



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION II
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ATLANTA, GEORGIA 30303-1257

January 26, 2018

Mr. Tom Simril
Site Vice President
Duke Energy Corporation
Catawba Nuclear Station
4800 Concord Road
York, SC 29745-9635

SUBJECT: CATAWBA NUCLEAR STATION – NRC INTEGRATED INSPECTION REPORT
05000413/2017004 AND 05000414/2017004

Dear Mr. Simril:

On December 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Catawba Nuclear Station Units 1 and 2. On January 23, 2018, the NRC inspectors discussed the results of this inspection with you and other members of your staff. The results of this inspection are documented in the enclosed report.

NRC inspectors documented two findings of very low safety significance (Green) in this report. These findings involved violations of NRC requirements. Additionally, NRC inspectors documented one Severity Level IV violation with no associated finding. The NRC is treating these violations as non-cited violations (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

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

T. Simril

2

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

Sincerely,

/RA/

Frank Ehrhardt, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-413, 50-414
License Nos.: NPF-35, NPF-52

Enclosure:
IR 05000413/2017004 and 05000414/2017004
w/Attachment: Supplemental Information

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3

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05000413/2017004 AND 05000414/2017004 January 26, 2018

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-413, 50-414

License Nos.: NPF-35, NPF-52

Report No.: 05000413/2017004 and 05000414/2017004

Licensee: Duke Energy Carolinas, LLC

Facility: Catawba Nuclear Station, Units 1 and 2

Location: York, SC 29745

Dates: October 1, 2017 through December 31, 2017

Inspectors: J. Austin, Senior Resident Inspector
C. Scott, Resident Inspector
M. Meeks, Senior Operations Engineer (Section 1R11)

Approved by: Frank Ehrhardt, Chief
Reactor Projects Branch 1

Enclosure

SUMMARY

IR 05000413/2017004 and 05000414/2017004, October 1, 2017, through December 31, 2017; Catawba Nuclear Station, Units 1 and 2; Operability Determinations and Functionality Assessments, Problem Identification and Resolution

The report covered a 3-month period of inspection by resident inspectors and regional inspectors. There were three NRC-identified violations documented in this report. The significance of inspection findings are indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process," (SDP) dated April 29, 2015. The cross-cutting aspects are determined using IMC 0310, "Aspects within the Cross-Cutting Areas" dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated November 1, 2016. The NRC's program for overseeing the safe operations of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Public Radiation Safety

Green: An NRC identified Green non-cited violation (NCV) of Technical Specification (TS) 5.4.1, "Procedures," was identified for the licensee's failure to establish and maintain a procedure for testing the Units 1 and 2 process and area radiation monitoring system. Specifically, the channel operational test procedures IP/1(2)/B/3314/036 Q, "1(2) EMF35, 1(2) EMF36, 1(2) EMF42, and, EMF50L Channel Operational Test," did not adequately test the trip functions for fuel pool ventilation radiation monitor EMF-42 on Units 1 and 2. As a result, the licensee declared the Units 1 and 2 EMF-42 radiation monitors non-functional and initiated corrective actions to revise the procedure. The licensee entered this issue into the corrective action program (CAP) as Condition Report (CR) 2168190.

The failure to establish adequate procedural guidance to test the trip functions of EMF-42 on Units 1 and 2 was a performance deficiency. The performance deficiency was more than minor because it was associated with the plant facilities/equipment and instrumentation attribute (reliability of process radiation monitors) of the radiation safety cornerstone (public radiation safety) and adversely affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian use. The inspectors determined the finding to be of very low safety significance because it was associated with the effluent program; however, it was not a substantial failure to implement the effluents program and it did not result in a public dose greater than an Appendix I criterion or 10 CFR 20.1301(e). The finding was associated with a cross-cutting aspect in the change management component of the human performance area because the licensee failed to effectively use a systematic process for evaluating and implementing a change to the testing procedure for EMF-42 in 2015, so that nuclear safety remains the overriding priority. (H.3) (Section 1R15)

Cornerstone: Mitigating Systems

Green: The inspectors identified a Severity Level (SL) IV NCV of 10 CFR 50.59, "Changes, Tests, and Experiments," for the licensee's failure to perform a written safety evaluation prior to implementing a change to licensee procedure PT/1/A/4200/009 "Engineering Safety Features Actuation periodic test (ESFAS)." This procedure was last used during refueling outage 22 (November 2015) and resulted in a missed surveillance for TS surveillance requirements (SR)

3.8.1.11 and 3.8.1.19. The licensee took corrective actions to revise the ESFAS procedure and complete repairs of the 1A auxiliary shutdown panel supply unit (ASPSU) to allow complete testing of the ESFAS logic circuitry during the next refueling outage in accordance with SR 3.0.3 (November 2018). The licensee entered this issue into the CAP as CR 2124814.

