



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

November 4, 2015

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

**SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION - NRC INTEGRATED
INSPECTION REPORT 05000250/2015003, 05000251/2015003**

Dear Mr. Nazar:

On September 30, 2015, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Turkey Point Nuclear Generating Station Units 3 and 4. On October 15, 2015, the NRC inspectors discussed the results of the inspection with Mr. Summers and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors documented one self-revealing finding of very low safety significance (Green) in this report. The finding did not involve a violation of NRC requirements.

If you contest the violation or significance of this non-cited violation (NCV), you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, U.S. Nuclear Regulatory Commission, Washington DC 20555-0001; and the NRC Resident Inspector at Turkey Point Nuclear Generating Station Units 3 and 4.

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

M. Nazar

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

Sincerely,

/RA/

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

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

Enclosure:
IR 05000250/2015003, 05000251/2015003
w/Attachment: Supplementary Information

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M. Nazar

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M. Nazar

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Letter to Mano Nazar from LaDonna B. Suggs dated November 4, 2015.

SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION - NRC INTEGRATED
INSPECTION REPORT 05000250/2015003, 05000251/2015003

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-250, 50-251

License Nos: DPR-31, DPR-41

Report Nos: 05000250/2015003, 05000251/2015003

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

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

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

Dates: July 1 to September 30, 2015

Inspectors: T. Hoeg, Senior Resident Inspector
M. Endress, Resident Inspector
M. Bates, Senior Operations Engineer
D. Bacon, Senior Operations Engineer

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

Enclosure

SUMMARY

IR 05000250/2015003, 05000251/2015003; 07/01/15 – 9/30/15; Turkey Point Nuclear Generating Station, Units 3 & 4; Event Follow-up.

The report covered a three-month period of inspection by the resident inspectors. One Green finding was identified. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. The cross-cutting aspects were determined using IMC 0310, "Aspects Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements were dispositioned in accordance with the NRC's Enforcement Policy dated February 4, 2015. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 5.

NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. A self-revealing finding was identified for the licensee's failure to provide adequate instructions for performing work on the Unit 4 main generator protection control circuitry. As a result, the lugged connections on an installed current transformer lacked the appropriate tightness causing increased electrical resistance and ultimately catastrophic failure of a lug connection. The lug failure produced an open circuit condition on the current transformer causing the generator protection circuit to actuate. This resulted in a turbine trip and reactor trip. Corrective actions included replacing the damaged lug and torquing all the current transformer lug connections to the vendor recommended value. A root cause evaluation was performed and a revision made to maintenance procedure 0-PME-090.03, "Maintenance of Isophase Neutral Bus and Grounding Transformer Connection Assemblies," to include additional instructions on torquing the lug assemblies. The licensee entered this performance deficiency in their corrective action program (CAP) as action request 02047137.

The performance deficiency was more than minor because it was associated with the procedure quality attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Specifically, the work package associated with engineering modification package EC 246904 and work order 40063905 directed the technician to connect the current transformer (CT) lugs hand tight and did not require torquing per the vendor specified torque value. The inspectors screened the significance of the finding using Manual Chapter 0609, Appendix A, Exhibit 1, Transient Initiators. The inspectors determined the finding was of very low safety significance (Green) because the finding did not result in a reactor trip and a loss of mitigation equipment relied upon to transition the plant to a stable shutdown condition. The finding was associated with a cross-cutting aspect in the resources component of the human performance area because the licensee failed to ensure an adequate work instruction document was available to support nuclear safety (H.1) (Section 4OA3).

Licensee-identified Violations

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

REPORT DETAILS

Summary of Plant Status

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

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

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

During the week of August 24th, 2015 the inspectors reviewed the status of licensee actions in accordance with Administrative Procedure 0-ADM-116, "Hurricane Season Readiness," and 0-ONOP-103.3, "Severe Weather Preparations," in preparation for Tropical Storm Erika approaching the Florida peninsula. The inspectors verified actions were performed and special equipment was staged or available as directed by the procedure. The inspectors performed a walk down of the following equipment on both units that are exposed to outside weather conditions to identify any potential adverse conditions:

- Unit 3 and Unit 4 Turbine Buildings
- Unit 3 and Unit 4 Component Cooling Water Heat Exchanger areas
- Unit 3 and Unit 4 Emergency Diesel Generator (EDG) engine buildings
- Unit 3 and Unit 4 ICCW Systems and Structures
- Auxiliary Feed Water (AFW) System Area
- Switchyard area

