



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

August 7, 2014

Mr. Scott Batson  
Site Vice President  
Duke Energy Carolinas, LLC  
Oconee Nuclear Station  
7800 Rochester Highway  
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000269/2014003, 05000270/2014003, 05000287/2014003

Dear Mr. Batson:

On June 30, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Oconee Nuclear Station Units 1, 2 and 3. The enclosed inspection report documents the inspection results which were discussed on July 14, 2014, with you and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report. The inspectors did not identify any findings or violations of more than minor significance.

In accordance with 10 Code of Federal Regulations 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

*/RA/*

Gerald J. McCoy, 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: NRC Integrated Inspection Report  
05000269/2014003, 05000270/2014003,  
05000287/2014003  
w/Attachment: Supplementary Information

cc distribution via ListServ

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 05000269/2014003, 05000270/2014003, 05000287/2014003

Dear Mr. Batson:

On June 30, 2014, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Catawba Nuclear Station Units 1 and 2. The enclosed inspection report documents the inspection results which were discussed on July 14, 2014, with you and other members of your staff. The inspectors documented the results of this inspection in the enclosed inspection report. The inspectors did not identify any findings or violations of more than minor significance.

In accordance with 10 Code of Federal Regulations 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

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S. Batson

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Letter to Scott L. Batson from Gerald McCoy dated August 7, 2014

SUBJECT: OCONEE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT  
05000269/2014003, 05000270/2014003, 05000287/2014003

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

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

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

Report Nos: 05000269/2014003, 05000270/2014003, 05000287/2014003

Licensee: Duke Energy Carolinas, LLC

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

Location: Seneca, SC 29672

Dates: April 1, 2014, through June 30, 2014

Inspectors: E. Crowe, Senior Resident Inspector  
G. Croon, Resident Inspector  
N. Childs, Resident Inspector  
B. Collins, Reactor Inspector (Section 1R08, 4OA5)  
M. Riley, Reactor Inspector (Section 1R17, 4OA5)  
T. Fanelli, Reactor Inspector (Section 1R17)  
W. Loo, Senior Health Physicist (Sections 2RS1, 2RS6, 4OA1)  
J. Rivera, Health Physicist (Sections 2RS7, 2RS8)

Approved by: Gerald McCoy, Chief  
Reactor Projects Branch 1  
Division of Reactor Projects

Enclosure

## **REPORT SUMMARY**

IR 05000269/2014-003, 05000270/2014-003, 05000287/2014-003; 04/01/2014 – 06/30/2014;  
Oconee Nuclear Station Units 1, 2 and 3; Integrated Inspection Report

The report covered a three-month period of inspection by the resident inspectors and five Region-based reactor inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process revision 5." No NRC-Identified or self-revealing findings were identified.

## REPORT DETAILS

### Summary of Plant Status

Units 1 and 2 operated at approximately 100 percent rated thermal power (RTP) for the entire inspection period.

Unit 3 began the inspection period at approximately 100 percent RTP. On April 15, 2014, the unit was taken offline for a planned refueling outage. The unit was made critical on May 13, 2014, and achieved 100 percent RTP on May 16, 2014. The unit remained at 100 percent RTP for the remainder of the inspection period.

#### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

Evaluation of Summer Readiness of Offsite and Alternate AC Power Systems: The inspectors reviewed the licensee's procedures used to respond to changing offsite grid conditions; including actions to be taken when notified by the Transmission Control Center that a Real Time Contingency Analysis (RTCA) shows inadequate post trip voltage to verify the implementation of the procedures protect mitigating systems from adverse weather affects. The inspectors also reviewed the procedural guidance for monitoring switchyard voltage and frequency when the RTCA tool is non-functional. The assessment of plant risk for maintenance activities that could affect grid reliability or offsite activities which could affect the transmission system's ability to provide adequate offsite power was discussed with the appropriate plant personnel. The inspectors also reviewed related work orders and performed a walkdown of the plant switchyards to verify the material condition of the offsite power sources. Documents reviewed are listed in the Attachment.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment

##### a. Inspection Scope

Partial Walkdown: The inspectors performed the five partial walkdowns listed below to assess the operability of redundant or diverse trains and components when safety-related equipment was inoperable or out-of-service and to identify any discrepancies that could impact the function of the system potentially increasing overall risk. The inspectors reviewed applicable operating procedures and walked down system components, selected breakers, valves, and support equipment to determine if they were correctly aligned to support system operation. The inspectors reviewed protected

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equipment sheets, maintenance plans, and system drawings to determine if the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the corrective action program (CAP). Documents reviewed are listed in the Attachment.

- Unit 3, Low pressure injection pump 1B and its associated valves and electrical supplies during reduced inventory conditions in the reactor coolant system.
- Unit 2, Emergency feedwater pump 2B and its associated valves and electrical supplies during planned maintenance of emergency feedwater pump 2A
- Unit 3, Reactor building spray pump 3A and its associated valves and electrical supplies during planned maintenance of reactor building spray pump 3B.
- Unit 1, 2, and 3 Turbine driven emergency feedwater pumps and their associated valves and electrical supplies during planned annual outage of the Standby Shutdown Facility (SSF).
- Unit 3 turbine driven emergency feedwater pump and associated valves and electrical supplies when Unit-3 was in and Orange condition due to SSF feed breaker OSXF5-C inoperable.

Full System Walkdown: The inspectors performed a full system walkdown of the Standby Shutdown Facility (SSF) Auxiliary Service Water System (ASW). The inspectors reviewed applicable operating procedures and walked down system components, selected breakers and support equipment to determine if they were correctly aligned to support system operation. The inspectors reviewed protected equipment sheets, maintenance plans, and system drawings to determine if the licensee had properly identified and resolved equipment alignment problems that could cause initiating events or impact the capability of mitigating systems or barriers and entered them into the CAP. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection

a. Inspection Scope

Fire Area Tours: The inspectors walked down accessible portions of the four plant areas listed below to assess the licensee's control of transient combustible material and ignition sources, fire detection and suppression capabilities, fire barriers, and any related compensatory measures. The inspectors observed the fire protection suppression and detection equipment to determine if any conditions or deficiencies existed which could impair the operability of that equipment. The inspectors selected the areas based on a review of the licensee's safe shutdown analysis probabilistic risk assessment and sensitivity studies for fire-related core damage accident sequences. Documents reviewed are listed in the Attachment.

- Unit 1 equipment room – fire zone 95
- Unit 2 equipment room – fire zone 92
- Unit 3 reactor building – fire zone 124
- Unit 1/2 Reactor Building Spray/LPI pump room – fire zone 53

b. Findings

No findings were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Submerged or Buried Cable Inspections: The inspectors inspected the condition of the following cable trench through direct observation. The inspectors inspected the trench to ensure there was no standing water and that the cables within the trench were intact and in good condition.