The failure to perform a 10 CFR 50.59 safety evaluation for a change to procedure PT/1/A/4200/009, "Engineering Safety Features Actuation periodic test (ESFAS)" was a performance deficiency. This performance deficiency was determined to be more than minor because there was a reasonable likelihood that the change would have required Commission review and approval prior to implementation in accordance with 10 CFR 50.59(c)(2). Violations of 10 CFR 50.59 are dispositioned using the traditional enforcement process because they are considered to be violations that could potentially impede or impact the regulatory process. However, when possible, the underlying technical issue is evaluated under the SDP to determine the significance of the violation. The performance deficiency impacted the mitigating systems cornerstone. The inspectors determined the issue to be of very low safety significance (Green) because it did not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time and did not represent an actual loss of function of one or more non-tech spec trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. In accordance with Section 6.1.d the NRC Enforcement Policy, issued November 1, 2016, a traditional enforcement violation of 10 CFR 50.59 that results in conditions evaluated as having very low safety significance (i.e., Green) by the SDP is considered to be a SL IV violation. There was no cross-cutting aspect associated with this violation because cross-cutting aspects are not assigned to traditional enforcement violations. (Section 1R15)

Green. The NRC identified a Green NCV of TS 5.4.1, "Procedures." Specifically, the licensee failed to follow procedure AD-HU-ALL-004, "Preparation and Work Instruction Use and Adherence." As a result, the licensee: (1) replaced a pressurizer heater breaker with an incorrect breaker, (2) performed a temporary modification incorrectly, and (3) did not perform an operational test procedure step as written. As corrective actions, the licensee: (1) replaced and tested satisfactorily breaker 1PHP1C-F01B with the correct model and entered this issue into their CAP as CR 2157978, (2) replaced 1NW-61B with the original design piping installed and entered this issue into CAP as CR 2161153, and (3) concluded there were no adverse effects to the diesel generator (DG) caused by this unloaded operation and entered this issue into the CAP as CR 21666032.

The failure to follow procedure AD-HU-ALL-0004 was a performance deficiency. The performance deficiency was more than minor because it was associated with the procedure adherence attribute of the mitigating systems cornerstone, and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, failing to follow AD-HU-ALL-0004 could result in undetected degradation of plant equipment to perform its intended safety functions. The finding was determined to be of very low safety significance (Green) because it was not a design or qualification deficiency confirmed to result in a loss of operability or functionality, did not represent a loss of system safety function, did not result in a loss of safety system function for a single train for greater than TS allowed outage time and did not result in a loss of safety function of one or more non-TS trains of equipment designated as risk significant for greater than 24 hours. The finding had a cross-cutting aspect of procedure adherence in the area of human performance, because the licensee failed to follow procedure AD-HU-ALL-0004 during implementation of plant maintenance, engineering changes and testing. (H.8) (Section 4OA2)

REPORT DETAILS

Summary of Plant Status

Unit 1: Operated at or near 100 percent rated thermal power for the entire inspection period.

Unit 2: Operated at or near 100 percent rated thermal power for the entire inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection (71111.01)

a. Inspection Scope

.1 Seasonal Extreme Weather Conditions

The inspectors conducted a detailed review of the station's adverse weather procedures written for extreme low temperatures. The inspectors verified that weather-related equipment deficiencies identified during the previous year had been placed into the work control process and/or corrected before the onset of seasonal extremes. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures before the onset of and during seasonal extreme weather conditions. Documents reviewed are listed in the attachment.

The inspectors evaluated the following risk-significant systems:

- Units 1 and 2 auxiliary feedwater pump turbine steam supply piping
- Units 1 and 2 refueling water storage tank level transmitters

b. Findings

No findings were identified.

1R04 Equipment Alignment (71111.04)

a. Inspection Scope

.1 Partial Walkdown

The inspectors verified that critical portions of the selected systems were correctly aligned by performing partial walkdowns. The inspectors selected systems for assessment because they were a redundant or backup system or train, were important for mitigating risk for the current plant conditions, had been recently realigned, or were a single-train system. The inspectors determined the correct system lineup by reviewing plant procedures and drawings. Documents reviewed are listed in the attachment.

The inspectors selected the following two systems or trains to inspect:

- safe shutdown facility (SSF) diesel generator (DG)
- 2A emergency DG

.2 Complete Walkdown

The inspectors verified the alignment of the Unit 1 4kV essential auxiliary power system. The inspectors selected this system for assessment because it is a risk-significant mitigating system. The inspectors determined the correct system lineup by reviewing plant procedures, drawings, the updated final safety analysis report, and other documents. The inspectors reviewed records related to the system design, maintenance work requests, and deficiencies. The inspectors verified that the selected system was correctly aligned by performing a complete walkdown of accessible components.

To verify the licensee was identifying and resolving equipment alignment discrepancies, the inspectors reviewed corrective action documents, including condition reports and outstanding work orders. The inspectors also reviewed periodic reports containing information on the status of risk-significant systems, including maintenance rule reports and system health reports. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R05 Fire Protection (71111.05AQ)

a. Inspection Scope

.1 Quarterly Inspection

The inspectors evaluated the adequacy of selected fire plans by comparing the fire plans to the defined hazards and defense-in-depth features specified in the fire protection program. In evaluating the fire plans the inspectors assessed the following items:

- control of transient combustibles and ignition sources
- fire detection systems
- fire suppression systems
- manual firefighting equipment and capability
- passive fire protection features
- compensatory measures and fire watches
- issues related to fire protection contained in the licensee's corrective action program

The inspectors toured the following five fire areas to assess material condition and operational status of fire protection equipment. Documents reviewed are listed in the attachment.

- Unit 1, auxiliary feedwater (CA) pump room area (fire area 3)
- Unit 2, CA pump room area (fire area 2)
- Unit 1, turbine building mezzanine 594' elevation (fire area TB1)

- Unit 2, 2B DG room and 2B diesel room corridor (fire areas 28,44)
- Unit 1/2, control room (fire area 21)

.2 Annual Inspection

The inspectors evaluated the licensee's fire brigade performance during a drill on November 16 and assessed the brigade's capability to meet fire protection licensing basis requirements. The inspectors observed the following aspects of fire brigade performance:

- capability of fire brigade members
- leadership ability of the brigade leader
- use of turnout gear and fire-fighting equipment
- team effectiveness
- compliance with site procedures

The inspectors also observed the post-drill critique to assess if it was appropriately critical, included discussions of drill observations, and identified any areas requiring corrective actions.

Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R06 Flood Protection Measures (71111.06)

a. Inspection Scope

.1 Internal Flooding

The inspectors reviewed related flood analysis documents and walked down the area listed below containing risk-significant structures, systems, and components susceptible to flooding. The inspectors verified that plant design features and plant procedures for flood mitigation were consistent with design requirements and internal flooding analysis assumptions. The inspectors also assessed the condition of flood protection barriers and drain systems. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the corrective action program. Documents reviewed are listed in the attachment.

- 1A diesel generator room and 1A diesel room corridor

.2 Underground Cables

The inspectors reviewed related flood analysis documents and inspected the area listed below containing cables whose failure could adversely impact risk-significant equipment. The inspectors directly observed the condition of cables and cable support structures and, as applicable, verified that dewatering devices and drainage systems were

functioning properly. In addition, the inspectors verified the licensee was identifying and properly addressing issues using the corrective action program. Documents reviewed are listed in the attachment.

- Manhole CMH-21

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification Program and Licensed Operator Performance (71111.11)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Requalification

On October 26, 2017, the inspectors observed a simulator scenario conducted for training of an operating crew that involved a component cooling water failure, a dropped control rod followed by another dropped rod, manual reactor scram and a main steam line break.

The inspectors assessed the following:

- licensed operator performance
- the ability of the licensee to administer the scenario and evaluate the operators
- the quality of the post-scenario critique
- simulator performance

.2 Resident Inspector Quarterly Review of Licensed Operator Performance in the Actual Plant/Main Control Room

The inspectors observed licensed operator performance in the main control room during surveillance testing of the Unit 2 turbine driven auxiliary feedwater pump on November 30, 2017.

The inspectors assessed the following:

- use of plant procedures
- control board manipulations
- communications between crew members
- use and interpretation of instruments, indications, and alarms
- use of human error prevention techniques
- documentation of activities
- management and supervision

.3 Annual Review of Licensee Requalification Examination Results

On October 27, 2017, the licensee completed the annual requalification operating examinations required to be administered to all licensed operators in accordance with

Title 10 of the *Code of Federal Regulations* 55.59(a)(2), "Requalification Requirements," of the NRC's "Operator's Licenses." During the week of December 18, 2017, the inspectors performed an in-office review of the overall pass/fail results of the individual operating examinations and the crew simulator operating examinations in accordance with Inspection Procedure (IP) 71111.11, "Licensed Operator Requalification Program." These results were compared to the thresholds established in Section 3.02, "Requalification Examination Results," of IP 71111.11.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors assessed the licensee's treatment of the one issue listed below to verify the licensee appropriately addressed equipment problems within the scope of the maintenance rule (10 CFR 50.65, "Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants"). The inspectors reviewed procedures and records to evaluate the licensee's identification, assessment, and characterization of the problems as well as their corrective actions for returning the equipment to a satisfactory condition. In addition, the inspectors performed a review of the licensee's Quality Assurance Program to ensure the licensee was in compliance with their program requirements.

- Units 1 and 2, CR 2087893, Replacements needed for Joslyn Clark size 4 starters

b. Findings

No findings were identified.

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

a. Inspection Scope

The inspectors reviewed the four maintenance activities listed below to verify that the licensee assessed and managed plant risk as required by 10 CFR 50.65(a)(4) and licensee procedures. The inspectors assessed the adequacy of the licensee's risk assessments and implementation of risk management actions. The inspectors also verified that the licensee was identifying and resolving problems with assessing and managing maintenance-related risk using the corrective action program. Additionally, for maintenance resulting from unforeseen situations, the inspectors assessed the effectiveness of the licensee's planning and control of emergent work activities.

- Unit 2, November 10, 2017, risk mitigation plan for planned maintenance on the 2A diesel generator
- Unit 2, November 14, 2017, risk mitigation plan for emergent issue with 2A air return fan failure

- Unit 1, November 28, 2017, risk mitigation plan for planned maintenance on the B train auxiliary building ventilation
- Unit 2, November 29, 2017, risk mitigation activities for unplanned maintenance on the B-train of containment penetration valve injection

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments (71111.15)

a. Inspection Scope

Operability and Functionality Review

The inspectors selected the five operability determinations or functionality evaluations listed below for review based on the risk-significance of the associated components and systems. The inspectors reviewed the technical adequacy of the determinations to ensure that technical specification operability was properly justified and the components or systems remained capable of performing their design functions. To verify whether components or systems were operable, the inspectors compared the operability and design criteria in the appropriate sections of the technical specification and updated final safety analysis report to the licensee's evaluations. Where compensatory measures were required to maintain operability, the inspectors determined whether the measures in place would function as intended and were properly controlled. Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with operability evaluations.

Documents reviewed are listed in the attachment.

- Unit 1, Kerotest weight values inaccurate on drawings, CR 2151627
- Unit 1, 1CA-188 Tempering flow to 1D steam generator failed to open, CR 2157935
- Units 1 and 2, Fuel pool rad monitor, CR 2168190
- Unit 2, Unusual cell stratification on entire 2EBA battery bank, CR 2166602
- Unit 1, Steam leak from Unit 1 turbine driven auxiliary feedwater pump, CR 2172574

b. Findings

Introduction: An NRC identified Green NCV of TS 5.4.1, "Procedures," was identified for the licensee's failure to establish and maintain a procedure for testing the Units 1 and 2 process and area radiation monitoring system. Specifically, channel operational test procedure IP/1(2)/B/3314/036 Q, "1(2) EMF35, 1(2) EMF36, 1(2) EMF42, and, EMF50L Channel Operational Test," did not adequately test the trip functions for fuel pool ventilation radiation monitor EMF-42 on Units 1 and 2. As a result the licensee declared the Units 1 and 2 EMF-42 radiation monitors non-functional and initiated corrective actions to revise the procedure. The licensee entered this issue into the CAP as CR 2168190.

