



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200
ATLANTA, GEORGIA 30303-1200

August 4, 2021

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

SUBJECT: TURKEY POINT UNIT 3 & 4 – INTEGRATED INSPECTION REPORT
05000250/2021002 AND 05000251/2021002

Dear Mr. Coffey:

On June 30, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at Turkey Point Unit 3 & 4. On July 14, 2021, the NRC inspectors discussed the results of this inspection with Michael Pearce, Site Vice President, and other members of your staff. The results of this inspection are documented in the enclosed report.

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

If you contest the violation or the significance or severity of the violation documented in this inspection report, 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 Turkey Point Unit 3 & 4.

If you disagree with a cross-cutting aspect assignment or a finding not associated with a regulatory requirement in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; and the NRC Resident Inspector at Turkey Point Unit 3 & 4.

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 Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

David E. Dumbacher, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Docket Nos. 05000250 and 05000251
License Nos. DPR-31 and DPR-41

Enclosure:
As stated

cc w/ encl: Distribution via LISTSERV®

SUBJECT: TURKEY POINT UNIT 3 & 4 – INTEGRATED INSPECTION REPORT
05000250/2021002 AND 05000251/2021002 DATED August 4, 2021

DISTRIBUTION:

M. Kowal, RII
S. Price, RII
L. Gibson, RII
RidsNrrPMTurkeyPoint Resource
RidsNrrDro Resource
PUBLIC

ADAMS ACCESSION NUMBER: **ML21216A065**

<input checked="" type="checkbox"/> SUNSI Review		<input checked="" type="checkbox"/> Non-Sensitive <input type="checkbox"/> Sensitive		<input checked="" type="checkbox"/> Publicly Available <input type="checkbox"/> Non-Publicly Available	
OFFICE	RIIDRP	RIIDRP			
NAME	AWilson	DDumbacher			
DATE	08/02/2021	08/04/2021			

OFFICIAL RECORD COPY

**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000250 and 05000251

License Numbers: DPR-31 and DPR-41

Report Numbers: 05000250/2021002 and 05000251/2021002

Enterprise Identifier: I-2021-002-0010

Licensee: Florida Power & Light Company

Facility: Turkey Point Unit 3 & 4

Location: Homestead, FL 33035

Inspection Dates: April 01, 2021 to June 30, 2021

Inspectors: M. Endress, Senior Resident Inspector
T. Morrissey, Senior Construction Inspector
D. Orr, Senior Resident Inspector
R. Reyes, Resident Inspector
A. Rosebrook, Senior Reactor Analyst

Approved By: David E. Dumbacher, Chief
Reactor Projects Branch 3
Division of Reactor Projects

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting an integrated inspection at Turkey Point Unit 3 & 4, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

Inadvertent Opening of 3A Steam Generator Feedwater Pump Recirculation Valves Causes a Rapid Decrease in Unit 3 Steam Generator Water Levels			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green FIN 05000250/2021002-01 Open/Closed	[H.11] - Challenge the Unknown	71153
A self-revealed Green finding was identified when the licensee failed to appropriately support plant operations to ensure the 3A steam generator feedwater pump (SGFP) could operate reliably and with sufficient margin during an emergent maintenance activity, as instructed in Section 5.5.1 of ER-AA-103, Core Duties of System Engineering. Specifically, system engineers did not identify that the 3A SGFP recirculation flow control valves to the condenser would fail open when all three feedwater flow transmitters were isolated resulting in rapidly lowering steam generator water levels and a manual turbine runback to 85% reactor power to reduce steam flow and match feedwater flow.			

Unit 3 Automatic Reactor Trip due to Reactor Trip Breaker Cell Switch Malfunction			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000250,05000251/2021002-02 Open/Closed	None (NPP)	71153
A self-revealed Green finding and associated Non-cited Violation (NCV) of Technical Specification (TS) 6.8.1, “Procedures and Programs,” was identified for the licensee’s failure to develop and establish a procedure and preventive maintenance schedule to appropriately verify the presence of graphite grease on reactor trip breaker (RTB) and bypass breaker (BYB) cubicle cell switch contacts and to additionally replace the RTB and BYB cell switches prior to the expiration of the manufacturer’s stated service life.			

