



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

January 25, 2017

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

**SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION - NRC INTEGRATED  
INSPECTION REPORT 05000250/2016004, 05000251/2016004**

Dear Mr. Nazar:

On December 31, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Turkey Point Nuclear Generating Station, Units 3 and 4. On January 11, 2017, the NRC inspectors discussed the results of the inspection with Mr. Berryman and other members of your staff. The results of this inspection are documented in the enclosed report.

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

If you contest the violation or significance of this 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; and the NRC resident inspector at the Turkey Point Nuclear Generating Station.

If you disagree with a cross-cutting aspect assignment in this report you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC resident inspector at the Turkey Point Nuclear Generating Station.

M. Nazar

2

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: Inspection Report 05000250/2016004, 05000251/2016004,  
w/Attachment: Supplemental Information

cc Distribution via ListServ



Letter to Mano Nazar from LaDonna B. Suggs dated January 25, 2017.

SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION - NRC INTEGRATED  
INSPECTION REPORT 05000250/2016004, 05000251/2016004

DISTRIBUTION:

S. Price, RII

Kimberly Sloan, RII

OE Mail

RIDSNRRDIRS

PUBLIC

RidsNrrPMTurkeyPoint Resource

**U.S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos: 50-250, 50-251

License Nos: DPR-31, DPR-41

Report Nos: 05000250/2016004, 05000251/2016004

Licensee: Florida Power & Light Company

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

Location: 9760 SW 344th Street  
Florida City, FL 33035

Dates: October 1, 2016 through December 31, 2016

Inspectors: J. Orr, Senior Resident Inspector  
J. Reyes, Resident Inspector  
M. Thomas, Resident Inspector (acting)  
A. Sengupta, Reactor Inspector (Section 1R07)  
P. Capehart, Senior Operations Engineer (Section 1R11)  
W. Loo, Senior Health Physicist (Sections 2RS6, 4OA1)  
J. Rivera, Health Physicist (Sections 2RS7, 4OA1)

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000250/2016004, 05000251/2016004; 10/01/2016 – 12/31/2016; Turkey Point Nuclear Generating Station, Units 3 & 4; Follow-up of Events and Notices of Enforcement Discretion.

The report covered a three-month period of inspection by the resident inspectors and region-based specialist inspectors. One self-revealing finding was identified which was determined to be a non-cited violation (NCV) of very low safety significance. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. Cross-cutting aspects are determined using IMC 0310, "Components Within the Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements 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: Mitigating Systems

- Green: A self-revealing NCV of Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.1 was identified for the licensee's failure to input the correct Eagle 21 resistance temperature detector (RTD) coefficients into the Eagle 21 reactor protection system (RPS) which resulted in channels being inoperable for longer than their allowed outage times. Immediate corrective actions to restore compliance included inputting the correct RTD coefficients into the Eagle 21 RPS. Planned corrective actions to prevent recurrence included revising engineering procedures to include validation that the RTD coefficients were derived via the correct methodology. This issue was entered into the licensee's corrective action program as action request (AR) 02129632.

The licensee's failure to input the correct RTD coefficients into the Eagle 21 RPS was a performance deficiency. The performance deficiency was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage) because the specified safety function of each functional unit was not met. The inspectors evaluated the significance of this finding and determined the finding was of very low safety significance (Green) because the finding did not affect the function of other redundant or diverse methods of reactor shutdown. The NRC assigned a cross cutting aspect associated with the Resources element of the Human Performance area because the licensee failed to ensure that procedures related to RTD replacement contained adequate information for verifying and inputting correct RTD coefficients [H.1]. (Section 4OA3)

### Licensee Identified Violations

None

## REPORT DETAILS

### Summary of Plant Status

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

Unit 4 began the inspection period at 100 percent of RTP. On October 1, 2016, the unit power was reduced to 48 percent to complete repairs on the 4B main feedwater pump. Unit 4 was returned to 100 percent RTP on October 6, 2016. On October 28, 2016, Unit 4 was reduced to Mode 2 to complete repairs to the left turbine stop valve. Unit 4 was returned to 100 percent RTP on October 31, 2016, 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)

##### Readiness for Impending Adverse Weather Conditions

##### a. Inspection Scope

During the week of October 3<sup>rd</sup>, 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, when hurricane Matthew was approaching the Florida peninsula. The inspectors verified actions associated with the procedures and special equipment were performed and staged or available as directed by the procedures. The inspectors performed a walk down of the following areas to identify any potential adverse conditions. This inspection constitutes one sample.

- Unit 3 and Unit 4 turbine buildings
- Unit 3 and Unit 4 emergency diesel generator (EDG) engine buildings
- Unit 3 and Unit 4 intake cooling water (ICW) systems and structures
- Unit 3 and Unit 4 component cooling water (CCW) systems and structures
- Unit 3 and Unit 4 start-up transformer areas
- Auxiliary feedwater (AFW) system area
- Switchyard area

##### b. Findings

No findings were identified.

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

##### .1 Partial Equipment Walk Downs (IP 71111.04)

##### 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 them into the corrective action program (CAP). Documents reviewed are listed in the Attachment. This inspection constitutes three samples.

- C AFW pump aligned to train 1 while performing maintenance
- Unit 3 and Unit 4 high pressure safety injection (HPSI) pumps while the 3B EDG was out of service (OOS) during maintenance
- 3A, 4A and 4B EDGs and auxiliaries while the 3B EDG was OOS

b. Findings

No findings were identified.

.2 Complete System Walk Down (IP 71111.04S)

a. Inspection Scope

The inspectors conducted a detailed walk down and review of the alignment and condition of the Unit 3 and Unit 4 AFW systems to verify their capability to meet their design basis function. The inspectors utilized licensee procedures 3/4 – OP-075, Auxiliary Feedwater System; and 3/4 – OSP- 075.5, Auxiliary Feedwater System Flowpath Verification, as well as other licensing and design documents, to verify the system alignment was correct. During the walk downs, the inspectors verified 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 were 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. Pending design and equipment issues were reviewed to determine if identified deficiencies significantly impacted the systems' functions. Items included in this review were the operator workaround list, the temporary modification list, system health reports, system description, and outstanding maintenance work requests and work orders. In addition, the inspectors reviewed the licensee's CAP to ensure that the licensee was identifying and resolving equipment alignment problems. Documents reviewed are listed in the attachment. This inspection constitutes one sample.

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 the licensee's 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 usage. This inspection constitutes six samples. The following areas were inspected:

- Zone 81: Unit 4 main condenser, auxiliary transformer, and start-up transformer
- Zone 86: Unit 3 main condenser and start-up transformer
- Zone 92: Unit 3 condensate pump area
- Zone 91: Unit 4 condensate pump area
- Zone 63: Unit 3B motor control center room
- Zone 61: Unit 4B motor control center room

b. Findings

No findings were identified.

