



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

May 9, 2017

Mr. Tom Ray
Site Vice President
Duke Energy Corporation
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

**SUBJECT: OCONEE NUCLEAR STATION – NRC INTEGRATED INSPECTION REPORT
05000269/2017001, 0500270/2017001, AND 05000287/2017001**

Dear Mr. Ray:

On March 31, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Oconee Nuclear Station Units 1, 2, and 3. On April 20, 2017, 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 one finding of very low safety significance (Green) in this report. The finding involved a violation of NRC requirements. Further, inspectors documented two licensee-identified violations which were determined to be of very low safety significance in this report. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2.a of the Enforcement Policy.

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

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

T. Ray

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.: 50-269, 50-270, 50-287
License Nos.: DPR-38, DPR-47, DPR-55

Enclosure:
IR 05000269/2017001, 0500270/2017001,
and 05000287/2017001 w/Attachment:
Supplemental Information

cc: Distribution via ListServ

T. Ray

3

SUBJECT: OCONEE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT
05000269/2017001, 0500270/2017001, AND 05000287/2017001 May 9, 2017

DISTRIBUTION:

M. Kowal, RII
K. Sloan, RII
OE Mail
RIDSNRRDIRS
PUBLIC
RidsNRRPMOconee Resource

ADAMS Accession Number: ML17129A355

OFFICE	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRP	RII:DRS
NAME	ECrowe	NChilds	JParent	MToth	JWorosilo	MBates
DATE	5/2/2017	4/28/2017	5/1/2017	5/2/2017	5/1/2017	4/28/2017
OFFICE	OCHO:TTC	RII:DRP				
NAME	GCallaway	FEhrhardt				
DATE	4/28/2017	5/9/2017				

OFFICIAL RECORD COPY

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-269, 50-270, 50-287

License Nos.: DPR-38, DPR-47, DPR-55

Report No.: 05000269/2017001, 05000270/2017001, and 05000287/2017001

Licensee: Duke Energy Carolinas, LLC

Facility: Oconee Nuclear Station, Units 1, 2, and 3

Location: Seneca, SC 29672

Dates: January 1, 2017 through March 31, 2017

Inspectors: E. Crowe, Senior Resident Inspector
N. Childs, Resident Inspector
J. Parent, Resident Inspector
M. Toth, Project Engineer
M. Bates, Senior Operations Engineer (Section 1R11)
G. Callaway, Senior Technology Instructor (Section 1R11)

Approved by: Frank Ehrhardt, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000269/2017001, 05000270/2017001, and 05000287/2017001, January 1, 2017, through March 31, 2017; Oconee Nuclear Station, Units 1, 2, and 3, Licensed Operator Requalification

The report covered a 3-month period of inspection by resident inspectors and regional inspectors. There was one NRC-identified violation 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: Mitigating Systems

Green: A Green NRC-identified non-cited violation (NCV) of 10 CFR 55.49, "Integrity of Examinations and Tests," was identified because the licensee engaged in an activity that compromised the integrity of examinations. Specifically, the licensee failed to ensure that current week simulator scenarios could not be predicted based on the previous week's simulator scenarios during the annual operating exams required by 10 CFR 55.59, "Requalification." While inspecting the annual operating examination schedules for the required simulator examinations for 2016 and 2017, the inspectors identified that one of the two scenarios that were administered during a single week of the annual exam cycle could be predicted for administration the following week. The licensee did not implement any immediate corrective actions because the exams were completed and there was no evidence of compromise. The licensee documented the issue in nuclear condition report (NCR) 2114313.

This performance deficiency was more than minor because it was associated with the human performance attribute of the mitigating systems cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, using predictable exam development and administration techniques adversely affected the integrity of the administration of the operating exams, which test licensed operator performance in order to ensure timely and correct mitigating actions during an event. Using the Licensed Operator Requalification Significance Determination Process, this finding was determined to be of very low safety significance (Green) because no known compromise of the examinations occurred. The inspectors determined the finding had a cross-cutting aspect of resources in the cross-cutting area of human performance because the licensee failed to ensure that adequate training procedures were available to meet industry standards and ensure that the potential for the compromise of regulatory examinations did not exist. [H.1] (Section 1R11)

Violations of very low safety significance that were identified by the licensee have been reviewed by the NRC. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

REPORT DETAILS

Summary of Plant Status

Unit 1: Operated at or near 100 percent rated thermal power (RTP) until February 18, 2017, when the unit was shutdown for a scheduled forced outage. The unit was returned to 100 percent RTP on February 25, 2017, and remained so for the duration of the inspection period.

Unit 2: Operated at or near 100 percent RTP for the entire inspection period.

Unit 3: Operated at or near 100 percent RTP 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:

- essential siphon vacuum system (ESV)
- standby shutdown facility (SSF)
- turbine building ventilation system

.2 Impending Adverse Weather Conditions

The inspectors reviewed the licensee's preparations to protect risk-significant systems from ice accumulation greater than 0.25 inch and heavy snow in excess of 5 inches in any 12 hour period expected during January 6, 2017 – January 8, 2017. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of the adverse weather conditions. The inspectors reviewed the licensee's plans to address the consequences that may result from ice accumulation greater than 0.25 inch or heavy snow in excess of 5 inches in any 12 hour period. The inspectors verified that operator actions specified in the licensee's adverse weather procedure maintain readiness of essential systems. The inspectors verified that required surveillances were current, or were scheduled and completed, if practical, before the onset of anticipated adverse weather conditions. The inspectors also verified that the licensee implemented periodic

equipment walkdowns or other measures to ensure that the condition of plant equipment met operability requirements. Documents reviewed are listed in the attachment.

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. The inspectors observed whether there was indication of degradation, and if so, verified the degradation was being appropriately managed in accordance with an aging management program and it had been entered into the licensee's corrective action program. Documents reviewed are listed in the attachment.

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

- Unit 0, chilled water system, 'B' chiller during 'A' chiller annual spring preventive maintenance (PM)
- Unit 0, SSF-auxiliary service water (ASW) during protected service water (PSW) primary and booster pump test
- Unit 0, volts direct current (VDC) vital instruments and controls (I&C) power sources during load center 1CA maintenance
- Unit 2, 2A motor driven emergency feedwater (MDEFDW) pump during 2B MDEFDW pump test
- Unit 3, 3A MDEFDW pump during 3B MDEFDW pump test

.2 Complete Walkdown

The inspectors verified the alignment of the Unit 1 component cooling 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. The inspectors observed whether there was indication of degradation, and if so, verified the degradation was being appropriately managed in accordance with an aging management program and it had been entered into the licensee's corrective action program.

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.