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Equipment Walk Downs (Quarterly)

a. Inspection Scope

The inspectors conducted three partial alignment verifications of the safety-related systems listed below. These inspections included reviews using plant lineup procedures, operating procedures, and piping and instrumentation drawings, which were compared with observed equipment configurations to verify that the critical portions of the systems were correctly aligned to support operability. The inspectors also verified that the licensee had identified and resolved equipment alignment problems that could

cause initiating events or impact the capability of mitigating systems or barriers by entering them into the CAP. Documents reviewed are listed in the Attachment. This inspection constitutes three samples.

- 4A EDG while 4B EDG was out of service (OOS)
- 3B EDG while 3A EDG was OOS
- A and C AFW pumps while the B AFW pump was OOS

b. Findings

No findings were identified.

.2 Equipment Alignment (Semi-annual)

a. Inspection Scope

The inspectors conducted a detailed review of the alignment and material condition of the AFW system to verify its capability to meet its design basis function while the A AFW pump was out of service for planned maintenance. The inspectors utilized licensee procedure 3-NOP-075 and 4-NOP-075, "Auxiliary Feedwater System," and Drawings 5613-M-3075, "Auxiliary Feedwater System," Sheets 1, 2, and 3, to verify the system alignment was correct. During the walk down, the inspectors verified, as appropriate, that: 1) valves were correctly positioned and did not exhibit leakage that would impact their function, 2) electrical power was available as required, 3) major portions of the system and components were correctly labeled, cooled, and ventilated, 4) hangers and supports appeared correctly installed and functional, 5) essential support systems were operational, 6) ancillary equipment or debris did not interfere with system performance, 7) tagging clearances were appropriate, and 8) valves were locked as required by the licensee's locked valve program. Other items reviewed included the operator workaround list, temporary modification list, system health reports, system description, and open maintenance work orders. In addition, the inspectors reviewed the licensee's CAP to ensure that the licensee was identifying and resolving associated equipment problems.

b. Findings

No findings were identified.

1R05 Fire Protection

.1 Fire Area Walk downs

a. Inspection Scope

The inspectors walked down the below mentioned six plant areas to evaluate conditions related to control of transient combustibles, ignition sources, material condition, and operational status of fire protection systems including fire barriers used to prevent fire damage and propagation. The inspectors reviewed these activities using provisions in the licensee's procedure 0-ADM-016, "Fire Protection Plan" and 10 CFR Part 50, Appendix R. The inspectors routinely reviewed the licensee's fire impairment lists and monitored the associated corrective actions for completion. The inspectors reviewed the 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 usage. This inspection constitutes six samples.

- Unit 3 South Electrical Penetration Room, Fire Zone 20
- Unit 3 Reactor Control Rod Equipment Room, Fire Zone 63
- Reactor Auxiliary Building Hallway, Fire Zone 58
- AFW Pump Area, Fire Zone 84
- Unit Auxiliary Transformer Area, Fire Zone 87
- Unit 4 Auxiliary Transformer Area, Zone 82

b. Findings

No findings were identified.

.2 Fire Protection - Drill Observation

a. Inspection Scope

On August 21, 2015, the inspectors observed an unannounced fire drill that took place within the station power block on the roof top above the control room. The drill was observed to evaluate the readiness of the plant fire brigade to fight fires. The inspectors verified 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. The inspectors also observed the operation of a fire hydrant and charging of fire hoses in the open lot area adjacent to Outside Machine Shop building. This inspection constitutes one sample.

b. Findings

No findings were identified.

1R06 Flood Protection Measures

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 Updated Final Safety Analysis Report (UFSAR), Appendix 5F, "Internal Plant Flooding," which discussed protection of areas containing safety-related equipment that could be affected by internal flooding. Specific plant attributes that were verified included structural integrity, sealing of penetrations, sump pump configurations, and control of debris. Operability of sump systems, including alarms were also verified to be functional.