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

a. Inspection Scope

On October 12, 2016, the inspectors observed an unannounced fire drill that took place within the station power block on the 18-foot elevation just outside the auxiliary feed water pump area. The drill was observed to evaluate the readiness of the plant fire brigade to fight fires and the control room to make the proper emergency action level (EAL) classification. 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 (SCBA); (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 placement and charging of the fire hoses used to simulate extinguishing the fire. The inspectors reviewed the SCBA program including storage,

training, expectations for use, and maintenance. This inspection constitutes one sample.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07T)

Triennial Review of Heat Sink Performance

a. Inspection Scope

The inspectors interviewed plant personnel, conducted plant walk downs, and reviewed records for a sample of heat exchangers (HXs) that were directly cooled by the ICW system, to verify that HX deficiencies or potential common cause problems that could result in initiating events; or affect multiple HXs in mitigating systems, were being identified, evaluated, and resolved. The inspectors selected the following HXs for review based on their risk-significance in the licensee's probabilistic risk analysis, and their safety-related mitigating functions:

- 3C and 4A CCW HXs
- 3B and 4A residual heat removal HXs
- 3B high head safety injection bearing cooler HX

For the HXs, the inspectors reviewed the results of routine maintenance inspections performed to monitor the effects of fouling and establish the inspection and cleaning frequency. The inspectors verified that the inspection frequency, monitoring and trending of as found conditions were consistent with accepted industry practices and Generic Letter (GL) 89-13 guidance. The inspectors also verified that the inspection results were being documented in such a way as to support the inspection and cleaning frequencies established for the HXs and that they provided reasonable assurance that heat transfer capability under current licensing and design basis conditions was being maintained. Additionally, the inspectors reviewed recent eddy current examination reports to verify that tube integrity was being assessed through use of eddy current testing methods, and that maximum tube plugging limits were considered during the inspection process.

The inspectors reviewed the inspection and cleaning methodologies for the selected HXs to verify that the licensee's activities were adequate to detect degradation prior to loss of heat removal capabilities below design basis values, and consistent with the licensee's regulatory commitments in response to GL 89-13. The inspectors' review included a sample of periodic flow testing records to verify flow through each HX was consistent with the system design and licensing basis. The inspectors also reviewed a sample of system health reports to verify that the licensee's chemical treatment programs for corrosion and fouling control were being evaluated, and that the programs were effective in preventing system degradation.

The inspectors reviewed the licensee's performance testing results. This included a review of the licensee's performance test results for key components and ICW flow balance test results. In addition, the inspectors compared the flow balance results to the

system configuration, and flow assumptions during design basis accident conditions. The inspectors also determined whether the licensee ensured adequate isolation during design basis events, consistency between testing methodologies and design basis leakage rate assumptions, and proper performance of risk significant non-safety related functions.

For buried or inaccessible piping, the inspectors reviewed the licensee's pipe testing, inspection, or monitoring program to determine whether structural integrity was ensured and that any leakage or degradation was appropriately identified and dispositioned by the licensee.

The inspectors performed a system walk down of the ICW structure to determine whether the licensee's assessment on structural integrity and component functionality was adequate and that the licensee ensured proper functioning of traveling screens and strainers and structural integrity of component mounts. In addition, the inspectors determined whether ICW pump bay silt accumulation was monitored, trended, and maintained at an acceptable level by the licensee; and that water level instruments were functional and routinely monitored. The inspectors also determined whether the licensee's ability to ensure functionality during adverse weather conditions was adequate. In addition, the inspectors reviewed available licensee testing and inspections results, the licensee's disposition of any active thru-wall pipe leaks, and the history of through-wall pipe leakage to identify any adverse trends since the last NRC inspection.

The inspectors also reviewed CAP documents related to the ICW system and performance issues to determine whether the licensee had an appropriate threshold for identifying issues, and to evaluate the effectiveness of the corrective actions.

These inspection activities constituted five heat sink inspection samples as defined in IP 71111.07T.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance

.1 Simulator Observation (IP 71111.11Q)

a. Inspection Scope

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

On October 19, 2016, the inspectors assessed licensed operator performance in the plant-specific simulator during an annual requalification exam. The exam scenario started with the unit in Mode 1 at 100 percent power with a containment spray pump out of service. The scenario included a turbine trip on low oil pressure during a fast load reduction with an associated failure of the reactor protection system inducing an

anticipated transient without scram (ATWS), and a failure of the auxiliary feedwater system to automatically initiate during the ATWS.

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
- 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. These observation were conducted to verify operator compliance with station operating guidelines, such as use of procedures, control and manipulation of components, and communications.

The inspectors also performed the following focused control room observations during reactivity manipulations and operational mode changes. These observation were conducted to verify operator compliance with station operating protocols and described in licensee procedure OP-AA-100-1000, 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 initials and sign-offs in procedures
- Supervision of activities including risk and reactivity management

Specifically, the inspectors performed the following two focused control room observations during reactivity manipulations and operational mode changes:

- 1) On October 1, 2016, the inspectors performed a focused control room observation during the Unit 4 power decrease from 100 percent RTP to 48 percent RTP in preparation to complete planned maintenance on the 4B main feedwater (MFW) pump;
- 2) On October 6, 2016, the inspectors performed a focused control room observation during the Unit 4 increase in power to 100 percent RTP after the maintenance activities on the 4B MFW pump were completed.

For both evolutions, the inspectors observed the pre-evolution operating crew brief which included reviews of specific critical steps to be performed which caused changes in reactivity. Additionally, prior to the start of the power changes, the inspectors reviewed specific reactivity control procedure steps and the expected system responses with the responsible control room reactivity senior reactor operator and the reactor engineer that were assigned to oversee the power changes during each evolution. This inspection constitutes two samples.

b. Findings

No findings were identified.

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

a. Inspection Scope

On November 22, 2016, the licensee completed the annual requalification operating examinations required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). The inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with IP 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in IMC 0609, "Significance Determination Process," Appendix I, "Operator Requalification Human Performance Significance Determination Process." This inspection constitutes one sample.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (IP 71111.12Q)

.1 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 effort 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 two routine samples.

- AR 1771733, Instrument air motors 3CM and 4CM returned to (a)(2)
- AR 2110331, Safety injection system MR scope change to add condition monitoring to motor operator valves’ (a)(1) criteria

## .2 Quality Control Inspection

The inspectors reviewed the control of quality parts required for the 4B CCW HX retube project, WO 40400119. Specifically, the inspectors verified that all components replaced during the retube project were specified and controlled by work order instructions and receipt inspections to be of the appropriate quality classification. This inspection constitutes one quality control sample.

### 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 3; and 0-ADM-225, “On Line Risk Assessment and Management.” The inspectors also reviewed the effectiveness of the licensee’s contingency actions to mitigate increased risk resulting from 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 two risk assessment samples during the inspection period:

- 3B emergency containment cooler and train 2 of AFW system OOS
- 3B EDG, 3B-train safety-related 4160V switch gear and 480V load center OOS

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

.1 Quarterly Review

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 two operability evaluations described in the ARs listed below. The inspectors reviewed applicable sections of the Updated Final Safety Analysis Report (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 two samples.

