



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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November 9, 2017

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

**SUBJECT: TURKEY POINT NUCLEAR GENERATING STATION – NUCLEAR
REGULATORY COMMISSION INTEGRATED INSPECTION REPORT
05000250/2017003, 05000251/2017003**

Dear Mr. Nazar:

On September 30, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Turkey Point Nuclear Generating Station, Units 3 and 4. On October 17, 2017, the NRC inspectors discussed the results of the inspection with Mr. Tom Summers, Southern Regional Vice President and other members of your staff. The results of this inspection are documented in the enclosed report.

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

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

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, 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

M. Nazar

2

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

Sincerely,

/RA/

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

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

Enclosure:
IR 05000250/2017003, 05000251/2017003
w/Attachment: Supplemental Information

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REGULATORY COMMISSION INTEGRATED INSPECTION REPORT
05000250/2017003, 05000251/2017003 November 9, 2017

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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: 05000250/2017003, 05000251/2017003

Licensee: Florida Power and Light Company (FPL)

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

Location: 9760 SW 344th Street
Homestead, FL 33035

Dates: July 1 to September 30, 2017

Inspectors: J. Orr, Senior Resident Inspector
J. Reyes, Resident Inspector
R. Carrion, Senior Reactor Inspector (Section 1R01)
D. Hardage, Senior Resident Inspector, Sequoyah Nuclear Plant
(Sections 1R01 and 4OA3)
J. Nadel, Senior Resident Inspector, Watts Bar Nuclear Plant
(Sections 1R15 and 1R18)
P. Capehart, Senior Operations Engineer (Section 1R11)

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

Enclosure

SUMMARY

IR 05000250/2017003, 05000251/2017003; 07/01/17 – 9/30/17; Turkey Point Nuclear Generating Station, Units 3 and 4; Equipment Alignment; Fire Protection; Maintenance Risk Assessments and Emergent Work Control.

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

NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green: An NRC-identified finding was identified for the failure to adequately implement OP-AA-100-1000, "Conduct of Operations" procedure. Specifically, non-licensed operators (NLOs) failed to identify that the diesel driven fire pump (DDFP) was operating in a degraded condition. The outboard shaft gland was at elevated temperature because there was no packing leakoff established. Plant operators initiated an action request (AR) 2220785 to repair the stuffing box packing and the DDFP was declared non-functional. The electric driven fire pump (EDFP) remained functional and available to supply 100% of the fire water capacity while the DDFP was non-functional. This issue has been entered into the licensee's corrective action program as ARs 2220785 and 2226305.

The failure to identify that the DDFP was operating in a degraded condition was a performance deficiency. The performance deficiency was more than minor because it was associated with the protection against external hazards (fire) attribute of the initiating events cornerstone and adversely affected the cornerstone's objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations. Specifically, NLOs did not identify a degrading and unreliable DDFP condition. The inspectors determined that the issue had very low safety significance (Green) because the EDFP remained available to provide 100 percent of the required fire water capacity. The finding had a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because NLOs did not recognize and consider that the DDFP was operating without adequate packing gland leakoff after a significant idle period [H.12]. (Section 1R05).

Cornerstone: Mitigating Systems

- Green: An NRC-identified NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," was identified for the licensee's failure to promptly identify and correct component cooling water (CCW) external pipe corrosion that led to a through-wall flaw and leak on the Unit 3 CCW surge tank makeup line. FPL performed an immediate operability screening and determined the condition was operable but degraded considering previous prompt operability determinations for more significant CCW system leaks that bounded the leak rate

and with similarly characterized structural flaws. Plant operators later isolated the through wall leak and established an alternate makeup path. This issue has been entered into the licensee's corrective action program as AR 2223132.

The failure to identify and correct the significant external corrosion that occurred on the Unit 3 CCW surge tank makeup line 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 of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, through wall corrosion affects the reliability of the CCW system. The inspectors determined the finding to be of very low safety significance because it did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. The finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Identification, because the licensee failed to identify the significant external corrosion and apparent metal pipe wastage. Prior opportunities for FPL to identify the significant external corrosion and pipe wastage occurred through maintenance activities on the same pipe section and system engineer quarterly systems walkdowns [P.1]. (Section 1R04.2)

- Green: An NRC-identified NCV of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," paragraph (a)(4), was identified for the licensee's failure to adequately assess and manage the Unit 3 and Unit 4 online risk associated with taking both Unit 4 high head safety injection (HHSI) pumps out of service. This issue was entered in the licensee's corrective action program as AR 2193584. Corrective actions completed included providing additional training to senior reactor operators (SROs) on the maintenance rule (a)(4) implementation procedure and the definition of "unavailability" as used in maintenance rule (a)(4) risk assessments.

The licensee's failure to adequately assess and manage the Unit 3 and Unit 4 online risk associated with taking both Unit 4 HHSI pumps out of service, as required by 0-ADM-225, On Line Risk Assessment and Management, was a performance deficiency. The performance deficiency was more than minor because it adversely affected the equipment performance attribute of the Mitigating Systems Cornerstone. The significance of the finding was determined using IMC 0609, Appendix K, "Maintenance Risk Assessment and Risk Management Significant Determination Process." The finding was determined to be of very low safety significance (Green) because the incremental core damage probability deficit for the timeframe the HHSI pumps were unavailable was less than 1E-6 for each unit, prior to, and after, the failure of the Unit 3A 4kV switchgear bus. The finding had a cross-cutting aspect in the area of Human Performance, Training, because the control room SROs did not have an adequate understanding regarding crediting operator actions and the definition of unavailability. The SROs incorrectly considered the Unit 4 HHSI pumps as available to perform their safety functions under the maintenance rule (a)(4) risk assessments [H.9]. (Section 1R13)

Licensee-identified Violations

None

REPORT DETAILS

Summary of Plant Status

Unit 3 began this inspection period at 100 percent rated thermal power (RTP). On September 9, 2017, operators shut down Unit 3 to operational mode 3, hot standby, in preparation for hurricane force winds predicted to arrive onsite from Hurricane Irma. Unit 3 was restarted on September 12, 2017, and returned to 100 percent RTP on September 13, 2017, where it remained through the end of this inspection period.