Additional Tracking Items

Type	Issue Number	Title	Report Section	Status
LER	05000250/2021-001-00	LER 2021-001-00 for Turkey Point, Unit 3, Automatic Reactor Trip due to Reactor Trip Breaker Cell Switch Malfunction	71153	Closed
URI	05000250/2021001-04	Inadvertent Opening of 3A Steam Generator Feedwater Pump Recirculation Valves	71153	Closed

		Causes a Rapid Decrease in Unit 3 Steam Generator Water Levels		
URI	05000250/2021001-03	Unit 3 Automatic Reactor Trip due to Reactor Trip Breaker Cell Switch Malfunction	71153	Closed

PLANT STATUS

Units 3 and 4 operated at or near rated thermal power for the entire inspection period.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), resident and regional inspectors were directed to begin telework and to remotely access licensee information using available technology. During this time, the resident inspectors performed periodic site visits each week, increasing the amount of time on site as local COVID-19 conditions permitted. As part of their onsite activities, resident inspectors conducted plant status activities as described in IMC 2515, Appendix D; observed risk significant activities; and completed on site portions of IPs. In addition, resident and regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.01 - Adverse Weather Protection

Seasonal Extreme Weather Sample (IP Section 03.01) (1 Sample)

- (1) The inspectors evaluated readiness for seasonal extreme weather conditions on May 17, 2021, prior to the onset of hurricane season for the following systems:
 - Unit 3 and 4 intake structure
 - Unit 4 emergency diesel generator (EDG) building
 - Unit 3 and 4 refueling water storage tanks
 - Unit 3 and 4 component cooling water (CCW) systems

External Flooding Sample (IP Section 03.03) (1 Sample)

- (1) The inspectors evaluated that flood protection barriers, mitigation plans, procedures, and equipment are consistent with the licensee's design requirements and risk analysis assumptions for coping with external flooding on May 17, 2021.

71111.04 - Equipment Alignment

Partial Walkdown Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) 3A EDG normal standby alignment while 3B EDG was out of service (OOS) for testing on April 01, 2021
- (2) Unit 3 and 4 high head safety injection (HHSI) systems after the 4B HHSI pump in-service test on April 08, 2021
- (3) Unit 3 CCW and intake cooling water (ICW) system headers while the 3C CCW heat exchanger was OOS on April 14, 2021
- (4) Unit 4 EDGs after the 4A EDG 24-hour endurance run on April 21, 2021
- (5) Unit 3 EDGs with the right-side starting air OOS to the 3B EDG on May 3, 2021
- (6) Unit 4 Startup transformer (SUT), Unit 3 A and B EDG engine rooms while the Unit 3 SUT was OOS for maintenance on May 11, 2021

Complete Walkdown Sample (IP Section 03.02) (1 Sample)

- (1) The inspectors evaluated system configurations during a complete walkdown of the ICW system on May 26 through June 29, 2021.

71111.05 - Fire Protection

Fire Area Walkdown and Inspection Sample (IP Section 03.01) (7 Samples)

The inspectors evaluated the implementation of the fire protection program by conducting a walkdown and performing a review to verify program compliance, equipment functionality, material condition, and operational readiness of the following fire areas:

- (1) Unit 3 and Unit 4 safety-related A and B 4.1-Kilo-Volt switchgears (Fire Zones (FZs) 067, 068, 070, and 071); and the Unit 3 EDG fuel-oil tank area (FZ 090) on April 06, 2021
- (2) Unit 3 electrical penetration west and south rooms (FZs 019 and 020); and Unit 4 electrical penetration west and north rooms (FZs 027 and 026) on April 14, 2021
- (3) Outdoor area west of Unit 4 containment, combined Unit 3 and Unit 4 auxiliary feedwater (AFW) pump area, and the Unit 3 and Unit 4 main steam header platforms (FZs 79, 84, 114 and 115) on April 28, 2021
- (4) Unit 3 main and startup transformer area (FZ 086) and Unit 4 auxiliary feedwater pump room (FZ 084) on May 11, 2021
- (5) Unit 4 main and startup transformers and Unit 3 lube oil reservoir areas (FZ 081); the Unit 3 main and startup transformer area (FZ 086); and Unit 4 Lube oil reservoir area (FZ 076) on May 16, 2021
- (6) Unit 3 and Unit 4 A, B, and C condensate pump and water box inlet areas FZs 092 and 091) on May 19, 2021
- (7) Unit 3 and Unit 4 ICW and circulating water pump areas, and ICW pit areas (FZs 119, 120 and 121), electrical, diesel and jockey fire pump areas (FZ 122) on May 26, 2021