Description: Licensee procedure IP/1(2)/B/3314/036 Q provides instructions for calibration and documentation of the process and area radiation system (EMF) instrumentation in accordance with selected licensee commitments (SLC) surveillance requirements. During a review of the procedure, inspectors identified that the trip functions for fuel pool ventilation radiation monitor EMF-42 were not adequately tested. This radiation monitor draws an air sample from the fuel pool system ductwork and, when radioactivity exceeds the high radiation setpoint of EMF-42, it will close the bypass ventilation path and initiate filtering of the fuel pool area. The inspectors noted that a relay in the circuit for EMF-42 that was not being tested. This relay must actuate to verify the trip functions of EMF-42. On November 28, 2017, the licensee declared the Units 1 and 2 EMF-42 radiation monitors non-functional and placed Units 1 and 2 fuel pool ventilation in filter mode to comply with SLC 16.7-10. The licensee revised the procedure and successfully completed the channel operational test for Units 1 and 2 EMF-42. In 2015, the test procedure for Units 1 and 2 EMF-42 was superseded and combined into a consolidated test procedure that included EMF-35, EMF-36 and EMF-50L. The licensee failed to ensure that the acceptance criteria from the individual tests was included into the consolidated procedure.

Analysis: The failure to establish adequate procedural guidance to test the trip functions of EMF-42 on Units 1 and 2 was a performance deficiency. The inspectors determined that the finding was more than minor because the finding was associated with the plant facilities/equipment and instrumentation attribute (reliability of process radiation monitors) of the radiation safety cornerstone (public radiation safety) and adversely affected the cornerstone objective of ensuring adequate protection of public health and safety from exposure to radioactive materials released into the public domain as a result of routine civilian use. The inspectors used IMC 0609, "Significance Determination Process," Attachment D, "Public Radiation Safety Significance Determination Process," February 12, 2008, and determined the finding to be of very low safety significance. Specifically, the finding was associated with the effluent program and was not a substantial failure to implement the effluents program and did not result in a public dose greater than an Appendix I criterion or 10 CFR 20.1301(e). The finding was associated with a cross-cutting aspect in the change management component of the human performance area because the licensee failed to effectively use a systematic process for evaluating and implementing a change to the testing procedure for EMF-42 in 2015, so that nuclear safety remains the overriding priority [H.3].

Enforcement: Technical Specification 5.4.1.a, "Procedures," requires, in part, that written procedures shall be established, implemented, and maintained covering the applicable procedures recommended in Regulatory Guide (RG) 1.33, Revision 2, Appendix A, dated February 1978. Regulatory Guide 1.33 Appendix A, Section 7, "Procedures for Control of Radioactivity," requires procedures for operation of the process radiation monitoring system. Licensee procedure IP/1(2)/B/3314/036 Q is the plant procedure for calibration and documentation of the process and area radiation system instrumentation in accordance with SLC surveillance requirements. Contrary to the above, since 2015, the licensee failed to establish and maintain an adequate test procedure for the process and area radiation monitoring system as required by Section 7 of RG 1.33. Specifically the licensee failed to adequately test the trip functions of the Units 1 and 2 fuel pool radiation monitor EMF-42 as required by SLC 16-10.7. This resulted in the Units 1 and 2 fuel pool radiation monitor EMF-42 being declared non-functional. As a corrective action, the licensee placed the Units 1 and 2 fuel pool ventilation system in filter mode and revised the test procedure. Because this violation

was of very low safety significance and was entered into the licensee's CAP as CR 2168190, this violation is being treated as an NCV consistent with Section 2.3.2.a of the NRC Enforcement Policy. (NCV 05000413, 414/2017004-01, "Inadequate Testing of Fuel Pool Ventilation Radiation Monitors.")

05000413/2017002-01 (Closed) Unresolved item (URI): 10 CFR 50.59 Evaluation of a Change to an Engineered Safety Features Actuation (ESFAS) Test Procedure

Introduction: The inspectors identified a SL IV NCV of 10 CFR 50.59, "Changes, Tests, and Experiments," for the licensee's failure to perform a written safety evaluation prior to implementing a change to licensee procedure PT/1/A/4200/009 "Engineering Safety Features Actuation periodic test (ESFAS)."

Description: In 2015, the licensee modified PT/1/A/4200/009 to allow completion of the test with the 1A auxiliary shutdown panel supply unit (ASPSU), an engineering safety feature, out of service. Procedure PT/1/A/4200/009 is the surveillance procedure that tests ESFAS circuitry compliance with TS SR 3.8.1.11 and 3.8.1.19. The licensee changed the procedure to verify that the "Sequenced On" light in the control room was received versus ensuring the 1A ASPSU started. Inspectors reviewed the circuit diagram for the 1A ASPSU and identified that there were two ESFAS contacts necessary to start the 1A ASPSU that were not verified by the procedure after the procedure change. The inspectors were concerned that the procedure did not adequately test all portions of the ESFAS logic circuitry and did not ensure the 1A ASPSU could perform its intended safety function. The inspectors also identified that the 2015 procedure change was completed without a screen to determine if a 10 CFR 50.59 evaluation was required. The licensee entered this issue into their CAP as NCR 2124814.