Unit 4 began this inspection period at 100 percent RTP. FPL initially scheduled a Unit 4 shutdown to hot standby to occur after the Unit 3 shutdown was completed. However, Hurricane Irma's forecast track shifted and hurricane force winds were no longer predicted to arrive onsite. On September 10, Unit 4 was manually tripped by control room operators in response to steam generator main feedwater regulating valve anomalies during tropical storm force winds and rain. Repairs were complete to the main feedwater regulating valve control circuits and Unit 4 was restarted on September 16, 2017, and returned to 100 percent RTP on September 18, where it remained through the end of this inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection (IP 71111.01)

.1 Readiness for Impending Adverse Weather Conditions

a. Inspection Scope

During the week of September 5, 2017, 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, as Hurricane Irma approached 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 decks
- Unit 3 and Unit 4 emergency diesel generator (EDG) engine buildings
- Unit 3 and Unit 4 intake cooling water systems and structures
- Unit 3 and Unit 4 main feed and condensate water systems
- Unit 3 and Unit 4 Auxiliary feedwater pumps enclosure
- Turkey Point switchyard
- Cable spreading room (alternate technical support center)
- Unit 3 and Unit 4 start-up transformer, main transformer and auxiliary transformer areas

During the approach, onset, and passing of Hurricane Irma, inspectors continuously monitored control room activities, including monitoring the planned shutdown of Unit 3 prior to the onset of hurricane winds at the site and the unplanned manual reactor trip of

Unit 4. The inspectors routinely attended hurricane preparation status and progress meetings in the outage control center. The licensee declared an Unusual Event emergency classification due to the site being under a hurricane warning. The inspectors verified the licensee documented and resolved weather-related problems in the corrective action program (CAP).

b. Findings

No findings were identified.

1R04 Equipment Alignment (IP 71111.04)

.1 Partial Equipment Walk Downs (IP 71111.04Q)

a. Inspection Scope

The inspectors conducted four 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 four samples.

- Auxiliary feedwater (AFW) system while A AFW pump was out of service (OOS), C AFW pump was aligned to train 1 and B AFW pump aligned to train 2
- 4A containment spray pump after full-flow in-service test
- 3B EDG after post-maintenance testing due to a failed relay during normal engine shutdown
- Unit 3 and Unit 4 refueling water storage tanks, 3A, 3B, and 4A HHSI pump while 3C motor-driven instrument air compressor, 4B HHSI pump and the B diesel-driven standby steam generator feed pump were OOS

b. Findings

No findings were identified.

.2 Complete System Walk Down (IP 71111.04S)

a. Inspection Scope

The inspectors conducted a detailed walkdown and review of the alignment and condition of the Unit 3 and Unit 4 component cooling water systems to verify their capability to meet their design basis function. The inspectors utilized licensee procedures 3/4 – OSP-030.3, Component Cooling Water 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

Introduction: The inspectors identified a Green NCV of 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," for the licensee's failure to promptly identify and correct component cooling water (CCW) external pipe corrosion that led to a through-wall flaw and leak.

Description: On several occasions throughout the inspection period, the inspectors walked down the Unit 3 and Unit 4 CCW heat exchanger rooms to evaluate the condition of pipe and structural component coatings for the Unit 3 and Unit 4 CCW systems. On August 9, 2017, system engineers generated AR 2219519 in response to several corrosion sites identified by the NRC inspectors. AR 2219519 was specific for external corrosion on a two-inch CCW pipe at a floor support/pipe interface downstream of PCV-3-832, Primary Water Pressure Control Valve to Unit 3 CCW Surge Tank. On August 16, 2017, AR 2219519 was completed with no action and closed to a work request to recoat the piping. The AR notes stated corrosion appears minor at this time.

On August 31, 2017, the inspectors readdressed the Unit 3 CCW surge tank makeup line pipe corrosion to additional FPL engineering personnel because the inspectors judged that FPL initially failed to properly evaluate the condition documented in AR 2219519. The inspectors noted significant pipe wastage at the corrosion site and that the loss of protective coating would allow further pipe wastage to occur. After repeated identification by NRC inspectors, system engineers walked down the corrosion locations and initiated AR 2223132 for the corrosion previously documented in AR 2219519 for the two-inch makeup line to the Unit 3 CCW surge tank. Later on August 31, 2017, during pipe preparation for non-destructive examination (NDE), the corrosion was cleaned with a wire brush and a through-wall leak developed at about one drop per minute. An NDE examiner examined the leak location and determined the pipe appeared to remain structurally sound. FPL performed an immediate operability screening and determined the condition was operable but degraded considering previous prompt operability determinations (PODs) for more significant CCW system leaks that bounded the leak rate and with similarly characterized pipe wall flaws. FPL determined the degradation mechanism was external corrosion by visual examination. FPL also concluded previous operating experience at Turkey Point existed for the CCW system with the same identified degradation mechanism. FPL initiated a corrective action item to complete a POD with a due date of September 8, 2017.

On September 3, 2017, after unsuccessful attempts by plant operators to isolate the leak with inlet and outlet isolation valves to PCV-3-832, the leak worsened to about 1.25 gallons per hour but was still within the bounding analysis of previous PODs. Plant operators initiated AR 2223433 for the increased Unit 3 CCW leakage. On September 8, 2017, FPL installed a temporary modification on the valve stem of the PCV-3-832 outlet isolation valve, 3-711B, closed the inlet isolation valve to PCV-3-832, 3-715, and isolated the through wall leak on the Unit 3 CCW surge tank makeup line. Plant operators established an alternate flow path for makeup to the Unit 3 CCW surge tank prior to isolating the normal flow path. FPL revised its corrective action to perform a past operability review (POR) for the degraded condition versus a POD because the leak was isolated.

FPL completed quantitative NDE and characterized the flaw size and surrounding pipe wall thicknesses, and also completed a structural evaluation to determine maximum flaw sizes and minimum pipe wall thicknesses and maintain adequate structural integrity for the CCW system. The actual flaw size and pipe wall thicknesses were measured to be adequate for structural integrity and the condition prior to isolating the leak was determined to be operable but degraded. These evaluations were documented by FPL and conclusions in its POR in AR 2223132 and completed the POR on September 13, 2017.