- Unit 3 and 4 4160 Volt Switchgear Rooms

The inspectors performed an underground cable manhole inspection which included checking for accumulated water. The inspectors also performed cable inspections in accordance with WO 40344892 and drawing 5610-E-53, "Tray, Conduit, and Grounding 18 foot elevation." The following areas were inspected and associated records reviewed:

- Manhole 403 and 734

b. Findings

No findings were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors selected the 4A component cooling water heat exchanger to verify the licensee was performing periodic cleaning and testing following maintenance in accordance with associated procedures. The inspectors observed portions of the heat exchanger cleaning performed by the licensee under WO 40088995. The inspectors also verified the cleaning and inspection following maintenance was performed and properly documented in accordance with completed maintenance procedure 0-PMM-030.01, "Component Cooling Water Heat Exchanger Cleaning and Inspection." The inspectors also reviewed completed licensee procedure 4-OSP-019.4, "Component Cooling Water Heat Exchanger Performance Monitoring" to ensure the heat exchanger was restored, leak tested, and returned to service with no deficiencies. The inspectors walked down portions of the cooling systems for integrity checks and to assess operational lineup and material condition.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program

Licensed Operator Requalification Biennial Inspection

a. Inspection Scope

The inspectors reviewed the facility operating history and associated documents in preparation for this inspection. During the week of August 31, 2015, the inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of operating tests associated with the licensee's operator requalification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the facility licensee in implementing requalification requirements identified in 10 CFR Part 55, "Operators' Licenses." The evaluations were also performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Requalification Program." The inspectors also evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations using ANSI/ANS-3.5-1998, "American National Standard for Nuclear Power Plant Simulators for use in Operator Training and Examination." The inspectors observed two crews during the

performance of the operating tests. Documentation reviewed included Job Performance Measures (JPMs), simulator scenarios, licensee procedures, on-shift records, simulator modification request records, simulator performance test records, licensed operator qualification records, remediation plans, watch standing records, and medical records. The records were inspected using the criteria listed in Inspection Procedure 71111.11. Documents reviewed during the inspection are documented in the List of Documents Reviewed.

The sample is incomplete because the biennial written examination will not be administered until the fourth calendar quarter; therefore, the inspection of that examination will not occur until the fourth calendar quarter.

b. Findings

No findings were identified.

Resident Inspector Quarterly Review

.1 Simulator Observation

a. Inspection Scope

The inspectors performed the following inspection sample of a simulator observation and assessed licensed operator performance while training. The observations included procedural use and adherence, response to alarms, communications, command and control, and coordination and control of the reactor plant operations.

On July 27, 2015, the inspectors assessed licensed operator performance in the plant-specific simulator during a training evolution. The training scenario was started with the unit in Mode 1 at 100 percent of rated thermal power. The training scenario began with a turbine runback and a dropped control rod followed by a feedwater line break inside of containment and an anticipated transient without a scram (ATWS).

During the simulator observation, simulator board configurations were compared with actual plant control board configurations reflecting recent plant changes or modifications. Specifically, the inspectors evaluated the following attributes related to operating crew performance and 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
- Evaluator's control of the scenario and post scenario evaluation of crew performance

b. Findings

No findings were identified.

.2 Control Room Observations

a. Inspection Scope

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

The inspectors also performed the following two focused control room observations during reactivity manipulations and mode changes. Observations were conducted to verify operator compliance with station operating protocols as described in licensee procedure OP-AA-100-100, Conduct of Operations. The inspectors focused on the following conduct of operations attributes as appropriate:

- Operator compliance and use of procedures
- Control board manipulations
- Communication between crew members
- Use and interpretation of plant instruments, indications, and alarms
- Use of human error prevention techniques
- Documentation of activities, including procedure place keeping and narrative logs
- Supervision of activities, including risk and reactivity management

On July 29, 2015, the inspectors performed a focused observation on Unit 4 consisting of a reactor coolant system (RCS) primary water dilution per 0-OP-046, Enclosure 6, "Chemical Volume Control System Boron Concentration Control." Specifically, the inspectors observed the reactor operators performing the pre-job brief per 0-ADM-200, Attachment 7, "Planned Reactivity Manipulations for Maintaining Steady State Plant Conditions" and verified the operators complied with the applicable procedure during the evolution.