The licensee's cause evaluation concluded that a 50.59 written safety evaluation should have been completed before implementing the procedure change. Engineering performed a safety evaluation to determine if the engineering safety feature designation of the ASPSU could be removed and if the non-safety related auxiliary ventilation system could fulfill the safety function of the ASPSU. Engineering determined that use of normal auxiliary ventilation to perform the automatic ASPSU safety function would require manual operation. Further, the licensee determined that permanently replacing an automatic function with a manual action results in a more than minimal increase in the likelihood of occurrence of a malfunction of a structure, system, or component (SSC) important to safety previously evaluated in the updated safety analysis report (UFSAR) and the change required NRC approval. This procedure was last used during refueling outage 22 (November 2015) and resulted in a missed surveillance for SR 3.8.1.11 and 3.8.1.19. The licensee took corrective actions to revise the ESFAS procedure and complete repairs of the 1A ASPSU to allow complete testing of the ESFAS logic circuitry during the next refueling outage (November 2018) in accordance with SR 3.0.3.

Analysis: The inspectors determined that the failure to perform a 10 CFR 50.59 safety evaluation for a change to procedure PT/1/A/4200/009 "Engineering Safety Features Actuation periodic test (ESFAS)," was a violation of 10 CFR 50.59(d)(1) and a performance deficiency. This performance deficiency was determined to be more than minor because there was a reasonable likelihood that the change would have required Commission review and approval prior to implementation in accordance with 10 CFR 50.59(c)(2). Violations of 10 CFR 50.59 are dispositioned using the traditional

enforcement process instead of the SDP because they are considered to be violations that could potentially impede or impact the regulatory process. However, when possible, the underlying technical issue is evaluated under the SDP to determine the significance of the violation. The inspectors completed a significance determination review using IMC 0609, Appendix A, "Significance Determination of Reactor Inspection Findings for At-Power Situations," issued June 19, 2012. The performance deficiency impacted the mitigating systems cornerstone. The inspectors determined the issue to be of very low safety significance (Green) because it did not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time and did not represent an actual loss of function of one or more non-tech spec trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24 hours. In accordance with Section 6.1.d the NRC Enforcement Policy, issued November 1, 2016, a traditional enforcement violation of 10 CFR 50.59 that results in conditions evaluated as having very low safety significance (i.e., Green) by the SDP is considered to be a SL IV violation.

There was no cross-cutting aspect associated with this violation because cross-cutting aspects are not assigned to traditional enforcement violations.

Enforcement: Title 10 CFR 50.59(d) (1) requires, in part, that licensees maintain records of changes in the facility, of changes in procedures, and of tests and experiments. These records must include a written evaluation which provides the basis for determination that the change, test, or experiment does not require a license amendment. Contrary to the above, since 2015, the licensee failed to perform a written safety evaluation prior to making a change to the facility as described in the UFSAR. Specifically, the licensee failed to perform a written safety evaluation prior to implementing a change to licensee procedure PT/1/A/4200/009, "Engineering Safety Features Actuation periodic test (ESFAS)." This procedure was last used during refueling outage 22 (November 2015) and resulted in a missed surveillance for SR 3.8.1.11 and 3.8.1.19. The licensee took corrective actions to revise the ESFAS procedure and complete repairs of the 1A ASPSU to allow complete testing of the ESFAS logic circuitry during the next refueling outage (November 2018) in accordance with SR 3.0.3. The failure to perform a written safety evaluation was characterized as a Severity Level IV violation. This issue is in the licensee's corrective action program as CR 2124814. Because this violation was of very low safety significance, was not repetitive or willful, and was entered into the licensee's corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. (NCV 05000413/2017004-02, "Failure to Perform a 10 CFR 50.59 Evaluation for a Change to Engineering Safety Features Actuation Periodic Test.")

1R18 Plant Modifications (71111.18)

a. Inspection Scope

The inspectors verified that the plant modification listed below did not affect the safety functions of important safety systems. The inspectors confirmed the modifications did not degrade the design bases, licensing bases, and performance capability of risk significant structures, systems and components. The inspectors also verified modifications performed during plant configurations involving increased risk did not place the plant in an unsafe condition. Additionally, the inspectors evaluated whether system operability and availability, configuration control, post-installation test activities, and

changes to documents, such as drawings, procedures, and operator training materials, complied with licensee standards and NRC requirements. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with modifications. Documents reviewed are listed in the attachment.

- EC 410011, Removal of Curbs near Doorways in the Auxiliary Building Units 1 and 2

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing (71111.19)

a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the five maintenance activities listed below to verify the work performed was completed correctly and the test activities were adequate to verify system operability and functional capability.

- Work request (WR) 20081360, 2A air return for failed to start during testing, October 16, 2017
- Work order (WO) 20063550, 2A DG test following EC 401603 2A DG chart recorder implementation, November 9, 2017
- WR 20090716, Unit 1 steam dumps failed to open in pressure mode, November 18, 2017
- WO 20215941-06, Repair leak downstream of flow orifice on CAPT#2 exhaust piping, December 1, 2017
- WR 20092797, Main steam supply to auxiliary equipment heat trace controller reading low, December 11, 2017

The inspectors evaluated these activities for the following:

- acceptance criteria were clear and demonstrated operational readiness
- effects of testing on the plant were adequately addressed
- test instrumentation was appropriate
- tests were performed in accordance with approved procedures
- equipment was returned to its operational status following testing
- test documentation was properly evaluated

Additionally, the inspectors reviewed a sample of corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with post-maintenance testing. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)a. Inspection Scope

The inspectors reviewed one surveillance test listed below and either observed the test or reviewed test results to verify testing adequately demonstrated equipment operability and met technical specification and current licensing basis. The inspectors evaluated the test activities to assess for preconditioning of equipment, procedure adherence, and equipment alignment following completion of the surveillance. Additionally, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with surveillance testing. Documents reviewed are listed in the attachment.