- protected area (PA), warehouse 2G (old warehouse 4), fire zone WPL-003
- Unit 1, east/west penetration rooms, fire zones 107 and 108
- Unit 1, 1A & 1B high pressure injection (HPI) pump rooms, fire zones 53, 54 and 55
- Unit 2, east/west penetration rooms, fire zones 102 and 103
- Unit 2, powdex, backup 1A compressors & control room chillers area, fire zone 18

.2 Annual Inspection

The inspectors evaluated the licensee's fire brigade performance during a drill on January 17, 2017 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 areas 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.

- Unit 1, 2, and 3, turbine building basement including safety-related equipment

.2 Underground Cables

The inspectors reviewed related flood analysis documents and inspected the areas 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.

- Unit 2 SSF cable trench
- Unit 3 SSF cable trench

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

Annual Review

The inspectors verified the readiness and availability of the Unit 1/Unit 2 'C' recirculating cooling water (RCW) heat exchanger to perform its design function by reviewing the completed eddy current test report and results from the licensee's heat exchanger clean and inspection. The inspectors reviewed the licensee's evaluation for determining which heat exchanger tubes required to be plugged by reviewing tube plugging criteria and test data from the eddy current test report. Additionally, the inspectors verified that the licensee had entered operating performance information for 'C' RCW heat exchanger into the corrective action program and that the licensee's corrective actions were appropriate. Documents reviewed are listed in the attachment.

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 February 2, 2017, the inspectors observed a simulator scenario conducted for training of an operating crew for requalification.

The scenario involved an increase in main turbine vibrations which required the crew to enter abnormal procedure AP/1/A/1700/029, "Rapid Unit Shutdown," to lower power to take the main turbine offline, where they subsequently experienced a controlling narrow range (NR) average temperature (Tave) failure, loss of instrument air (IA) and loss of power, which led the crew to swap emergency feedwater pump suction to the hotwell. Events progressed to a point where the crew entered a site area emergency declaration.

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

Documents reviewed are listed in the attachment.

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

The inspectors observed licensed operator performance in the Unit 1/2 main control room on February 17 and 18, 2017 during reactor shutdown for the Unit 1 forced outage to replace the 1B2 reactor coolant pump (RCP) seal.

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

Documents reviewed are listed in the attachment.

.3 Licensed Operator Regualification

The inspectors reviewed the facility operating history and associated documents in preparation for this inspection. During the period of March 6 – 31, 2017, the inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of operating tests associated with the licensee's operator regualification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the facility licensee in implementing regualification requirements identified in 10 CFR Part 55, "Operators' Licenses." The evaluations were also performed to determine if the licensee effectively implemented operator regualification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Regualification Program." The inspectors also evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations using ANSI/ANS-3.5-2009, "American National Standard for Nuclear Power Plant Simulators for use in Operator Training and Examination." The inspectors observed two crews during the performance of the operating tests. Documentation reviewed included written examinations, job performance measures (JPMs), simulator scenarios, licensee procedures, on-shift records, simulator modification request records, simulator performance test records, operator feedback records, licensed operator qualification records, remediation plans, watchstanding records, and medical records. The records were inspected using the criteria listed in Inspection Procedure 71111.11. Documents reviewed during the inspection are documented in the attachment.

b. Findings

Introduction: A Green NRC-identified NCV of 10 CFR 55.49, "Integrity of Examinations and Tests," was identified because the licensee engaged in an activity that compromised the integrity of examinations. Specifically, the licensee failed to ensure that current week simulator scenarios could not be predicted based on the previous week's simulator

scenarios during the annual operating exams required by 10 CFR 55.59, "Requalification."

Description: While inspecting simulator exam scenario schedules for exams administered during the required annual operating exams for both 2016 and 2017, the inspectors identified that one of the two simulator scenarios that would be administered each week could be predicted based on the previous week's administered scenarios. For both years, the licensee used a predictable pattern where one of the two scenarios that were administered the previous week during the exam cycle were repeated in the subsequent week. The licensee entered the issue into their corrective action program as NCR 2114313.

The licensee's procedure, OTP-5405.0, "Development, Administration, and Security of Exams," Step 15.5, states, "If the possibility of contact with other students exists, students taking the exam will be monitored/sequestered by an individual whose only responsibility is to ensure that they do not come into contact with other students. If the same exam is going to be given to two different groups: (A) When the first group completes its exam, it must be monitored/sequestered until everyone in the second group is together and are being monitored/sequestered in a different location; (B) When the second group is sequestered, the first group can be released. The second group will then be escorted into the exam room or simulator to be evaluated."

Contrary to OTP-5405.0, the licensee used the same exam for more than one group repeatedly for both their 2016 and 2017 NRC-required requalification annual operating tests without monitoring or sequestering the students. Specifically, the licensee consistently and predictably re-used one simulator scenario from the previous week's tests that were administered as part of the same annual requalification exam without implementing adequate exam security measures to ensure the integrity of the exam material and compliance with OTP-5405.0.

Analysis: The inspectors determined that developing and utilizing predictable exam material for NRC-required annual requalification operating exams was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the human performance attribute of the mitigating systems cornerstone, and adversely affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, consistently and predictably re-using a simulator scenario from one week to the next during both the 2016 and 2017 annual requalification operating exams, affected the integrity of the administration of the operating exams, which test the licensed operator performance in order to ensure timely and correct mitigating actions after an event.

The significance determination was performed in accordance with Manual Chapter 0609, Significance Determination Process, Appendix I, Licensed Operator Requalification Significance Determination Process (SDP). Question 10, in Appendix I, asked if the finding was related to requalification exam security. The answer to this question was "YES" because the finding was related to preventing the use of predictable examination content on the annual requalification operating exams. Question 11 asked if there was an actual effect on the equitable and consistent administration of any examination required by 10 CFR 55.59. Because the inspectors did not identify any evidence that an "actual" effect or examination compromise occurred, the answer to Question 11 was

“NO.” Because there was no evidence that a licensed operator had actually gained an unfair advantage on an examination required by 10 CFR 55.59, this finding was characterized as having very low safety significance (Green).

The finding was related to the cross-cutting aspect of resources in the cross-cutting area of human performance because the licensee failed to ensure that adequate training procedures and practices were available and employed to ensure compliance with 10 CFR 55.49. [H.1]

Enforcement: 10 CFR 55.49, “Integrity of Examinations and Tests,” states that applicants, licensees, and facility licensees shall not engage in any activity that compromises the integrity of any application, test, or examination required by this part. The integrity of a test or examination is considered compromised if any activity, regardless of intent, affected, or, but for detection, would have affected the equitable and consistent administration of the test or examination. This includes activities related to the preparation and certification of license applications and all activities related to the preparation, administration, and grading of the tests and examinations required by this part. Activities covered by this part include the requirements stated in 10 CFR 55.59, “Requalification.” The annual operating exam administered to all licensed operators is required by 10 CFR 55.59.

