licensee's failure to include instructions in sufficient detail to prevent foreign material from entering nearby electrical equipment was a PD. This PD resulted in loss of safety-related battery chargers and a high energy arc fault (HEAF) that damaged the 3A 4kV switchgear bus.

Description: On July 18, 2016, the licensee authorized Thermo-Lag plant modifications in the new electrical equipment room (NEER) to comply with commitments made to the NRC for transitioning to National Fire Protection Association (NFPA) 805 standard. The plant modifications included upgrades to fire protection barriers or wraps by overlaying Thermo-Lag 330-1 mat with one or two mats of Thermo-Lag 770-1, in order to increase

the qualification of the barriers from one-hour to three-hours. The fire wraps protected electrical cables required for post-fire safe shutdown. At some cable locations the plant modifications required new Thermo-Lag 330-1, to be installed prior to overlaying the Thermo-Lag 770-1 mat. In the NEER, all Thermo-Lag materials were cut and trimmed in the vicinity of battery chargers D51, 3A2, and 3B2.

The licensee documented detailed work instructions in WO 40339055-04 for the Thermo-Lag modifications in the NEER. This WO required Thermo-Lag fire barrier material to be installed in accordance with procedure 0-GMP-102.21, "Installation, Modification and Maintenance of Thermo-Lag Fire Barrier System" Rev. 0C, which was silent on the electrical shorting hazards associated with the Thermo-Lag carbon fiber materials and it did not provide any FME control instructions to workers to perform the Thermo-Lag barrier installations safely in the vicinity of energized electrical equipment. Instead FME hazards were to be evaluated and appropriate foreign material controls established by the job supervisor using maintenance instruction MA-AA-101-1000, "Foreign Material Exclusion Procedure." Specifically, Step 2.3 of the WO required the job supervisor to evaluate FME hazards and referred to form MA-AA-101-1000-F01 Part b "FME Hazards Evaluation," which asked: "Does the job activity involve any of the following Hazards?" The following responses: 1) "Cutting, welding, grinding, or wire wheels;" 2) "Ventilation/air conditioning work affecting internals of system; and," 3) "Other debris generating work in the same area" were appropriate to answer "Yes" and therefore, a FME Area 2 control plan or higher would have been required for the activities. The supervisor determined the activity did not involve any of the listed hazards and a FME plan was not developed. The supervisor determined clean as you go was an appropriate control for the dust and debris generated during Thermo-Lag modification activities.

For Thermo-Lag 330-1 installation, the activities included cutting the integral metal mesh of the mat, wire, and metal bands. Cutting operations generated dust and thin metal debris, which could all potentially enter nearby electrical equipment. Additionally, room ventilation created an airborne condition for the dust and thin metal debris. For Thermo-Lag 770-1 installation, the same foreign material debris existed as well as carbon fiber dust. Additionally the Thermo-Lag 770-1 mat included integral carbon fiber mesh and the installation included a high temperature fabric mesh (Thermo-Lag 75), which was constructed entirely of a carbon fiber yarn.

Thermo-Lag 770-1 installations began in the NEER on December 7, 2016. On February 2, 2017, the 3A2 and D51 125Vdc battery chargers tripped within four minutes of each other. The licensee promptly recognized that the dust generated from the Thermo-Lag activities may be a possible cause for battery charger trips and all Thermo-Lag installation activities were stopped. The NEER and the internals of all battery chargers in the NEER were thoroughly cleaned of dust and returned to service. On February 8, 2017, the 3B2 125Vdc battery charger tripped. The licensee considered that the 3B2 battery charger may not have been adequately cleaned after recognition of the internal dust conditions on the control circuits and the battery charger was re-cleaned. In addition to the D51, 3A2, and 3B2 battery chargers in the NEER, there were two Unit 4 redundant battery chargers; the 4A2 and the 4B2 battery chargers. The A2 and B2 chargers are redundant to the A1 and B1 chargers for each Unit 3 and Unit 4 vital 125Vdc batteries. The D51 battery charger maintained a spare 125Vdc battery which was used as a swing spare in the event of maintenance on any one of the Unit 3 or Unit 4 vital 125Vdc batteries. The D51 battery charger tripped again on May 16, 2017, while

high efficiency particulate air (HEPA) vacuums were being used in the NEER for cleanup activities. The licensee secured each battery charger in the NEER one at a time for internal cleaning. All battery chargers were found dust free at the onset of the internal cleaning with the exception of the D51 battery charger.

Thermo-Lag installation activities began in the 3A 4kV switchgear room on October 19, 2016. The detailed work instructions were documented in WO 40464284-03 and the modification work was similar to what was performed in the NEER. Unlike the activities in the NEER, mat cutting was not performed in the 3A 4kV switchgear room, however, metal and carbon fiber mesh were trimmed to fit in the 3A 4kV switchgear room. The supervisor evaluated the foreign material hazards using form MA-AA-101-1000-F01, Part b "FME Hazards Evaluation," and, determined that the hazards were not applicable, and therefore, an FME plan was not developed.

On the morning of March 18, 2017, Thermo-Lag activities were ongoing in the 3A 4kV switchgear room. Several workers had left the room and one worker was climbing off a scaffold ladder when a HEAF occurred within the 3A 4kV switchgear bus reactor coil cubicle. The high fault currents activated protective relays and the 3A 4kV switchgear bus was deenergized. As a result, the reactor tripped on an under voltage condition sensed on the 3A 4kV switchgear bus.

The licensee promptly ceased all Thermo-Lag activities and initiated a root cause evaluation, which was completed on May 3, 2017 in AR 2192198. The evaluation found that Thermo-Lag 75, which was used in the Thermo-Lag 770-1 installation, was composed entirely of an electrically conductive carbon fiber. The licensee concluded that the fault was caused by conductive material that entered the reactor coil cubicle and created an electrical bridge between the bus bar and the wall of the cubicle which then caused the arc fault. During the investigation the licensee also identified two large open gaps where the 4kV bus bars entered the reactor coil cubicle slightly above where the arc flash occurred. The licensee concluded that most likely the carbon fibers or other conductive material entered the reactor coil cubicle through these gaps which were not protected by louvers. Additionally, a portable fan used to cool workers provided sufficient air currents to move the carbon fibers into the open gaps.