- Manhole 7

Internal Flood Protection: The inspectors reviewed risk-important plant design features and licensee procedures to protect the plant and its safety-related equipment from internal flooding events. The inspectors reviewed flood analysis documentation associated with internal plant areas to determine the effects of flooding for the area listed below. The internal area was selected and walked down based on the flood analysis calculation. The inspectors reviewed sealing of doors, holes in elevation penetrations, sump pump operations and potential flooding sources. The inspectors also reviewed corrective action program documents to ascertain the licensee was identifying and resolving issues. Documents reviewed are listed in the Attachment.

- Unit 1, 2, and 3 turbine building/auxiliary building wall and its penetrations

b. Findings

No findings were identified.

1R08 Inservice Inspection Activities (Unit 3)

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities: From April 21, 2014, through May 2, 2014, the inspectors conducted an onsite review of the implementation of the licensee's Inservice Inspection (ISI) Program for monitoring degradation of the reactor coolant system, emergency feedwater systems, risk-significant piping and components, and containment systems in Unit 3. The inspectors' activities included a review of non-destructive examinations (NDE) to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and

Pressure Vessel Code (BPVC), Section XI (Code of record: 1998 Edition with 2000 Addenda), and to verify that indications and defects were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI, acceptance standards.

The inspectors directly observed the following NDE mandated by the ASME Code to evaluate compliance with the ASME Code Section XI and Section V requirements, and if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement.

- Ultrasonic Testing (UT) of safe end-to-pipe weld 3RC-211-73, High Pressure Injection (HPI) system, 2.5", ASME Class 1
- Penetrant Testing (PT) of inspection port installation weld, BS system, 2", ASME Class 2

The inspectors reviewed records of the following NDE mandated by the ASME Code Section XI to evaluate compliance with the ASME Code Section XI and Section V requirements, and if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement.

- UT of nozzle-to-safe end weld, Core Flood system, 15", ASME Class 1

The inspectors observed the welding activity referenced below and reviewed associated documents in order to evaluate compliance with procedures and the ASME Code. The inspectors reviewed the work order (WO), repair and replacement plan, weld data sheets, welding procedures, procedure qualification records, welder performance qualification records, and NDE reports.

- WO # 2076606, Installation of 2" inspection port in Building Spray piping, ASME Class 2

The inspectors reviewed the following volumetric examination records with recordable indications that were analytically evaluated and accepted for continued service against the ASME Code Section XI or an NRC-approved alternative.

- UT of safe end-to-pipe weld 3RC-211-70, HPI system, 3.5", ASME Class 1
- UT of Lower Core Barrel bolt #15, 8 1/8", Augmented ISI Exam: Vessel Internals

Pressurized Water Reactor Vessel Upper Head Penetration Inspection Activities: For the Unit 3 vessel head, a bare metal visual (BMV) examination was not required this outage pursuant to 10 CFR 50.55a, as it had been performed during the last refueling outage. Therefore, no NRC review was done for this inspection procedure attribute.

Boric Acid Corrosion Control Inspection Activities: The inspectors reviewed the licensee's boric acid corrosion control (BACC) program activities to ensure implementation with commitments made in response to NRC Generic Letter 88-05,

“Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary,” and applicable industry guidance documents. Specifically, the inspectors performed an onsite record review of procedures, and the results of the licensee’s containment walkdown inspections performed during the current spring refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of containment to evaluate compliance with licensee’s BACC program requirements, and verified that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee’s CAP.

The inspectors reviewed the following condition reports and associated corrective actions related to evidence of boric acid leakage, to evaluate if the corrective actions completed were consistent with the requirements of the ASME Code Section XI and 10 CFR Part 50, Appendix B, Criterion XVI.

- O-14-04279, Inadequate Leakage Information in PIP O-13-12054 Leading to Inadequate Boric Acid Corrosion Evaluation
- O-13-12054, Unit 3 Reactor Building Tour Results (MODE 3)
- O-12-06949, 3EOC26 Engineering Mode 3 Hot Startup Tour
- O-14-04271, Unit 3 Reactor Building Tour as Part of ISI Baseline Inspection
- O-14-03778, Unit 3 Reactor Building Tour Results (Mode 3)

The inspectors reviewed the engineering evaluations listed in the Attachment completed for evidence of boric acid leakage to determine if degraded components were documented in the CAP. The inspectors also evaluated corrective actions for any degraded components to determine if they met the ASME Section XI Code.

Steam Generator Tube Inspection Activities: The inspectors observed the following activities and/or reviewed the following documentation, and evaluated them against the licensee’s technical specifications, commitments made to the NRC, ASME Section XI, and Nuclear Energy Institute (NEI) 97-06, “Steam Generator Program Guidelines:”

- Reviewed the licensee’s in-situ steam generator (SG) tube pressure testing screening criteria. In particular, the inspectors assessed whether assumed NDE flaw sizing accuracy was consistent with data from the Electric Power Research Institute (EPRI) examination technique specification sheets (ETSS), or other applicable performance demonstrations.
- Compared the numbers and sizes of SG tube flaws/degradation identified against the licensee’s previous outage Operational Assessment.
- Reviewed the SG tube eddy current testing (ECT) examination scope and expansion criteria.
- Evaluated if the licensee’s SG tube ECT examination scope included potential areas of tube degradation identified in prior outage SG tube inspections, and/or as identified in NRC generic industry operating experience applicable to the licensee’s SG tubes.
- Reviewed the licensee’s implementation of their extent-of-condition inspection scope and repairs for new SG tube degradation mechanism(s). No new degradation mechanisms were identified during the ECT examinations.

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- Reviewed the licensee's repair criteria and processes.
- Verified that primary-to-secondary leakage (e.g., SG tube leakage) was below 3 gallons per day, or the detection threshold, during the previous operating cycle.
- Evaluated if the ECT equipment and techniques used by the licensee to acquire data from the SG tubes were qualified or validated to detect the known/expected types of SG tube degradation in accordance with Appendix H, Performance Demonstration for Eddy Current Examination, of EPRI Pressurized Water Reactor Steam Generator Examination Guidelines, Revision 7.
- Reviewed ECT personnel qualifications.

Identification and Resolution of Problems: The inspectors reviewed a sample of ISI-related problems that were identified by the licensee and entered into the CAP as condition reports (CRs). The inspectors reviewed the CRs to confirm the licensee had appropriately described the scope of the problem, and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification

a. Inspection Scope

Routine Operator Regualification Review: On June 24, 2014, the inspectors observed one active simulator training session to assess the performance of licensed operators during the session. The scenario involved various reactor building spray and reactor coolant system component malfunctions, an anticipated transient without scram (ATWS) event, and a loss of main feedwater. Events progressed to a point where the crew declared a site area emergency declaration. The post-scenario critique conducted by the training instructor and the crew was also observed. Documents reviewed are listed in the Attachment.