Contrary to the above, the licensee engaged in an activity that compromised the integrity of examinations, in that they used predictable exam material for both their 2016 and 2017 NRC-required requalification annual operating tests. Specifically, the licensee consistently and predictably re-used one simulator scenario from the previous week’s tests that were administered as part of the same annual requalification exam without implementing adequate exam security measures to ensure the integrity of the exam material.

The licensee did not implement any immediate corrective actions because the exams were completed and there was no evidence of compromise. Because this issue is of very low safety significance and has been entered into the licensee’s corrective action program, NCR 2114313, the violation is being treated as a Non-Cited Violation consistent with Section 2.3.2.a. of the NRC Enforcement Policy. [NCV 05000269, 270, 287/2017001-01, “Failure to Comply with 10 CFR 55.49”]

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors assessed the licensee’s treatment of the two issues 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. The inspectors also interviewed plant personnel to assess the licensee’s treatment of performance deficiencies and extent of condition. Documents reviewed are listed in the attachment.

- Unit 1, 2, 3, radiation indication and alarm (RIA) instrumentation, RIA faults
- Unit 3, rod control, control rod drive global system fault

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. Documents reviewed are listed in the attachment.

- Unit 3, January 13, 2017, borderline green/yellow risk due to performing EC 401474 (Unit 3 PSW Pressurizer Heaters Control Circuit Upgrade)
- Unit 0, February 8, 2017, yellow risk due to 2017 Keowee Hydro dual unit outage with Lee Combustion Turbines (LCT) as backup power.
- Unit 0, February 16, 2017, yellow risk (turbine building flood) with condenser circulating water (CCW) system 1A intake pump discharge isolation valve 1CCW-10 out of service for planned maintenance
- Unit 1, March 7, 2017, projected yellow risk due to 1CB control battery out of service for planned maintenance

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 seven 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 0, SSF D/G auto-idle start issues, NCR 02094781
- Unit 0, Investigate/repair "A" chiller condenser water inlet and outlet water sensors, NCR 02107681
- Unit 1, Inspection of the 1CB battery cells due to potential Part 21, NCR 02094824
- Unit 1, Pressurizer spray valve (1RC-1) failed to open during testing, NCR 02102767
- Unit 1, Investigate/repair train B HPI cross-connect valve (1HP-116) failure to close, NCR 02106063
- Unit 1, 2, & 3, Quality Control rejection of improperly installed crimp lugs, NCR 02093147
- Unit 1, 2, & 3, Engineering evaluation of CCW-267 actuator failure, NCR 02095185

b. Findings

No findings were identified.

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 400853, Replace the Unit 1 vital I&C batteries (1CA and 1CB)

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 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 Order (WO) 20138100, Unit 1 SSF Reactor Coolant (RC) Makeup Pump Trips Intermittently, January 6, 2017
- WO 20135293, 3PSW-24 Perform Calibration on New Positioner, January 9, 2017
- WO 20094708, Final Readings/Post Maintenance Test of 1CB Battery Following Replacement, January 21, 2017
- WO 01890394, 1 LPI RL 1CR52: Replace Low Pressure Injection (LPI) Pump Motor 1A Trip/Close Relay, January 31, 2017
- WO 20145316, Replace 2-LPSW-SV-0203 as Required, February 7, 2017
- WO 20103669, Final Readings/Post Maintenance Test of 1CA Battery Following Replacement, March 17, 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.

1R20 Refueling and Other Outage Activities (71111.20)

a. Inspection Scope

For the Unit 1 planned forced outage to replace the 1B2 RCP seal, from February 17, 2017 through February 25, 2017, the inspectors evaluated the following outage activities:

- shutdown and cooldown
- reactivity and inventory control
- decay heat removal and spent fuel pool cooling system operation
- containment closure

The inspectors verified that the licensee:

- controlled plant configuration per administrative risk reduction methodologies
- developed mitigation strategies for loss of key safety functions
- adhered to operating license and technical specification requirements

The inspectors verified that safety-related and risk-significant structures, systems, and components not accessible during power operations were maintained in an operable condition. The inspectors also reviewed a sample of related corrective action documents to verify the licensee was identifying and correcting any deficiencies associated with outage activities. Documents reviewed are listed in the attachment.

b. Findings

No findings were identified.

1R22 Surveillance Testing (71111.22)

a. Inspection Scope

The inspectors reviewed the five surveillance tests 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 Tests

- PT/1/A/0600/013, Motor Driven Emergency Feedwater Pump Test
- PT/2/A/0400/007, SSF RC Makeup Pump Test
- PT/3/A/0600/012, Turbine Driven Emergency Feedwater Pump Test

In-Service Tests (IST)

- PT/2/A/0202/011, High Pressure Injection Pump Test

Reactor Coolant System (RCS) Leak Detection

- PT/1/A/0600/010, Reactor Coolant Leakage

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 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, Unit 2 and Unit 3 PIs listed below. The inspectors reviewed plant records compiled between March 2016 and March 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. Documents reviewed are listed in the attachment.

Cornerstone: Initiating Events

- unplanned scrams per 7000 critical hours
- unplanned power changes per 7000 critical hours
- unplanned scrams with complications

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 problem identification program 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 the licensee's operator work-around, operator burden, and control room deficiency lists in effect on March 8, 2017. This review included the NCRs listed below.

- NCR 01799557, During ACB-1, 2, 3, and 4 trip operations ACB statalarms are received due to air pressure fluctuations resulting from the improper performance of the installed relief valves.
- NCR 01869655, Start of Unit 1 low pressure injection, reactor building spray, or borated water storage tank recirculation pumps causes pressure spikes that causes SF-166 and SF-167 to automatically close.
- NCR 01909050, Leaking valves associated with Unit 3 core flood tanks.
- NCR 02035073, During Unit 1 delithiations, high letdown pressure causes alarms which requires auxiliary operators to be dispatched to locally monitor pressure.

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.

4OA3 Followup of Events and Notices of Enforcement Discretion (NOED)

.1 (Closed) Licensee Event Report (LER) 05000269, 270, 287/2016-002-00, Containment High Range Radiation Monitors Inoperable Due to Potential Thermally Induced Current Effects

a. Inspection Scope

On October 25, 2016, containment high range radiation monitors (CHRRMs) RIA-57 and RIA-58 for Oconee Units 1, 2, and 3 were declared inoperable when the licensee determined that a high energy line break (HELB) in the east penetration room of each unit could cause false high indications on the CHRRMs for that unit due to thermally induced current (TIC) effects. Instrument accuracy requirements could not be met due to this condition.