- AR 2161113, MOV-6459A AFW trip and throttle valve failure to open
- AR 2170850, Containment spray pump 4A suction to recirculation test line valve found mispositioned

b. Findings

No findings were identified.

.2 Annual Review: Operator Workarounds

a. Inspection Scope

The inspectors reviewed the licensee's implementation of the process used to identify, document, track, and resolve operator workarounds (OWAs) as described in procedure OP-AA-108-1000, "Operator Challenges Program Management," to verify the licensee was identifying OWAs at an appropriate threshold and entering them into the CAP. Daily plant and equipment status logs, and degraded instrument logs, were reviewed to identify any potential sources of unidentified operator challenges. The inspectors reviewed the overall operator challenges logs, which included OWAs, operator burdens, and control room deficiencies, to determine if any potential aggregate issue requiring operator actions existed. The inspectors reviewed specific details of the 3B ICW pump fuse holder operator burden with the Operator Challenges Coordinator. The inspectors reviewed the December 28, 2016, Operational Focus Committee meeting minutes to determine whether the licensee's planned actions and timeliness to resolve present operator challenges were appropriate and commensurate with any safety significance. This inspection constitutes one sample.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing (IP 71111.19)a. Inspection Scope

For the post maintenance tests and associated work orders (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," was incorporated into the test requirements. The inspectors reviewed the following WOs consisting of three inspection samples:

- WO 40457173, 4B intake cooling water pump packing replacement
- WO 40390212, B standby steam generator feed pump 10-year PM
- WO 40476227, Alternate shutdown panel transfer and control switches maintenance

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 two surveillance test samples and one containment isolation valve leak test sample. The inspectors reviewed the following tests:

Surveillance Tests:

- 3-OSP-055.1, 3A and 3B Emergency Containment Cooler Operability Test
- 4-SMI-049.01B, 4B RPS Logic Matrix Test

Containment Isolation Valve Test:

- 3-OSP-051.5, Containment Penetration 35 – Containment Purge Supply

b. Findings

No findings were identified.



## Cornerstone: Emergency Preparedness

### 1EP6 Drill Evaluation (IP 71114.06)

#### Licensed Operator Requalification

##### a. Inspection Scope

On October 19, 2016, the inspectors observed and assessed a licensed operator crew's performance during an evaluated annual licensed operator requalification exam in the control room simulator. The simulated scenario included assessing classification of the emergency events and completing notifications to State of Florida authorities and the NRC. The inspectors assessed the licensee's actions to verify that emergency classifications and notifications were timely and made in accordance with the licensee emergency plan implementing procedures and 10 CFR 50.72 requirements. This inspection constitutes one sample.

##### b. Findings

No findings were identified.

## 2.0 RADIATION SAFETY

### Cornerstone: Occupational Radiation Safety and Public Radiation Safety

### 2RS6 Radioactive Gaseous and Liquid Effluent Treatment (IP 71124.06)

##### a. Inspection Scope

Radioactive Effluent Treatment Systems The inspectors walked-down selected components of the gaseous and liquid radioactive waste (radwaste) processing and effluent discharge systems. To the extent practical, the inspectors observed and evaluated the material condition of in-place waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment. Inspected components included waste monitor tanks and liquid waste processing equipment and associated piping and valves. The inspectors interviewed licensee staff regarding equipment configuration and effluent monitor operation. The inspectors also walked down and reviewed surveillance test records for auxiliary building filtered ventilation systems.

Effluent Sampling and Discharge The inspectors observed the collection and processing of liquid and gas effluent samples from the plant vent and spent fuel pool. Technician proficiency in collecting, processing, and preparing the applicable release permits was evaluated. The inspectors reviewed recent liquid and gaseous release permits including pre-release sampling results, effluent monitor alarm setpoints, and public dose calculations. For containment air particulate and radioactive gas monitors, condenser air ejector monitors, and main steam line monitors, the inspectors reviewed calibration and functional test records and evaluated traceability of radioactive calibration sources to National Institute of Standards and Technology (NIST) standards. The inspectors also evaluated the licensee's capability to collect high-range post-accident effluent samples

from these monitoring systems. The inspectors reviewed and discussed with licensee staff methodology for determining vent and stack flow rates and compared current vent flows to design values in the UFSAR.

The inspectors reviewed the 2014 and 2015 Annual Radioactive Effluent Reports to evaluate reported doses to the public, review any anomalous events, and to review Offsite Dose Calculation Manual (ODCM) changes. The inspectors also reviewed compensatory sampling data for time periods when selected radiation monitors were out of service. The inspectors reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze effluent samples. The inspectors also reviewed licensee effluent source term characterizations and changes to effluent release points. In addition, the inspectors evaluated recent land use census results.

Problem Identification and Resolution The inspectors reviewed and discussed selected CAP documents associated with gaseous and liquid effluent processing and release activities including licensee sponsored assessments. The inspectors evaluated the licensee's ability to identify and resolve issues.

Inspection Criteria Radwaste system operation and effluent processing activities were evaluated against requirements and guidance documented in the following: 10 CFR Part 20; 10 CFR Part 50 Appendix I; ODCM; UFSAR Section 11; Regulatory Guide (RG) 1.21, "Measuring, Evaluating, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants"; RG 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50 Appendix I"; and Technical Specifications (TS) Section 6. Documents reviewed during the inspection are listed in the Attachment.

This inspection constitutes six completed samples under IP 71124.06.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP) (IP 71124.07)

a. Inspection Scope

REMP Implementation The inspectors reviewed the 2014 and 2015 Annual Radiological Environmental Operating Reports and the 2014 and 2015 Annual Radioactive Effluent Release Reports. Selected environmental measurements were reviewed for consistency with licensee effluent data, evaluated for radionuclide concentration trends, and compared with detection level sensitivity requirements as described in the ODCM. The inspectors assessed the licensee's response to any missed or anomalous environmental samples. The inspectors also reviewed the results of interlaboratory cross-checks for laboratory instruments used to analyze environmental samples. Changes to the ODCM, Land Use Census, or environmental program processes were discussed with licensee staff.

The inspectors observed routine collection of air particulate and iodine, surface water, broadleaf vegetation, and thermo-luminescent dosimeters at selected locations as

required by the licensee's ODCM. The inspectors noted the material condition of the continuous air samplers and environmental dosimeters. The inspectors also reviewed calibration and maintenance records for the environmental sampling equipment.

Meteorological Monitoring Program The inspectors observed the physical condition of the meteorological tower and its instrumentation and discussed equipment operability and maintenance history with licensee staff. The inspectors evaluated transmission of locally generated meteorological data to the main control room operators. Calibration records for the meteorological measurements of wind speed, wind direction, and temperature were reviewed. The inspectors also reviewed meteorological measurement data recovery for 2014 and 2015.