The licensee concluded the root cause was that procedure 0–GMP-102.21, which contained the specific installation requirements of Thermo-Lag did not provide any guidance to address foreign material in general or specifically what "special precautions" should be taken to control the airborne debris or fibers generated during the installation process. Additionally, steps; 6.4.7.1, 6.16.3.2, and 6.20.1.3.a, of procedure 0-GMP-102.21, specifically stated that Thermo-Lag 770-1 and Thermo-Lag 75, could be trimmed during installation. The procedure steps above did not include any precautions on the potential for debris to enter nearby energized electrical equipment.

The inspectors noted that due to the destructive nature of the HEAF, the exact material that initiated the HEAF could not be conclusively determined. The inspectors also noted that workers were generating metal debris by cutting and trimming Thermo-Lag 330-1 materials and banding wire for Thermo-Lag 770-1 which could have also initiated the HEAF as a result of the deficient FME controls. Individual metal staples used in the installation of Thermo-Lag 330-1 and 770-1 installation were an additional foreign material hazard.

Prior to resuming Thermo-Lag installation activities at Turkey Point Units 3 and 4, the licensee developed a work activity risk management plan to prevent Thermo-Lag 75, or high temperature fabric, debris or fibers from becoming airborne or otherwise entering electrical equipment. The licensee completed the modifications in the 3A 4kV switchgear room without further incident and repaired the 3A 4kV switchgear bus to its original design configuration.

Additional corrective actions planned by the licensee in AR 2192198 included:

- Thermo-Lag installation procedure will be revised to incorporate additional precautions for handling Thermo-Lag materials;
- A case study will be provided to targeted personnel concerning this event emphasizing that FME also applies to nearby equipment that was not opened and can be affected by the work activity; and,
- Procedures governing foreign material and material control will be revised to enhance personnel awareness of the potential to introduce foreign material into nearby equipment that was not opened and that can be affected by the work activity.

Analysis: The licensee's failure to establish adequate foreign materials exclusion controls during Thermo-Lag fire barrier modifications was a PD. Specifically, the licensee committed to implement these controls through TS 6.8.1.a., "Procedures and Programs," and the Quality Assurance Topical Report (QATR). Appendix B, "Maintenance Procedures," of the QATR required in part that maintenance procedures contain instructions in sufficient detail to permit maintenance work to be performed correctly and safely. Procedure 0-GMP-102.21, was deficient in this case, in that it did not prescribe instructions to prevent foreign material generated during Thermo-Lag modification activities in the NEER and the 3A 4kV switchgear room. The PD was more than minor because it was associated with the procedure quality attribute of both the initiating events and mitigating systems cornerstones and adversely affected the cornerstone objectives by limiting the likelihood of events that upset plant stability and challenge critical safety functions as well as the availability, reliability, and capability of systems to respond to an initiating event because the issue rendered two safety-related battery chargers inoperable and initiated a HEAF that deenergized the 3A 4kV switchgear bus causing it to be unavailable.

The inspectors evaluated the significance of this finding by utilizing IMC 0609, Attachment 4, "Initial Characterization of Findings," and IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," and determined that it affected both the initiating events and mitigating systems cornerstones. A detailed risk evaluation was required because the finding caused both a reactor trip and the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition, given the event deenergized the 3A 4kV switchgear bus and all associated mitigation equipment powered from the bus was unavailable.

A regional Senior Reactor Analyst (SRA) conducted the detailed risk assessment and limited the evaluation to the 3A 4kV switchgear room and the NEER, the two areas in which the licensee conducted Thermo-Lag work. The assessment addressed the risk for each unit because the equipment in the 3A 4kV switchgear room and the NEER supported the operation of both units. For the 3A 4kV switchgear room, the SRA used Systems Analysis Programs for Hands-on Integrated Reliability Evaluation (SAPHIRE) Version 8.1.5 and the Turkey Point Unit 3 and 4 Standardized Plant Analysis Risk

(SPAR) Model, Version 8.50 modified to include the Flowserve N9000 seals that were installed at the plant. In addition, the SRA adjusted the human error probabilities for operators failing to trip reactor coolant pumps and to switch the 3D 4kV switchgear from the 3A 4kV to the 3B 4kV switchgear using the SPAR-H method. For the effect on Unit 3, the SRA ran an initiating event assessment as specified in Risk Assessment Standardization Project (RASP), Risk Assessment of Operational Events Handbook, Rev. 2.0, Section 8.0, with the Loss of Bus 3A Initiating Event set to 1.0 and all others set to zero. For the effect on Unit 4, the SRA ran a condition assessment with an exposure time of 150 days and an increased failure probability of the 3A 4kV switchgear based on a Bayesian update for 1 failure during that 150 day exposure time. The results were a change in core damage frequency (CDF) of 2.68E-7/year for Unit 3 and 1.64E-9/year for Unit 4. The dominant sequences for Unit 3, which accounted for 57.7 percent of the change, involved anticipated transient without scram (ATWS) sequences. Insufficient moderator coefficient or failure to emergency borate would result in core damage. Sequences involving a loss of seal cooling followed by seal failure accounted for an additional 24.5 percent of the change. Remaining mitigating capability included the 3B 4kV switchgear and auxiliary feedwater. The risk was also reduced by the use of Flowserve N9000 seals for the reactor coolant pumps.

For the NEER, the SRA only considered increases in CDF due to fires. This was based on the absence of an initiating event for the NEER in addition to the sensitivity analysis for the assessment done for the 3A 4kV switchgear room. For the sensitivity, the SRA increased the failure probability of the four chargers in the NEER by a factor of 100 and ran the initiating event assessment mentioned above. There was no change in the results. For the fire risk in the NEER, the SRA reviewed the licensee's fire scenarios for the room, which was 24 in total, and increased the fire ignition frequency for each by a factor of 10. The SRA considered this a bounding assessment because of the uncertain effects of the Thermo-Lag fibers on all chargers in the room. The results were a change in CDF of 1.5E-7/year for Unit 3 and 5.7E-7/year for Unit 4.