Technical Specification 3.3.8, "Post Accident Monitoring (PAM) Instrumentation," requires both channels of CHRRMs (RIA-57 and RIA-58) to be operable in Modes 1, 2, and 3 for each unit. With both channels for each unit inoperable, the licensee would be required to submit a PAM Instrumentation Report to the NRC within 14 days outlining the preplanned alternate method of monitoring, the cause of the inoperability, and the plan and schedule for restoring the PAM instrumentation channels to operable status in accordance with Technical Specification 5.6.6. The licensee became aware of the TIC phenomenon in 1998 when Information Notice (IN) 97-45, Supplement 1, "Environmental Qualification Deficiency for Cables and Containment Pigtailed" was issued to the industry. However, at the time the licensee did not recognize that the TIC phenomenon could adversely impact the CHRRMs and did not implement any of the required actions of Technical Specification 3.3.8 and Technical Specification 5.6.6 until October 2016 when the CHRRMs were declared inoperable. Therefore, the allowed completion times of Technical Specification 3.3.8 were exceeded and this condition was reportable to the NRC as a plant condition prohibited by technical specifications.

The inspectors reviewed the LER, the licensee's evaluation, and corrective action documents to verify the accuracy of the LER and that corrective actions were identified and implemented to address the issue. In response to this issue, the licensee informed the appropriate staff of the expected radiation monitor response and appropriate personnel response actions, implemented the appropriate technical specification action requirements, and developed a plan to restore operability of the CHRRMs. The licensee

entered this issue into their corrective action program as NCRs 02069527 and 02077587. LER 05000269, 270, 287/2016-002-00 is closed.

b. Findings

One licensee-identified violation was identified and is documented in Section 4OA7 of this report.

.2 (Closed) Licensee Event Report (LER) 0500269/2016-003-00, Engineered Safeguards Protection System Automatic Actuation Output Logic System Automatic Output Logic Bypassed

a. Inspection Scope

Oconee Nuclear Station Unit 1 entered Mode 4 on November 24, 2016 following a refueling outage. At 6:45 a.m. on November 25, 2016 operators in the main control room recognized the Unit 1 engineered safeguards (ES) protective system voters 1 and 2 were in an abnormal configuration (bypassed) for the plant mode of operation. Oconee Technical Specification 3.3.7 requires the automatic actuation output logic for containment isolation valves, reactor building cooling and reactor building spray to be operable in Modes 1 and 2 and Modes 3 and 4 when associated ES equipment is required to be operable. At 7:45 a.m. on November 25, all ES protective system voters were placed in operate and technical specification compliance was restored.

The inspectors reviewed the LER, the licensee's apparent cause evaluation, and corrective action documents to verify the accuracy of the LER and that corrective actions were identified and implemented to address the issue. The licensee identified the cause of this issue as inadequate/incomplete procedures in that unit startup procedures did not contain sufficient guidance to ensure the ES system was properly aligned prior to the plant mode change. The licensee also identified that an incorrect assumption by the procedure writer developing the ES system required testing procedure contributed to this issue. The procedure writer assumed that other procedures would control the proper configuration of the system. Additionally, shift operators failed to validate that ES voters were placed to operate following testing and additional questions by the operating shift personnel. The licensee entered this issue in their corrective action program as NCR 02081523. The inspectors noted that planned licensee actions included revision of station procedures and additional training of operating shift personnel. LER 0500269/2016-003-00 is closed.

b. Findings

One licensee-identified violation was identified and is documented in Section 4OA7 of this report.

4OA5 Other Activities

.1 Temporary Instruction (TI) 2515/192, "Inspection of the Licensee's Interim Compensatory Measures Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems."

a. Inspection Scope

The objective of this performance based TI was to verify implementation of interim compensatory measures associated with an open phase condition design vulnerability in electric power systems for operating reactors. The inspectors conducted an inspection to determine if the licensee had implemented the interim compensatory measures listed below. These compensatory measures are to remain in place until permanent automatic detection and protection schemes are installed and declared operable for open phase condition design vulnerability. The inspectors verified the following:

- The licensee identified and discussed with plant staff the lessons-learned from the open phase condition events at U.S. operating plants including the Byron Station open phase condition and its consequences. This included conducting operator training for promptly diagnosing, recognizing consequences, and responding to an open phase condition.
- The licensee updated plant operating procedures to help operators promptly diagnose and respond to open phase conditions on off-site power sources credited for safe shutdown of the plant.
- The licensee established and implemented periodic walkdown activities to inspect switchyard equipment such as insulators, disconnect switches, and transmission line and transformer connections associated with the offsite power circuits to detect a visible open phase condition.
- The licensee ensured that routine maintenance and testing activities on switchyard components have been implemented and maintained. As part of the maintenance and testing activities, the licensee assessed and managed plant risk in accordance with 10 CFR 50.65(a)(4) requirements.

b. Findings

No findings were identified.

40A6 Meetings, Including Exit

On April 20, 2017, the resident inspectors presented the inspection results to Mr. Tom Ray 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.

40A7 Licensee-Identified Violations

The following licensee-identified violations of NRC requirements were determined to be of very low safety significance (Green) and met the NRC Enforcement Policy criteria for being dispositioned as NCVs.

- Technical Specification 3.3.8, "PAM Instrumentation," requires CHRRMs, RIA-57 and RIA-58, to be operable in Modes 1, 2, or 3. Contrary to the above, from 1998 to October 2016, the licensee failed to maintain operability of the CHRRMs for all three units when they failed to provide reasonable assurance that the CHRRMs would provide accurate measurement of containment radiation levels during a HELB event in the east penetration room of the affected unit(s). The CHRRMs are utilized in the Oconee site emergency plan and implementing procedures to support assessment of

the severity of an accident. The performance deficiency was determined to be more than minor because it was associated with the facilities and equipment attribute of the emergency preparedness cornerstone and adversely affected the cornerstone objective to ensure the licensee's capability to implement adequate measures to protect the health and safety of the public in the event of a radiological emergency. The inspectors used IMC 0609, Att. 4, "Initial Characterization of Findings," issued June 19, 2012, and IMC 0609, Appendix B, "Emergency Preparedness Significance Determination Process," issued September 22, 2015, and determined the finding was of very low safety significance (Green) because no planning standard function failure occurred due to the availability of other parameters that could be used to validate the indications from the CHRRMs. The licensee has entered this issue into their corrective action program as NCRs 02069527 and 02077587.