Ground Water Protection The inspectors reviewed the licensee's continued implementation of the industry's Ground Water Protection Initiative (Nuclear Energy Institute (NEI) 07-07) and discussed any changes to the program. The inspectors discussed program guidance for responding to spills, leaks, and unexpected discharges with licensee staff and reviewed recent monitoring well results and any voluntary communications. The inspectors also reviewed recent entries into the 10 CFR 50.75(g) decommissioning file. The inspectors reviewed and discussed the licensee's program for monitoring of structures, systems, and components with the potential to release radioactive material to the environment. Potential effluent release points due to onsite surface water bodies were also evaluated.

Problem Identification and Resolution The inspectors reviewed CAP documents in the areas of radiological environmental monitoring and meteorological tower maintenance. The inspectors evaluated the licensee's ability to identify and resolve the issues. The inspectors also reviewed recent self-assessment results.

Inspection Criteria The inspectors evaluated REMP implementation, meteorological monitoring, and groundwater protection against the requirements and guidance contained in: 10 CFR Part 20; Appendices E and I to 10 CFR Part 50; TS Section 6.0; ODCM; UFSAR Chapter 2; RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment; Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program" – 1979; RG 1.23, "Meteorological Monitoring Programs for Nuclear Power Plants", Rev. 1; NEI 07-07, "Industry Groundwater Protection Initiative – Final Guidance Document"; and licensee procedures. Documents reviewed during the inspection are listed in the Attachment.

This inspection constitutes three completed samples under IP 71124.07.

b. Findings

No findings were identified.

4OA1 Performance Indicator Verification (IP 71151)

1. Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors reviewed licensee submittals for the Unit 3 and Unit 4 mitigating system performance indicators (PIs) listed below for the period October 1, 2015 through September 30, 2016, to verify the accuracy of the PI data reported during that period. PI definitions and guidance contained in NEI 99-02, Regulatory Assessment Performance Indicator Guideline, and licensee 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 ten samples. The Unit 3 and Unit 4 PIs reviewed are listed below:

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

b. Findings

No findings were identified.

2. Radiation Safety Cornerstone

a. Inspection Scope

Occupational Radiation Safety Cornerstone The inspectors reviewed the Occupational Exposure Control Effectiveness PI results for the Occupational Radiation Safety Cornerstone from October 2015 through September 2016. For the assessment period, the inspectors reviewed electronic dosimeter alarm logs and CAP documents related to controls for exposure of significant areas. Documents reviewed during the inspection are listed in the Attachment.

Public Radiation Safety Cornerstone The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from October 2015 through September 2016. For the assessment period, the inspectors reviewed cumulative and projected doses to the public contained in liquid and gaseous release permits and CAP documents related to Radiological Effluent Technical Specifications/ODCM issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. Documents reviewed during the inspection are listed in the Attachment.

This inspection constitutes two samples.

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, reactor coolant system (RCS) unidentified leakage was checked on a daily basis to verify no substantive or unexplained changes occurred.

b. Findings

No findings were identified.

.2 Semi-Annual Trend

a. Inspection Scope

The inspectors performed a review of the licensee's records, including action requests, condition evaluation reports, and other associated CAP documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review focused on repetitive equipment issues, but also considered the plant status reviews, plant tours, licensee trending efforts, and the results of daily inspector CAP item screenings discussed in section 4OA2.1. The inspectors' review nominally considered the six month period of July 2016 through December 2016, although some examples expanded beyond those dates when the scope of the issue warranted.

The inspectors reviewed the following ARs associated with Unit 3 and Unit 4 unanticipated control rod movement anomalies:

- AR 02133483, Unit 4, Rods stepped in one half step for no apparent reason
- AR 02132204, Unit 3, Control rods inserted 1.5 steps in automatic with no known cause
- AR 02016080, Unit 3, Auto rod insertion

The inspectors verified that the ARs were dispositioned in accordance with the CAP as specified in licensee procedure PI-AA-104-1000, "Condition Reporting."

This inspection constitutes one sample.

b. Findings and Observations

No findings were identified. The inspectors reviewed troubleshooting dispositions and maintenance rule functional failure dispositions related to AR 02133483 and AR 02132204 to assess the licensee's explanation for unanticipated control rod movements. The inspectors determined that each issue was isolated and that the licensee's corrective actions were adequate. For AR 02016080, the licensee was unable to determine the cause for the unanticipated automatic control rod insertion. Corrective actions included calibration checks and recording rod control system health. Based on

the inability to reproduce the anomaly, the inspectors determined the licensee's correction actions were acceptable. The inspectors did not identify any adverse trends occurring in the Eagle 21 rod control system.

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

(Closed) Licensee Event Report (LER) 05000251/2016-001-00, "Technical Specification Action Not Taken for Unrecognized Inoperable Reactor Protection Instrument Channel"

##### a. Inspection Scope

This LER documents an event in which incorrect resistance temperature detector (RTD) coefficients were input into channel III of the Eagle 21 reactor protective system (RPS). The inspectors reviewed the LER and associated root cause evaluation to verify the accuracy and completeness of the LER and the appropriateness of the licensee's corrective actions. The inspectors also reviewed the LER to identify any licensee performance deficiencies associated with the event. This LER is closed.

##### b. Findings

Introduction: A self-revealing Green NCV of TS LCO 3.3.1 was identified for the failure to input the correct Eagle 21 RTD coefficients. This performance deficiency resulted in the overtemperature delta temperature (OTΔT) and the overpower delta temperature (OPΔT) channel III, functional units 5 and 6 respectively, being inoperable for longer than their TS allowed outage times.

Description: On April 20, 2016, while Unit 4 was in operational Mode 5, the licensee swapped one of the active RCS hot leg RTDs,  $T_{hot}$ , of RPS Channel III with its associated spare RTD and changed the penetration port as part of engineering change (EC) 286285, Rev. 0, to resolve issues with intermittent spiking of the active  $T_{hot}$  RTD. The licensee did not verify the RTD coefficients supplied by Westinghouse were correct. Westinghouse did not obtain the coefficients using the Callendar-Van Dusen equation, which was the appropriate methodology for the Turkey Point Unit 4 RTD application. An opportunity to identify the incorrect coefficients occurred on April 25, 2016, when a cross-calibration check at 450 degrees Fahrenheit failed and an 8 degree Fahrenheit difference with other  $T_{hot}$  instrument channels was noted. The licensee assumed that the  $T_{hot}$  input would be removed by the Eagle 21 redundant sensor algorithm (RSA) because they assumed the preset amount, DELTAH, was set at 4 degrees Fahrenheit (F). However, per work order instructions for the Unit 4 startup, DELTAH was actually set at 12 degrees F. Plant heatup and startup continued and on April 27, 2016, at 2020 hours, Unit 4 entered operational Mode 2.