On August 20, 2015, the inspectors performed a focused observation on Unit 3 during a periodic moderator temperature coefficient (MTC) surveillance test per procedure 3-OSP-040.12, "MTC Testing." Specifically, the inspectors observed the reactor operators performing a pre-job briefing and verified operators complied with the applicable procedure during the evolution. The inspectors also observed the reactor operators return the plant to a normal line-up and condition per the applicable procedure following the evolution.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the following equipment problem and periodic evaluation report to verify that the licensee's maintenance efforts met the requirements of 10 CFR 50.65, Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, and licensee procedure ER-AA-100-2002, Maintenance Rule Program Administration.

The inspectors' efforts focused on maintenance rule scoping, characterization of maintenance problems and failed components, risk significance, determination of a(1) classification, corrective actions, and the appropriateness of established performance goals and monitoring criteria. The inspectors also interviewed responsible engineers and observed some of the corrective maintenance activities. The inspectors verified that equipment problems were being identified and entered into the corrective action program. The inspectors used licensee maintenance rule data base, system health reports, and the corrective action program as sources of information on tracking and resolution of issues. This inspection includes two samples.

- AR 02024373, 3B emergency diesel generator output breaker malfunction
- Maintenance Rule (a)(3) Periodic Evaluation Report for 4/1/13 - 3/31/15

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors completed in-office reviews and control room inspections of the licensee's risk assessment of five 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 3; and procedures O-ADM-068, "Work Week Management;" WM-AA-1000, "Work Activity Risk Management;" and O-ADM-225, "On Line Risk Assessment and Management." The inspectors also reviewed the effectiveness of the licensee's contingency actions to mitigate increased risk resulting from the degraded equipment and the licensee assessment of aggregate risk using procedure OP-AA-104-1007, "Online Aggregate Risk." The inspectors discussed the on-line risk monitor (OLRM) results with the control room operators and verified all applicable out-of-service equipment was included in the OLRM calculation. The inspectors evaluated the following five risk assessment samples during the inspection period:

- 3B EDG, 3B Charging Pump, and 3BCCW Heat Exchanger OOS
- A AFW Pump, 4A EDG, and 4A CCW Heat Exchanger OOS
- B AFW Pump, 3B EDG, and 3B AFW Steam Supply Valve MOV-3-1404 OOS
- B AFW Pump, 4A CCW Heat Exchanger, and 4B EDG OOS
- B Standby Steam Generator Feed Pump, MOV-3-536, PCV-3-455C, and the Diesel Driven Fire Pump OOS

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

a. Inspection Scope

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

- AR 02060004, 3A Emergency Diesel Generator Starting Air Compressor Breaker
- AR 02064084, 4160 Volt Switch Gear Room High Temperature Alarm
- AR 020577895, Unit 3 and Unit 4 Containment Building Air Lock Equalizing Valve
- AR 02054289, FT-3-496 As found valves outside acceptance criteria
- AR 02068741, 3A EDG Crankcase Lube Oil Leak

b. Findings

No findings were identified.

1R18 Plant Modifications

Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed a permanent plant modification to the Unit 3 component cooling water (CCW) system associated with adding a heat exchanger cooled by supplemental chilled water to assist CCW cooling during summer months. The modifications involved installation of welded connections, valves, instrumentation, a heat exchanger, and circulation pump. The inspectors reviewed the 10 CFR 50.59 screening and technical evaluation to verify that the modification had not affected system operability or availability. The inspectors reviewed associated plant drawings, design analyses, and UFSAR documents impacted by this modification and discussed the changes with licensee personnel to verify that the modifications were consistent with the work order and associated documents. The inspectors observed portions of the modification and surrounding area to determine if conditions resulted in any potential unsafe conditions not described in the engineering change documentation. Additionally, the inspectors reviewed and verified that any conditions associated with the modification were being identified and entered into the CAP. This inspection constitutes one sample.

- EC 283225, CCW Supplemental Cooling

b. Findings

No findings were identified.

1R19 Post Maintenance Testinga. Inspection Scope

For the five 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 0-ADM-737, "Post Maintenance Testing," were incorporated into the test requirements. The inspectors reviewed the following WOs consisting of five inspection samples:

- WO 40217022, 4B Emergency Diesel Generator Appendix R Emergency Light Replacement
- WO 40379383, 3B Charging Pump Coupling Repair
- WO 40356019, A Auxiliary Feedwater Pump Planned Maintenance
- WO 40379348, B Auxiliary Feedwater Pump Turbine Repair
- WO 40373467, 3A Emergency Diesel Generator Relay Replacement

b. Findings

No findings were identified.