- Oconee Nuclear Station Technical Specification 3.0.4 requires that when a limiting condition of operation is not met, entry into a mode or other specified condition in the applicability shall not be made except when the associated actions to be entered permit continued operation in the mode or other specified condition in the applicability for an unlimited period of time. Oconee Nuclear Station Technical Specification 3.3.7, "Engineered Safeguards Protective System (ESPS) Automatic Actuation Output Logic Channels," requires eight ESPS automatic actuation output logic channels to be operable in Modes 1 and 2 and Modes 3 and 4 when associated ES equipment is required to the operable. Contrary to the above, Oconee Nuclear Station Unit 1 entered Mode 4 on November 24, 2016 with ES protective system voters 1 and 2 in an abnormal configuration (bypassed) for the plant mode of operation. Operations shift personnel discovered this abnormal configuration on November 25, 2016 and restored voters 1 and 2 to an operate condition which met Technical Specification 3.3.7. This failure to maintain ESPS channels in the correct mode of operation for the required mode of applicability was a performance deficiency and was determined to be more than minor. The issue is more than minor because it was associated with the configuration control attribute of the mitigating system cornerstone and 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, the issue challenged the configuration control attribute of ensuring operating equipment was available to respond to initiating events. The inspectors used IMC 0609, Att. 4, "Initial Characterization of Findings," issued October 07, 2016, and IMC 0609, Appendix A, "Significance Determination Process for Findings at Power," issued June 19, 2012, and determined the finding was of very low safety significance (Green) because the finding did not represent an actual loss of function of at least a single train for greater than its technical specification allowed outage time or two separate safety systems out-of-service for greater than its technical specification allowed outage time. The licensee has entered this issue into their corrective action program as NCR 02081523.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

B. Bowers, Operations Instructor
E. Burchfield, Plant Manager
T. Doss, LOR Supervisor
C. Dunton, Director of Nuclear Site Support
T. Grant, Manager Engineering
C. Hartsock, Training Supervisor
R. Meixell, Regulatory Compliance
T. Ray, Site Vice-President
C. Rop, Operations Training Supervisor
J.R. Steely, Training Manager
C. Wasik, Regulatory Affairs Manager

NRC Personnel

N. Childs, Resident Inspector
E. Crowe, Senior Resident Inspector
F. Ehrhardt, Branch Chief
J. Parent, Resident Inspector
M. Toth, Project Engineer

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000269, 270, 287/2017001-01	NCV	Failure to Comply with 10 CFR 55.49 (Section 1R11.3)
-------------------------------	-----	--

Closed

05000269, 270, 287/2016-002-00	LER	Containment High Range Radiation Monitors Inoperable Due to Potential Thermally Induced Current Effects (Section 4OA3.1)
--------------------------------	-----	--

05000269/2016-003-00	LER	Engineered Safeguards Protection System Automatic Actuation Output Logic System Automatic Output Logic Bypassed (Section 4OA3.2)
----------------------	-----	--

TI 2515/192	TI	Inspection of the Licensee's Interim Compensatory Measures Associated with the Open Phase Condition Design Vulnerabilities in Electric Power Systems (Section 4OA5)
-------------	----	---

LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Procedures

OP/0/A/1106/041, Turbine Building Ventilation, Rev. 006
PT/0/A/0110/017, Cold Weather Protection, Rev. 012
RP/0/A/1000/035, Severe Weather Preparations, Rev. 002

Section 1R04: Equipment Alignment

Documents

AD-OP-ALL-0201, Protected Equipment, Rev. 3
Oconee Nuclear Site Technical Specifications, amended August 13, 2014
Oconee Nuclear Site Technical Specifications Bases, updated June 3, 2011

Drawings

O-0705, Rev. 104
O-1705, Rev. 87
O-2705, Rev. 87
OFD-116J-1.5, Rev. 24
OFD-121D-2.1, Rev. 39
OFD-121D-3.1, Rev. 46
OFD-133A-2.5, Rev. 55
OFD-144A-1.1, Rev. 16
OFD-144A-1.2, Rev. 15
OFD-144A-1.3, Rev. 10
OFD-144A-1.4, Rev. 10

Procedures

MP/0/A/3007/054 A, Chillers – A And B – York – Codepak – Preventive Maintenance (QA-5),
Rev. 034

Work Orders/Requests

20085997; 20095495; 20104045; 20104322; 20112663; 20118654; 20126636

Section 1R05: Fire Protection

Documents

Oconee Nuclear Station Fire Brigade Drill, Drill # 1TX-1A

Other

O-FS-0-PA-9000-004, Pre-Fire Plan for PA Warehouse 2G (Old Warehouse 4), Rev. 02
O-FS-1-AB-9758-001, Pre-Fire Plan for Unit 1 Auxiliary Building Elevation 758', Rev. 002
O-FS-1-AB-9809-001, Pre-Fire Plan for Unit 1 Auxiliary Building Elevation 809', Rev. 2
O-FS-2-AB-9809-001, Pre-Fire Plan for Unit 1 Auxiliary Building Elevation 809', Rev. 2
O-FS-2-TB-9775-001, Pre-Fire Plan for Unit 2 Turbine Building Elevation 775', Rev. 001

Procedures

AD-HU-ALL-0003, Standard Pre-Job Brief Form, Rev. 0
AD-OP-ALL-0207, Fire Brigade And Hazmat Team Administrative Controls, Rev. 0

Section 1R06: Internal Flood ProtectionDocuments

OSC-6667, Auxiliary and Turbine Building Loss of Cooling/Ventilation Analysis, Rev. 23
 OSC-10709, Internal Flooding Analysis, Rev. 1
 OSC-11214, SSF Licensing Summary Documents, Rev. 1
 OSC-11586, Turbine Building AIS Timeline - Loss of Critical Components, Rev. 0

Drawings

OEE-136-01; Elementary Diagram – CCW System Emergency Controls, Rev. 14
 OEE-136-01-0A, Elementary Diagram CCW System Emergency Controls, Rev. 4
 OEE-136-24, CCW System Condenser Discharge Valves and Condenser Discharge Water Vent Valves, Rev. 10
 OEE-136-24-0A, Elementary Diagram CCW System Condenser Valves, Rev. 0
 OEE-136-24-01-0B, Elementary Diagram CCW System Condenser Valves, Rev. 1
 ON-0-0320W-010, Standby Shutdown Facility cable trench concrete & reinforcing plan, sections, & details, Rev. 10
 ON-0-0320W-010A, Standby Shutdown Facility cable trench concrete & reinforcing plan, sections, & details, Rev. 10