To determine the total risk for each unit, the SRA summed together the results from the 3A 4kV switchgear room and the NEER. The total change in CDF was 4.18E-7 for Unit 3 and 5.73E-7 for Unit 4. Based on these results being less than 1E-6, this issue was considered Green for each unit. The issue screened out for large early release frequency (LERF) because no sequences involved an intersystem LOCA or steam generator tube rupture (Table 5.1).

The most-significant contributor of the performance deficiency was the licensee did not ensure that procedure 0-GMP-102.21, was adequate to safely install Thermo-Lag materials in the vicinity of energized electrical equipment. The cross-cutting aspect (CCA) that best corresponds to the root cause as described in IMC 0310, "Aspects Within the Cross-Cutting Areas," was leaders ensure that personnel, equipment, procedures, and other resources were available and adequate to support nuclear safety (H.1).

Enforcement: TS 6.8.1.a., "Procedures and Programs," required, in part, that written procedures shall be established, implemented, and maintained covering the activities referenced in the applicable procedures required by the QATR. Requirements specific to procedures were provided in Appendix B of the QATR dated June 2016. Appendix B, "Maintenance Procedures," of the QATR required in part that maintenance procedures contain instructions in sufficient detail to permit maintenance work to be performed

correctly and safely. 0-GMP-102.21, "Installation, Modification and Maintenance of Thermo-Lag Fire Barrier System," Rev. 0C, was a maintenance procedure used for modification work performed in the NEER and the 3A 4kV switchgear room from July 18, 2016 to March 18, 2017. Contrary to the requirements of Appendix B of the QATR, sufficient detail to permit maintenance work to be performed safely was not contained within 0-GMP-102.21 and controls were not implemented through this procedure to prevent foreign material generated from these activities from affecting safety related SSCs. Consequently, adverse dust and debris conditions affected and faulted the following safety-related SSCs:

- The 3A2 125Vdc battery charger tripped on February 2, 2017 and was rendered inoperable;
- The 3B2 125Vdc battery charger tripped on February 8, 2017 and rendered inoperable; and,
- The 3A 4kV switchgear bus experienced a HEAF on March 18, 2017 and was rendered inoperable.

After March 18, 2017, the licensee ceased all Thermo-Lag installation activities at all its nuclear facilities and commissioned a failure investigation team and initiated a root cause investigation to support the determination of the direct cause and the restoration of the equipment that was damaged. The licensee did not resume Thermo-Lag installation activities until adequate foreign material exclusion controls were established and deemed sufficient to preclude electrical shorts in electrical equipment housed within the same room as Thermo-Lag installation. The root cause and associated corrective actions were documented in the corrective action program in AR 2192198.

This violation is being treated as a NCV consistent with Section 2.3.2.a of the Enforcement Policy. NCV 05000250, 251/2017002-02, "Inadequate Foreign Materials Exclusion Controls for Thermo-Lag Activities Renders Electrical Equipment Inoperable and Results in a High Energy Arc Flash," (EA-17-095).

.3 Annual Sample: Follow-up of URI Related to Fire Detection Capability on Credited Train of Equipment Following HEAF Event

(Closed) URI 05000250, 251/2017008-01, Potential Failure of Fire Detection Capability on Credited Train of Equipment Following High Energy Arc Flash Event

a. Inspection Scope

On March 18, 2017, control room operators at Turkey Point declared an Alert based on Emergency Action Level H.A.2 – Fire or Explosion affecting plant safety systems. As a result of this event the NRC launched a Special Inspection. The results of the special inspection were documented in NRC reactive inspection report 05000250, 05000251/2017008 (ADAMS Accession No. ML17132A258). URI 05000250, 05000251/2017008-01, "Potential Failure of Fire Detection Capability on Credited Train of Equipment Following High Energy Arc Flash Event" was opened to further review the licensee's actions to implement fire watches and reestablish fire detection capability in the 3A and 3B 4kV switchgear rooms.

As part of follow-up for the URI documented in the Inspection Report listed above the inspectors reviewed the administrative controls for out-of-service, degraded and/or

inoperable fire protection features (e.g. detection systems) to verify that short-term compensatory measures were adequate for the degraded function or features until appropriate corrective actions could be taken. The inspectors reviewed impairment and compensatory measures forms for fire watch tours to confirm they were being performed within the allowable time frames.

This inspection constitutes one sample and closes URI 05000250, 251/2017008-01.

b. Findings

Introduction: A NRC identified Green finding was identified for the licensee's failure to follow plant procedure O-ADM-016, "Fire Protection Program," Rev. 19. Specifically, the licensee failed to properly implement fire watches following a high energy arc fault (HEAF) on 3A 4kV switchgear bus, which resulted in inadequate fire detection capability in the 3B switchgear room for a period of approximately 28 hours.

Description: On March 18, 2017 at approximately 11:00 a.m., as a result of a HEAF in 3A 4kV switchgear room, seven out of eleven spot detectors and two out of two very early warning detectors activated in the adjacent 3B switchgear room. The four detectors, which were closest to the exit door on the east side of the room, remained in active status. The licensee acknowledged the alarms at fire alarm control panel 3C286 after the incident. However, the licensee did not reactivate the smoke detectors until approximately 62 hours later on March 21, 2017 at 12:51 a.m. The inspectors confirmed with the licensee that the detectors were not able to perform their design function between the times they were acknowledged and reactivated.