TS limiting safety system settings (LSSS) 2.2.1 requires the OTΔT and OPΔT setpoints be set consistent with the trip setpoint values shown in TS LSSS Table 2.2-1, which receive inputs from their respective  $T_{hot}$  instrument. The applicability of TS LSSS 2.2.1 is provided by TS LCO 3.3.1 Table 3.3-1. For OTΔT and OPΔT functional units, the modes of applicability are Mode 1 and Mode 2. Action 13 of TS LCO 3.3.1 should have been completed when Unit 4 entered Mode 2 but the licensee incorrectly assumed the RSA function of Eagle 21 RPS removed the incorrect RTD value from the OTΔT and OPΔT instrument calculations. Action 13 required the inoperable channels be placed in

the tripped condition within 6 hours. Unit 4 continued in power ascension and subsequently entered Mode 1 on the morning of April 29, 2016.

On May 2, 2016, the licensee input the correct coefficients for the spare Channel III  $T_{\text{hot}}$  RTD. When the correct RTD coefficients were input, the licensee observed a significant change to the associated OT $\Delta$ T and OP $\Delta$ T instrument setpoints and realized that the previous setpoints exceeded the allowed values given by TS LSSS Table 2.2-1. The licensee initiated a past-operability review and a root cause evaluation.

From April 27 to May 2, 2016, Channel III of the Eagle 21 RPS OT $\Delta$ T and OP $\Delta$ T functional units 5 and 6 were inoperable. In addition, during the five days of inoperability of the Channel III OT $\Delta$ T and OP $\Delta$ T functional units, another channel of the Eagle 21 RPS OT $\Delta$ T and OP $\Delta$ T functional units was coincidentally inoperable for test and adjustment activities. The cumulative period of coincident inoperability was approximately four hours. During this time the specified safety function of each functional unit was not met. Eagle 21 RPS logic requires, for each of these functional units, two operating channels to trip the reactor when RCS  $\Delta$ T reaches the OT $\Delta$ T or OP $\Delta$ T setpoints.

The licensee promptly initiated AR 02129632 to document the event and completed a past-operability review and root cause evaluation. The licensee's corrective actions included revising the procedure used to replace RCS RTDs to require validation of the RTD coefficient source as the Callendar-Van Dusen methodology, and developing a controlled engineering document which contained the basis and methodology for deriving RCS RTD coefficients.

Analysis: The licensee's failure to input the correct RTD coefficients into Channel III of the Eagle 21 RPS was a performance deficiency. Specifically, the licensee failed to input the correct RTD coefficients in accordance with the Callendar-Van Dusen methodology which rendered Channel III functional unit 5 (OT $\Delta$ T) and Channel III functional unit 6 (OP $\Delta$ T) of the Eagle 21 RPS inoperable for longer than allowed by TS LCO 3.3.1. The performance deficiency was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage) because the specified safety function of each functional unit was not met.

The inspectors evaluated the significance of this finding by utilizing IMC 0609 Attachment 4, "Initial Characterization of Findings," under the mitigating systems cornerstone which includes RPS and IMC 0609 Appendix A, "The Significance Determination Process for Findings At-Power" because the plant was in operational Modes 1 and 2 during the time of exposure. The inspectors screened the significance using Exhibit 2, Section C, Reactivity Control Systems, of IMC 0609 Appendix A. Because the finding only affected a single RPS trip channel and did not affect the function of other redundant or diverse methods of reactor shutdown (e.g., other automatic RPS trips, or manual reactor trip capacity) and did not involve control manipulations that unintentionally added positive reactivity and did not result in a mismanagement of reactivity by operators, the inspectors determined the finding was of very low safety significance (Green).

The NRC assigned a cross cutting aspect associated with the Resources element of the Human Performance area because the licensee failed to ensure that procedures related to RTD replacement contained adequate information for verifying and inputting correct RTD coefficients. [H.1]

Enforcement: TS LCO 3.3.1 requires, in part, that 3 channels of functional unit 5 (OTΔT) and 3 channels of functional unit 6 (OPΔT) shall be operable in Modes 1 and 2. With one of the required channels of either functional unit inoperable, Action 13 requires the inoperable channel be placed in the tripped condition within 6 hours.

Contrary to this, Channel III of functional unit 5 (OTΔT) and Channel III of functional unit 6 (OPΔT) became inoperable when the unit entered Mode 2 on April 27, 2016 at 2020 hours and neither was placed in the tripped condition within 6 hours of Mode 2 entry as required by TS. This condition had the potential to affect the RPS system's ability to respond to a possible event. The condition was corrected on May 2, 2016, when the licensee input the correct Eagle 21 RTD coefficients. Corrective actions included completing a past-operability review, root cause evaluation, and implementing corrective actions to prevent reoccurrence (CAPRs). The CAPRs included developing a controlled engineering document containing the basis and methodology for deriving RCS RTD coefficients and adding an additional step to the RTD replacement procedure for validating that the RTD coefficients were derived via the correct methodology.

Because the issue was of very low safety significance and was entered into the licensee's corrective action program as AR 02129632, this violation is being treated as a NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000251/2016004-01, "Unrecognized Inoperable Reactor Protection System Instrument Channel.")

#### 4OA5 Other Activities

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

###### a. Inspection Scope

On December 20, 2016, the inspectors conducted a walk down of the independent spent fuel storage installation (ISFSI) protected area per IP 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

On December 2, 2016, the reactor inspectors presented their inspection results concerning the heat seat inspection to Mr. Summers, Site Vice-President, and other members of the licensee staff. On December 16, 2016, the health physicist inspectors



discussed the results of their inspection with Mr. Summers and other members of licensee management. On January 11, 2017 the resident inspectors presented their inspection results to Mr. Berryman 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.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee Personnel:

C. Cashwell, Training Manager  
P. Czaya, Licensing Engineer  
B. Berryman, Site Director  
O. Hernandez, Security Manager  
M. Guth, Licensing Manager  
O. Hanek, Licensing Engineer  
A. Katz, Projects Manager  
G. Melin, Assistant Operations Manager  
S. Mihalakea, Licensing Engineer  
K. O'Hara, Performance Improvement Manager  
M. Downs, Emergency Preparedness Manager  
J. Pallin, Engineering Director  
B. Stamp, Operations Director  
T. Summers, Southern Regional Vice-President  
D. Barrow, Maintenance Director  
R. Hess, General Operations Training Supervisor  
W. Hinson, Radiation Protection Manager  
R. Smith, System Engineer

#### NRC Personnel:

L. Pressley, Senior Project Engineer

### **LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

#### Opened and Closed

05000251/2016004-01	NCV	Unrecognized Inoperable Reactor Protection System Instrument Channel (Section 4OA3)
---------------------	-----	---

#### Closed

05000251/2016-001-00	LER	Technical Specification Action Not Taken for Unrecognized Inoperable Reactor Protection Instrument Channel (Section 4OA3)
----------------------	-----	---