Procedures

IP/0/B/0235/003, Turbine Basement Water Level Alarm System Check, Rev. 10

Work Orders/Requests

20070991; 20109382

Section 1R07: Heat Sink PerformanceCalculations

OSC-3500, Minimum Wall Thickness Evaluation for Recirculation Water Cooler Tubes, Rev. 1

Drawings

DWG# C-29156-2. P-K Type 0 Recirculation Water Cooler, Model 30-24

Nuclear Condition Report

01812182; 01839761; 01844172; 02095167; 02106865

Other

2016 Heat Exchanger System Health Reports
 Eddy Current Inspection Report, 0117 Inage
 Inlet/Outlet Tube Sheet Map for RCW 'C' Cooler Tubes
 MP/0/A/1100/017, Enclosure 9.2, Tube Number and Verification Sheet, Rev. 014
 MP/0/A/1100/017, Enclosure 9.3, Tube Plugging Log Sheet, Rev. 014

Procedures

MP/1-2/A/1800/138, Units 1 and 2 RCW Cooler – Disassembly, Cleaning, and Reassembly, dated 1/30/17, Rev. 06
 MP/0/A/1100/017, Heat Exchanger Tube Plugging and Stabilization/Mechanical, Rev. 014

Work Orders/Requests

20044798-01; 20044798-05

Section 1R11: Licensed Operator Requalification**Documents**

OMP 1-18, Implementation Standard During Abnormal and Emergency Events, Rev. 040
 OP-OC-SAE-R262, Main Turbine Vibrations, Loss of IA with Loss of Power, Rev. 01

Procedures

AP/1/A/1700/022, Loss of Instrument Air, Rev. 028
 AP/1/A/1700/029, Rapid Unit Shutdown, Rev. 013
 EP/1/A/1800/001 00, Unit 1 Emergency Operating Procedures (EOP) Immediate Manual
 Actions and Subsequent Actions, Rev. 001
 EP/1/A/1800/001 0B, EOP Unit 1 Blackout, Rev. 003
 OP/1/A/1102/010, Controlling Procedure for Unit Shutdown, Rev. 224
 OP/1/A/1102/004, Enclosure 4.2, Power Reduction, Rev. 150
 OP/1/A/1102/004, Enclosure 4.9, Core Thermal Power Adjustments, Rev. 150
 OTP-2701.0, Simulator Configuration Management, Revision 33, 2/23/2017.
 OTP-4116.1, Licensed Operator Requalification, Revision 49.
 OTP 5701.0, Simulator Training and Evaluation, Revision 31, 4/14/2016.
 OTP-5405.0, Development, Administration, and Security of Exams, Revision 34.
 OTP-5405.2, LOR Sample Plan and Exam Selection Process, Revision 6.
 OTP-5601.0, JPM Administration, Revision 15.
 AD-TQ-ALL-0068, Licensed Operator Continuing Training Program, Revision 2, 9/15/2015.
 AD-TQ-ALL-0230, Licensed Operator Requalification Annual and Biennial Exam Development,
 Revision 5, 9/12/2016.
 AD-TQ-ALL-0320, Development of Simulator Training and Evaluation Guides, Revision 1,
 09/12/2016.
 AD-TQ-ALL-0410, Remediation and Reevaluation, Revision 3, 12/13/2016.
 AD-TQ-ALL-0420, Conduct of Simulator Training and Evaluation, Revision 2, 1/4/2017.
 AD-TQ-ALL-0470, Trainee Evaluation and Examination Security, Revision 0, 6/1/2015.

Records:

License Reactivation Packages (1 Records Reviewed).
 LORP Training Attendance records (4 Records Reviewed).
 Medical Files (20 Reviewed).
 Remedial Training Records (3 Record Reviewed).
 Remedial Training Examinations (3 Record Reviewed).

Written Examinations:

LOR Biennial A Shift 3/6/2015, Revision 0, 3/6/2015.
 LOR Biennial E Shift 2/23/2015, Revision 1, 2/23/2015.

Simulator Maintenance Records:

SDR-2195, SBO control room indications.
 SDR-2436, CC response to loss of LPSW.
 SDR-2483, Spent fuel cooling pump low level trip.
 SDR-2665, CC cooler model deficiency.
 HWR-2724, PORV flow lights not working.
 SDR-2734, Condenser vacuum decreasing.
 SDR-2764, HPI flow rates too high.
 SDR-2818, Previous revision dropped.
 SDR-2765, SFP low level pump trip.

Simulator Transient Tests:

PT/01/T/01, Main turbine/reactor trip with slow transfer to CT1.
 PT/02/T/02, Loss of main FW with emergency FDW overfeed.
 PT/03/T/03, Loss of offsite power.
 PT/04/T/04, Trip of one RCP.

Simulator Scenario Based Tests:

ASE-06, Active Simulator exam 2/22/2016.

Simulator Problem Reports & Design Change Requests:

MODE 4 Entered with ES VOTERS Bypassed, Revision 1, 11/24/2016.
 Voltage Discovered on LC3N relay 27X4 during 2EC, Revision 2, 4/23/2015.

Scenario Packages:

ASE-14, Revision 1, 02/21/2017.
 ASE-41, Revision 2, 02/23/2017.
 ASE-44, Revision 0, 02/21/2017.
 ASE-44, Revision 0a, 02/21/2017.
 ASE-7, Revision 1, 02/21/2017.
 ASE-32, Revision 1, 02/21/2017.
 ASE-40, Revision 1, 02/24/2017.
 ASE-5, Revision 1, 02/23/2017.
 ASE-33, Revision 0, 02/17/2016.
 ASE-35, Revision 0, 02/17/2016.
 ASE-38, Revision 02, 02/17/2016.
 ASE-38, Revision 02a, 02/17/2016.
 ASE-12, Revision 1, 03/14/2016.
 ASE-12, Revision 0, 02/23/2016.
 ASE-4B, Revision 0, 02/23/2016.
 ASE-36, Revision 1, 02/24/2016.
 ASE-24, Revision 0, 02/24/2016.
 ASE-22, Revision 00b, 02/19/2015.
 ASE-6, Revision 1, 02/25/2016.

JPM Packages:

AO-604, TRANSFER SSF 600V MOTOR CONTROL CENTER XSF POWER SUPPLY BY PROCEDURE, Revision 1, 02/22/2017.
 ADM-CO-014, Perform Manual RCS Leakage Calculation, Revision 0, 02/21/2017.
 ADM-SO-015, DETERMINE EMERGENCY CLASSIFICATION, Revision 0, 02/21/2017.
 AO-S404, ALIGN EFDWP SUCTION TO THE HOTWELL, Revision 1, 02/22/2017.
 CO-P401a, PERFORM REQUIRED ACTIONS FOR A FAILED LPI TRAIN, Revision 0, 02/21/2017.
 CO-803a, ALIGN PSW TO HPI PUMP MOTOR COOLERS, Revision 0, 02/21/2017.