Observation of Operator Performance: The inspectors observed operator performance in the main control room on May 3, 2014, during startup of Unit-3 decay heat removal, prior to reloading the core. Inspectors observed licensed operator performance to assess 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

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's effectiveness in performing the following four corrective maintenance activities. These reviews included an assessment of the licensee's practices pertaining to the identification, scoping, and handling of degraded equipment conditions, as well as common cause failure evaluations. For each activity selected, the inspectors performed a detailed review of the problem history and surrounding circumstances, evaluated the extent of condition reviews as required, and reviewed the generic implications of the equipment and/or work practice problem. For those structures, systems and components (SSCs) scoped in the Maintenance Rule per 10 CFR 50.65, the inspectors verified that reliability and unavailability were properly monitored and that 10 CFR 50.65 (a)(1) and (a)(2) classifications were justified in light of the reviewed degraded equipment condition. Documents reviewed are listed in the Attachment.

- O-14-03331, 2 CS-56 determined to be faulted equipment
- O-14-03725, Unit 3 Power Battery Room Temperatures
- O-14-04454, Melted bus bar in 600V MCC compartment 3XS1-F2D, RB Purge Outlet Breaker
- O-14-04945, 3HP-4 Torque Switched Open Due to Cross-Arm Bind During VIPER Surveillance Test

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated the following attributes for the four activities listed below: 1) the completeness of the risk assessments performed before maintenance activities were conducted; 2) the management of risk; 3) that, upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and 4) that maintenance risk assessments and emergent work problems were adequately identified and resolved. Documents reviewed are listed in the Attachment.

- Emergent risk assessment and management in response to reduced inventory condition during Unit-3 outage risk condition

- Emergent risk assessment and management in response to adverse weather at ONS
- Emergent risk assessment and management of Unit-3 in response to orange risk condition during SSF annual outage when main feed breaker OXSF-5C inoperable.
- Emergent risk assessment and management in response to adverse weather and degraded grid conditions at ONS during annual SSF outage

b. Findings

No findings were identified.

1R15 Operability Evaluations and Functionality Assessments

a. Inspection Scope

The inspectors reviewed the following two operability evaluations or functionality assessments affecting risk significant systems to assess: 1) the technical adequacy of the evaluations; 2) whether continued system operability was warranted; 3) whether other existing degraded conditions were considered; 4) if compensatory measures were involved, whether the compensatory measures were in place, would work as intended, and were appropriately controlled; and 5) where continued operability was considered unjustified, the impact on Technical Specifications (TS) limiting condition for operations. Operating Experience Smart Sample (OpESS) 2012/02, Technical Specification Interpretation and Operability Determination was used by the inspectors during the review.

- O-14-04491, Wrong Fuses for 3HP-409/410
- O-14-06283, Keowee Main Transformer Lockout

b. Findings

No findings were identified.

1R17 Evaluation of Changes, Tests, and Experiments and Permanent Plant Modifications

a. Inspection Scope

Permanent Plant Modifications: The inspector reviewed licensee activities associated with the permanent plant modification listed below.

- Tornado Project Modification - Alternate Keowee Power Supply to the new Protected Service Water (PSW) System

The inspectors only reviewed sections of EC91875, OD500927- "Keowee AC Power Supply Tie-Ins," which related to the verification of Milestone 2 in Confirmatory Order EA-13-010 (Accession No. ML13114A928). The inspectors assessed the modification of breakers KPF 9 and KPF 10 on the ability for the Keowee Hydro Units to perform their safety-related function. The inspectors verified that the circuit breakers were compatible

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with both the Oconee Nuclear Station (ONS) and Keowee control room designs. The inspectors reviewed breaker coordination and loading calculations for the protected service water (PSW) system. The inspectors reviewed applicable plant drawings and observed a sample of the PSW circuit breaker verification testing, specifically for circuit breakers KPF 9 and KPF 10. The inspectors also reviewed work orders to verify breaker control of breakers KPF 9, KPF 10, KPF 11, and KPF 12. The inspectors conducted a walk-down to assess the material condition of the electrical equipment installed in the PSW building, SSF building, and the Keowee Hydro Plant. The inspectors also observed terminations and tan delta testing for several of the SSF feeder cables from the PSW switchgear.

b. Findings

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed the following plant modification to verify the adequacy of the modification package and the 10 CFR 50.59 screenings and to evaluate the modification for adverse effects on system availability, reliability, and functional capability. Documents reviewed are listed in the Attachment.

Permanent Plant Modifications

- EC 107579 3LP-2 Stroke Time Increase

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following six post-maintenance test procedures and/or test activities to assess if: 1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; 2) testing was adequate for the maintenance performed; 3) acceptance criteria were clear and demonstrated operational readiness consistent with design and licensing basis documents; 4) test instrumentation had current calibrations, range, and accuracy consistent with the application; 5) tests were performed as written with applicable prerequisites satisfied; 6) jumpers installed or leads lifted were properly controlled; 7) test equipment was removed following testing; and 8) equipment was returned to the status required to perform its safety function. Documents reviewed are listed in the Attachment.

- 3B motor driven emergency feedwater (MDEFW) pump test following lubrication preventive maintenance
- Unit 2 high pressure injection (HPI) pump test following lubrication preventive maintenance
- 1B MDEFWP motor test following lubrication preventive maintenance

- O-14-05997, 3KI Inverter failure
- SSF functional test following annual maintenance
- 3 HP-4 functional test after failure of VIPER testing of stroke time.

b. Findings

No findings were identified.

1R20 Refueling and Outage Activities

The inspectors evaluated licensee pre-outage activities associated with the Unit 3 refueling outage to determine if the licensee adhered to operating license, TS and Selected Licensee Commitment requirements and applicable procedural guidance. The inspectors reviewed the licensee's risk control plan associated with the receipt and movement of new nuclear fuel to assess the adequacy of the risk assessments that had been conducted and that the licensee had implemented appropriate risk management strategies as required by 10 CFR 50.65(a)(4). The inspectors conducted portions of the following activities associated with the refueling outage. Documents reviewed are listed in the Attachment.