1R22 Surveillance Testinga. Inspection Scope

The inspectors either reviewed or observed the following six 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 two surveillance test samples, three in-service testing (IST) samples, and one leak detection surveillance sample. The inspectors reviewed the following tests:

Surveillance Test:

- 3-OSP-028.6, Unit 3 Periodic Rod Control Exercise
- 4-OSP-023.1, 4B EDG Monthly Test

In-Service Tests:

- 3-OSP-068.2, 3A Containment Spray Pump Test (IST)
- 3-OSP-055.1, Unit 3 Emergency Core Cooling System Valve Stroke Test
- 4-OSP-055.1, Unit 4 Emergency Core Cooling System Valve Stroke Test

Reactor Coolant System Leak Detection Test:

- 3-OSP-041.1, Unit 3 Reactor Coolant System Leak Rate Calculation

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

4OA1 Performance Indicator Verification (IP 71151)Barrier Integrity Cornerstonea. Inspection Scope

The inspectors reviewed licensee submittals for the Unit 3 and Unit 4 performance indicators (PI) listed below for the period July 1, 2014, through June 30, 2015, to verify the accuracy of the PI data reported during that period. Performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedure 0-ADM-032, "NRC Performance Indicators Turkey Point," were used to check the reporting for each data element. The inspectors checked operator logs, plant status reports, condition reports, system health reports, and PI data sheets to verify that the licensee had identified the required data, as applicable. The inspectors interviewed licensee personnel associated with performance indicator data collection, evaluation, and distribution. This inspection constitutes two samples.

- Unit 3 Safety System Functional Failures
- Unit 4 Safety System Functional Failures

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (IP 71152).1 Daily Reviewa. 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. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Annual Sample: 3B Emergency Diesel Generator Starting Circuit Relay Failures

a. Inspection Scope

The inspectors selected action request (AR) 02051897, "3B EDG Sequencer Relay Failure," and AR 02024373, "3B EDG frequency monitor relay (FMR) Relay Failure," for a more in-depth review of the circumstances and the corrective actions that followed. The action request report was reviewed to ensure that an appropriate evaluation was performed and corrective actions were specified and prioritized in accordance with the licensee's program. Other attributes checked included disposition of operability and resolution of the problem including cause determination, past operability determination, and corrective actions. The inspectors interviewed plant personnel and evaluated the condition report in accordance with the requirements of the licensee's corrective actions process as specified in licensee's procedures PI-AA-100-1008, "Condition Evaluation," and PI-AA-104-1000, "Corrective Action." This inspection constitutes one sample.

b. Findings and Observations

No inspector findings were identified. For AR 02024373, "3B EDG FMR Failure," the licensee determined that the apparent cause of the failure of the FMR was an age-related issue due to applying an inappropriate preventative maintenance (PM) strategy. For AR 02051897, "3B EDG Sequencer Relay Failure," the licensee determined that the failure of the relay was due to an intermittent failure mode that was not predictable or preventable. The inspectors noted that the licensee's evaluation for the FMR failure concluded that the FMRs had a 10 year replacement interval recommended by Electric Power Research Institute (EPRI) and had been installed since 1991. The inspectors also noted that the licensee's evaluation for the Sequencer relay failure concluded that the Sequencer relay was designed for 200,000 cycles and had been cycled approximately 1200 times at the time of the failure.

Immediate corrective actions for these events included replacement of the 3B EDG FMR and Sequencer Relay and performing an extent of condition to determine other relays that did not have proper PM strategies implemented. The licensee determined the cause of the Sequencer relay failure was due to increased resistance between the metal plunger mechanism and brass sleeve. The licensee determined that the FMR failed when the set point drifted high and failed to pick-up when conditions required it to satisfy EDG 3B output breaker closure logic. The licensee also determined, through the extent of condition, that FMRs on the 3 other EDGs did not have the correct PM strategy applied and were installed since 1991. As a result of the extent of condition, the licensee replaced all EDG FMR relays on Unit 3.