Corrective Action Program Documents:

PIP# O-15-03596 / NCR# 01910532, Voltage discovered on LC 3X1 relay 27X4 during ZEC.
 Quick Cause Evaluation Report, CR: 01935465.
 Quick Cause Evaluation Report, CR: 01974116-02.
 Quick Cause Evaluation Report, CR: 02057816.
 CR# 02081523, Apparent Cause Evaluation Report, Mode 4 Entered with ES VOTERS Bypassed.

Section 1R12: Maintenance EffectivenessDocuments

AD-EG-ALL-1210, Maintenance Rule Program, Rev. 1

NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, Rev. 4A

Oconee Maintenance Rule database

Oconee Operable but Degraded/Non-Conforming Items database, dated January 25, 2017

System health report for Control Rod Drive (CRD) – Digital Control Rod Drive Control System, dated January 25, 2017

System health report for RIA – Radiation Monitoring System, dated January 11, 2017

Nuclear Condition Reports

01855582; 01908336; 02070053; 02085280; 02085281; 02089967; 02090496; 02091241;
02091804; 02093416; 02093574; 02095376; 02100979; 02107178; 02109361; 02111366;
02111568

Procedures

IP/0/B/0350/010, CRD Triplex TMR Module Hot/Smart Swap, Rev. 12

IP/0/B/0360/030, Sorrento Process Radiation Monitor Functional Check, Rev. 048

Work Orders/Requests

20035785-01; 20156245-01

Section 1R13: Risk AssessmentsDocuments

AD-EG-ALL-1004, Conduct of Probabilistic Risk Analysis Engineering, Rev. 1

AD-NF-ALL-0501, Electronic Risk Assessment Tool (ERAT), Rev. 0

AD-NF-NGO-0502, Probabilistic Risk Assessment (PRA) Model Technical Adequacy, Rev. 1

Nuclear System Directive 415, Nuclear Policy Manual, Rev. 8

Nuclear Condition Report

02105872

Procedures

AD-WC-ALL-0410, Work Activity Integrated Risk Management – Critical Activity Plan, Rev. 2

OP/0/A/1107/003 Enclosure 4.3, Charging Standby Bus #1 and Bus #2 from Lee Steam Station for Backup Power, Rev. 90

TN/3/B/EC401474/001, Unit 3 PSW Pressurizer Heaters Control Circuit Upgrade EC401474, Rev. 000

Work Orders/Requests

20031358

Section 1R15: Operability EvaluationsDocuments

LCO O-1-17-00482

Unit 1 station logs dated 3/6 – 3/7/2017

Drawings

O-FD-133A-02-5, Flow Diagram of Condenser Circulating Water System (SSF Auxiliary Service), Rev. 55

Nuclear Condition Report

01817577; 01905795; 01934008; 02093147; 02094563; 02094781; 02094824; 02102767;
02106063; 02107681; 02109022

Other

EDB Data Sheet, CCW-267 – SSF Auxiliary Service Water Pump Return, Rev. 24

Procedures

PT/0/A/0400/005, SSF Auxiliary Service Water Pump Test, Rev. 66

Work Orders/Requests

02187779; 20064598; 20104045; 20104322; 20125701

Section 1R18: Plant ModificationsCalculations

OM-1320.0103.001, I&C Control Batteries Operations and Maintenance (O&M) Manual
(125VDC), Rev. 2

OM-1320.0103.002, Vital I&C Batteries Seismic and Equipment Qualifications (EQ) Manual,
Rev. 0

Documents

BCT-2000 Battery Load Test Report for 1CB Control Battery, dated 1/21/17

EC 400853, Replace the Unit 1 Vital I&C Batteries (1CA and 1CB), Rev. 0

EC 401423, Replace the Unit 3 Vital I&C Batteries (3CA and 3CB), Rev. 0

Procedures

IP/1/A/3000/003 CB, Instrument and Control Battery 1CB Service Test and Annual Surveillance,
Rev. 3

Work Orders/Requests

20094708

Section 1R19: Post-Maintenance TestingCalculations

OM-1320.0103.001, I&C Control Batteries O&M Manual (125VDC), Rev. 2

Documents

BCT-2000 Battery Load Test Report for 1CA Control Battery, dated 3/17/17

BCT-2000 Battery Load Test Report for 1CB Control Battery, dated 1/21/17

EC 400853, Replace the Unit 1 Vital I&C Batteries (1CA and 1CB), Rev. 0

EC 401423, Replace the Unit 3 Vital I&C Batteries (3CA and 3CB), Rev. 0

Drawings

OFD-131A-03-02, Flow Diagram of PSW Steam Generator and HPI Pump Motor Cooling
Service Water, Rev. 2

Nuclear Condition Report

02089372; 02097687; 02101883

Other

DBD OSS-0254.00-00-1053, Protected Service Water System, Rev. 02

Procedures

AD-EG-ALL-1311 Attachment 5, Failure Investigation Process (FIP), Rev. 0
 AD-MN-ALL-0204, Plant Status Control, Rev. 01
 AD-MN-ALL-1000, Conduct of Maintenance, Rev. 11
 IP/0/A/0075/011, Maintenance of Valcor V70900 – 65 Series Solenoid Valves, Rev. 023
 IP/0/A/3009/017, Wire Terminal Installation, Labeling, and Termination (600 Volts or Less), Rev. 039
 IP/0/A/5090/001, Tube Fitting and Tubing Installation, Rev. 024
 IP/1/A/0101/007, Unit 1 Control Relay Replacement, Rev. 008
 IP/1/A/0315/080 B, TXS Engineered Safeguards Protective System LPI Channel 3 Component Go Test, Rev. 004
 IP/1/A/3000/003 CA, Instrumentation and Control Battery 1CA Service Test and Annual Surveillance, Rev. 3
 IP/1/A/3000/003 CB, Instrumentation and Control Battery 1CB Service Test and Annual Surveillance, Rev. 3
 MP/0/A/1200/189 B, Valve-Target Rock – Modulating solenoid operated Globe – Model 09L-001 – Disassembly, Cleaning, Inspection, and Reassembly, Rev. 05
 PT/1/A/0203/006 A, Low Pressure Injection Pump Test – Recirculation, Rev. 091
 PT/1/A/0400/007, SSF RC Makeup Pump Test, Rev. 069
 PT/2/A/0600/013, Motor Driven Emergency Feedwater Pump Test, Rev. 069
 PT/3/A/0152/035, 3PSW-22 and 3PSW-24 Valve Stroke Test, Rev. 03
 SI/0/A/5120/001, Wire Splice Insulating and Repair (600 Volts or Less), Rev. 012