## LIST OF DOCUMENTS REVIEWED

### **Section 1R04: Equipment Alignment**

3-NOP-022, Emergency Diesel Generator Fuel Oil System  
 5613-M-3075, Sh. 1, Auxiliary Feedwater System Steam to Auxiliary Feedwater Pump Turbines  
 5613-M-3075, Sh. 2, Auxiliary Feedwater System Auxiliary Feedwater to Steam Generators  
 5613-M-3075, Sh. 3, Auxiliary Feedwater System Nitrogen Supply to AFW Control Valves

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

0-ONOP-016.10, Safe Shutdown Manual Actions  
 PFP-3-TB-18, Pre-Fire Plan Outside Non-RCA Turbine Building  
 PFP-AB-10, Pre-Fire Plan Unit 3&4 Auxiliary Building  
 PFP-AB-18, Pre-Fire Plan Unit 3&4 Auxiliary Building  
 PFP-AB-34, Pre-Fire Plan Unit 3&4 Auxiliary Building  
 Unannounced Fire Drill Scenario and Evaluation Form

### **Section 1R07: Heat Sink Performance**

#### **Procedures**

0-ADM-235, Technical Specifications Surveillance Frequency Control Program, Rev. 6  
 0-ADM-523, ASME Section XI Pressure Tests for Quality Group A, B, C Systems/Components, Rev. 30  
 0-ADM-547, Gas Accumulation Management Program, Rev. 12A  
 0-NOP-011.01, Intake Intrusion Monitoring and Mitigation, Rev. 2  
 0-NOP-10.3., Severe Weather Preparations, Rev. 22  
 0-PMM-030.01, CCW Heat Exchanger Cleaning and Inspection, Rev. 5  
 3-NOP-030, Component Cooling Water System, Rev. 26  
 3-OP-050, Residual Heat Removal System, Rev. 18  
 3-OSP-019.1, Intake Cooling Water Inservice Test, Rev. 19  
 3-OSP-030.1, Component Cooling Water Heat Exchanger Performance Test, Rev. 14  
 3-OSP-030.4, Component Cooling Water Heat Exchanger Performance Test, Rev. 10  
 3-OSP-030.9, Component Cooling Water System Flow, Rev. 6  
 3-OSP-062.2B, Safety Injection Pump 3B Group B Pump Test, Rev. 4  
 3-OSP-202.2, RHR Pump and Piping Venting, Rev. 12  
 4-OSP-030.1, Component Cooling Water Pump Inservice Test, Rev. 6  
 4-OSP-030.4, Component Cooling Water Heat Exchanger Performance Test, Rev. 6  
 4-OSP-030.9, Component Cooling Water Systems Flow Balance, Rev. 66A  
 4-OSP-202.2, RHR Pump and Piping Venting, Rev. 15  
 ER-AA-103, Core Duties of Systems Engineering, Rev. 2  
 ER-AA-123, NRC Generic Letter 89-13 Service Water Program, Rev. 1  
 PI-AA-100-1005, Root Cause Analysis, Rev. 15  
 PI-AA-100-1007, Apparent Cause Analysis, Rev. 17

#### **Calculations**

GL2008-01, Evaluation of High Points and Maximum Potential Voids, Rev. 2  
 M12-128-09, ICW System Water hammer by 15 and 20 Second TPCW Isolation Valve, Rev. 1  
 PTN-3F-S-M-90-046, RHR Heat Exchanger 3A Performance Test, Rev. 1  
 PTN-4F-S-M-90-046, RHR Heat Exchanger 4B Performance Test, Rev. 1

PTN-BFSM-92-009, Component Cooling Water Heat Exchanger Plugged Tube Evaluation, Rev.

2

PTN-BFSM-96-022, CCW Post Accident Heat-up and Water hammer Calculation, Rev. 1

#### Corrective Action Documents

1931761(RCA), CCW Pipe Leak Upstream of RV-4-747B, 4B RHR Heat Exchanger Return Relief Valve

1977357, Intake Cooling Water Pump Packing Leakage/Overspray

1979256(RCA), Canal Temperature Exceeded 100 F

1996753, Document Appropriate Position on Unplanned Power Changes

2098672(ACE), Algae Causing Increased Fouling of Basket Strainers

2123024, Various Piping Supports in U3 ICW Valve Pit Are Degraded

2143244, Cracking was Observed in the Intake Slab along the Barrel of the 3A ICW Pump Opening

2172158, NRC Heat Sink Inspection Observation-Corrosion Assessment

2172183, Maintenance Rule Scoping for Canal System

#### Work Orders

40003165-01, Trash Rack 3F2A Diving Inspection

40171520-01, U4 ICW Crawl Thru A Header to A Pump/TPCW/CCW

40183227-01, U3 ICW Crawl Thru A HDR to A Pump/TPCW/CCW

40220808-01, 3F1A New Travel Screen Maintenance Inspection

40248860-01, U4 CCW Heat Exchanger RTD ICE Point CK/INSPEC (A-Train)

40309478-01, Divers Support to Investigate Debris in Wall

40317117-01, U3 CCW Heat Exchanger RTD ICE Point CK/INSPEC (A-Train)

40380775-01, IST 3-45 CCW Pump A Discharge Pressure Ind Cal

40401241-01, IST-F-3-613-A, CCW A Supply HDR Calibration

40405985-01, IST 3-40, CCW Pump 3A Suction Pressure Ind-Cal

40408920-01, IST F-3-613-B, CC B Supply HDR

40409971-01, Residual Heat Removal System Inservice Test

40419915-01, Unit 4 CCW System Flow Balance

40419915-01, Unit 4 CCW System Flow Balance

40422627-01, Calibration of Flow Indicator

40426524-01, BS-3-1402 Clean and Inspect/Annual

40429155-01, 3B Safety Injection Pump/Valve IST

40432384-01, U3 ICW Crawl Thru B Header

40437256-01, 3A Component Cooling Water Pump/Valve IST

40443625-01, 3B Residual Heat Removal Pump/Valve IST

40445315-01, U3 RHR SYS Monthly Gamp Testing and Venting

40445316-01, U4 RHR SYS Monthly Gamp Testing and Venting

40446034-01, 4A Component Cooling Water Pump/Valve IST

40449288-01, 4P9A-4A Intake Cooling Water Pump IST

40453290-01, IST-F-613A CCW Loop A Flow Loop Cal

40454567-01, 4B Residual Heat Removal Pump/Valve IST

40464612-01, 3A CCW Heat Exchanger (3E207A) Needs Cleaning

40469513-01, 3 A Intake Cooling Water Pump IST

40487403-01, 4E207A:4A CCW Heat Exchanger Needs Cleaning

Other Documents

Eddy Current Inspection Report, Component Cooling Water, October 2016  
 PTN-ENG-SEMS-97-003, NRC Generic Letter 96-06 Response Summary Technical Evaluation, Rev. 0  
 Q3 2016, Unit 3, 4 Component Cooling Water System Health Report  
 Q3 2016, Unit 3, 4 Intake Cooling Water System Health Report  
 Report#1500479.401, CCW 3 Heat Exchanger Tube Samples ID Deposit Analysis and Metallography  
 Report#30122, Unit 3B Header Crawl Through Inspection, Nov 2010  
 SPEC-M-086, Intake Cooling Water System Piping Inspection, TP Units 3 and 4, Rev. 1  
 Test#03-ICW-1970-L-03, ASME XI System Leakage Pressure Test Record Sheet, dated 4/14