71111.06 - Flood Protection Measures

Inspection Activities - Internal Flooding (IP Section 03.01) (1 Sample)

The inspectors evaluated internal flooding mitigation protections in the:

- (1) Unit 3 EDG rooms on April 13, 2021

71111.11Q - Licensed Operator Regualification Program and Licensed Operator Performance

Licensed Operator Performance in the Actual Plant/Main Control Room (IP Section 03.01) (1 Sample)

- (1) The inspectors observed and evaluated licensed operator performance in the control room during shift turnover, and discussions and development of a troubleshooting plan for an emergent issue with the 3B CCW pump on June 2, 2021

Licensed Operator Regualification Training/Examinations (IP Section 03.02) (1 Sample)

- (1) The inspectors observed and evaluated a licensed operator continuing training simulator scenario administered to an operating crew on May 10, 2021

71111.12 - Maintenance Effectiveness

Maintenance Effectiveness (IP Section 03.01) (3 Samples)

The inspectors evaluated the effectiveness of maintenance to ensure the following structures, systems, and components (SSCs) remain capable of performing their intended function:

- (1) Action Request (AR) 2387733, Turkey Point Maintenance Rule Program a(3) Assessment on April 30, 2021
- (2) ARs 2390430 and 2339563: Rosemount Transmitter, FT-3-474, 3A Steam Generator Steam Flow Spiking; and AR 2377380, Rosemount Transmitter, FT-4-495, 4C Steam Generator Steam Flow Oscillations on June 2, 2021
- (3) AR 2312781, Revised Maintenance Rule (a)(1) Plan for Deficiencies in Manholes; and Evaluation EVAL-PTN-000-01662, Manholes in Maintenance Rule Scope on June 28, 2021

71111.13 - Maintenance Risk Assessments and Emergent Work Control

Risk Assessment and Management Sample (IP Section 03.01) (4 Samples)

The inspectors evaluated the accuracy and completeness of risk assessments for the following planned and emergent work activities to ensure configuration changes and appropriate work controls were addressed:

- (1) Unit 3 and Unit 4 online risk assessment with the following equipment OOS on April 06, 2021: 4P 201C, Unit 4C charging pump; E232, electrical equipment room HVAC; E233, new electrical equipment room HVAC; MOV-4-535, pressurizer power operated

- relief valve (PORV) block valve; PCV-4-456, pressurizer PORV; Unit 3CD diesel instrument air compressor; and Unit 4CD diesel instrument air compressors.
- (2) Unit 3 and Unit 4 online risk assessment with the following equipment OOS on April 14, 2021: E233 new electrical equipment room HVAC; 3C component cooling water heat exchanger; B standby steam generator feed pump; 3E241 and 3E242A load center room air handling units; PCV-4-456 PORV; and MOV-4-535 PORV block valve.
 - (3) Unit 3 and Unit 4 online risk assessment with the following equipment OOS on May 11, 2021: Unit 3 startup transformer; Unit 4 PCV-4-456, pressurizer PORV; and Unit 4 MOV-4-535, PORV block valve.
 - (4) Unit 3 and Unit 4 online risk assessment with the following equipment OOS on May 26, 2021: 3P211A 3A CCW pump; 4V30B 4B emergency containment cooler; E233 water chiller unit for electrical equipment room AHU-V78; FCV-3-114A primary water to blender flow control valve; MOV-4-1405 auxiliary feed water turbines steam supply from steam generator 4C; and P2A A auxiliary feedwater pump.