Routine Surveillance Test

- PT/0/A/4200/017A, Standby Shutdown Facility Diesel Test

b. Findings

No findings were identified.

4. OTHER ACTIVITIES4OA1 Performance Indicator Verification (71151)a. Inspection Scope

The inspectors reviewed a sample of the performance indicator (PI) data, submitted by the licensee, for the Unit 1 and Unit 2 PIs listed below. The inspectors reviewed plant records compiled between October 2016 and September 2017 to verify the accuracy and completeness of the data reported for the station. The inspectors verified that the PI data complied with guidance contained in Nuclear Energy Institute 99-02, "Regulatory Assessment Performance Indicator Guideline," and licensee procedures. The inspectors verified the accuracy of reported data that were used to calculate the value of each PI. In addition, the inspectors reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with PI data.

Cornerstone: Mitigating Systems

- safety system functional failures
- reactor coolant leakage
- unplanned power changes per 7000 critical hours

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution (71152)

.1 Routine Review

The inspectors screened items entered into the licensee's corrective action program to identify repetitive equipment failures or specific human performance issues for follow-up. The inspectors reviewed nuclear condition reports, attended screening meetings, or accessed the licensee's computerized corrective action database.

.2 Annual Followup of Selected Issues

a. Inspection Scope

The inspectors conducted a detailed review of nuclear condition report CR 2153594, "Adverse Trend in Missed Surveillances."

The inspectors evaluated the following attributes of the licensee's actions:

- complete and accurate identification of the problem in a timely manner
- evaluation and disposition of operability and reportability issues
- consideration of extent of condition, generic implications, common cause, and previous occurrences
- classification and prioritization of the problem
- identification of root and contributing causes of the problem
- identification of any additional condition reports
- completion of corrective actions in a timely manner

Documents reviewed are listed in the attachment.

b. Findings and Observations

No findings were identified.

.3 Semi-Annual Trend Review

a. Inspection Scope

The inspectors reviewed issues entered in the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors focused their review on repetitive equipment issues, but also considered the results of inspector daily nuclear condition report screenings, licensee trending efforts, and licensee human performance results. The review nominally considered the 6-month period of July 2017 through December 2017 although some examples extended beyond those dates when the scope of the trend warranted. The inspectors compared their results with the licensee's analysis of trends. Additionally, the inspectors reviewed the adequacy of corrective actions associated with a sample of the issues identified in the licensee's trend reports. The inspectors also reviewed corrective action documents that were processed by the licensee to identify

potential adverse trends in the condition of structures, systems, and/or components as evidenced by acceptance of long-standing non-conforming or degraded conditions. Documents reviewed are listed in the attachment.

b. Findings and Observations

Introduction: The NRC identified a Green NCV of Technical Specification (TS) 5.4.1, "Procedures." Specifically, the licensee failed to follow procedure AD-HU-ALL-004, "Procedure and Work Instruction Use and Adherence." The inspectors identified three examples: (1) a pressurizer heater breaker was replaced with an incorrect breaker, (2) a temporary modification was performed incorrectly, and (3) an operational test procedure step was not performed as written.

Description: Licensee procedure AD-HU-ALL-004 "Procedure and Work Instruction Use and Adherence" Section 5.1 Step 4 states, "Procedures and work instructions shall be followed as written and in the sequence specified, and performers shall not deviate except as specifically allowed by the procedure, work instruction, or by approved processes." The inspectors identified the following three examples of the licensee's failure to follow procedures.

Example 1. Failure to replace pressurizer heater breaker (1PHP1C-F01B) in accordance with administrative procedure AD-EG-ALL-1132:

On October 14, 2017, 1PHP1C-F01B tripped after being energized for approximately 24 hours following breaker replacement. Operators responded and energized the 1A pressurizer heater bank restoring pressurizer pressure.

The breaker originally installed was model HFB and was to be replaced with a model HFD per engineering change (EC) CNCE-73131 (replacement for 2 and 3 pole HFB breakers). The EC was originally approved in June 2004 and was to be used on a case-by-case replacement of HFB breakers. The technician identified that the installed breaker was obsolete and needed to be replaced under EC CNCE-73131 with an HFD. To cross-reference the old style breaker and select the new style breaker, the technician used procedure IP/0/A/3850/023. The technician performed the breaker replacement as a minor maintenance activity (via a work request) in conjunction with procedure IP/0/A/3850/023, "Molded Case Circuit Breaker Inspection and Testing." The licensee identified that the technician replaced the HFB breaker with the wrong style HFD breaker. The breaker installed was calibrated at 40 degrees Celsius, but should have been calibrated at 50 degrees Celsius, which caused the 1C pressurizer heater bank to de-energize.

Procedure AD-EG-ALL-1132, "Preparation and Control of Design Change Engineering Changes," Section 4.10, Step 2, requires that implementation of engineering changes be performed in accordance with approved work orders. Also, Section 4.12, Step 1, requires that work orders be developed in accordance with work management procedures to implement the engineering change. The licensee failed to implement the engineering change via a work order. The licensee entered this issue into their CAP as CR 2157978 and breaker 1PHP1C-F01B was replaced with the correct model at the correct setpoint and tested satisfactorily.