3B 4kV switchgear bus was the protected train after the HEAF occurred on the 3A 4kV switchgear bus. Table 5.6.3-1 of plant procedure O-ADM-016, "Fire Protection Program," Rev. 19, denoted Fire Zone (FZ) 70 (3B 4kV switchgear) to include fire detection instruments in the FZ and specified required risk informed interim compensatory actions for degraded or nonfunctional detectors. Section 5.6.3.3.d outlined these compensatory actions as the following: "…all detection instruments must be in service when required to be functional. If any single detector instrument is declared out of service, within one hour, a continuous fire watch shall be established and maintained until the detection instrument is returned to service…"

Immediately following the HEAF, personnel were in the 3B 4kV switchgear room for nearly four hours conducting smoke removal activities. Subsequently, based on security access logs, at 2:43 p.m. on March 18, 2017, two maintenance personnel were placed on fire watch duty until 5:09 p.m. Inspectors determined that these groups could be credited as performing the role of the continuous fire watch. However, the licensee's next credited fire watch shift was located outside of both the 3A and 3B 4kV switchgear rooms with the entry doors closed, instead of being located in the area with the nonfunctional detection system. Additionally, this crew did not maintain appropriate fire watch logs. NRC inspectors discovered that there were no fire watches in either of the 3A or 3B 4kV switchgear rooms on the morning of March 19, 2017 and informed the fire watch coordinator.

Inspectors and the licensee were unable to verify the location or coverage time of the fire watch crews. The licensee generated AR 2194579 to document that the fire watches which were located outside the room did not meet the intent of 0-ADM-016.4, "Fire

Watch Program." The first documented log of continuous fire watches occurred at 1:15 p.m. on March 19, 2017. However, these individuals were located in the 3A 4kV switchgear room and only checked the 3B side of fire door "D070-3," every 15 minutes. Inspectors determined that the maintenance supervisor instructed the fire watch personnel to not enter the 3B 4kV switchgear room. Checking only the status of the 3B 4kV switchgear room on a 15 minute intervals did not meet the intent of a continuous fire watch. On March 19 at approximately 9:00 p.m., the fire protection coordinator directed the continuous fire watch to open fire door "D070-3," between the two rooms to reestablish a continuous watch of both fire zones that were affected by the out of service detectors.

The licensee determined that the 3B 4kV switchgear room was without smoke detection or an appropriate compensatory measure for approximately 28 hours following smoke removal activities. Inspectors noted the cause of this deficiency was primarily due to lack of training and guidance for individuals performing the fire watches. The licensee initiated AR 2194720 to update procedures with appropriate guidance to reset alarms and to address compensatory measures and fire watch responsibilities. The AR also initiated training to reinforce fire watch expectations.

Analysis: Failure to implement fire watches in accordance the Fire Protection Program (FPP) was a PD. This PD was more than minor because it was associated with the reactor safety mitigating system cornerstone attribute of protection against external events (i.e., fire). Specifically, as a result of the inactive smoke detectors and no fire watches in the 3B 4kV switchgear room, the credited train of equipment was without fire detection for approximately 28 hours.

Inspectors used IMC 0609, Attachment 4, "Initial Characterization of Findings," which routed the evaluation to IMC 0609, Appendix F, "Fire Protection Significance Determination Process." The PD affected the fixed fire detection and represented a high degradation condition per IMC 0609 Appendix F, Attachment 2, because the system would not function. The PD was screened in accordance with NRC IMC 0609 Appendix F, Attachment 1, which determined that a quantitative screening was required because the condition would result in more than a five minute delay in detection of a fire large enough to damage equipment important to safety. The Phase 2 screening was bypassed by the regional SRA, and instead performed a bounding analysis for the finding. A risk analysis of the PD was performed in accordance with IMC 0609 Appendix F, which utilized input from the NRC Turkey Point SPAR model. The major analysis assumptions included a 58 hour exposure period, an Ignition Frequency of 2E-2 per year for the switchgear room and a probability of non-suppression of 1.0 due to the PD. A bounding conditional core damage probability was determined assuming a fire induced loss of offsite power with common cause failure of the Unit 3 EDGs with no recovery of the EDGs or offsite power for two hours. The risk was mitigated by the short exposure period. The risk increase in core damage frequency due to the PD was less than 1.0E-6/year, equivalent to a Green finding of very low safety significance.

The finding was identified to have a cross cutting aspect in the area of Human Performance associated with the 'Training' attribute because site personnel failed to reset fire detectors and implement fire watches in appropriate areas following the incident. During interviews, inspectors found that fire drills did not emphasize post

incident activities. The organization provides training and ensures knowledge transfer to maintain a knowledgeable, technically competent workforce and instill nuclear safety values (H.9).

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding. The licensee entered this issue into the corrective action program as AR 2194706 and AR 2194720. Because this finding does not involve a violation and is of very low safety significance, it is identified as FIN 05000250, 251/2017002-03, "Failure to Implement Fire Detection."

4OA3 Follow-Up of Events and Notices of Enforcement Discretion (IP 71153)

(Closed) Licensee Event Report (LER) 05000250, 251/2017-001-00, Loss of 3A 4kV Vital Bus Results in Reactor Trip, Safety System Actuations and Loss of Safety Injection Function

a. Inspection Scope

The LER documented a loss of the 3A 4kV vital bus that resulted in a Unit 3 reactor trip. The loss of the bus was due to an electrical high energy arc fault inside the current-limiting reactor cubicle of the 3A 4kV bus. The electrical fault resulted in smoke in the 3A 4kV switchgear room and the declaration of an Alert emergency classification. The licensee determined that the fault was attributed to the introduction of foreign material into the cubicle during installation of Thermo-Lag insulation in the 3A 4kV switchgear room. On March 29, 2017, the NRC completed a Special Inspection of this event with the results of the inspection documented in NRC Reactive Inspection Report 05000250/2017008 and 05000251/2017008 (ADAMS Accession No. ML17132A258). The inspectors reviewed the LER and associated root cause evaluation (AR 2192198) to verify the accuracy and completeness of the LER and the appropriateness of the licensee's corrective actions. This LER is closed.

b. Findings

Licensee performance deficiencies and enforcement aspects of this event are documented in Section 4OA2.2 of this report.