71111.15 - Operability Determinations and Functionality Assessments

Operability Determination or Functionality Assessment (IP Section 03.01) (6 Samples)

The inspectors evaluated the licensee's justifications and actions associated with the following operability determinations and functionality assessments:

- (1) AR 2391071, Unit 3 Startup Transformer Potential Light Not Lit on April 27, 2021
- (2) AR 2388625, Reduced Turbine Loading Due to Calorimetric Power on May 7, 2021
- (3) AR 2392124, 4B EDG Normal Start Would Not Release Out of Idle Speed on May 18, 2021
- (4) AR 2393738, 457242 and 2386544, Unit 4 4-inch component cooling water Piping Corrosion North of 4-710B Remaining Wall 0.160" on May 28, 2021
- (5) AR 2394255, 4A EDG Exhaust Trend Anomaly on June 2, 2021
- (6) AR 2395285, Electric Driven Fire Pump Motor Bearing Seized on June 7, 2021

71111.18 - Plant Modifications

Temporary Modifications and/or Permanent Modifications (IP Section 03.01 and/or 03.02) (2 Samples)

The inspectors evaluated the following temporary or permanent modifications:

- (1) Engineering change 293454, Provide Temporary Alternate Method of Supplying Diesel Fuel Oil to the Unit 3 EDG Day Tanks on May 20, 2021
- (2) Temporary modification 296352, Disable the 3B CCW Auto-Start Function in order to Prevent the Pump from Auto-Starting on June 18, 2021

71111.19 - Post-Maintenance Testing

Post-Maintenance Test Sample (IP Section 03.01) (6 Samples)

The inspectors evaluated the following post-maintenance test activities to verify system operability and functionality:

- (1) Work order (WO) 40593834, 40728025, and 40719987, for the replacement of the 3B EDG engine governor and testing performed using 3-OSP-023.1, Diesel Generator Operability Test, on April 2, 2021
- (2) WO 40688834 and 40580849, testing per 3-OSP-023.1, Diesel Generator Operability Test; and 3-OSP-023.2, Diesel Generator 24 Hour Full Load Test and Load Rejection, for the Unit 3A emergency diesel generator that was tested after complex maintenance management on April 13, 2021
- (3) WO 40717090, Testing of the B standby steam generator feed pump per 0-OSP-074.3, Standby Steam Generator Feedwater Pumps Availability Test, after performing annual preventive maintenance, on April 21, 2021
- (4) WO 40775533, Unit 4B emergency diesel generator normal start test, after completing maintenance to change normal start relay timer, and testing using 4-OSP-023.1, Diesel Generator Operability Test, on May 18, 2021
- (5) WO 40423503, 40774605, 40640147, 40765150, Unit 3 Startup Transformer testing after performing complex maintenance management on May 13, 2021
- (6) WO 40736824, 3B EDG after repairing radiator flange coolant leak per 3-OSP-023, Emergency Diesel Generator, on June 4, 2021

71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

Surveillance Tests (other) (IP Section 03.01) (3 Samples)

- (1) 0-OSP-205.1, Startup Transformer and Onsite A.C. Power Distribution Verification, completed on April 24, 2021
- (2) 3-OSP-047.1H, Charging Pump 3C Comprehensive Pump Test, completed on April 21, 2021
- (3) 3-OSP-055.1, Emergency Containment Cooler Operability Test (3A Cooler); and 4-OSP-055.1, Emergency Containment Cooler Operability Test (4A Cooler), completed on April 26, 2021

Inservice Testing (IP Section 03.01) (2 Samples)

- (1) 4-OSP-062.2B, Safety Injection Pump 4B Group B Pump Test, completed on April 08, 2021
- (2) 4-OSP-068.5B, 4B Containment Spray Pump In-service Test, completed on May 6, 2021

71114.06 - Drill Evaluation

Drill/Training Evolution Observation (IP Section 03.02) (1 Sample)

The inspectors evaluated:

- (1) Emergency classifications and notifications to Florida and local county authorities during a licensed operator continuing training simulator scenario on May 10, 2021.