Example 2. Failure to install temporary stainless steel tubing in the containment penetration valve injection system in accordance with administrative procedure AD-EG-ALL-1132:

On October 26, 2017, the licensee identified that 1NW-61B, 1B containment penetration surge chamber service water supply, had been installed with stainless steel piping per EC 400437 with a 6-month expiration and that the 6 months had expired on October 7, 2017. The design change was implemented as an equivalency to the original design because the pressure, temperature, allowable stress, and elasticity were all comparable. However, there was an exception in equivalency to corrosion resistance and the licensee had imposed a 6-month installation limit due to this exception. Licensee procedure AD-EG-ALL-1132, "Preparation and Control of Design Change Engineering Changes," Revision 6, Section 3.0, defines a temporary change (TCHG) as the EC subtype to be used to authorize temporary physical changes to SSCs (systems, structure or components) that will remain in service with the change installed. The inspectors concluded that EC 400437 should have been installed as a temporary change as required by AD-EG-ALL-1132 Revision 6. The TCHG was not entered into the operation's logbook, tracked, or audited in accordance with Section 5.4.1, Step 6, which states, in part, that Operations maintains a log of all TCHG ECs installed in the plant. The licensee entered this issue into their CAP as CR 2161153 and 1NW-61B was replaced with the original design piping material.

Example 3. Failure to perform a procedural step while testing the standby shutdown facility diesel generator (D/G) in accordance with administrative procedure AD-HU-ALL-0004.

On November 9, 2017, during the performance of PT/0/A/4200/017A, "Standby Shutdown Facility Test," the (D/G) was operated unloaded for greater than 30 minutes. At the conclusion of the test, conditional Step 12.50.1 directs running the D/G loaded for 3 hours if the D/G ran unloaded for greater than 30 minutes. The licensee marked this step "N/A" (not applicable). The inspectors identified that AD-HU-ALL-0004 Section 3.0 defines a conditional step as "a step which is performed or not performed based on the condition or conditions stated in the step." Conditional steps begin with the word "IF" which is bold, underlined and capitalized. PT/0/A/4200/017A, Section 12 Step 12.50 states:

IF for any period during the performance of this PT, the SSF DG was idled continuously for greater than or equal to 30 minutes, perform the following: Use OP/0/B/6350/011 (Standby Shutdown Facility Diesel Operations) to run and load the SSF DG for greater than or equal to 3 hours at greater than or equal to 600 kW to blow carbon from injector tips.

This step was an applicable conditional step and should have been performed. The licensee entered this issue into their CAP as CR 21666032 and concluded there were no adverse effects to the D/G caused by this unloaded operation.

Analysis: The failure to follow administrative procedure AD-HU-ALL-0004 during implementation of plant maintenance, an engineering change, and testing was a performance deficiency. The performance deficiency resulted in configuration management and potential equipment degradation issues. The performance deficiency was more than minor because it was associated with the human performance attribute of

the mitigating systems cornerstone, and it adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, failing to follow AD-HU-ALL-0004 could result in undetected degradation of plant equipment to perform its intended safety functions. The inspectors used IMC 0609 Appendix A, Exhibit 2, "Mitigating Systems Screening Questions," and determined the finding to be of very low safety significance (Green) because it was not a design or qualification deficiency confirmed to result in a loss of operability or functionality, did not represent a loss of system safety function, did not result in a loss of safety system function for a single train for greater than technical specification (TS) allowed outage time, and did not result in a loss of safety function of one or more non-TS trains of equipment designated as risk significant for greater than 24 hours.

The finding had a cross-cutting aspect of procedure adherence in the area of human performance, because the licensee failed to follow procedure AD-HU-ALL-0004 during implementation of plant maintenance, engineering changes, and testing attribute. (H.8)

Enforcement: Technical Specification 5.4.1, "Procedures," requires that written procedures shall be established, implemented, and maintained, covering applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. Section 1.d of Appendix A of Regulatory Guide 1.33, Revision 2, February 1978, states that written procedures should be provided for Procedure Adherence and Temporary Change Method. The licensee's procedure AD-HU-ALL-004 "Procedure and Work Instruction Use and Adherence," Section 5.1, Step 4 states "Procedures and work instructions shall be followed as written and in the sequence specified, and performers shall not deviate except as specifically allowed by the procedure, work instruction, or by approved processes." Contrary to the above, from October 14 through November 11, 2017, the licensee failed to properly implement procedure AD-HU-ALL-0004 during implementation of plant maintenance, engineering changes and testing. As a result: (1) 1PHP1C-F01B tripped after being energized for approximately 24 hours following breaker replacement, (2) 1NW-61B was installed with stainless steel piping for greater than the 6-month allowance, and (3) the standby shutdown facility D/G was operated unloaded for greater than the allowable 30 minutes. As corrective actions, the licensee: (1) replaced and tested satisfactorily breaker 1PHP1C-F01B with the correct model and entered this issue into their CAP as CR 2157978, (2) replaced 1NW-61B with the original design piping installed and entered this issue into CAP as CR 2161153, and (3) concluded there were no adverse effects to the diesel generator (DG) caused by this unloaded operation and entered this issue into the CAP as CR 21666032. Because the finding was of very low safety significance and it was entered into their corrective action program, this violation is being treated as an NCV, consistent with Section 2.3.2.a of the Enforcement Policy. (NCV 050000413/414/2017004-03, "Failure to Follow Administrative Procedures.")