- Attended the pre-outage schedule and risk assessment meetings for the 3EOC26 refueling outage.
- Reviewed the licensee's Integrated Risk Profile for the 3EOC26 refueling outage
- Observed fuel handling operations during new fuel receipt, inspection and movement into the spent fuel pool to verify that those operations and activities were being performed in accordance with TS and procedural guidance
- Observed power reduction process, removing the reactor from service and portions of the cooldown from normal operating pressure and temperature to ensure that the requirements in the TS and Selected Licensee Commitments were followed
- Conducted a containment entry once Mode 4 had been reached to observe the condition of major, normally-inaccessible equipment and check for indications of previously unidentified leakage from the reactor coolant system including the reactor vessel upper and bottom head penetrations
- Reviewed the licensee's responses to emergent work and unexpected conditions to verify that resulting configuration changes were controlled in accordance with the outage risk control plan
- Periodically reviewed the setting and maintenance of containment integrity, to establish that the RCS and containment boundaries were in place and had integrity when necessary
- Reviewed system lineups and/or control board indications to substantiate that TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant configurations
- Conducted containment walkdown to inspect for overall cleanliness and material condition of plant equipment after the licensee completed their closeout inspection prior to restart

- Observed the approach to criticality, placing the main generator on-line which completed the refueling outage and portions of the power ascension activities.
- Reviewed the items that had been entered into the CAP to verify that the licensee had identified outage related problems at an appropriate threshold
- Observed activities to verify that the licensee maintained defense-in-depth commensurate with the outage risk control plan for key safety functions and applicable TS when taking equipment out of service

b. Findings

No findings were identified

1R22 Surveillance Testing

a. Inspection Scope

The inspectors either witnessed and/or reviewed test data for the eight surveillance tests listed below to assess if the SSCs met TS, Updated Final Safety Analysis Report (UFSAR), and licensee procedure requirements. In addition, the inspectors determined if the testing effectively demonstrated that the SSCs were ready and capable of performing their intended safety functions. Documents reviewed are listed in the Attachment.

Routine Surveillances

- PT/3/A/0251/024, HPI Full Flow Test
- PT/3/A/0610/001L, Load Shed Channel Verification
- PT/3/A/0610/001J, Emergency Power Switching Logic Functional Test
- IP/0/A/3001/011 K, 3HP-4 VIPER Surveillance Test

In-Service Tests

- PT/3/A/0600/013, Motor Driven Emergency Feedwater Pump Test (3B MDEFDW)

Containment Isolation

- PT/3/A/0151/042, Penetration 42 Leak Rate Test (3PR-87, 3PR-90)
- PT/3/A/0151/024, Penetration 24 Leak Rate Test (3PR-81, 3PR-84)

RCS Leakage

- PT/2/A/0600/010, Reactor Coolant Leakage

b. Findings

No findings were identified.

## 2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety and Public Radiation Safety

### 2RS1 Radiological Hazard Assessment and Exposure Controls

#### a. Inspection Scope

Hazard Assessment and Instructions to workers: During tours of Units 1, 2, and 3, the inspectors observed labeling of radioactive material and postings for radiation areas (RAs), high RAs (HRAs), and very HRAs (VHRAs) in the radiologically controlled areas (RCAs), Independent Spent Fuel Storage Installations (ISFSI), and selected radioactive waste (radwaste) processing and storage locations to include Warehouse No. 10. Inspectors also observed and evaluated labels on selected containers in those selected locations. The inspectors reviewed survey records for several plant areas to include surveys for:

- alpha emitters
- hot particles
- airborne radioactivity
- gamma surveys within areas of high dose rate gradients
- pre-job surveys for upcoming tasks

Inspectors independently surveyed areas in the plant and compared results to radiological conditions and postings in the plant. Inspectors also reviewed air sample records and observed work in potential airborne areas to assess the location of air monitors to include transfer canal drain down, reactor head set, nozzle dam removal, and Unit 3 letdown cooler room activities. The inspectors discussed changes to plant operations that could contribute to changing radiological conditions since the last

inspection. For selected Unit 3 outage work, the inspectors attended pre-job briefings and reviewed radiation work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers.

Hazard Control and Work Practices: The inspectors evaluated access barrier effectiveness for locked high radiation area and VHRA locations. Procedures for LHRA and VHRA access controls were discussed with knowledgeable health physics (HP) supervisors and staff, and Operations personnel. Controls and their implementation for storage of irradiated material within the spent fuel pool were reviewed and discussed with knowledgeable radiation protection (RP) and reactor engineering personnel. Areas where dose rates could change significantly as a result of plant shutdown and refueling operations were also discussed.

Radiological controls were evaluated for selected outage tasks to include:

- reactor head set
- nozzle dam removal
- transfer canal drain down

- U3 letdown cooler room activities

Occupational workers' adherence to selected RWPs and HP technician (HPT) proficiency in providing job coverage was evaluated through direct observations and interviews with selected licensee staff of selected outage activities. Electronic dosimeter alarm set points and worker stay times were evaluated against area radiation survey results for selected outage work activities in the reactor, auxiliary and turbine buildings. Worker response to dose and dose rate alarms during selected work activities was evaluated. HPT coverage and actions at the Unit 3 containment access point, remote monitoring area, and RCA Single Point of Access (SPA) were reviewed.

Control of Radioactive Material (RAM): The inspectors observed the use of small article monitors, personnel contamination monitors, and portal monitors to survey material and personnel being released from the following areas:

- RCA SPA
- turbine deck
- radwaste facility
- Warehouse No. 10

The inspectors also walked-down portions of the ISFSI, auxiliary building, turbine deck, and radwaste storage areas. The inspectors compared recent 10 CFR Part 61 results for the dry active waste radwaste stream with radionuclides used in calibration sources to evaluate the appropriateness and accuracy of release survey instrumentation. The inspectors also reviewed source inventory and discussed leak tests for selected sealed sources and discussed nationally tracked source transactions with cognizant RP staff. This included a walk down of storage locations for sealed sources to include Room Nos. 220, 332 and 362 in the auxiliary building.

Problem Identification and Resolution: Problem Investigation Program Reports associated with radiological hazard assessment and control were reviewed and assessed. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with NSD 208, Problem Investigation Program, Rev. 41.

RP activities were evaluated against the requirements and guidance of Updated Final Safety Analysis Report (UFSAR) Section 12; 10 Code of Federal Regulations Parts 19 and 20; Regulatory Guide 8.38, Control of Access to High and Very High Radiation Areas in Nuclear Power Plants, and approved licensee procedures. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

## 2RS6 Radioactive Gaseous and Liquid Effluent Treatment

### a. Inspection Scope

Event and Effluent Program Reviews: The inspectors reviewed the 2012 and 2013 Annual Radiological Effluent Release Report (ARERR) documents for consistency with requirements in the Offsite Dose Calculation Manual (ODCM) and Technical Specifications (TS). Routine and abnormal effluent release results and reports, as applicable, were reviewed and discussed with responsible licensee representatives. Status of the radioactive gaseous and liquid effluent processing and monitoring equipment, and applicable equipment changes, as described in the Updated Final Safety Analysis Report (UFSAR) and current ODCM were discussed with responsible staff. Radioactive effluent monitor operability issues and the status of the engineering design change to correct the issues were discussed with plant staff.