The inspectors noted that licensee procedure 0-ADM-564, "Systems/Programs Monitoring," stated system engineers should walk down assigned systems on a least a quarterly basis. 0-ADM-564 stated that the scope of the walkdown is at the discretion of the system engineer, but should be commensurate with risk significance or recent system performance. CCW is the second most important contributor to core damage frequency for Turkey Point Units 3 and 4 and the inspectors judged that through wall leaks resulting from external corrosion in CCW piping may be risk significant. The inspectors also noted that FPL recently replaced a large section of the same two-inch makeup line about two feet away from the stated flaw, but workers, supervisors, engineers, and NDE examiners that were present at the job site did not identify the obvious significant corrosion and loss of protective coating during planning or repair activities associated with work order 40329690. Work order 40329690 was completed during the Unit 3 refuel outage on April 9, 2017. Finally, the inspectors judged closing AR 2219519 to a work request to recoat the piping inappropriate considering the deep apparent metal wastage at the structural support/pipe interface. The inspectors concluded there was ample opportunity for FPL to identify the significant external corrosion that occurred on the two-inch CCW pipe downstream PCV-3-832.

Analysis: The inspectors determined that the failure to identify and correct the significant external corrosion that occurred on the two-inch CCW pipe downstream PCV-3-832 was a performance deficiency. The performance deficiency was determined to be more-than-minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and adversely affected the cornerstone objective of ensuring the reliability of systems that respond to initiating events to prevent undesirable consequences. Specifically, through wall corrosion and pipe wastage was ongoing and affected the reliability of the CCW system. The inspectors used IMC 0609, Att. 4, "Initial Characterization of Findings," for mitigating systems, and IMC 0609 App. A, "The Significance Determination Process for Findings At-Power," and determined the finding to be of very low safety significance (Green) because it did not represent an actual loss of function of one or more non-technical specification trains of equipment designated as

high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. Specifically, the licensee performed an evaluation of piping thickness at the flaw location and determined that remaining wall thickness did not challenge minimum wall thickness limits and the actual flaw size was smaller than the maximum dimensions allowed for structural integrity.

The finding had a cross-cutting aspect in the area of Problem Identification and Resolution, Identification, because the licensee failed to identify the significant external corrosion and apparent metal pipe wastage. Prior opportunities for FPL to identify the significant external corrosion and pipe wastage occurred through maintenance activities on the same pipe section and system engineer quarterly systems walkdowns [P.1].

Enforcement: Title 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," stated in part that conditions adverse to quality, such as deficiencies, are promptly identified and corrected. Contrary to the above, during system engineer quarterly system walkdowns, and during maintenance in the vicinity of the CCW pipe corrosion that completed on April 9, 2017, FPL did not identify the significant external corrosion that occurred on the two-inch CCW pipe downstream PCV-3-832. Additionally, when NRC inspectors identified the condition to system engineers on August 9, 2017, the condition was not corrected and an AR was inappropriately closed to a work request to recoat the piping. The deficient pipe condition was not properly addressed in FPL's CAP until August 31, 2017, when AR 2223132 was issued. This finding was entered into the licensee's CAP as ARs 2223132 and 2223433. Immediate corrective actions isolated the through wall leak to ensure the CCW system remained operable and a POR was completed. This violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC's Enforcement Policy. NCV 05000250/2017003-01, "Failure to Identify and Correct CCW Pipe Corrosion."

1R05 Fire Protection (IP 71111.05)

.1 Fire Area Walk downs

a. Inspection Scope

The inspectors walked down the plant areas described below to evaluate conditions related to control of transient combustibles, ignition sources, material condition, and operational status of fire protection systems including fire barriers used to prevent fire damage and propagation. The inspectors reviewed these activities using provisions in the licensee's procedure 0-ADM-016, "Fire Protection Plan" and 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 and the diesel-driven and electric-driven fire pump 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.

- 3B motor control center (MCC), 4B MCC and plant computer rooms
- Unit 3 condensate pump pit and 3A MCC
- Unit 3 and Unit 4 intake structure area including circulation water screens, intake cooling water pumps and motors

- Unit 4 A and B safety-related 4kV switchgear rooms during thermal lag installation
- Unit 3 and U4 Spent fuel pools, and auxiliary building roof
- Unit 3 electrical penetration west and south rooms and Unit 4 Electrical penetration north room on the 18' auxiliary building

b. Findings

Introduction: A Green NRC-identified finding was identified for the failure to adequately implement OP-AA-100-1000, "Conduct of Operations" procedure. Specifically, non-licensed operators (NLOs) failed to identify that the diesel-driven fire pump (DDFP) was operating in a degraded condition. The outboard shaft gland was at elevated temperature because there was no packing leakoff established.

Description: On August 17, 2017, NLOs started the DDFP for a monthly surveillance test using the procedure instructions in 0-OSP-016.23, "Diesel Driven Fire Pump Operability Test." The DDFP was started at 4:14 a.m. and operators continued to establish the surveillance test conditions. Several minutes after the DDFP was started and verified operating satisfactory by the NLOs, the inspectors observed its operation and noted that there was no packing leakoff at the outboard stuffing box but rather steam or vapor was visibly escaping from the stuffing box gland. The inspectors noted the condition to the NLOs and they returned with a contact pyrometer. When the NLOs measured the packing gland temperature with a contact pyrometer it read 177°F and slowly rose to 179.5°F before the NLOs secured the DDFP. The stuffing box gland was about 100°F above the supply water temperature. The DDFP operated for about 30 minutes before it was secured. Plant operators initiated an AR to repair the stuffing box packing and the DDFP was declared non-functional. The electric-driven fire pump (EDFP) remained functional and available to supply 100 percent of the fire water capacity while the DDFP was non-functional. Repairs and a successful operability test of the DDFP were completed on August 18, 2017. Operators declared the DDFP functional at 12:29 a.m on August 19, 2017.

The direct cause of the overheated stuffing box was not determined by FPL but over time built-in lubricants from the packing are gradually lost to pump operation. The loss of lubricants can lead to steam or smoke at the stuffing box, overheating of the pump shaft and additional load on the prime-mover. Eventually a breakdown and loss of packing can occur that may result in excessive leakoff at the shaft gland. Operating the DDFP with failed packing is an unreliable condition.