Work Orders/Requests

01890394; 20094708; 20103669; 20124513; 20135293; 20138100; 20145316

Section 1R20: Refueling and Other Outage ActivitiesProcedures

AP/1/A/1700/044, Abnormal Pressurizer Pressure Control, Rev. 004
 MP/0/A/1800/132, Inspection, Assessment, and Cleanup of Boric Acid on Plant Materials, Rev. 009
 MP/0/A/3005/012, Containment Inspection / Close Out Procedure, Rev. 015
 OP/0/A/1108/001, Enclosure 4.31, Unit 1 Reactor Coolant System Heatup/Cooldown Curves, Rev. 111

Section 1R22: Surveillance TestingNuclear Condition Report

02095967

Other

PT/1/A/0600/010, Reactor Coolant Leakage, completed performance February 12, 2017

Procedures

PT/1/A/0600/013, Motor Driven Emergency Feedwater Pump Test, Rev. 072
 PT/2/A/0202/011, High Pressure Injection Pump Test, Rev. 089
 PT/2/A/0400/007, SSF RC Makeup Pump Test, Rev. 070
 PT/3/A/0600/012, Turbine Driven Emergency Feedwater Pump Test, Rev. 091

Section 4OA1: Performance Identification VerificationDocuments

Unit 1 station logs covering period of March, 2016 through March, 2017
 Unit 2 station logs covering period of March, 2016 through March, 2017
 Unit 3 station logs covering period of March, 2016 through March, 2017

Section 4OA2: Problem Identification and ResolutionNuclear Condition Report

01762345; 01799557; 01800429; 01818385; 01827739; 01832561; 01869655; 01871057;
 018770560; 01904879; 01904910; 01905498; 01905659; 01908924; 01909050; 01909393;
 01909611; 01991058; 01997923; 02029326; 02029371; 02035073; 02100987

Procedures

AD-OP-ALL-0202, Aggregate Operator Impact Assessment, Rev. 1

Work Orders/Requests

02156615; 02167839; 02167841; 02184689; 20033330; 20039649; 20044017; 20044018;
 20081210; 20081419; 20294284; 20110722

Section 4OA3: Followup of Events and Notices of Enforcement Discretion (NOED)Documents

Information Notice 97-45, Supplement 1, Environmental Qualification Deficiency for Cables and
 Containment Pigtails, dated February 17, 1998
 Oconee Nuclear Site Technical Specifications, amended August 13, 2014
 Oconee Nuclear Site Technical Specifications Bases, updated June 3, 2011
 Oconee Nuclear Station, Units 1, 2, and 3 Special Report per Technical Specification 5.6.6,
 Inoperability of Post-Accident Monitoring Instrument Containment High Range Radiation
 Monitors, dated November 14, 2016
 Regulatory Guide 1.97, Instrumentation for Light-Water Cooled Nuclear Power Plants to Assess
 Plant and Environs Conditions During and Following an Accident, Rev. 3
 Oconee Nuclear Station Emergency Plan, Rev. 2016-002
 Zachary Nuclear Engineering Report R17002, Oconee Penetration Room High Range Radiation
 Monitor (HRRM) Cable Temperature Induced Current, Rev. 0

Nuclear Condition Report

01574708; 02034217; 02062735; 02069527; 02070945; 02052758; 02073450; 02073587;

Other

Licensee Event Report 269/2016-002, Containment High Range Radiation Monitors Inoperable
 due to Potentially Thermally Induced Current Effects, Rev. 0
 Oconee Nuclear Station Regulatory Affairs Group, White Paper on CHRRMs Inoperability
 Ops Guide #16-17, 1/2/3RIA-57 and 1/2/3RIA-58 Indications during HELB Event Affecting the
 Pen Rooms, Rev. 1

Section 4OA5: Other ActivitiesNuclear Condition Report

01733811; 01981365; 01996577

Other

Apparent Cause Evaluation Report for CT-3 Drop Line Open Phase
 Licensee's Response to RAI regarding IN 2012-03 and Bulletin 2012-01 (ML14035A453)

Training records for various Auxiliary Operators (AO)
 Watchstanding Principles AO Training and Attachments

Procedures

IP/0/A/2007/001, Transformer Inspection and Maintenance, Revs. 34, 35, 36
 IP/0/A/2400/002, Substation Insulators, Lightning Arrestors, Coupling Capacitor Voltage
 Transformer, and Transmission Bus-Line Inspection and Maintenance, Rev. 8
 OP/2/A/1102/020 D, SSF and Outside Rounds, Rev. 84
 PT/0/A/0610/026, Electrical System Weekly Surveillance (Common), Rev. 14
 PT/0/A/0610/025, Electrical System Weekly Surveillance (Unit 3), Rev. 23
 OP/0/A/6100/004, Alarm Response Guides SA-4, SA-5, Rev. 007
 MP/0/A/3016/012, CT-1 Transformer thermographic scan, Rev. 003

Work Orders/Requests

WO 20049894-04, March 14, 2016 (prior to shutdown)
 WO 20049894-05, March 28, 2016 (after startup)
 WO 20049605, Perform Major PM on transformer CT-1, March 22, 2016
 WO 20005698-05, Unit 3, Perform Minor PM on CT-3 Transformer, May 17, 2016
 WO 20005698-04, Unit 3, Perform Minor PM on CT-3 Transformer, April 21, 2016
 WO 20005698-01, Unit 3, Perform Minor PM on CT-3 Transformer, May 4, 2016

Section 40A7: Licensee-Identified Violations

Documents

Oconee Nuclear Station Emergency Plan, Rev. 2016-002
 Oconee Nuclear Station, Units 1, 2, and 3 Special Report per Technical Specification 5.6.6,
 Inoperability of Post-Accident Monitoring Instrument Containment High Range Radiation
 Monitors, dated November 14, 2016
 OSS-0254.00-00-00-2003, Engineered Safety Features Actuation Systems Design Basis
 Specification, approved December 15, 2016
 Zachary Nuclear Engineering Report R17002, Oconee Penetration Room HRRM Cable
 Temperature Induced Current, Rev. 0

Nuclear Condition Report

01574708; 02034217; 02069527; 02070945; 02073450; 02073587; 02081523

Other

Oconee Nuclear Station Regulatory Affairs Group, White Paper on CHRRMs Inoperability
 Ops Guide #16-17, 1/2/3RIA-57 and 1/2/3RIA-58 Indications during HELB Event Affecting the
 Penetration Rooms, Rev. 1

Procedures

RP/0/A/1000/001, Emergency Classification, Rev. 5