Equipment Walk downs: The inspectors walked-down and discussed selected components of the Unit 1 (U1), Unit 2 (U2), and Unit 3 gaseous and liquid waste processing and discharge systems to ascertain material condition, configuration and alignment. The walk-downs included visual inspection of RIA-33 [Plant discharge liquid radioactive waste (radwaste)], RIA-40 (U1, U2 and U3 Condenser Air Ejector Off Gas) 4RIA-45 (Radwaste Facility Vent), RIAs-43, -44, -45 and -46 (U1, U2 and U3 Vent Particulate, Iodine and Gas), RIAs -47, -48, -49 and -49A (Reactor Building Vent Particulate, Iodine, and Gas), RIA-53 (Interim Radwaste Building Vent Gas), and Hot Machine Shop Vent. To the extent practical, the inspectors observed the material condition of abandoned in place liquid waste processing, and in-service gaseous and liquid waste processing equipment for indications of degradation or leakage that could constitute a possible release pathway to the environment. The walk-downs were accompanied by Radiation Protection (RP) and Operations personnel and included discussion and evaluation of observed leaks, material condition, and configuration control associated with waste processing and monitor tanks and pumps, gas decay tanks, and associated piping and valves. The inspectors discussed operability of the particulate and iodine monitors with plant personnel and reviewed effluent radiation monitoring system health reports.

Effluent Processing The inspectors discussed the various configurations available for processing liquid radwaste using the liquid waste management system and reviewed the DMT sample analysis results and liquid waste release permits with Operations personnel. The reviews included review and discussion of selected dose calculation summaries, maximum release flowrate, and required release point dilution flowrate. Release quantities and dose impacts were reviewed and discussed. The inspectors reviewed 10 CFR 61 analysis data for expected nuclide distributions used to quantify effluents, treatment of hard to detect nuclides, and determination of appropriate calibration nuclides for effluent analysis instruments. The inspectors reviewed and discussed the site administrative control to hold waste gas for at least 30 days before release, reviewed selected waste gas release permits, and observed how weekly routine plant vent stack gaseous and tritium sampling and analysis. The inspectors reviewed the calculated public dose results for any indications of higher than anticipated or abnormal releases. In addition, the inspectors discussed testing requirements for the

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high efficiency particulate air and charcoal iodine filters in the SFP and Reactor Building Ventilation systems and minimum system efficiency assumptions used in public dose calculations for gaseous releases.

Ground Water Protection: The inspectors reviewed the licensee's continued implementation of the industry's Ground Water Protection Initiative [Nuclear Energy Institute (NEI) 07-07] and discussed any changes to the program with Chemistry and RP representatives. The inspectors discussed program guidance for dealing with spills, leaks, and unexpected discharges with licensee staff and reviewed recent entries into the 10 CFR 50.75(g) decommissioning file. The inspectors reviewed and discussed the licensee's program for monitoring of structures, systems, and components with the potential to release radioactive material to the environment. Potential effluent release points due to onsite surface water bodies were also evaluated. The inspectors also reviewed Event Notification No. 50093 regarding a transfer pipe that leaked water with tritium into the ground and had the potential to reach groundwater as discussed in Section 4OA3.

Problem Identification and Resolution: The inspectors reviewed selected CAP documents in the areas of gaseous and liquid effluent processing and release activities. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure NSD-208, Problem Investigation Program (PIP), Revision (Rev.) 44. The inspectors also discussed the scope of the licensee's internal audit program and reviewed recent assessment results.

Effluent process and monitoring activities were evaluated against the details and requirements documented in UFSAR Sections 11, 12 and 16; ODCM; 10 CFR Part 20; Appendix I to 10 CFR Part 50; and approved licensee procedures. In addition, ODCM and UFSAR changes since the last onsite inspection were reviewed against the guidance in NUREG-1301 and Regulatory Guide (RG) 1.109, RG 1.21, and RG 4.1. Records reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2RS7 Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope

REMP Status and Results The inspectors reviewed changes to the ODCM and results presented in the Annual Radiological Environmental Operating Report (AREOR) documents issued for calendar year (CY) 2012 and CY 2013. REMP contract laboratory cross-check program results, and current procedural guidance for offsite collection, processing and analysis of airborne particulate and iodine, broadleaf vegetation, fish, milk, shoreline sediment, and surface water samples were reviewed and discussed. The AREOR environmental measurement results were reviewed for consistency with licensee effluent data and evaluated for radionuclide concentration trends. The inspectors reviewed detection level sensitivity requirements for environmental samples

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analyzed by the offsite environmental laboratory.

Equipment Walk-down The inspectors observed implementation of selected REMP monitoring and sample collection activities for atmospheric and milk samples as specified in the current ODCM and applicable procedures. The inspectors observed equipment material condition and verified operability, including verification of flow rates and total sample volume results for the weekly airborne particulate filter and iodine cartridge change-outs at six atmospheric sampling stations. Thermo-luminescent dosimeter (TLD) material condition and placement were observed at select ODCM locations. Land use census results and actions for missed samples, including compensatory measures, were reviewed and discussed. In addition, calibration and maintenance surveillance records for the installed environmental air sampling stations and composite water samplers were reviewed.

Meteorological Monitoring Program The inspectors toured the primary and backup meteorological towers and observed local data collection equipment readouts through observation of a weekly meteorological instrumentation check. The inspectors observed the physical condition of the towers and their instruments and discussed equipment operability, maintenance history, and backup power supplies with licensee staff. The inspectors evaluated transmission of locally generated meteorological data from the primary meteorological tower to the main control room operators. For the meteorological measurements of wind speed, wind direction, and temperature, the inspectors reviewed applicable tower instrumentation calibration records and evaluated annual meteorological measurement data recovery for CY 2012 and CY 2013.

Procedural guidance, program implementation, quantitative analysis sensitivities, and environmental monitoring results were reviewed against 10 CFR Part 20; Appendix I to 10 CFR Part 50; TS Sections 5.0; ODCM, Rev. 55; RG 4.15, Quality Assurance for Radiological Monitoring Programs (Normal Operation) - Effluent Streams and the Environment; and the Branch Technical Position, An Acceptable Radiological Environmental Monitoring Program - 1979. Licensee procedures and activities related to meteorological monitoring were evaluated against: ODCM; UFSAR; RG 1.23, Meteorological Monitoring Programs for Nuclear Power Plants, and ANSI/ANS-2.5-1984, Standard for Determining Meteorological Information at Nuclear Power Sites. Documents reviewed are listed in the Attachment.