4OA5 Other Activities

.1 Follow-up on Traditional Enforcement Actions Including Violations, Deviations, Confirmatory Action Letters, Confirmatory Orders, and Alternate Dispute Resolution Confirmatory Orders (IP 92702)

(Closed) VIO 05000250, 251/2016010-01, Inaccurate Fire Watch Logs

a. Inspection Scope

During the week of June 12, 2017, the inspector performed an onsite review of FPL's records related to corrective actions taken in response to a Severity Level (SL) III Notice of Violation (NOV), issued on October 10, 2016 in NRC Inspection Report 05000250, 05000251/2016010, (ADAMS Accession No. ML 16285A348). The NOV was associated with the inaccurate/incomplete documentation of hourly fire watches, contrary to the

requirements of 10 CFR 50.9(a), Completeness and Accuracy of Information. The NOV was described in NRC Inspection Report 05000250, 05000251/2016009, issued on August 22, 2016 (ADAMS Accession No. ML16235A381). The objectives of the inspection were to ensure that FPL implemented adequate corrective actions for the SL III NOV, identified root causes, addressed generic implications, and appropriately enhanced FPL's programs and practices to prevent recurrence.

The inspector reviewed corrective action program documents, which included the root cause evaluation report, to verify corrective actions had been implemented and were effective. The inspector reviewed procedure 0-ADM-16.4, "Fire Watch Program," Rev. 8, and had discussions with members of the operations and fire protection staff to understand and assess the corrective actions made to address the root cause, which was determined to be that operations management was not adequately engaged with the fire protection program. The inspector accompanied operations staff on an hourly fire watch rove to ensure that the individual performing the hourly fire watch was knowledgeable of the fire watch rove responsibilities and adequately performed the roves in accordance with site procedures. The inspector reviewed the most recent fire watch program assessment document, several hourly fire watch audit reports, and verified that supervisors were routinely performing observations of the fire watch roves to ensure the fire watch program was being properly maintained. Additionally, the inspectors reviewed the documentation of the regulatory commitment that was contained in the licensee's reply to the violation. Specifically, the inspectors reviewed the training material and attendance forms that documented the licensee's annual review of the fire watch misconduct issue with FPL employees.

b. Findings and Observations

No findings were identified.

In general, the inspectors concluded the following:

- The licensee's evaluations of the violation identified how the issue was identified; how long it existed and possible opportunities for identification;
- The SL III violation received an appropriate level of evaluation to identify causes;
- The evaluation included appropriate consideration of prior occurrences;
- The evaluation appropriately addressed extent of condition and extent of cause of the problem;
- Corrective actions were appropriate, and were appropriately prioritized and scheduled; and,
- Measures of success were developed and being monitored to determine the effectiveness of the corrective actions.

In summary, the inspectors determined that the corrective actions taken in response to the violation have been adequate. VIO 05000250, 251/2016010-01 is closed.

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

a. Inspection Scope

On June 1, 2017, the inspectors conducted a walk down of the independent spent fuel storage installation (ISFSI) protected area per Inspection Procedure 60855.1, "Operation of an ISFSI at Operating Plants." The inspectors observed each cask building temperature indicator and passive ventilation system to be free of any obstruction allowing natural draft convection decay heat removal through the air inlet and air outlet openings. The inspectors observed associated cask building structures to be structurally intact and radiation protection access and security controls to the ISFSI area to be satisfactory.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

On April 7, 2017, the region based specialist ISI inspectors presented the inspection results to Mr. T. Summers, Southern Regional Vice President, and other members of the licensee staff. The inspectors confirmed that all proprietary information reviewed during the inspection was returned or would be destroyed following report completion.

On June 15, 2017, a regional inspector discussed the results of the follow up inspection for a SL III NOV with Mr. B. Stamp, Plant General Manager, and other members of the licensee staff. The inspector noted that proprietary information reviewed, if any, would be handled accordingly.

On June 30, 2017, the resident inspectors presented their inspection results to Mr. B. Stamp, Plant General Manager, and other members of licensee management. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary information. The licensee did not identify any proprietary information.

On July 18, 2017, a region based specialist inspector presented the final inspection results via phone to Mr. M. Guth, Licensing Manager, and other members of the licensee staff. The inspectors confirmed that no proprietary information was reviewed during the inspection.

On August 9, 2017, the resident inspectors performed a final re-exit with Mr. B. Stamp, Plant General Manager, and other members of licensee management. The purpose of the re-exit was to update the final status of the significance of NCV 05000250, 251/2017002-02.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:
T. Summers, Regional Vice President
B. Stamp, Plant General Manager
G. Alexander, Fleet Programs Supervisor
D. Barrow, Maintenance Director
M. Blue, ISI Program Owner
C. Cashwell, Training Manager
P. Czaya, Licensing Engineer
W. Hinson, Radiation Protection Manager
M. Downs, Emergency Preparedness Manager
M. George, Operations – Fire Protection Coordinator
R. Gil, Steam Generator Program Manager
M. Guth, Licensing Manager
O. Hanek, Licensing Engineer
O. Hernandez, Security Manager
R. Hess, Operations – AOM Support
G. Melin, Operations Site Director
S. Mihalakea, Licensing Engineer
E. Neville, Assistant Operations Manager, Shift Operations
J. Nobel, In-service Inspector, Level II
K. O'Hare, Performance Improvement Manager
J. Pallin, Engineering Director
K. Thompson, Steam Generator Engineer
J. Timm, Curtiss-Wright Contractor, ISI Principle Level III
M. Dobson, Manager (AREVA)
D. Cornell, ECT Level III (AREVA)
W. Waters, Data Management (AREVA)

NRC Personnel:
L. Pressley, Senior Project Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed		
05000250/2017002-01	NCV	Failure to Perform 100 Percent General Visual Examinations of Containment Moisture Barriers Associated with Containment Liner Leak Chase Test Connections (Section 1R08)
05000250, 251/2017002-02	NCV	Inadequate Foreign Materials Exclusion Controls for Thermo-Lag Activities Renders Electrical Equipment Inoperable and Results in a High Energy Arc Flash (Section 4OA2.2)
05000250/2017002-03	NCV	Failure to Implement Fire Detection (Section 4OA2.3)
Closed		
05000250/2017001-02	URI	Failure of Vital Battery Chargers Due to Conductive Dust / Particulate Foreign Material (Section 4OA2.2)
05000250, 251/2017008-03	URI	Potential Failure to Implement Adequate Foreign Material Exclusion Controls (Section 4OA2.2)
05000250, 251/2017008-01	URI	Potential Failure of Fire Detection Capability on Credited Train of Equipment Following High Energy Arc Flash Event (Section 4OA2.3)
05000250, 251/2017-001-00	LER	Loss of 3A 4kV Vital Bus Results in Reactor Trip, Safety System Actuations and Loss of Safety Injection Function (Section 4OA3)
05000250, 251/2016010-01	VIO	Inaccurate Fire Watch Logs (Section 4OA5.1)