OP-AA-100-1000 established expectations associated with the conduct of operations activities at all FPL/NextEra Energy nuclear sites. OP-AA-100-1000 instructed operators to use operator fundamentals as described in Attachment 14 and that operator fundamentals will be at the forefront of all actions taken and decisions made related to the safe, reliable operation of the facility. Attachment 14 for NLOs stated, in part, that they will identify degrading parameters and equipment trends. The inspectors judged that verifying a centrifugal pump, such as the DDFP, is operating with satisfactory shaft gland leakoff is a fundamental principle of monitoring satisfactory pump operation.

Analysis: The failure to identify that the DDFP was operating in a degraded condition was a performance deficiency. Specifically, not properly monitoring the conditions of the DDFP after it had been started for a significant idle period and not identifying a lack of adequate packing leakoff at the outboard shaft gland allowed the DDFP to remain in an

unreliable condition. OP-AA-100-1000 instructed operators to use operator fundamentals and identify degrading parameters and equipment trends.

The performance deficiency was determined to be more than minor because it was associated with the protection against external hazards (fire) attribute of the initiating events cornerstone. The performance deficiency adversely affected the cornerstone's objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown, as well as power operations, because NLOs did not identify a degrading DDFP condition. Using NRC Inspection Manual Chapter 0609, Appendix F, "Fire Protection Significance Determination Process," the inspectors determined that the issue had very low safety significance (Green) because the EDFP remained available to provide 100% of the required fire water capacity (Step 1.4, task 1.4.7).

The finding had a cross-cutting aspect in the area of Human Performance, Avoid Complacency, because NLOs did not recognize and consider that the DDFP was operating without adequate packing gland leakoff after a significant idle period [H.12].

Enforcement: The inspectors did not identify a violation of regulatory requirements associated with this finding. This finding was entered into the licensee's CAP as ARs 2220785 and 2226305. FIN 05000250&251/2017003-02, "Inadequate Operator Fundamentals during Diesel Driven Fire Pump Surveillance Testing."

1R06 Flood Protection Measures (IP 71111.06)

a. Inspection Scope

The inspectors performed a review of underground cable manhole and bunker inspection documentation including checking for accumulated water and cable inspections in accordance with maintenance work order (WO) 40493262. The inspectors observed technicians inspect the following outside cable bunker using detailed instructions in WO 40493262.

- Bunker 329

b. Findings

No findings were identified

1R07 Heat Sink Performance (IP 71111.07)

a. Inspection Scope

The inspectors selected the Unit 4 CCW heat exchangers to verify that the licensee was performing routine performance test inspections in accordance with required surveillance procedures. The inspectors observed the heat exchanger surveillance data collection and reviewed the applicable data sheets for completeness and accuracy. The inspectors reviewed completed licensee procedure 4-OSP-030.4, "Component Cooling Water Heat Exchanger Performance Test," to ensure the heat exchangers were tested satisfactorily with no deficiencies. The inspectors walked down portions of the Unit 4

CCW system for integrity checks and to assess operational lineup and material condition of the heat exchangers, pumps, motors, and associated valves and piping.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program and Licensed Operator Performance (IP 71111.11)

.1 Licensed Operator Regualification Biennial Inspection (IP 71111.11B)

a. Inspection Scope

The inspectors reviewed the facility operating history and associated documents in preparation for this inspection. During the week of August 28, 2017, the inspectors reviewed documentation, 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 Regualification Program and Licensed Operator Performance." The inspectors also evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations using ANSI/ANS-3.5-2009, "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, watchstanding records, and medical records. The records were inspected using the criteria listed in Inspection Procedure 71111.11. Documents reviewed are listed in the attachment.

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.

.2 Resident Inspector Quarterly Review (IP 71111.11Q)

Simulator Observations

a. Inspection Scope

On August 16, 2017, the inspectors assessed licensed operator performance in the plant-specific simulator during an annual NRC licensed operator requalification examination. The examination was evaluated by a licensed reactor operators and a senior nuclear training operations instructors. The scenario required control room operators to respond to a ruptured steam generator with loss of auxiliary feedwater and standby steam generator feed pumps.

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

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

This inspection constitutes one sample.

b. Findings

.2 Control Room Observations

a. Inspection Scope

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

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

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

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

- July 25 - 27, operations during execution of Unit 3 reactivity management procedure 3-NOP-075, Auxiliary Feedwater System, for testing of newly installed B AFW pump governor
- September 9, operations, including observed execution of emergency operating procedure 3-EOP-E0, Reactor Trip or Safety Injection, during the planned Unit 3 down power and manual reactor trip in anticipation of Hurricane Irma force winds projected to be on site
- September 10, operations, including observed execution of emergency operating procedure 4-EOP-E0, Reactor Trip or Safety Injection, during the unplanned Unit 4 manual reactor trip during Hurricane Irma due to a failed-closed main feedwater regulating flow control valve, FCV-4-498
- September 12, operations during the Unit 3 reactor start-up and reactor power increase

This inspection constitutes four samples.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (IP 71111.12Q)

.1 Routine Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the following equipment problems and periodic evaluation reports to verify that the licensee's maintenance efforts met the requirements of 10 CFR 50.65, "Requirements for monitoring the effectiveness of maintenance at nuclear power plants," and licensee procedure ER-AA-100-2002, "Maintenance Rule Program Administration." The inspectors' efforts focused on maintenance rule scoping, characterization of maintenance problems and failed components, risk significance, determination of a(1) classification, corrective actions, and the appropriateness of established performance goals and monitoring criteria. The inspectors also interviewed responsible engineers and observed some of the corrective maintenance activities. The inspectors verified that equipment problems were being identified and entered into the corrective action program. The inspectors used licensee maintenance rule database, system health reports, and the CAP as sources of information on tracking and resolution of issues. This inspection constitutes two samples.

- AR 2172183, Intake cooling water system maintenance rule review of canal cooling system scoping
- AR 2203604, 2203605 and 2203822, a(3) Maintenance Rule Periodic Evaluation

b. Findings

No findings were identified.

.2 Quality Control

a. Inspection Scope

The inspectors reviewed the licensee's quality control activities through an inspection of rupture disk diaphragms installed in the Unit 3 Trains 1 and 2, nitrogen supply to auxiliary feedwater system flow control valves. The rupture disk diaphragms were purchased as commercial-grade parts but were dedicated prior to installation to a quality-grade. These activities constituted completion of one quality control sample, as defined in Inspection Procedure 71111.12.

b. Findings

No findings were identified.