Problem Identification and Resolution The inspectors reviewed selected CAP documents in the areas of environmental and meteorological monitoring. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with NSD 208, Problem Investigation Program (PIP), Rev. 41. The inspectors also reviewed the scope of the licensee's internal audit program and recent assessment results. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

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2RS8 Radioactive Solid Waste Processing and Radioactive Material Handling, Storage, and Transportation

a. Inspection Scope

Radioactive Material Storage: During walk-downs of selected indoor and outdoor radioactive material storage areas to include the Radwaste Building and RAM Storage Warehouse No. 10, the inspectors observed the physical condition and labeling of storage containers and the posting of RAM Areas. The inspectors also reviewed and discussed with the licensee procedures for storage and monitoring of RAM.

Waste Processing and Characterization: During inspector walk-downs, accessible sections of the liquid and solid radwaste processing systems were assessed for material condition and conformance with system design diagrams. Inspected equipment included radwaste storage tanks; resin transfer piping, resin and filter packaging components; and abandoned evaporator equipment. The inspectors discussed component function, processing system changes, and radwaste program implementation with cognizant licensee representatives.

The 2012 Annual Radioactive Effluent Release Report and the latest radionuclide characterizations for the Dry Active Waste and Demineralizer Resin waste streams were reviewed and discussed with cognizant licensee representatives. For these waste streams, the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing, concentration averaging, and waste form stabilization (dewatering) for resins and filters was evaluated and discussed with radwaste staff. The inspectors also reviewed the licensee's procedural guidance for monitoring changes in waste stream isotopic mixtures.

Transportation: The inspectors observed the preparation of shipment no. 14-2023 containing surface contaminated objects. The inspectors discussed with selected shipping representatives procedures regarding surveys, marking and placarding of shipping packages, and other related Department of Transportation (DOT) regulations. Four shipping records were reviewed for consistency with licensee procedures and compliance with NRC and DOT regulations. The inspectors reviewed emergency response information, DOT shipping package classification, waste classification, radiation survey results, and evaluated whether receiving licensees were authorized to accept the packages.

Problem Identification and Resolution: The inspectors reviewed CAP documents in the areas of radwaste processing, material storage, and transportation. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure NSD 208, Rev. 41. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

Radwaste processing, radioactive material handling, and transportation activities were reviewed against the requirements contained in the licensee's Process Control Program,

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UFSAR Chapter 11, 10 CFR Part 20, 10 CFR Part 61, 10 CFR Part 71, and 49 CFR Parts 172-178. Licensee activities were also evaluated against guidance provided in the Branch Technical Position on Waste Classification (1983) and NUREG-1608, "Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects". Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

40A1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors sampled licensee data to confirm the accuracy of reported PI data for the following nine PIs. To determine the accuracy of the report PI elements, the reviewed data was assessed against PI definitions and guidance contained in Nuclear Energy Institute 99-02, Regulatory Assessment Indicator Guideline, Revision 6. Documents reviewed are listed in the Attachment.

Cornerstone: Mitigating Systems

- MSPI Cooling Water System (3 units)
- MSPI High Pressure Injection (3 units)

Cornerstone: Barrier Integrity

- RCS Activity (3 units)

For the period of April 1, 2013, through June 30, 2014, the inspectors reviewed Operating Logs, Train Unavailability Data, Maintenance Records, Maintenance Rule Data, PIPs, Consolidated Derivation Entry Reports, and System Health Reports to verify the accuracy of the PI data reported for each PI.

Cornerstone: Occupational Radiation Safety

- Occupational Exposure Control Effectiveness

For the period from November 2013 through March 2014, the inspectors assessed CAP records to determine if HRA, VHRA or unplanned exposures, resulting in TS or 10 CFR 20 non-conformances, had occurred during the review period. In addition, the inspectors reviewed selected personnel contamination event data, internal dose assessment results, and electronic dosimeter alarms for cumulative doses and/or dose rates exceeding established set-points.

Cornerstone: Public Radiation Safety

- Radiological Control Effluent Release Occurrences

For the period from November 2013 through May 2014, the inspectors reviewed cumulative and projected doses to the public and PIP documents related to Radiological Effluent TS/ODCM issues. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

.1 Daily Screening of Corrective Action Reports: In accordance with Inspection Procedure (IP) 71152, Identification and Resolution of Problems, and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing copies of PIPs, attending daily screening meetings, and accessing the licensee's computerized database.

.2 Semi-annual Trend Review

a. Inspection Scope

As required by IP 71152, Identification and Resolution of Problems, the inspectors performed a review of the licensee's CAP and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on open corrective actions greater than five years old, but also considered the results of daily inspector CAP item screenings discussed in section 4OA2.1 above, licensee trending efforts, licensee human performance results and inspector observations made during in-plant inspections and walk-downs. The inspectors' review primarily considered the six-month period of January 2014 through June 2014, although some examples expanded beyond those dates when the scope of the trend warranted. The review also included issues documented outside the normal CAP in major equipment problem lists, plant health reports, Independent Nuclear Oversight reports, self-assessment reports, and maintenance rule reports. The inspectors compared and contrasted their results with the results contained in the licensee's latest quarterly trend reports. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy.

b. Observations and Findings

No findings were identified. In general, the licensee performs adequate monitoring of their programs for adverse trends. However, the inspectors identified what appear to be a large number of open corrective actions greater than five years old. The licensee in general is tracking these open corrective actions in their CAP program. The inspectors

reviewed corrective actions associated with problem identification reports for potential trends and observed the corrective actions were adequate to address the trends.

Additionally, the inspectors noted a marked decrease in the instances of discovery of uncontrolled transient combustibles in fire areas. The inspectors noted increased site wide communications from the senior management staff in an effort to increase site staff's awareness of the need to control and manage transient combustible material. The inspectors noted site efforts to manage transient combustible material had been effective and the inspectors believe this previously identified adverse trend has been reversed.

#### 4OA3 Follow-up of Events and Notices of Enforcement Discretion

##### Follow-up of Event Notification No. 50093: Voluntary Notification to Offsite Government Agencies Due to Leak of Water Containing Low-Level Tritium Concentration in Accordance with NEI Initiative 07-07

On May 7, 2014, the licensee notified the NRC of an event surrounding a leak that occurred from a transfer pipe from Chemical Treatment Ponds (CTP) 1 and 2 as reported in NRC Event Notification No. 50093. On May 6, 2014, the licensee identified a slow water leak coming from gravel located around a pipe next to the Oconee Office Building. The licensee determined that the water came from a hole in a pipe that was used to transfer water from Chemical Treatment Ponds (CTPs) 1 and 2 to CTP 3. The licensee determined that a 2007 security modification required a hole be drilled into the transfer pipe to run some cables. On January 19, 2011, a modification was made to install a baffle plate on a manway cover upstream from the hole in the transfer pipe. The baffle plate modification caused the flow of water in the pipe from CTP 1 and 2 to splash water up into the unsealed drilled hole from the 2007 security modification. As a result, every time a transfer of water from CTP 1 and 2 was made to CTP 3, water would be redirected to this hole and leak out into the ground. The licensee determined that from Jan 19, 2011, to May 6, 2014, that a total of approximately 196,335 gallons of water leaked out of the pipe and into the ground. The average concentration of tritium in the water released from the CTPs 1 and 2 was 11,900 pCi/L. The licensee had eight monitoring wells and one groundwater well located in the vicinity of the leaking pipe that the licensee sampled for tritium and have not identified any trends indicating an increase of tritium since the leak occurred. The concentration of tritium identified in these samples ranged from 4.62 to 994 pCi/L since the time of the leak.