**Section 1R11: Licensed Operator Regualification Process**

0-ADM-211, Emergency and Off-Normal Operating Procedure Usage  
 4-GOP-103, Power Operation to Hot Standby  
 TR-AA-230-1007, Conduct of Simulator Training and Evaluation  
 Turkey Point Annual Regualification Exam, October 2016

**Section 1R12: Maintenance Effectiveness**

EN-AA-203-1102, Safety Classification Determination  
 NA-AA-210-1000, Quality Assurance Program Administration  
 PC/M 92-014, Cathodic Protection for Component Cooling Water Heat Exchanger  
 PTN 00362390, Procurement Engineering Record  
 RM-AA-100-1000, Processing Quality Assurance Records  
 WO 40400119, 4B Component Cooling Water Heat Exchanger Retube

**Section 1R13: Maintenance Risk Assessments and Emergent Work Control**

ER-AA-100-2002, Maintenance Rule Program Administration  
 WM-AA-100-1000, Work Activity Risk Management  
 WM-AA-100-1001, Support Organization Risk Management

**Section 1R15: Operability Evaluations**

0-ADM-213, Technical Specification Related Equipment Out of Service Logbook  
 EN-AA-203-1001, Operability Determinations / Functionality Assessments  
 Operational Focus Committee Meeting Minutes 12/28/16

**Section 1R22: Surveillance Testing**

Calibrated Item Usage Report for TLLRT6  
 MTE Calibration Data Sheet for TLLRT6  
 Operations Department Measuring and Test Equipment Item Log  
 QI-12-PTN-1, Control of Measuring and Test Equipment  
 WO 40438222, T.S. 3B ECC Op Test  
 WO 40438248, T.S. 3A ECC Op Test  
 WO 40441326, POV-3-2600 Local Leak Rate Tests

## **Section 2RS6: Liquid and Gaseous Effluents**

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

Offsite Dose Calculation Manual for Gaseous and Liquid Effluents from the Turkey Point Plant Units 3 and 4, Rev. 21  
 0-HPS-040.5, 10CFR61 Compliance and Radioactive Waste/Material Shipment Classification and Characterization, Approval Date: 06/22/10  
 0-NCAP-104, Primary to Secondary Leak Detection, Rev. No. 3  
 0-NCAP-212, Tritium Determination, Rev. No. 2  
 0-NCCP-210, SPING and MSL Monitor Channel Checks, Rev. No. 7  
 0-NCOP-003, Preparation of Liquid Release Permits, Rev. No. 5B  
 0-NCOP-004, Preparation of Gas Release Permits, Rev. No. 4A  
 0-NCOP-006, Preparation of Radioactive Effluent Release Reports, Rev. No. 4A  
 0-NCZP-051.3, Obtaining Plant Effluent Samples Via the SPING Monitors During Non-Accident Conditions, Rev. 4B  
 0-PMI-067.2, Process Radiation Monitoring System Channel R-14 Calibration Procedure, Rev. Nos. 3 and 4  
 0-PMI-067.9, Process Radiation Monitoring System SPING Calibration Procedure, Rev. Nos. 2B and 3  
 3-PMI-067.1, Process Radiation Monitoring System Channel R-3-11 and R-3-12 Calibration Procedure, Rev. Nos. 4 and 6  
 4-PMI-067.13C, High Range Noble Gas Effluent Radiation Monitor RAD-4-6426 MSL C Channel Calibration, Rev. Nos. 2 and 4  
 4-PMI-067.6, Process Radiation Monitoring System Channel R-4-19 Calibration Procedure, Rev. Nos. 2 and 4  
 CY-TP-104-0045, Monitor Tank Sampling, Rev. No. 1  
 PI-AA-01, Corrective Action Program and Condition Reporting, Rev. No. 4  
 PI-AA-02, Self-Assessment, Rev. No. 0  
 PI-AA-104-1000, Corrective Action, Rev. No. 12

### **Records and Data Reviewed**

0-NCZP-051.3, Obtaining Plant Effluent Samples Via the SPING Monitors During Non-Accident Conditions, Rev. 4B; Plant Vent, 12/13/16 and Spent Fuel Pool, 12/13/16  
 10CFR61 Analysis for 2016 DAW, 04/13/16  
 2014 Annual Radioactive Effluent Release Report, Turkey Point Units 3 and 4, 02/25/15  
 2015 Annual Radioactive Effluent Release Report, Turkey Point Units 3 and 4, 02/26/16  
 CY-TP-104-0045, Monitor Tank Sampling, Rev. No. 1; 12/14/16  
 Gas Decay Tank Release Permit, G-2016-104, 10/26/16; and G-2016-1112, 12/08/16  
 Log Entries Report for Out-of-Service Entries for Radiation Monitors, November 2014 to November 2016  
 Radioactive Liquid Release Permits, L-2016-100, 10/25/16; L-2016-115, 12/12/16; and L-2016-116, 12/14/16  
 Results of Radiochemistry Cross Check Program, FPL, Turkey Point, 1<sup>st</sup> Quarter 2016, 07/25/16; and 2<sup>nd</sup> Quarter 2016, 08/15/16  
 Work Order Package (WOP) 40239925 01, RAD-4-6426C: Calib Main Steam Line 'C' Rad Monitor 18M, 09/05/14  
 WOP 40241018 01, T.S. RAD-4-6417 SJAE 18MTH CALB, 02/17/14  
 WOP 40247314 01, T.S. CAL. Plant Vent Gas Monitor RD-14 IAW 0-PMI-067.2, 11/21/13  
 WOP 40268555 01, T.S. PRMS R-11/12 CALB. 3-PMI-067.1, 05/06/16  
 WOP 40280868 01, T.S. R-4-19 S/G Liquid Sample PRMS Channel Calibration (STP), 12/18/14  
 WOP 40332852 01, T.S. CAL. Plant Vent Gas Monitor RD-14 IAW 0-PMI-067.2, 05/22/15

WOP 40352662 02, T.S. RAD-4-6417 SJAE 18MTH CALB (STP 319), 07/10/15  
 WOP 40367232 01, T.S. PRMS R-11/12 CALB. 3-PMI-067.1, 06/24/14  
 WOP 40379131 01, RAD-4-6426C: Calib Main Steam Line 'C' Rad Monitor 18M, 05/19/16  
 WOP 40396171 01, T.S. R-4-19 S/G Liquid Sample PRMS Channel Calibration, 08/12/16

#### CAP Documents

Level 1 Core Business Assessment Report Guideline, AR No.: 2165585, Topic/Title:  
 Radioactive Effluent Treatment and Monitoring Systems, Assessment Dates: 10/24 –  
 10/31/16  
 Action Request (AR) 02092864  
 AR 02175382