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

.1 Routine 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 emergent or planned maintenance activities. The inspectors verified the licensee's risk assessment and risk management activities using the requirements of 10 CFR 50.65(a)(4); the recommendations of Nuclear Management and Resource Council 93-01, "Industry Guidelines for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants;" and procedures WM-AA-203, "Online Scheduling Process," WM-AA-100-1000, "Work Activity Risk Management," and 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 four risk assessment samples during the inspection period:

- Unit 3 and Unit 4 OLRM while the A AFW pump, 3A EDG, and 3CM instrument air compressor was OOS
- Unit 3 and Unit 4 OLRM while the B AFW pump and 3B EDG were OOS
- Unit 3 and Unit 4 OLRM while the 4B HHSI pump, 4C Charging Pump and 3CM Instrument Air Compressor were OOS

- Unit 3 and Unit 4 OLRM while 3C CCW heat exchanger, 3B CCW pump, and motor operated valve MOV-3-1403, 3A steam generator AFW steam supply, were OOS

b. Findings

No findings were identified.

.2 Inadequate Maintenance Rule (a)(4) Risk Assessment for the High Head Safety Injection Pumps

a. Inspection Scope

On March 18, 2017, control room operators at Turkey Point declared an Alert based on Emergency Action Level H.A.2 – Fire or Explosion affecting plant safety systems. As a result of this event the NRC launched a special inspection. The results of the special inspection were documented in NRC reactive inspection report 05000250, 05000251/2017008 (ADAMS Accession No. ML17132A258). Unresolved Item (URI) 05000250, 251/2017008-02, “Potential Failure to Complete an Adequate Risk Assessment” was opened to: 1) determine the adequacy of risk management actions taken to protect Unit 3 equipment while the 4A and 4B HHSI pumps were removed from service; (2) review the OLRM tool to determine whether the core damage frequency (CDF) results were consistent with the unavailability of the HHSI pumps and the 3A 4kV switchgear; and, (3) review the licensee’s procedures to determine why instructions were provided to the start the HHSI pumps while the recirculation lines were tagged out, without evaluating the potential consequences for damaging the pumps during a small break loss of coolant accident (LOCA).

The inspectors reviewed the information that was obtained during the special inspection relating to this URI, including interviews with senior reactor operators (SROs). The inspectors also reviewed the licensee’s risk assessment that addressed the Unit 4 HHSI pumps that were taken out of service and the assessments and risk management actions (RMAs) completed after the 3A 4kV switchgear failed. The senior reactor analyst reviewed results of the licensee’s OLRM program for various equipment alignments and configurations simulating the equipment failures that occurred on March 18, 2017 including the unavailability of the HHSI pumps, to determine if the CDF output was consistent with expected results obtained from NRC risk models. The inspectors noted the licensee had not completed a risk assessment after the failure of the 3A 4kV switchgear. After the 3A 4kV switchgear failed, CDF of Unit 3 and Unit 4 increased; Unit 4 remained in the green risk band and Unit 3 transitioned to the red band. However, the inspectors noted that the licensee mitigated the increased risk by promptly establishing RMAs to address the failure of the 3A 4kV switchgear that resulted in the unavailability of the 3A HHSI pump and prioritized restoration of the Unit 4 HHSI pumps to an operable condition. Specifically, since the maintenance had not progressed to cutting the HHSI pump recirculation piping, the licensee was able to take immediate actions to back out of the maintenance and restore the Unit 4 HHSI pumps to an operable condition within about two hours. Additionally, immediate actions were taken to start a Unit 3 reactor coolant pump to establish forced convection cooling in the RCS, and immediate actions were taken to assess the integrity of, and, guard the 3B 4kV switchgear. The inspectors determined the licensee’s prioritization of activities and management of actions to address the increased risk were appropriate.

The inspectors reviewed the Condition Evaluation AR 2193584 and the associated corrective actions which the licensee completed to address this URI. The inspectors reviewed with engineering personnel the HHSI pump design aspects and failure mechanisms associated with operating a pump in dead head configuration, i.e., with the pump recirculation line isolated and no flow established through the pump. The inspectors reviewed with operations personnel the emergency operating procedure (EOP) accident scenarios during which a HHSI pump could be operated dead headed with no injection flow. Additionally, the inspectors reviewed the refueling water storage tank (RWST) inventory that would be lost if failure of the pump seals occurred due to overheating a HHSI pump during operation in dead head. The inspectors reviewed the licensee's procedures used to assess online risk management and guarding of equipment to determine if correct RMAs were taken to protect Unit 3 equipment while the 4A and 4B HHSI pumps were removed from service. The inspectors determined that the 0-ADM-225 procedure was very comprehensive and included adequate instructions for assessing and managing online plant risk, including protection of Unit 3 equipment while the 4A and 4B HHSI pumps were removed from service. However, the inspectors determined that operating the HHSI pumps in a dead head configuration with no recirculation flow during accident scenarios and the resulting equipment complications and operator actions was not reviewed in the licensee's maintenance rule (a)(4) risk assessment on March 18, 2017. An NRC-identified Green NCV is discussed below.

This inspection constitutes one additional sample and closes URI 05000250, 251/2017008-02.

b. Findings

Introduction: An NRC-identified Green NCV of 10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants," paragraph (a)(4), was identified for the failure to conduct an adequate risk assessment prior to performing maintenance on the Unit 4 HHSI pumps. As a result, both Unit 4 HHSI pumps were simultaneously taken out of service and declared available to perform their safety function and control room board operators were provided instructions to operate the pumps in a configuration that would have damaged the pumps and created emergent equipment complications for safety injection during accident mitigation.

Description: On March 18, 2017, in preparation to perform emergent maintenance, the licensee executed an equipment clearance that isolated the minimum flow recirculation lines for the 4A and 4B HHSI pumps. The maintenance rule (a)(4) risk assessment concluded the pumps were available to perform their safety function during the maintenance. Control room operators were additionally provided instructions to operate the Unit 4 HHSI pumps during safety injection for accident mitigation as directed by EOPs. Due to the Unit 3 and Unit 4 HHSI cross-tie, the assessment determined all 4 HHSI pumps were available for Unit 3 and Unit 4 safety injection.