The inspectors determined that the licensee's failure to seal the hole during a modification and maintain the integrity of the transfer pipe from CTP 1 and 2 was a performance deficiency. Using IMC 0612, Appendix B, "Issue Screening," dated September 7, 2012, the inspectors determined the issue was of minor significance because, if left uncorrected, would not have led to a more significant safety concern. The transfer pipe leak was onsite and the leakage did not migrate offsite. Monitoring well samples in the vicinity of the leaking transfer pipe have identified no significant levels or increasing trends of tritium over the past five (5) years. In addition, the average concentration of tritium that was released from CTPs 1 and 2 was below both the 20,000 pCi/L EPA standard for drinking water and the 10 CFR Part 20, Appendix B, Table 2,

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Column 2, limit for tritium effluent concentrations in water. The licensee has repaired the hole in the pipe to prevent further leaks. This issue was entered into the CAP as PIP O-14-05180. This failure to comply with 10 CFR 20.1501(a)(2) constitutes a minor violation that is not subject to enforcement action in accordance with the NRC's Enforcement Policy.

b. Findings

No findings were identified.

4OA5 Other Activities

Verification of Completion of Milestone 2 of Protected Service Water Major Plant Modification

Milestone 2 of Confirmatory Order EA-13-010 of July 1, 2013, (Accession No. ML 13114A928) states:

*“The licensee shall provide the capability to supply electrical power from each of the Keowee Hydro Units to the PSW [protected service water] building switchgear and from there to the SSF [safe shutdown facility] switchgear, with sufficient capacity to operate all credited SSF equipment in the event of a failure of the SSF diesel generator during a fire for which the SSF is credited. This modification along with approved plant procedures and the completion of operator training necessary to accomplish this lineup, and a combination of testing and engineering evaluation in accordance with station procedures which verifies this capability, will be completed and operational no later than July 18, 2014.”*

The inspectors reviewed the design change modifications and associated post-modification testing associated with providing power from the Keowee Hydro Units (KHUs) to the PSW switchgear and from there to the SSF switchgear. The inspectors found that the licensee's modification met the intent of Milestone 2, in that electric power from the KHUs to the PSW switchgear and SSF switchgears was installed and available for use. The inspectors noted that an unresolved item (URI) was identified during the Oconee 2014 Component Design Bases Inspection concerning the configuration of electrical cabling in the underground concrete raceway which may affect the PSW plant modification. The inspectors further noted that this URI was opened pending assistance from subject matter experts in the Office of Nuclear Reactor Regulation via a Task Interface Agreement to review the emergency power system licensing basis to determine the acceptability of the licensee's design. At issue is the potential single failure of the emergency power cables which could adversely affect surrounding cables, including the DC control cables. If the design of the emergency power system is found to be noncompliant with the licensing basis, the licensee will be required to implement corrective actions to restore compliance. Details concerning this unresolved item were documented in the Oconee 2014 CDBI report as URI 05000269, 270, 287/2014007-05, “Potential Unanalyzed Condition Associated with Emergency Power System.” (Accession No. ML14178A535).

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The review of approved plant procedures and completed operator training associated with Milestone 2 was documented in the Oconee Nuclear Station – NRC integrated inspection Report 05000269, 270, 287/2013005 (Accession No. ML14037A283).

.2 (Closed) Temporary Instruction (TI) 2515/182 – Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks

a. Inspection Scope

The inspectors conducted a review of records and procedures related to the licensee's program for buried piping and underground piping and tanks in accordance with Phase II of TI 2515/182 to confirm that the licensee's program contained attributes consistent with Sections 3.3.A and 3.3.B of Nuclear Energy Institute (NEI) 09-14, "Guideline for the Management of Buried Piping Integrity," Revision 3, and to confirm that these attributes were scheduled and/or completed by the NEI 09-14 deadlines. The inspectors interviewed licensee staff responsible for the buried piping program and reviewed program related activities to determine if the program attributes were accomplished in a manner which reflected acceptable practices in program management.

The licensee's buried piping and underground piping and tanks program was inspected in accordance with paragraph 03.02.a of the TI and it was confirmed that activities, which correspond to completion dates specified in the program which have passed since the Phase 1 inspection was conducted, have been completed. The licensee's buried piping and underground piping and tanks program was inspected in accordance with paragraph 03.02.b of the TI and responses to specific questions found in <http://www.nrc.gov/reactors/operating/ops-experience/buried-pipe-ti-phase-2-insp-req-2011-11-16.pdf> were submitted to the NRC headquarters staff. Additionally, the inspectors reviewed the licensee's risk ranking process and implementation of the inspection plan using the guidance of paragraph 03.04 and 03.05 of the TI.

b. Findings

No findings were identified. Based upon the scope of the review described above, Phase 2 of TI-2515/182 was completed.

4OA6 Management Meetings (Including Exit Meeting)

On July 14, 2014, the resident inspectors presented the inspection results to Mr. Scott Batson and other members of licensee management. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

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## SUPPLEMENTARY INFORMATION

### KEY POINTS OF CONTACT

#### Licensee

G. Armentrout, Site Program Owner  
M. Barnes, Nuclear Oversight Manager  
S. Batson, Site Vice President  
C. Blackwelder, Fleet Program Owner  
S. Boggs, Emergency Services Coordinator  
E. Burchfield, Engineering Manager  
T. Cheslak, Oconee Fire Protection Engineer  
P. Fisk, Superintendent of Operations  
R. Guy, Organization Effectiveness Manager  
C. King, Engineering Manager  
E. Lampe, Radiation Protection (RP), Supervising Scientist  
R. Lampe, Supervisor, Radiation Protection (RP)  
A. Loffi, Duke - Construction  
M. McNeely, Security Manager  
T. Patterson, Safety Assurance Manager  
J. Pounds, OMP Tornado/HELB QA Oversight  
T. Ray, Plant Manager  
F. Rickenbaker, OMP Manager  
D. Robinson, Radiation Protection Manager  
J. Smith, Regulatory Affairs  
A. Spear III, Senior Engineer  
P. Street, Emergency Planning Manager  
C. Wasik, Regulatory Compliance Manager

### LIST OF REPORT ITEMS

#### Closed

2515/182	TI	Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase II (Section 4OA5.1)
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### LIST OF DOCUMENTS REVIEWED