40A3 Follow-up of Events and Notice of Enforcement Discretion (IP 71153)

(Closed) Licensee Event Report (LER) 05000251/2015-002-00, Reactor Trip Resulting From Generator Differential Lockout

On May 12, 2015, Turkey Point Nuclear Station experienced and unplanned reactor Trip from 80 percent rated thermal power. The reactor trip was due to a turbine trip caused by a generator differential lockout protection signal. The licensee's root cause concluded that the event was due to the current transformer (CT) lugs not being torqued to the vendor recommended value of 5 foot-pounds. The reactor plant systems responded as designed and the operators stabilized the plant in Mode 3, Hot Standby, in accordance with station procedures. The licensee took corrective actions to install a

temporary modification to disconnect the failed lug connection from the CT and torqued the other lugs to specification before returning the unit to Mode 1, Power Operation. The inspectors reviewed the LER to verify its accuracy, completeness, and associated corrective actions taken or planned. These activities constitute completion of one event follow-up inspection sample.

a. Inspection Scope

During the week of July 27, 2015, the inspectors reviewed the details of this LER. The inspectors reviewed the licensee's root cause evaluation for this event documented in action request 02047137. The licensee's root cause concluded that the root cause of the event was due to the CT lugs not being torqued to the vendor recommended value of 5 foot-pounds. The work instructions did not provide vendor specified torque information and relied upon "skill of the craft" to tighten the lug connections hand tight. Corrective actions included performing a root cause evaluation of the event and a revision to procedure 0-PME-090.03, "Maintenance of Isophase Neutral Bus and Grounding Transformer Connection Assemblies," to include additional guidance on torquing the lug assemblies.

b. Findings

Introduction: A Green self-revealing finding was identified for the licensee's failure to provide adequate instructions for performing work on the Unit 4 main generator protection control circuitry. As a result, the lugged connections on an installed current transformer lacked the appropriate tightness causing increased electrical resistance and ultimately catastrophic failure of a lug connection. The lug failure produced an open circuit condition on the current transformer causing the generator protection circuit to actuate. This resulted in a turbine trip and reactor trip.

Description: In 2013, as part of an extended power uprate project, the licensee modified their Unit 4 turbine generator control circuit in accordance with engineering modification package EC 246904 and work order 40063905. On May 12, 2015, Unit 4 tripped from 80 percent power while performing power ascension to full power. The licensee determined that a work order document directed the technician to connect the CT lugs hand tight and did not require torquing to the vendor torque specification of 5 foot-pounds. As a result, the CT lugged connections lacked the appropriate tightness causing increased electrical resistance, increased heat, catastrophic failure of the lug, and an open circuit condition. The open circuit on the current transformer caused the generator protection circuit to actuate resulting in a turbine trip and reactor trip.

The licensee entered this event into their corrective action program as action request 02047137 and conducted a root cause evaluation (RCE). The RCE determined that the vendor recommended torque value for the lugged connections was not used during the design modification or work order process. In addition, the RCE determined two contributing causes to be that; (1) Turkey Point had no periodic maintenance activity to periodically check the tightness of these connections, and (2) Operating experience was overlooked from the industry that identified similar events. Corrective actions included replacing the damaged lug and torquing all the current transformer lug connections to the vendor recommended value. The RCE resulted in a revision being made to maintenance procedure 0-PME-090.03, "Maintenance of Isophase Neutral Bus and Grounding Transformer Connection Assemblies," to include additional guidance on torquing the lug assemblies.

Analysis: The licensee's failure to provide adequate instructions for performing work on the Unit 4 main generator protection control circuit was a performance deficiency. Specifically, engineering modification package EC 246904 and work order 40063905 did not provide adequate instructions to torque the lugged connections on the current transformer terminals which caused a high electrical resistance condition on the terminal lugs. The inspectors determined that the performance deficiency was more than minor because it was associated with the procedure quality attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Specifically, the failure to have an adequate procedure for performing work on the main generator protection control circuit caused it to unexpectedly actuate resulting in a turbine trip and reactor trip. The inspectors determined the finding was of very low safety significance (Green) because the finding did not result in a reactor trip AND a loss of mitigation equipment relied upon to transition the plant to a stable shutdown condition. The finding was associated with a cross-cutting aspect in the resources component of the human performance area because the licensee failed to ensure an adequate work instruction document was available to support nuclear safety (H.1)

Enforcement: This finding does not involve enforcement action because no violation of a regulatory requirement was identified. The licensee entered this issue into their corrective action program as AR 02047137. Because this finding does not involve a violation and is of very low safety significance, it is identified as FIN 05000251/2015003-01, Inadequate Work Instructions for Replacing Main Generator Current Transformers.