During the special inspection, NRC inspectors identified that for small break LOCA scenarios or when the HHSI pump's discharge pressure was equal or close to the reactor coolant system (RCS) pressure, operating the Unit 4 pumps in dead head without recirculation flow would overheat and cause damage to the pumps. The licensee had not evaluated this issue in their risk assessment. The design basis accident scenarios that would cause operating the HHSI pumps in dead head

configuration were: loss of charging, spurious safety injection (SI), main feed line break, main steam line break and small break LOCA.

The engineering department technical review of the failure mechanisms for the HHSI pumps operating in dead head configuration without recirculation flow determined that the pumps would be damaged on the order of seconds to about one minute depending on specific pump mechanical clearances. The pumps were not designed to operate in a dead head configuration without recirculation flow as the pump would heat the trapped water within the pump casing and mechanically seize and lock the motor rotor. Depending on how quickly pump seizure occurs, the mechanical seals may overheat and fail, resulting in a loss of RWST inventory. The pump design includes a safety bushing that limits inboard and outboard seal leakage to 0.33 gallons per minute per seal. Control room annunciator instructions included starting an available pump and stopping the damaged pump and dispatching operators to determine the cause of the motor overload or trip. However, control room operators would not be able to identify that the pumps had failed until well after the pumps had seized and therefore would not be able to prevent the pump failures. Loss of RWST inventory would require identification by field operators and subsequently each pump's manual suction valves would need to be closed to stop inventory loss. Operating the HHSI pumps in a dead head configuration with no recirculation flow during these accident scenarios and the resulting equipment complications and operator actions was not reviewed in the licensee's maintenance rule (a)(4) risk assessment on March 18, 2017.

Based on interviewing SROs that were on shift March 18, the inspectors determined that the SROs did not have an adequate understanding of the definition of unavailability for maintenance rule risk assessment purposes. For example, the SROs interviewed did not challenge the licensee's plan to maintain the pumps as available during the maintenance. The inspectors found that the initial and continuing operations training provided to the SROs did not include specific training regarding the definition of maintenance rule unavailability or other definitions used to determine if structures, systems, or components (SSCs) can be made available. For example, no training was included describing requirements for a dedicated operator, having a procedure with simple steps, or having a validated timeline to complete a safety function for assessing if an SSC can be made available for maintenance rule a(4) purposes.

Procedure 0-ADM-225, "On Line Risk Assessment and Management," is the Turkey Point maintenance rule implementation procedure used for assessing and managing risk. This procedure implemented the guidance in NUMARC 93-01, Revision 4A, "Nuclear Energy Institute Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants." Throughout much of the procedure, the guidance is documented verbatim as described in the NUMARC document. The inspectors determined that the 0-ADM-225 procedure was very comprehensive and included adequate instructions for assessing and managing online plant risk, including protection of Unit 3 equipment while the 4A and 4B HHSI pumps were removed from service

Condition evaluation (CE) AR 2193584 was written to address the NRC unresolved item that was opened by the special inspection team. The CE considered several ARs that documented inadequate risk assessments. The CE identified that the operator initial and continuing training programs did not specifically address the requirements of 10 CFR 50.65 (a)(4), NUMARC 93-01, and 0-ADM-225 for risk assessment, risk

management, and requirements for equipment availability under the maintenance rule. The CE concluded that SROs did not have an adequate understanding of the definition of unavailability as it related to maintenance rule (a)(4) risk assessment and this issue contributed to incorrectly declaring the Unit 4 HHSI pumps as available on March 18, 2017 during maintenance. Corrective actions included additional training to the licensed operator initial and continuing training modules of the maintenance rule (a)(4) implementation procedure and training on the definition of “unavailability” as used in maintenance rule (a)(4) risk assessment. Additional corrective actions included enhancements to the 0-ADM-225 procedure on the definition of unavailability and additional guidance from the NUMARC maintenance rule implementation document.

The inspectors concluded the licensee failed to complete an adequate risk assessment for the emergent maintenance on Unit 4 HHSI pump recirculation lines. Specifically:

- The licensee tagged out both Unit 4 HHSI pump’s recirculation lines preventing recirculation flow through the pumps during dead head operation and did not declare the pumps as “unavailable” to perform their safety function, the pumps would be damaged within seconds to a minute during some accident scenarios;
- There was no simple procedure, with a single action or a few simple actions, and there was no dedicated operator for starting the HHSI pumps, instead, the control room board operators were assigned the task of starting the pumps using EOP instructions for HHSI pump control switches that were placed in pull-to-lock;
- The licensee provided control room operators with instructions to operate the HHSI pumps in a manner that would have damaged the pumps and caused operators to have to address additional equipment complications during some accident scenarios including small break LOCA mitigation;
- There was no validated timeline to verify the HHSI pumps could perform the safety function prior to the pumps being started by the Unit 4 control room operator using EOP procedures which was estimated to be 8.5 minutes (in place of the automatic SI actuation design);
- Unknowingly, during the maintenance, both Units were operating at a higher CDF than calculated due to not having declared both Unit 4 HHSI pumps as unavailable on the OLRM; and,
- Unknowingly, after failure of the 3A 4kV switchgear only one HHSI pump was available for accident mitigation for both Units, with Unit 4 operating high in the Green CDF band and Unit 3 in the Red CDF band.

Analysis: The licensee’s failure to adequately assess and manage Unit 3 and Unit 4 online risk associated with taking both Unit 4 HHSI pumps out of service, as required by 0-ADM-225, “On Line Risk Assessment and Management,” was a performance deficiency. Specifically, the licensee’s risk assessment failed to identify that both Unit 4 HHSI pumps were unavailable to perform their safety function when the recirculation lines were tagged out to perform emergent maintenance. As a result, control room operators were provided instructions to operate the pumps for safety injection during accident mitigation in a configuration that would have damaged the HHSI pumps and challenged control room operators during accident mitigation for some small break LOCA scenarios. The inspectors determined that the performance deficiency was more than minor because it adversely affected the equipment performance attribute of the Mitigating Systems Cornerstone. The senior reactor analyst determined the significance of the finding using IMC 0609, Appendix K, “Maintenance Risk Assessment and Risk

Management Significant Determination Process.” The finding was determined to be of very low safety significance (Green) because the incremental core damage probability deficit for the timeframe the HHSI pumps were unavailable was less than 1E-6 for each unit, prior to, and after, the failure of the Unit 3A 4kV switchgear. The inspectors determined that the finding had a cross-cutting aspect in Human Performance, Training, because SROs did not have an adequate understanding regarding use of operator actions and the definition of unavailability and incorrectly assessed the Unit 4 HHSI pumps as available to perform their safety functions under the maintenance rule (a)(4) risk assessments [H.9].