OTHER ACTIVITIES – BASELINE

71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below:

BI01: Reactor Coolant System (RCS) Specific Activity Sample (IP Section 02.10) (2 Samples)

- (1) Unit 3 April 1, 2020 through March 31, 2021
- (2) Unit 4 April 1, 2020 through March 31, 2021

BI02: RCS Leak Rate Sample (IP Section 02.11) (2 Samples)

- (1) Unit 3 April 1, 2020 through March 31, 2021
- (2) Unit 4 April 1, 2020 through March 31, 2021

71152 - Problem Identification and Resolution

Semiannual Trend Review (IP Section 02.02) (1 Sample)

- (1) The inspectors reviewed the licensee's corrective action program for potential adverse trends in operations department component configuration issues that might be indicative of a more significant safety issue. The inspectors review concluded there was no adverse trend.

Annual Follow-up of Selected Issues (IP Section 02.03) (2 Samples)

The inspectors reviewed the licensee's implementation of its corrective action program related to the following issues:

- (1) The inspectors selected several ARs associated with previously identified piping support issues at the intake structure: AR 2249049, 2273641, 2292404, 2294709, 2300548, 2305565, 2308071, 2321051, and 2386577. These ARs were selected for follow-up to verify the licensee's corrective actions were appropriate to maintain structural integrity of ICW piping.
- (2) The inspectors selected several level one assessments associated with the implementation of the Boric Acid Corrosion Control Program. The level one assessments performed by the licensee were documented in: AR 2344234, 2349200, 2351897, 2358533, 2363278, 2369231, and 2394398. These level one assessments were selected for follow-up to verify the licensee's corrective actions were appropriate to prevent unacceptable degradation of pressure boundaries or other affected structures, systems, or components.

71153 - Follow Up of Events and Notices of Enforcement Discretion

Event Report (IP Section 03.02) (1 Sample)

The inspectors evaluated the following licensee event reports (LERs):

- (1) LER 05000250/2021-001-00, Automatic Reactor Trip due to Reactor Trip Breaker Cell Switch Malfunction, (ADAMS Accession No. ML21119A005). The inspection

conclusions associated with this LER are documented in this report in the Inspection Results Section.

OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL

2515/194 - Inspection of the Licensee’s Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01)

The inspectors reviewed the licensee’s implementation of the “Nuclear Energy Institute Voluntary Industry Initiative,” (ADAMS Accession No. ML15075A454) dated March 16, 2015. This included reviewing how the licensee updated their licensing basis to reflect the need to protect against open phase conditions.

Inspection of the Licensee’s Implementation of Industry Initiative Associated With the Open Phase Condition Design Vulnerabilities In Electric Power Systems (NRC Bulletin 2012-01) (1 Sample)

- (1) Revision 0 of this Temporary Instruction (TI) was previously inspected, and closed, in Inspection Report 05000250/2019013 and 05000251/2019013 (ADAMS Accession No. ML19296B727). However, a subsequent revision to the NEI Voluntary Initiative (Revision 3) provided plants the option of to leave the open phase protection (OPP) system in monitoring mode only in lieu of activating the automatic trip circuitry, provided it was supported by a risk evaluation. Revision 1 (and later Revision 2) of this TI was issued to provide inspection guidance for the new option.

The inspectors reviewed licensee analyses and procedures that demonstrated operator manual actions would successfully mitigate the impact of an Open Phase Condition (OPC). The analyses were reviewed remotely, and the procedures were reviewed and walked down on site. The inspectors completed Section 03.01c of TI 2515/194, Revision 2.

The inspectors verified that modeling used for the OPC reflected the as-designed and as-built plant, assumptions made by the licensee were reasonable, and licensee procedures were adequate to successfully respond to an OPC. The inspectors also verified that human reliability analysis and recovery evaluations were done in accordance with NEI and voluntary initiative guidance.