40A6 Meetings

The resident inspectors presented the inspection results to Mr. Summers and other members of licensee management on October 15, 2015. 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.

40A7 Licensee-identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meets the criteria of the NRC Enforcement Policy for being dispositioned as an NCV.

10 CFR 50, Appendix B, Criterion XVI, Corrective Action, required, in part, that measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected. Contrary to the above, after the licensee determined that the site had an inadequate relay PM program (AR 02053778), they failed to identify that the FMR for the 3B EDG needed a 10 year replacement PM. As a result, during the monthly surveillance run of the 3B EDG, the 3B EDG was rendered inoperable when the 3B EDG output breaker failed to close due to the failure of the 3B EDG FMR. The FMR for the 3B EDG had been installed since 1991. A detailed risk evaluation was performed on this licensee identified violation and was determined to be of very low risk significance, i.e., $< 1E-6$ (Green). The dominant risk result was a grid-related Loss of Offsite Power where multiple EDGs fail and neither offsite power nor

the EDGs are recovered. This violation was associated with the Mitigating Systems Cornerstone and determined to be of very low safety significance (Green) after performing a detailed risk evaluation in accordance with Manual Chapter 0609, Appendix A. The licensee entered this violation into their CAP as AR 02024373.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

F. Banks, Nuclear Oversight Manager
C. Cashwell, Training Manager
P. Czaya, Licensing Engineer
C. Domingos, Plant General Manager
T. Eck, Security Manager
M. Guth, Licensing Manager
O. Hanek, Licensing Engineer
A. Katz, Projects Manager
G. Melin, Assistant Operations Manager
S. Mihalakea, Licensing
K. Ohara, Emergency Preparedness Manager
J. Pallin, Engineering Director
D. Sluszka, Work Controls Manager
B. Stamp, Operations Director
T. Summers, Site Vice-President
A. Carrasquillo, System Engineering Manager
R. Hess, General Operations Training Supervisor
M. Wilson, Operations Training Supervisor
T. Ouret, Corporate Training
T. Wendlen, Simulator Support

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000251/2015003-01	FIN	Inadequate Work Instructions for Replacing Main Generator Current Transformers (Section 4OA3)
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Closed

05000251/2015-002-00	LER	Reactor Trip Resulting From Generator Differential Lockout (Section 4OA3)
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LIST OF DOCUMENTS REVIEWED

Action Requests:

02060261, Contract Employee Pinched Finger While Moving Material
02060263, Smoke Detector Detached From Its Base
02060280, Emergency Light Lamp Head Not Aimed In Correct Direction
02060297, Changes Required for 0-ADM-016.4 Fire Watch Program
02060641, 3A High-Head Safety Injection (HHSI) Pump Modification Outside Design Processes
NOS Identified
02060910, Level 2 Leak rate Investigation on Unit 3
02061901, Excessive Oil and Grease Leaking From Valve AFSS-3-007
02061897, Gasket Loose Allowing Water Intrusion to Sensitive AFW Equip
02062637, Received AN-H1/1, SFP Lo Level Alarm
02062660, U3 LEFM Failure
02063014, K3B B AUX Feed Pump
02063016, Bravo AUX Feed Pump Parts Availability
02064562, Transient Combustibles Observed in AUX Feedwater Pump Area
02069718, RCS Metal Impart Alarm Received
02069722, Channel B RX Vessel Level Monitoring System Failed
02068581, Plastic Stanchions Improperly Stored Within the Power Block
02068741, Lube Oil Pool on North Side of 3A EDG
02070848, South Dade Met Tower 10M Wind Speed Sensor Found Damaged

Section 1R01: Adverse Weather

0-EPIP-20106, Natural Emergencies

Section 1R04: Equipment Alignment

P&ID 5614-M-3022, Emergency Diesel Engine and Oil System
P&ID 5613-M-3022, Emergency Diesel Engine and Oil System
3-NOP-075, Unit 3 Auxiliary Feedwater System
4-NOP-075, Unit 4 Auxiliary Feedwater System
P&ID 5613-M-3075, Auxiliary Feedwater System

Section 1R05: Fire Protection

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

Section 1R06: Flood Protection Measures

0-SMM-102.1, Flood Protection Stop Log and Penetration Seal Inspection
Drawing 5610-C-1695, Network of Barriers for External Flood Protection