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

0-ADM-116, Hurricane Season Readiness
0-ADM-216, PTN and PTF Shared System Work Control and Switchyard Access
0-ONOP-103.2, Cold/Hot Weather Conditions
0-ONOP-103.3, Severe Weather Preparations
0-SMM-102.1, Flood Protection Stop Log and Penetration Seal Inspection
OP-AA-102-1002, Seasonal Readiness

Section 1R04: Equipment Alignment

0-OSP-205.1, Startup Transformers and Onsite A.C. Power Distribution Verification
3-NOP-005, 4kV Buses A, B, and D
3-NOP-022, Emergency Diesel Generator Fuel Oil System
3-NOP-062, Safety Injection
4-NOP-005, 4kV Buses A, B, and D
4-NOP-062, Safety Injection

Section 1R05: Fire Protection

0-ONOP-016.10, Pre – Fire Plan Guidelines and Safe Shutdown Manual Actions
0-ONOP-016.20, Pre – Fire Plans
PFP-AB-18, Unit 3 & 4 Auxiliary Building, Elevation 18
PFP-CB-30, Unit 3 & 4, Control Building, Elevation 30
Fire Drill Evaluation for 5/16/17
SCBA Training Exercise Forms for 5/16/17
Respiratory Protection / Misc Routine Matrix for year 2017

Section 1R08: Inservice Inspection (ISI) Activities

Procedures

0-ADM-537, Turkey Point Plant, Boric Acid Corrosion Control Program, Rev. 12
0-OSP-041.26, Turkey Point Plant, Operations Surveillance Procedure, Containment Visual Leak Inspection, Rev 9A
3-OSP-045.1, Turkey Point Plant, Operations Surveillance Procedure, ASME Section XI Quality Group “A” Bolting Examination, Rev. 4
ENG-CSI 2.2, Planning and Reporting Results of Steam Generator Tubing Examinations, Revision 46
ENG-CSI 2.3, Steam Generator Integrity Program Administration, Revision 33
ER-AP-116, NEXTera Nuclear Fleet, Program Description, Boric Acid Corrosion Control, Rev. 0
ER-AP-121, Steam Generator Integrity, Revision 4
FPL NDE Manual Examination Procedure 4.1, Component Support Inspection VT-1, Rev. 14
FPL NDE Manual Examination Procedure 4.8, Component, Support & Inspection, Enhanced Visual Examination of Steam Generator (Primary Side) and Pressurizer Nozzles Inside Radius Surface, Rev. 4
NDE Manual Examination Procedure 4.8, Component, Support & Inspection, Enhanced Visual Examination of Steam Generator (Primary Side) and Pressurizer Nozzles Inside Radius Surface, Rev. 4
MA-AA-1000, NEXTera Nuclear Fleet Administrative Procedure, Plant Leak Management Procedure, Rev. 10
VP-09-065, Field Procedure & Operating Instructions for Installation of a Flexible Stabilizer in a Recirculating Steam Generator (03-1217919) (AREVA), Revision 3A
VP-09-073, Field Procedure for Remote Rolled Plugging Utilizing the LAN SAP Box (03-1275284) (AREVA), Revision 5
Welding Procedure Specification (WPS) 24, Rev. 5

Corrective Actions

Action Request (AR) 02024069, Fleet Steam Generator Program Self-Assessment, dated 7/30/15
AR 02143080, Evaluate Industry Operating Experience, Westinghouse Nuclear Safety Advisory Letter (NSAL) 16-1, 8/1/16
AR 02196637, (NRC Identified) Un-grouted Air Test Connection on Containment Base Mat, 4/5/17
AR 02193248, 3T237U-3 RX Head, Inactive Boric Acid around RX Head Studs, 3/23/17
AR 02194609, Foreign Object Recovered During Core Plate Inspection, 3/28/17
AR 02196560, (NRC Identified) LT-3-460, Inactive, Minor, Dry, Boric Acid on Swagelok Cap in Containment, 5/5/17
AR 02196644, (NRC Identified) RCP "C", Cold Leg Penetration Area, Water Dripping on Snubber 3-1069, 5/7/17
AR 02093963, Water Spray Out of Reactor Vessel Level Monitoring System Column No. 59, 4/4/17
AR 02181810, MOV-3-872, Active Boric Acid Leakage at Valve Packing, 1/25/17
AR 02192917, CV-3-311 Inactive Brown Dry Boric Acid at Valve Packing, 3/22/17
AR 02192917, Charging to Pressurizer Auxiliary Spray Control Valve, 3/20/17

NDE Personnel Certifications

P. Kunze, Curtiss-Wright, Ultrasonic Testing (UT), Level II Qualification, Expires 8/17/2018
P. Kunze, Curtiss-Wright, Certification of Visual Acuity, Completed 1/9/2017
J. Nobel, FPL, PT Level II Qualification, Expires 11/29/2019
J. Nobel, FPL Vision Examination, Completed 12/19/2016
D. Shaugabay, Curtiss-Wright, UT, Level II Qualification, Expires 1/10/2020
D. Shaugabay, Curtiss-Wright, Certification of Visual Acuity, Completed 1/10/17
B. Thompson, Curtiss-Wright, Penetrant Testing (PT), Level II Qualification, Expires 1/8/2019
B. Thompson, Curtiss-Wright, Certification of Visual Acuity, Expires 7/27/17
J. Timm, Curtiss-Wright, VT-1, Level III Qualification, 6/21/17
J. Timm, Curtiss-Wright, Certification of Visual Acuity, Completed 11/18/16