INSPECTION RESULTS

Inadvertent Opening of 3A Steam Generator Feedwater Pump Recirculation Valves Causes a Rapid Decrease in Unit 3 Steam Generator Water Levels			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green FIN 05000250/2021002-01 Open/Closed	[H.11] - Challenge the Unknown	71153
A self-revealed Green finding was identified when the licensee failed to appropriately support plant operations to ensure the 3A steam generator feedwater pump (SGFP) could operate reliably and with sufficient margin during an emergent maintenance activity, as instructed in Section 5.5.1 of ER-AA-103, Core Duties of System Engineering. Specifically, system engineers did not identify that the 3A SGFP recirculation flow control valves to the condenser			

would fail open when all three feedwater flow transmitters were isolated resulting in rapidly lowering steam generator water levels and a manual turbine runback to 85% reactor power to reduce steam flow and match feedwater flow.

Description: On March 24, 2021, at 1630 hours, a nuclear plant operator reported a steam leak at the 3A SGFP feedwater flow transmitters FT-3-1416A/B/and C. In preparation to isolate the steam leak, control room operators requested system engineers review the logic response of the 3A SGFP recirculation valves with all flow transmitters FT-3-1416A/B/and C isolated. The FT-3-1416A/B/and C isolation was to support a steam leak repair on an associated instrument sensing line. In response to the request, plant engineers recommended placing the recirculation flow control valves controller in manual and closed to prevent movement of the SGFP recirculation valves while the flow transmitters were isolated. The system engineers failed to refer to appropriate distributed control system (DCS) logic diagrams, but instead relied on a piping and instrument drawing and operational procedures. The oversight by the engineers missed a protective design feature, detailed in the DCS logic diagrams, that fully opens the SGFP recirculation to condenser valves, regardless of the controller being selected to manual and closed, when a significant decrease in flow is detected on all associated feedwater flow transmitters.

At 1915 hours, plant operators isolated FT-3-1416A/B/and C to support the emergent steam leak repair. The main control room operators subsequently recognized that the SGFP recirculation to condenser valves were open and unresponsive to close. Control room operators then performed a manual turbine runback on Unit 3 from 100% power to 85% in response to a rapid decrease in steam generator water levels. The unexpected and rapid water level decrease was caused by an equally unexpected and rapid reduction in steam generator feedwater flow due to the unanticipated opening of the 3A steam generator feedwater pump recirculation to condenser flow control valves, CV-3-1415 and CV-3-1416. At 2045 hours, plant operators completed all actions associated with off normal procedure 3-ONOP-089, Turbine Runback, and Unit 3 was stable at 85% power.

Corrective Actions: FPL promptly initiated AR 2387840 and entered this issue into its corrective action program. AR 2387840 included an extent of condition review to ensure that additional digital control systems are appropriately reviewed for overrides and, if overrides were identified, that procedures and logic drawings clearly identify the override control function.

Corrective Action References: AR 2387840

Performance Assessment:

Performance Deficiency: The failure of system engineers to appropriately support plant operations, as instructed in Section 5.5.1 of ER-AA-103, Core Duties of System Engineering, by ensuring the 3A SGFP would operate reliably with all three feedwater flow transmitters isolated was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Configuration Control attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, system engineers failed to review DCS logic diagrams and ensure the 3A SGFP recirculation flow control valves to condenser would remain closed in manual when all three feedwater flow transmitters were isolated. The human performance error caused an unnecessary upset to steam generator water level and plant transient.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Exhibit 1, "Initiating Events Screening Questions," the inspectors determined the finding to be of very low safety significance (Green) because the finding, when screened as a transient initiator, did not cause both a reactor trip AND the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (e.g., loss of condenser, loss of feedwater).

Cross-Cutting Aspect: H.11 - Challenge the Unknown: Individuals stop when faced with uncertain conditions. Risks are evaluated and managed before proceeding. The inspectors reviewed this performance deficiency for cross-cutting aspects as required by IMC 0310, "Aspects Within the Cross-Cutting Areas." The system engineers did not reference the detailed DCS logic diagrams and rather assumed plant operations procedures and piping and instrumentation were adequate to review this first-time evolution.

Enforcement: Inspectors did not identify a violation of regulatory requirements associated with this finding.

The disposition of this finding closes URI: 05000250/2021001-04.