Section 1R11: Licensed Operator Regualification Process

0-ADM-211, Emergency and Off-Normal Operating Procedure Usage
TR-AA-230-1007, Conduct of Simulator Training and Evaluation

Records:

License Maintenance Packages (6)
Reactivation Packages (7)

LORP Training Attendance records (7)
Medical Files (6)
Remedial Training Records (2)
Remedial Training Examinations (2)

Licensee Event Reports:
2014-002-00
2014-005-00
2015-001-00

Action Requests:
01966208
01967899
01969680
01975540
01983618
02071431

Procedures:
Simulator Engineering Instruction Number 25, Simulator Operability Testing, 09/27/2013.
Simulator Engineering Instruction Number 09, Simulator Physical Fidelity Validation, 07/13/2010.
Simulator Engineering Instruction Number 10, Plant Design Change Tracking, 06/15/2015.
Simulator Engineering Instruction Number 19, Simulator Exam Security, 03/11/2014.
Simulator Engineering Instruction Number 26, Simulator Verification and Validation Testing, 07/21/2010.
Simulator Engineering Instruction Number 31, Post-Event Simulator Testing, 10/29/2013.
TR-AA-221, Simulator Change Control, Rev. 1, 11/03/11.

Simulator Steady State Tests:
Reduced Power (≤ 50) Steady State Test, SST-001, Rev. 2, Performed 09/29/2014.

Simulator Transient Tests:
Manual Reactor Trip, TRN-001, Rev. 4, Performed 09/06/2014.
Loss of Normal and Emergency Feedwater, TRN-002, Rev 4. Performed 09/06/2014.
Benchmark 08/11/2014 Unit 3 Loss of Instrument Air & Manual Reactor Trip.

Simulator Scenario Based Tests:
Scenario Based Testing for PTN 750204901, Steam Generator Tube Rupture Faulted Outside Containment, 06/04/2015.

Simulator Problem Reports & Design Change Requests:
List of Open Simulator TWRS as of July 29, 2015.
List of Completed TWRS from July 29, 2013 to July 29, 2015.
Closed TWR 01934087, Compare Simulator to Unit 3 Shutdown to 95% and 300 ppm MTC Test (Modification of IC).
Open TWR 01983608, 08/11/14 Unit 3 Loss of Instrument Air & Manual Reactor Trip.
Closed TWR 01943567, Unit 3 Cycle 27 Core Reload.

Simulator Reports:

PTN Simulator Review Committee Meetings Minutes, 07/28/2015.

Scenario Packages:

Simulator Exercise Guide, PTN 750203500, 04/07/2015.

Simulator Exercise Guide, PTN 750204901, 07/07/2015.

Simulator Exercise Guide, PTN 750205401, 04/20/2015.

Simulator Exercise Guide, PTN 750206507, 06/01/2015.

JPM Packages:

01041036102 Perform Manual Leak Rate Calculation Revision 1-0.

02201052321 Classify Events and Fill Out SNF Revision 0-0.

01023003100 Crosstie EDG Starting Air Revision 0-0.

04075022300 Align AFW System to Maintain Dual Train Redundancy Revision 2-0.

01041038102 Start 3A Reactor Coolant Pump (RCP) in Mode 3 Revision 1-0.

01046008304 Emergency Borate the RCS Revision 1-1.

01201013103 Prepare an ECO for the B AFW Pump Revision 1-0.

02051013101 Evaluate TS Condition While Performing A Valve Operability Test Revision 1-1.

01053002101 PACV Alternate Air Pressurization Revision 1-0.

01025003200 CREVS Initiation from Control Room Revision 0-0.

Section 1R15: Operability Evaluations

0-ADM-213, Technical Specification Related Equipment Out of Service Logbook

0-ADM-226, Operability Screening and Condition Reports

EN-AA-203-1001, Operability Determinations and Assessments

Section 1R18: Plant Modifications

5613-M-3030, Component Cooling Water System

3-NOP-030.01, CCW Supplemental Cooling System

Work Order 4036965-16, CCW Supplemental Cooling System Functional Testing

Section 1R19: Post Maintenance Testing

0-ADM-737, Post Maintenance Testing

MA-AA-203-1000, Maintenance Functional Testing

Section 4OA1: Performance Indicator Verification

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