Other Documents

Areva Certificate of Conformance,
03-9252849, Turkey Point Units 3 & 4 Eddy Current Data Analysis Guidelines, Level 3 - Information Use, Spring 2017, Revision 001
AES 13118520-2Q-3, Condition Monitoring and Operational Assessment for the Turkey Point Unit 3 Steam Generators Based on Eddy Current Examination End of Cycle 26, March 2014, Revision 0
AIM 161010151-2-1, Degradation Assessment for Turkey Point Unit 3 and Turkey Point Unit 4 Steam Generators, Update for Turkey Point Unit 3 End-of-Cycle 28 (March 2017 Outage), Revision 1
Bechtel Corporation Drawing, 5610-C-164, Containment Structure Floor Liner Plate Plan, Rev. 14
EC285447, PTN-ENG-SESJ-16-001, Form OAR-1Owners Activity Report No. ISI-PTN3-28, 2/25/16
Engineering Information Record 51-5026697-01, Screening for High Residual Stress Condition Tubes PTN Unit 3
Engineering Information Record 51-5029214-014, Qualified Eddy Current Techniques for Turkey Point (PTN) Units 3 & 4
Engineering Information Record 51-9248932-000, Secondary Side Visual Inspection Final Report for Florida Power & Light, Turkey Point 3, PTN3-28

Engineering Information Record 51-9266559-000, Turkey Point Unit 3 EOC28 (T3R29) Steam Generator Eddy Current Inspection Plan
Evaluation # ENG/CSI-NDE-99-051, Steam Generator Secondary Side Integrity Plan, Rev. 16
Eddy Current Examination Technique Specification Sheet (ETSS) #1 (Bobbin), Revision 0, for detection of Anti-Vibration Bar (AVB) wear
ETTS #2 (3-Coil), Revision 0, for circumferential ODSCC
ETTS #3 (1-Coil), Revision 0, for Low Row U-bend MR +Point Exam & Special Interest
ETTS #4 (Ghent), Revision 0, for tubesheets, dented and non-dented tube support structures, expansion transitions, freespan dents, and freespan bobbin indications
ETTS #5 (X-Probe), Revision 0, for Loose Parts and Loose Part Wear
Florida Power & Light (FPL), Ultrasonic Examination (UT) Indication Report Sheet, Weld 14-FWA-2301-21, Summary Number 330500, 4/1/17
FPL Liquid Penetrant (PT) Checklist for Work Order 40329690-03, Data Sheet 17-082, 3/31/17
FPL PT Checklist for Work Order 40329690-02, Data Sheet 17-040, 3/15/17
FPL PT Checklist for Work Order 40329690-02, Data Sheet 17-039, 3/14/17
FPL PT Checklist for Work Order 40329690-02, Data Sheet 17-079, 3/31/17
FPL Visual Examination Record, VT-1 Data Sheet 4.8-001, Summary No. 040300, Steam Generator “B” Primary Side, Examination Item 3-SGB-I-IRS, 4/3/17
FPL Visual Examination Record, VT-1 Data Sheet 4.8-002, Summary No. 040400, Steam Generator “B” Primary Side, Examination Item 3-SGB-O-IRS, 4/3/17
FPL Turkey Point Nuclear Plant, Integrated Leakage Rate Test Report, 3-OSP-051.16, Attachment 12, Test Results, 7/29/12
Intertek AIM Report AES 15048862-2-1, Review of Degradation and Operational Assessments for Turkey Point Unit 3 Steam Generators for Cycles 27 and 28, Revision 0
Precision Surveillance Corporation (PSC) Turkey Point Unit-3, 45th Year Tendon Surveillance, Tendon No. 45V01 “D” and “G”, 2/16/17
PSC Turkey Point Unit-3, 45th Year Tendon Surveillance, Tendon No. 34V23 “D” and “G”, 2/16 & 17/2017
PSC Turkey Point Unit-3, 45th Year Tendon Surveillance, Tendon No. 63H83 “BT-2” and “BT-6”, 2/17 & 15/2017
PSC Turkey Point Unit-3, 45th Year Tendon Surveillance, Tendon No. 62H44 “BT-2” and “BT-6”, 2/15/2017
PSC Turkey Point Unit-3, General Visual Examination Results, Tendon Gallery Basement Concrete, Data Sheet SQ 8.4, 3/1/17
Quick Hit /Department Assessment Report No.02075566, 7/8/16
Work Order 40329690-02, Unique Weld Traveler, Weld FW-01, 4/1/17
Work Order 40329690-02, Unique Weld Traveler, Weld FW-02, 4/1/17
Work Order 40329690-02, Unique Weld Traveler, Weld FW-08, 3/31/17
Work Order 40432417-20, Snubber Inspection/Testing/Rebuild/Replace, SN-3-1069, 4/6/17
Work Order 40528136-01, Unit-3, Excavate Air test Connections in Containment, Reference AR 02196637, 4/27/17
Work Order 40528136-03, Unit-3, Un-grouted Air Test Connection, AR 02196637, 4/15/17
Work Order 40486406, Task 94, PTN-4-30, Support, and Perform ISI Examinations Inside Containment, 6/12/17

Section 1R11: Licensed Operator Requalification Process

0-ONOP-002, McGregor Substation Malfunction
0-OSP-040.19, Low Power Physics Testing
3-GOP-301, Hot Standby to Power Operation
3-OP-041.7, Draining the Reactor Coolant System
3-OP-201, Filling/Draining the Refueling Cavity and the SFP Transfer Canal
PTN 760207000, RTD Failure / Loss of 3P06, Loss of Charging, dated 9/22/14