Unit 3 Automatic Reactor Trip due to Reactor Trip Breaker Cell Switch Malfunction

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Initiating Events	Green NCV 05000250,05000251/2021002-02 Open/Closed	None (NPP)	71153

A self-revealed Green finding and associated Non-cited Violation (NCV) of Technical Specification (TS) 6.8.1, "Procedures and Programs," was identified for the licensee's failure to develop and establish a procedure and preventive maintenance schedule to appropriately verify the presence of graphite grease on reactor trip breaker (RTB) and bypass breaker (BYB) cubicle cell switch contacts and to additionally replace the RTB and BYB cell switches prior to the expiration of the manufacturer's stated service life.

Description: On March 1, 2021, at 1108 hours, Unit 3 experienced an unplanned reactor trip from 100% power. Restoration from a routine surveillance test of the reactor protection system (RPS) was in progress when the reactor trip occurred. All equipment required for the immediate reactor trip response functioned normally. The licensee determined a malfunction of the B-train RTB cubicle cell switch during the RPS test restoration caused the reactor trip.

RTB and BYB cubicle cell switches provide logic inputs to the turbine trip primary and backup relays. The sequence of events report revealed that the reactor trip signal was initiated by turbine trip logic. The most likely cause identified by the licensee was that following the RPS surveillance, with the RTB racked in, a RTB cell switch incorrectly provided racked-out position logic input to the backup turbine trip relay. When the BYB was tripped open during surveillance test restoration, the logic to actuate the backup turbine trip relay was completed, tripping the turbine and by design, initiating RPS Train-A and Train-B reactor trip signals. The Westinghouse supplied DB-50 RTBs and BYBs utilize cell switch contact assemblies located inside the breaker cubicles that provide breaker position logic to the turbine trip relays if the breaker is racked out. Although no root cause was definitively determined by the licensee, failure analysis performed jointly between the licensee and Westinghouse revealed that the most likely cause of the incorrect RTB position logic was attributed to the failure of the cell

switch contacts. Graphite grease used for lubrication was found accumulated and hardened. The licensee's review of the RTB associated preventive maintenance procedure further identified that steps to clean and reapply grease on the switch contacts was condition-based rather than prescriptive. Westinghouse concurred with the licensee's postulated faults and subsequent conclusions and did not have any further areas recommended to investigate beyond those identified in the licensee's root cause evaluation report.

The NRC inspectors reviewed the licensee root cause evaluation report in AR 2385529, the Westinghouse failure analysis report, the Westinghouse third-party review of the root cause evaluation, and interviewed licensee personnel. The NRC inspectors noted that the licensee failed to follow some recommendations established by the Westinghouse maintenance program manual (MPM) for the DB-50 RTBs and BYBs in its established procedure, 0-PME-049.01, Reactor Trip and Trip Bypass Breaker Inspection and Maintenance. Instructions provided in 0-PME-049.01, Step 4.25.7.O. stated if cell switch contacts require cleaning or lubrication, then clean with a cloth and isopropyl alcohol and then apply grease. No criteria was established in the procedure to determine if the cell switch contacts required cleaning or lubrication. In contrast, the Maintenance Program Manual for Westinghouse Safety Related Type DB Circuit Breakers and Associated Switchgear, Rev. 1 dated July 2011, stated to check for the presence of graphite grease on the switch contacts.

The licensee root cause evaluation also identified that the Westinghouse MPM recommended cell switch replacements at 100 cycles of breaker operation but the two cell switches associated with the B RTB were likely original plant equipment and in service much longer than recommended by the Westinghouse MPM. The licensee later determined that a replacement frequency of 5 refueling cycles for RTBs and 10 refueling cycles for BTBs was within 100 cycles of breaker operation and appropriate.