Enforcement: 10 CFR 50.65, “Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants,” paragraph (a)(4), requires in part, that before performing maintenance activities (including but not limited to surveillance, post maintenance testing, and corrective and preventive maintenance) the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Turkey Point procedure 0-ADM-225, “On Line Risk Assessment and Management,” implements those requirements. Contrary to the above, on March 18, 2017, prior to performing emergent maintenance the licensee incorrectly assessed the increase in risk and incorrectly managed the unavailability and RMAs associated with the HHSI pumps which, during accident mitigation in a dead head configuration, could have damaged the pumps and resulted in additional mitigation complications during an accident. This issue was entered into the CAP as AR 2193584. Corrective actions completed included implementing additional training to SROs on the maintenance rule (a)(4) implementation procedure and training on the definition of “unavailability” as used in maintenance rule (a)(4) risk assessments. Because the licensee entered this issue into its CAP and the finding is of very low safety significance (Green), this violation is being treated as an NCV, consistent with Section 2.3.2.a of the NRC Enforcement Policy. NCV 05000250,251/2017003-03, “Inadequate Maintenance Rule (a)(4) Risk Assessment for the High Head Safety Injection Pumps.”

1R15 Operability Determinations and Functionality Assessments (IP 71111.15)

a. Inspection Scope

The inspectors evaluated the technical adequacy of the licensee evaluations to ensure that Technical Specification (TS) operability was properly justified and the subject component or system remained available such that no unrecognized increase in risk occurred for the operability evaluations described in the ARs listed below. The inspectors reviewed applicable sections of the 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 eight samples.

- AR 2173094, 2215773, Adverse condition monitoring
- AR 2216642, 3B EDG locked out during the EDG shutdown
- AR 2221212, 4A EDG oil storage tank sample questionable during 4-OSP-022.6A

- AR 1982999, Unit 3 containment equivalent hours
- AR 2219505, Restore automatic actuation of the third emergency containment cooler
- AR 2220132, Control room emergency filtration system sample failed laboratory test
- AR 2224344, MOV-4-140, 4B steam generator feedwater flow control valve motor operated inlet isolation valve, failure of closed control switch trip
- AR 2220765, Personnel unaware of the live load restrictions on top of the 4A 4KV switchgear cubicles

b. Findings

No findings were identified.

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors reviewed the temporary modification and associated 10 CFR 50.59 screening listed below against the requirements of EN-AA-205-1102, "Temporary Configuration Changes" and verified that the modification did not affect system operability or availability as described by the TS or the UFSAR. In addition, the inspectors determined whether: 1) the installation of the temporary modification was in accordance with the work order instructions; 2) adequate configuration control was in place; 3) procedures and drawings were updated; and 4) post-installation tests verified operability of the affected systems. This activity constituted one Plant Modifications inspection sample, as defined in IP 71111.18.

- EC 288957, Temporary Installation of Supplemental Mass to 3P214A Containment Spray Pump Motor to Control Vibration

b. Findings

No findings were identified.

1R19 Post Maintenance Testing (IP 71111.19)

a. Inspection Scope

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

- WO 40489753 and WO 40489698, A AFW pump test after performing preventive maintenance
- WO 40483734, Test after performing preventive maintenance on the U4 A 7.5 KV vital inverter

- WO 40551776, PMT operability testing after failure of normal start relay during surveillance testing
- WO 40380326, B AFW pump removal of new governor and reinstallation of old governor
- WOs 40469897, 40495652, 40499337, and 40500718, for 4B HHSI 4kV breaker and motor inspections
- WO 40541285, 3B CCW heat exchanger retube
- WO 40489939 and surveillance procedure 3-OSP-300-.1, after performing maintenance on MOV-3-1403 S/G AFW steam supply
- WO 40559522; WR 94165766, 94165767 and 94165768; Flow control valves FCV-3-378, FCV-4-478, FCV-4-488 and FCV-4-498 for testing completed after performing inspection and repair of valves
- WO 40085151, Unit 4 source/intermediate range detectors testing

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 three surveillance test samples, and one inservice test sample.

The inspectors reviewed the following tests:

Surveillance Test:

- 4-OSP-006.2, 480 Volt Switchgear Undervoltage Test
- 3-SMI-049.01B, Train B Reactor Protection System Logic Test
- 0-OSP-074.3, A and B Standby Steam Generator Feedwater Pumps Availability Test

In-Service Tests:

- 4-OSP-068.5A, 4A containment spray in-service test

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation (IP 71114.06)Licensed Operator Simulator Requalificationa. Inspection Scope

On August 16, 2017, the inspectors observed and assessed a licensed operator crew's performance during an evaluated annual licensed operator requalification examination 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.

4OA1 Performance Indicator Verification (IP 71151)Mitigating Systems 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, 2016, through June 30, 2017, to verify the accuracy of the PI data reported during that period. Performance indicator definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedure 0-ADM-032, "NRC Performance Indicators Turkey Point," were used to check the reporting for each data element. The inspectors checked operator logs, plant status reports, condition reports, licensee event 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 Review

a. Inspection Scope

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

b. Findings

No findings were identified.

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

Event Follow Up - Unit 4 Shutdown

a. Inspection Scope

On September 10, 2017, at 1855 operators manually tripped the Unit 4 reactor from 88 percent RTP when the 4C steam generator main feedwater flow control valve failed to respond to a full open demand. Earlier at 1631 operators reduced reactor power from 100 to 88 percent RTP in response to similar anomalies with the 4B steam generator main feedwater flow control valve controller. These feedwater flow control valve controller anomalies occurred when tropical storm force winds and rain from Hurricane Irma were occurring. Inspectors were onsite and promptly responded to the control room to review reactor plant parameters and operator response to this event. The licensee maintained the reactor plant in operational mode 3, hot standby, to investigate and correct the deficiencies that led to the main feedwater regulating valve controller failures.

b. Findings

No findings were identified

4OA6 Meetings

On October 17, 2017, the resident inspectors presented their inspection results to Mr. T. Summers, Southern Regional Vice President, and other members of licensee management. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary information. The licensee did not identify any proprietary information.