Section 1R13: Maintenance Risk Assessments and Emergent Work Control
ER-AA-100-2002, Maintenance Rule Program Administration
OP-AA-102-1003, Guarded Equipment
OP-AA-104-1007, Online Aggregate Risk
WM-AA-100-1000, Work Activity Risk Management
WM-AA-100-1001, Support Organization Risk Management
4-EOP-E-0, Reactor Trip or Safety Injection
0-ADM-051, Outage Risk Assessment and Control
0-ADM-225, On Line Risk Assessment and Management
4-EOP-E-0 Attachment 3, Prompt Action Verifications
5614-M-3062, Safety Injection System
5613-M-3062, Safety Injection System
4-NOP-062, Safety Injection

Section 1R15: Operability Evaluations
0-ADM-213, Technical Specification Related Equipment Out of Service Logbook
3-EOP-E-1, Loss of Reactor or Secondary Coolant
3-OSP-050.2C, Residual Heat Removal Train A Comprehensive Test – Cooldown Alignment
3-OSP-050.2D, Residual Heat Removal Train B Comprehensive Test – Cooldown Alignment
AR 1957443
EN-AA-203-1001, Operability Determinations / Functionality Assessments
PTN-BFSE-92-004, PTN Units 3 & 4 EDG Loading Charts for Use During Eighteen Month Surveillance Tests
PTN-BMHE-11-003, Motor Operated Valve Thermal Overload Heater Selection

Section 1R19: Post-Maintenance Testing
3-OSP-075.7, Auxiliary Feedwater Train 1
AR 2198240
AR 2200267
AR 2200270
AR 2200382

Section 1R20: Refueling and Other Outage Activities
0-ADM-051, Outage Risk Assessment and Control
0-ADM-215, Operations Surveillance Tracking
0-OSP-040.19, Low Power Physics Testing
0-OSP-059, Core Mapping Following Core Loading
3-GOP-301, Hot Standby to Power Operation
3-NOP-041.02, Pressurizer Operation
3-OP-038.9, Refueling Activities Checkoff List
3-OP-041.7, Draining the Reactor Coolant System
3-OP-041.8, Filling and Venting the Reactor Coolant System
3-OP-201, Filling/Draining the Refueling Cavity and the SFP Transfer Canal
3-OSP-051.12, Refueling Containment Penetration Alignment
3-SMM-050.01, Containment Recirculation Strainer Inspection
3-SMM-051.03, Containment Close Out Inspection
AD-AA-101-1004, Work Hour Controls
Clearance: 3-OUTAGE, Section: 3-000-GOP-305 CSD PLACARD Att.2-022 &
Section: 3-036-6427A -008
SY-AA-100-1011, Fatigue Management
WO 40433335

Section 1R22: Surveillance Testing
Westinghouse Technical Bulletin NSD-TB-94-02-RO, Damaged Fuel Assemblies During Refueling, 05/19/94

Section 4OA1: Performance Indicator Verification
0-ADM-032, NRC Performance Indicators Turkey Point
AR 2211506

Section 4OA2: Problem Identification and Resolution
WO 40339055
WO 40464284
WO 40464285

Procedures
0-ADM-016, Fire Protection Program, Rev 19
0-ONOP-016.8, Response to a Fire/Smoke Detection System Alarm, Rev 17
PFP-3-TB-18, Unit 3 Turbine Building Pre Fire Plan
3-PME-017/-2, Preventive Maintenance Procedure, Rev 2
0-PME-091.1, Outside Containment Smoke Detector Sensitivity Check and Calibration, Rev 5
0-ADM-016.4, Fire Watch Program, Rev 7

Drawings
5610-A-62, Floor Plan At El 30' Showing Fire Walls, Door, Dampers and FireProofing, Rev 11
5610-A-61, Floor Plan At El. 18'-0 Showing Fire Walls, Doors, Dampers and FireProofing, Rev 25

Calculations
5610-016-DB-001, Fire Protection System Design Basis Document
PTN-FPER-11-002, NFPA 805 Recovery Action Feasibility Evaluation, Rev 1
EC 282069, Fire Protection Program, License Renewal Basis Document, Rev 6

Miscellaneous Documents
Continuous Post Local Log, 03/19/2017
Fire Alarm Initiation Sequence
STD-M-006, Engineering Guidelines for Fire Protection, Rev 1

Corrective Action Documents
0219230
2194706
2194720

Section 4OA3: Follow-up of Events and Notice of Enforcement Discretion
AR 2211479

Section 4OA5: Other Activities
Procedures
0-ADM-16.1, Transient Combustible and Flammable Substances Program
0-ADM-16.3, Fire Protection Impairments
0-ADM-16.4, Fire Watch Program
0-ADM-16.5, Hot Work Program

Condition Reports
AR 2175717
AR 2179207
AR 2042744
AR 2056905
AR 2156821
AR 2210310
AR 2210305

Other
Reply to Apparent Violations in NRC Inspection Report 05000250/2016009, 05000251/2016009, and Investigation Report No. 2-2015-029; EA-16-099
Hourly Rove Route Log, dated 6/13/2017
Hourly Rove Route Checklist, dated 6/13/2017
Hourly Rove Audit Reports, dated 4/5/2017, 4/19/2017, 5/10/2017, 5/28/2017
Operations Department – 2017 Shift Roster, Rev. 8

LIST OF ACRONYMS

AFW	Auxiliary Feedwater
AR	Action Request
AV	Apparent Violation
CAP	Corrective Action Program
CCA	Cross-cutting Aspect
CCW	Component Cooling Water
CFR	Code of Federal Regulations
EDG	Emergency Diesel Generator
FME	Foreign Material Exclusion
FPL	Florida Power and Light Company
HEAF	High Energy Arc Fault
HHSI	High-head Safety Injection
ICW	Intake Cooling Water
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
KV	Kilo-Volt
LER	Licensee Event Report
MCC	Motor Control Center
MR	Maintenance Rule
MOV	Motor Operated Valve
NCV	Non-cited Violation
NEER	New Electrical Equipment Room
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NRC	Nuclear Regulatory Commission
OLRM	Online Risk Monitor
PI	Performance Indicator
QATR	Quality Assurance Topical Report
RHR	Residual Heat Removal
RCS	Reactor Coolant System
RTP	Rated Thermal Power
RVH	Reactor Vessel Head
SFP	Spent Fuel Pit
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order