Corrective Actions: All associated issues were entered into the corrective action program in AR 2385529. On May 21, 2021, the licensee revised 0-PME-049.01, Reactor Trip and Trip Bypass Breaker Inspection and Maintenance to always require cell switch contact cleaning and lubrication and additionally required an engineer to observe this activity. On May 26, 2021, the licensee initiated new preventive maintenance activities to require RTB and BYB cubicle cell switch replacements at no more than 5 and 10 refueling cycles respectively. The following corrective actions were also completed or entered into the corrective action program for completion:

- The Unit 3 B-train RTB breaker and cubicle cell switches were replaced;
- The Unit 3 A-train RTB and BYB, and the B-train BYB breaker cubicles and cell switches were inspected, cleaned, and tested for proper operation;
- A modification to detect for a standing trip signal from cell switch contacts prior to surveillance testing restoration was installed on Unit 3 A-train and B-train RTB and BYBs;
- Work orders for Unit 4 RTB and BYB cell switch inspection will be originated and scheduled for the next Unit 4 outage; and,
- A modification to detect for a standing trip signal from cell switch contacts for Unit 4 RTB and BYBs will be developed and scheduled for implementation during the next Unit 4 refueling outage.

Corrective Action References: AR 2385529

Performance Assessment:

Performance Deficiency: The licensee’s failure to implement a preventive maintenance plan consistent with vendor document Maintenance Program Manual for Westinghouse Safety Related Type DB Circuit Breakers and Associated Switchgear, Rev. 1 dated July, 2011, to ensure the RPS RTB and BYB cubicle cell switches were appropriately lubricated and replaced prior to the end of their service life was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Initiating Events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the licensee failed to establish appropriate preventive maintenance for the RTB and BYB cell switches which caused a Unit 3 reactor trip.

Significance: The inspectors assessed the significance of the finding using Appendix A, “The Significance Determination Process (SDP) for Findings At-Power.” Using Exhibit 1, Initiating Events, for “Transient Initiators,” determined the finding to be of very low safety significance (Green) because the finding did not cause both a reactor trip AND the loss of mitigation equipment relied upon to transition the plant from the onset of the trip to a stable shutdown condition (e.g., loss of condenser, loss of feedwater).

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance. The licensee did not incorporate vendor recommendation maintenance for RTB and BYB breaker cell switches from a July 2011, Westinghouse MPM revision.

Enforcement:

Violation: Turkey Point Technical Specification 6.8.1.a, stated in part, that written procedures shall be established, implemented, and maintained covering the activities referenced in the applicable procedures required by the NextEra QATR. NextEra QATR, Appendix B, “Procedures,” in part stated, NextEra committed to use Appendix A, of Regulatory Guide 1.33, Revision 2, as guidance for establishing the types of procedures that are necessary. Regulatory Guide 1.33, Revision 2, Appendix A, item 9, Procedures for Performing Maintenance, subsection b, stated in part, preventive maintenance schedules should be developed to specify lubrication schedules and replacement of parts that have a specified lifetime. The RTB and BYB cubicle cell switches since July 2011, have a vendor recommended lubrication schedule not to exceed five years and a specified lifetime of 100 cycles of breaker operation. Contrary to the above, from July 2011, until May 21 and May 26, 2021, respectively, the licensee failed to establish a lubrication schedule and replacement schedule for the RTB and BYB cubicle cell switches.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

The disposition of this finding and associated violation closes URI: 05000250/2021001-03.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On July 14, 2021, the inspectors presented the integrated inspection results to Michael Pearce, Site Vice President, and other members of the licensee staff.
- On April 9, 2021, the inspectors presented the TI-194 Follow Up inspection results to Michael Pearce, Site Vice President, and other members of the licensee staff.

THIRD PARTY REVIEWS

On May 3, 2021, the inspectors reviewed a World Association of Nuclear Operators report that was issued for a peer review conducted in February 2021.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
2515/194	Calculations	PTN-BFJR-20-010	Turkey Point Units 3 and 4 Open Phase Condition Evaluation	Revision 0
	Corrective Action Documents	AR # 02389358	Update the OPC PRA evaluation report to address the missing sensitivity analysis	04/09/2021
	Procedures	3-NOP-092.02	OPEN PHASE DETECTION AND PROTECTION	Revision 0A
		4-ONOP-092.03	STARTUP TRANSFORMER MALFUNCTION	Revision 1A