4OA6 Meetings, Including Exit

On January 23, 2018, the resident inspectors presented the inspection results to Mr. Tom Simril and other members of the licensee's staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

C. Abernathy, Manager, Nuclear Site Services
S. Andrews, Sr. Engineer Regulatory Affairs,
T. Arlow, Emergency Planning Manager
E. Benfield, RP Supervising Scientist
C. Bigham, Director Nuclear Organizational Effectiveness
M. Carwile, Chemistry Manager
B. Cauthen, Lead Engineer
C. Curry, Plant Manager
C. Fletcher, Regulatory Affairs Manager
N. Flippin, Work Management Manager
B. Foster, Operations Manager
T. Jenkins, Maintenance Manager
L. Keller, General Manager Nuclear Engineering
B. Leonard, Training Manager
T. Simril, Site Vice-President
J. Smith, Radiation Protection Manager
J. Wylie, Director, Nuclear Plant Security
C. Wilson, Sr. Engineer Regulatory Affairs

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000413,414/2017004-01	NCV	Inadequate Testing of Fuel Pool Ventilation Radiation Monitors (Section 1R15)
05000413/2017004-02	SLIV	Failure to Perform a 10 CFR 50.59 Evaluation for a Change to Engineering Safety Features Actuation Periodic Test. (Section 1R15)
05000413,414/2017004-03	NCV	Failure to Follow Administrative Procedures (Section 4OA2)

Closed

05000413/2017002-01	URI	Evaluation of a Change to an Engineered Safety Features Actuation (ESFAS) Test Procedure (Section 1R15)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

CNC-1223.43-02-0009, SA System TDAFWP Steam Supply Pipe Trace Heating Operability, Rev. 5
OP/1/A/6100/010 I, Trace Heating Borated Water Alarm
CR 2091514, Evaluate/include listed items for Winter Readiness Critique
WO 01113564, FZP PT/0/B/4700/38 Cold Weather Protection (NOV)
WO 2014894, OEHT: PM Heat Trace System (Fall)
IP/0/B/3560/008, Preventive Maintenance and Operational Check of Freeze Protection Heat Trace and Instrument Box Heaters (EHT/EIB) Systems (Fall PM), Rev. 60
PT/0/B/4700/038, Cold Weather Protection, Rev. 40
OP/0/B/6700/015, Weather Related Activities, Rev. 002
CR 1446337, Implement a preventative maintenance program to ensure external flood mitigation features are subject to age management

Section 1R04: Equipment Alignment

PT/2/A/4350/002 A, Diesel Generator 2A Operability Test, Rev. 114
OP/1/A/6550/001, DG FD Valve Checklist

Section 1R05: Fire Protection

CSD-CNS-PFP-TBI-0594-001, Turbine Building Elevation 594 Pre-fire plan, Rev. 0
CSD-CNS-PFP-DG2-0556-001, Diesel Generator Building Elevation 556 Pre-fire plan, Rev. 0
CSD-CNS-PFP-AB-0543-001, Auxiliary Building Elevation 543 Pre-fire plan, Rev. 0
CSD-CNS-PFP-AB-594-001, Auxiliary Building Elevation 594 Pre-fire plan, Rev. 0
CR 2166502, Annual Offsite Fire Drill –D- shift 4th quarter drill

Section 1R06: Flood Protection Measures

WO 20165693-04, 1FW ZP CMH-21, Civil Engineering Inspection

Section 1R15: Operability Evaluations

Operational Decision Making for 1CA-188, 10/12/2017
CR 2155394, Missed Surveillance for SR 3.8.1.11 and 3.8.1.19
CR 2153614, APSU-1A
CR 1993656, 16wk3 WO#2003916101
WO 2121945, 1 VA AH ASPSU1B PFM Semi-Annual
CR 2124814, NRC questions on Auxiliary Shutdown Panel Supply Units
CNC-1211.00-00-0020, Auxiliary Control Panel Area Load and Static Pressure Calculations
OP/0/A/6450/003, Auxiliary Building Ventilation System, Rev.065
CR 2107611, ASPSU units out of service
OP/1/A/6100/004, Shutdown outside the Control Room from Standby to Cold Shutdown, Rev. 055
CR 1897367, Horizons Investment Owners to re-slot cancelled/ deferred
CR 1534047, Rounds PDA 2A ASPSU Return Duct Temperature Upper Limit Exceeded
CR 1534278, ASPSU-2A Compressor Tripped
CNS Maintenance Rule Expert Panel. 2/17/2000
AP/1/A/5500/017, Loss of Control Room, Rev. 58
CNEE-0166-01.06, Elementary Diagram Auxiliary Building Ventilation System (VA) Aux. Shutdown PNL. Supply Unit APSU-1, Rev. 09

Section 1R18: Plant Modifications

CNC-12060.03-00-0001, Flood Levels for Structures Outside of the Reactor Building, Rev.25

Section 1R19: Post-Maintenance Testing

20215941, 2SA OR 40: Perform Functional

Section 1R22: Surveillance Testing

1P/B/3314/042 Q, 1-EMF42 Gas Monitor Quarterly Channel Operation Test, Rev. 009

CR 2168190, Inadequate Overlap Testing for 1/2 EMF42

1P/B/3314/036 Q, 1EMF35, 1EMF36, 1EMF42, and 0EMF50L Channel Operational Test,
Rev.29

Section 4OA2: Problem Identification and Resolution

AD-EG-A-11-1132, Preparation and Control of Design Change Engineering Changes, Reg. 6
and Rev. 9

OMP 2-14, Temporary Engineering changes, Rev. 23

IP/0/A/3850/023, Molded case circuit breaker – Inspection and testing procedure, Rev. 125