### **Section 2RS7: Radiological Environmental Monitoring Program (REMP)**

#### Procedures, Guidance Documents, and Manuals

Calibration Procedure 7 (Florida DOH Nuclear Power Surveillance Program), Calibration of Gas  
 Meters and Flowrators, Rev. 9  
 0-NCAP-103, Secondary System and Groundwater Chemistry, Rev. 7  
 MET-DIR-001, Land Utilization Department - Lab, Administrative Directive Manual,  
 Meteorological System Walkdowns and Inspections, Rev. 0.1  
 Offsite Dose Calculation Manual for Gaseous and Liquid Effluents from the Turkey Point Plant  
 Units 3 and 4, Rev. 21  
 Sampling Procedure 1 (Florida DOH Nuclear Power Surveillance Program), Collection of Air  
 Particulates and Radioiodines, Rev. 12  
 Sampling Procedure 4 (Florida DOH Nuclear Power Surveillance Program), Collection of  
 Surface Water, Rev. 7  
 Sampling Procedure 5 (Florida DOH Nuclear Power Surveillance Program), Collection of  
 Broadleaf Vegetation, Rev. 4  
 Sampling Procedure 12 (Florida DOH Nuclear Power Surveillance Program), Annual Land Use  
 Census, Rev. 2  
 PI-AA-104-1000, Corrective Action, Rev. 12

#### Records and Data Reviewed

10CFR61 Analysis for 2016 DAW, 4/13/16  
 2014 Annual Radioactive Effluent Release Report, Turkey Point Units 3 and 4, 02/25/15  
 2014 Annual Radiological Environmental Operating Report, Turkey Point Units 3 and 4,  
 05/11/15  
 2015 Annual Radioactive Effluent Release Report, Turkey Point Units 3 and 4, 02/26/16  
 2015 Annual Radiological Environmental Operating Report, Turkey Point Units 3 and 4,  
 05/12/16  
 Attachment 1, Meteorological System Inspection Log, 12/13/16  
 Groundwater Monitoring Results, 1<sup>st</sup> Quarter - 3<sup>rd</sup> Quarter 2016  
 Environmental Surveillance Air Sample Data (Collection Sheet), 12/13/16  
 Mixed Analyte Performance Evaluation Program, Laboratory Results for MAPEP Series 34,  
 FDHE01 Florida Dept of Health Environmental Laboratory, 6/2/16  
 PTN Gas Meter Calibration Data (Spreadsheet), 2014-2016  
 Turkey Point Joint Frequency Distribution Report (includes 90% meteorological data recovery),  
 2014, 7/13/15  
 Turkey Point Joint Frequency Distribution Report (includes 90% meteorological data recovery),  
 2015, 7/7/16

Turkey Point Monthly Samples (Collection Sheet) for Surface Water and Broadleaf Vegetation,  
12/13/16

Turkey Point Quarterly TLD Samples (Collection Sheet), 12/13/16

WOP 40367344 01, Semi-Annual MET Tower Cal Check, 12/11/15

WOP 40404926 01, Semi-Annual MET Tower Cal Check, 6/21/16

#### CAP Documents

AR 2017263

AR 2115847

AR 2122631

AR 2127477

AR 2132870

AR 2143543

AR 2146539

AR 2153819

AR 2165565

Level 1 Core Business Assessment Report, Radioactive Treatment and Monitoring Systems,  
October 24 - October 31, 2016

Quick Hit / Department Assessment Report, State of Florida BRC REMP Program South Region  
Biennial Assessment, June 1 - 2, 2016

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

##### Procedures, Guidance Documents and Manuals

0-ADM-032, NRC Performance Indicators Turkey Point, Rev. No. 7C

0-NCOP-003, Preparation of Liquid Release Permits, Rev. No. 5B

0-NCOP-004, Preparation of Gas Release Permits, Rev. No. 4A

##### Records and Data Reviewed

Attachment 17, Occupational Exposure Control Effectiveness PI Data Sheets,

0-ADM-032, NRC Performance Indicators Turkey Point; 4<sup>th</sup> Quarter 2015 to 3<sup>rd</sup> Quarter  
2016

Attachment 18, RETS/ODCM Radiological Effluent Occurrences PI Data Sheets,

0-ADM-032, NRC Performance Indicators Turkey Point; 4<sup>th</sup> Quarter 2015 to 3<sup>rd</sup> Quarter  
2016

Gas Decay Tank Release Permit, G-2016-104, 10/26/16; and G-2016-1112, 12/08/16

Radioactive Liquid Release Permits, L-2016-115, 12/12/16; and L-2016-116, 12/14/16

#### CAP Documents

AR 2026332

AR 2059050

AR 2084752

AR 2139763

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

AR 01969680, Rods Left in Manual After AFW Run

AR 02032536, Rods Demanded at 71 SPM in Auto

AR 02039773, Unanticipated Rod Motion on Unit 3

AR 02095561, Control Rods Automatically Inserted Due to T<sub>ave</sub> Spiking

AR 02120548, 2BD RCC Power Cabinet Urgent Failure



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

RCE 02129632, Past Operability Concern for U4 Eagle 21 Channel III

**Section 4OA5: Other Activities**

0-OSP-200.5, Miscellaneous Tests, Checks and Operating Evolutions

MSPI Indicator Margin Remaining in Green Reports for Turkey Point Unit 3 and 4, Period  
Ending Sep 2016

RP-TP-103-3001, ISFSI Radiological Controls

## LIST OF ACRONYMS

AFW	Auxiliary Feedwater
AR	Action Request
ATWS	Anticipated Transient Without Scram
CAP	Corrective Action Program
CAPR	Corrective Action to Prevent Recurrence
CCW	Component Cooling Water
CFR	Code of Federal Regulations
EDG	Emergency Diesel Generator
F	Fahrenheit
GL	Generic Letter
HX	Heat Exchanger
ICW	Intake Cooling Water
IMC	Inspection Manual Chapter
IP	Inspection Procedure
ISFSI	Independent Spent Fuel Storage Installation
LCO	Limiting Condition for Operation
LER	Licensee Event Report
LSSS	Limiting Safety System Settings
MFW	Main Feedwater
MR	Maintenance Rule
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NIST	National Institute of Standards and Technology
NRC	Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
OLRM	Online Risk Monitor
OOS	Out of Service
OPΔT	Overpressure Delta Temperature
OTΔT	Overtemperature Delta Temperature
OWA	Operator Workaround
PI	Performance Indicator
Radwaste	Radioactive Waste
RCS	Reactor Coolant System
REMP	Radiological Environmental Monitoring Program
RG	Regulatory Guide
RTD	Resistance Temperature Detector
RTP	Rated Thermal Power
RWP	Radiation Work Permit
SCBA	Self-Contained Breathing Apparatus
SDP	Significance Determination Process
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
V	Volt
WO	Work Order