On October 25, 2017, the resident inspectors performed a final re-exit with Mr. T. Summers, Southern Regional Vice President. The purpose of the re-exit was to update observations relative to an in-progress Problem Identification and Resolution annual sample.

4OA7 Licensee-identified Violations

None.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel:

T. Summers, Southern Regional Vice President
B. Bakke, Nuclear Principal Engineer
C. Cashwell, Training Manager
J. Garcia, System Engineer
M. Guth, Licensing Manager
O. Hanek, Licensing Engineer
O. Hernandez, Security Manager
R. Hess, Assistant Operations Manager, Support
G. Melin, Operations Director
S. Mihalakea, Licensing Engineer
E. Neville, Assistant Operations Manager, Shift Operations
K. O'Hare, Emergency Preparedness Manager
J. Pallin, Engineering Director
B. Stamp, Plant General Manager

NRC Personnel:

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

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000250/2017003-01	NCV	Failure to Identify and Correct CCW Pipe Corrosion (Section 1R04.2)
05000250,251/2017003-02	FIN	Inadequate Operator Fundamentals during Diesel Driven Fire Pump Surveillance Testing (Section 1R05)
05000250,251/2017003-03	NCV	Inadequate Maintenance Rule (a)(4) Risk Assessment for the High Head Safety Injection Pumps (Section 1R13.2)

Closed

05000250,251/2017-008-02	URI	Potential Failure to Complete an Adequate Risk Assessment (Section 1R13.2)
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OP-AA-100-1001 License Maintenance and Activation, Rev. 4
 TR-AA-220-1004 Licensed Operator Continuing Training Annual Operating and Biennial Written Exams, Rev. 2
 TR-AA-221-1000 Simulator Change Control, Rev. 2
 Simulator Engineering Instruction Number 9, Simulator Physical Fidelity Validation, Rev. 0
 Simulator Engineering Instruction Number 10, Plant Design Change Tracking, Rev. 0
 SEI-19, Simulator Exam Security, Rev. 3
 SEI-25, Simulator Operability Testing, Rev. 1
 Simulator Engineering Instruction Number 26, Simulator Verification and Validation Testing, Rev. 0
 SEI-31, Post-Event Simulator Testing, Rev. 0
 SEI-36, Simulator Core Update, Rev. 1
 0-OSP-040.19 Low Power Physics Testing, Rev. 5
 JPM 01200013301 Respond to Control Room as Third Licensed Reactor Operator, Rev. 2-1
 JPM 014028003100 Startup a Rod Drive Motor Generator Set, Rev. 1-2
 PTN 750206503 CCW Leak / Loss of Vacuum / LBLOCA, Rev. 2-0
 PTN 750206501 RCS Leak / PZR Level Channel Failure / Station Black Out, Rev. 2-0

Other Documents

Licensed Operator Requalification Attendance Records for 2016 and 2017
 Operator License Reactivations completed in 2015, 2016, and 2017
 Licensed Operator Medical Records
 Remedial Training Records for 2015 and 2016
 Licensed Operator watchstanding records for 2015, 2016, and 2017
 Post Event Scenario Testing for March 18, 2017 Unit 3 Loss of 3A 4kV Bus Reactor Trip
 Simulator Steady State Tests
 SST-001 Reduced Power ($\leq 50\%$) Steady State Test, Rev. 3
 SST-002 Reduced Power ($< 100\%$) Steady State Test, Rev. 3
 SST-003 Full Power Steady State Test, Rev. 3
 Simulator Normal Plant Evolutions
 NPE-002 Plant Startup from Cold Shutdown to Hot Standby, Rev. 3
 NPE-003 Plant Startup from Hot Standby to Rated Power, Rev. 3
 NPE-005 Plant Shutdown from Rated Power to Hot Standby, Rev. 3
 NPE-006 Plant Shutdown from Hot Standby to Cold Shutdown, Rev. 3
 Simulator Scenario Based Testing – Reactivity Manipulations
 PTN 760200404-1 Fast Load Reduction – Reactivity Manipulation, Rev. 1
 PTN 760200206 Power Ascension – Reactivity Manipulation, Rev. 0
 Simulator Reactor Core Performance Testing Unit 3 Cycle 29
 RCPT-001 Reactor Core Performance Test, Rev. 0
 Simulator Transient Tests
 TRN-001 Manual Reactor Trip, Rev. 5
 TRN-002 Loss of Normal and Emergency Feedwater, Rev. 5
 TRN-003 Simultaneous Closure of all Main Steam Isolation Valves, Rev. 5
 TRN-004 Simultaneous Trip of all Reactor Coolant Pumps, Rev. 5
 TRN-005 Trip of Any Single Reactor Coolant Pump, Rev. 5
 TRN-006 Turbine Trip Which does not cause Automatic Reactor Trip, Rev. 6
 TRN-007 Maximum Rate Power Ramp (100% to ~75% and back to 100%), Rev. 8
 TRN-008 Large Break LOCA combined loss of Offsite Power, Rev. 5

LIST OF ACRONYMS

AFW	Auxiliary Feedwater
AR	Action Request
CAP	Corrective Action Program
CCW	Component Cooling Water
CDF	Core Damage Frequency
CE	Condition Evaluation
CFR	Code of Federal Regulations
DDFP	Diesel Driven Fire Pump
EC	Engineering Change
EDFP	Electric Driven Fire Pump
EDG	Emergency Diesel Generator
EOP	Emergency Operating Procedure
FPL	Florida Power & Light
HHSI	High Head Safety Injection
IMC	Inspection Manual Chapter
IP	Inspection Procedure
JPM	Job Performance Measure
LOCA	Loss of Coolant Accident
MCC	Motor Control Center
MR	Maintenance Rule
NCV	Non-Cited Violation
NDE	Non-Destructive Examination
NLO	Non-Licensed Operators
NRC	Nuclear Regulatory Commission
OLRM	Online Risk Monitor
OOS	Out of Service
PI	Performance Indicator
POD	Prompt Operability Determination
POR	Past Operability Review
RCS	Reactor Coolant System
RTP	Rated Thermal Power
RWST	Refueling Water Storage Tank
SDP	Significance Determination Process
SRO	Senior Reactor Operator
SSC	Structures, System, or Component
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
WO	Work Order