#### **Section 1R01: Adverse Weather Protection**

AP/1/A/1700/034, Degraded Grid, Rev 34  
COP-NUC-P01, TCC/SOC Response to Nuclear Switchyard Low Voltage, dated November 6, 2013  
NSD 417, Generation Risk Management Process, Rev 16  
OP/0/A/1107/016, Removal and Restoration of Switchyard Electrical Equipment, Rev 35  
PT/0/A/0610/022, Degraded Grid and Switchyard Isolation Test, Rev 35  
System Health Report – 230 kV & 525 kV Switchyard Power System, 1<sup>st</sup> quarter 2014

**Section 1R04: Equipment Alignment**

OP/0/A/1600/009, Enclosure 4.1, SSF Auxiliary Service Water System, Rev 36  
 O-FS-0-PA-9000-004, Standby Shutdown Facility Pre-Fire Plan, Rev 0

**Other:**

A/R #00444269, 10CFR50.59 screen for EC112941  
 EC 112941, Removing Lower Bus Section of Compartment MCC 3XS1-F2D and 3X1-F5E  
 Maintenance Rule Summary Sheets – OPD (250/125 VC Power System)  
 Maintenance Rule Summary Sheets – VTB (Turbine Building Ventilation System)  
 System Health Report – SSF Supersystem Health Report, 1<sup>st</sup> Quarter 2014

**Section 1R05: Fire Protection**

O-FS-1-AB-9758-001, Unit 1 Auxiliary Bldg. Pre-Fire Plan EI 758', Rev 0  
 O-FS-1-AB-9796-001, Unit 1 Auxiliary Bldg. Pre-Fire Plan EI 796', Rev 1  
 O-FS-2-AB-9796-001, Unit 2 Auxiliary Bldg. Pre-Fire Plan EI 796', Rev 1  
 O-FS-3-RB-9000-001, Unit 3 Reactor Bldg. Pre-Fire Plan, Rev 0

**Section 1R06: Flood Protection Measures****Documents:**

UFSAR 3.4, Water Level (Flood) Design, Section 3.4.1.1.1, Current Flood Protection Measures for the Turbine and Auxiliary Buildings, Dated Dec. 31, 2013  
 SLC 16.9.11, Turbine Building Flood Protection Measures, Dated 11/15/12  
 SLC 16.9.11a, Auxiliary Building Flood Protection Measures, Dated 11/15/12  
 BACC Evaluations: O-12-07214, O-12-07365, O-12-11086, O-12-11120, O-12-11587, O-12-11845, O-12-13405, O-12-13408, O-12-14291, O-13-01070, O-13-01846, O-13-05481, O-13-14678, O-14-00161  
 PIPs O-14-04501, O-14-04526, O-14-04531, O-14-14535, O-14-14588

**Calculations:**

51-9112756-002, AREVA Engineering Information Record: Technical Justification for Upper and Lower Core Barrel Bolting Volumetric (Ultrasonic) Examinations at Oconee Nuclear Station, Rev. 002  
 51-9122970-000, AREVA Engineering Information Record: Assessment of April 2014 Lower Core Barrel and Flow Distributor Bolts Inspection Results – Oconee Unit 3, Rev. 000

**Procedures:**

54-ISI-823-01, AREVA ID Automated Ultrasonic Examination of Dissimilar Metal Core Flood Piping Welds, Rev. 01  
 54-ISI-860-01, AREVA Procedure for Encoded, Phased Array Ultrasonic Examination of Dissimilar Metal Piping Welds, Rev. 01  
 54-ISI-900-001, AREVA Ultrasonic Examination of B&W Upper and Lower Core Barrel Bolts, Upper and Lower Thermal Shield Bolts, and Flow Distributor Bolts, Rev. 1  
 NDE-35, Liquid Penetrant Examination, Rev. 25  
 NDE-995 FC 14-015, Ultrasonic Examination of Small Diameter Piping Butt Welds and Base Materials for Thermal Fatigue, Field Change FC 14-015, Rev. 000  
 NDE-995, Ultrasonic Examination of Small Diameter Piping Butt Welds and Base Materials for Thermal Fatigue Damage, Rev. 006  
 MP/0/A/8140/001, QA and Non-QA Welding, Rev. 008  
 OP/3/A/1102/028, Reactor Building Tour, Rev. 009

PDI-UT-10, Duke Energy NDE Procedures Manual – Volume 4 – PDI Generic Procedure for the Ultrasonic Examination of Dissimilar Metal Piping Welds, Rev. E

Other Documents:

131984, Duke Energy Oconee Nuclear Station Weld Process Control, NDE Surface Exam  
 39487, AREVA Certificate of Calibration: Digital Thermometer  
 39537, AREVA Certificate of Calibration: OmniScan UT Instrument  
 51-9222927-000, Oconee 3EOC27 Final Report: Encoded Ultrasonic Phased Array Examination of 3RC-212-53V Dissimilar Metal Weld, Rev. 000  
 AREVA Automated Ultrasonic Phased Array Examination Summary Sheet: 3RC-212-53V, dated 4/29/2014  
 AREVA Certificate of Personnel Qualification: 54-ISI-823-01 (Hacker)  
 AREVA Certificate of Personnel Qualification: 54-ISI-860 (Bauman)  
 AREVA Certificate of Personnel Qualification: 54-ISI-860 (Steinbauer)  
 AREVA Certificate of Vision Examination (Steinbauer)  
 AREVA Certification of Vision Examination (Bauman)  
 AREVA RPV Weld UT Data Sheet: 3-RPV-WR53, dated 4/30/2014  
 AREVA RPV Weld UT Data Sheet: 3-RPV-WR53A, dated 4/30/2014  
 Babcock & Wilcox Certificate of NDE Personnel Qualification (Baumann)  
 Babcock & Wilcox Certificate of Vision Examination (Baumann)  
 Day & Zimmerman Eye Examination Record (Neal)  
 Duke Energy Certificate of Method Qualification: LII (Dean)  
 Duke Energy Record of Welder Performance Qualification Test – Groove Weld (Paite)  
 Duke Energy Visual Acuity Examination Record (Dean)  
 Duke Power Welder Performance Qualification Record (Christmas)  
 DZ Atlantic Certification Record: Liquid Penetrant (Solvent Removable) (Neal)  
 EPRI Performance Demonstration Initiative Program Specific Detail of Qualification: PDI-UT-10 (Dean)  
 GT000808-04, Duke Energy Corporation ASME Section IX Welding Procedure Specification, Rev. 0  
 L-110D, Duke Power Company Procedure Qualification Record: Manual GTAW, Rev. 0  
 L-138, Duke Power Company Procedure Qualification Record: Manual GTAW, Rev. 0  
 L-148C, Duke Power Company Procedure Qualification Record: Manual GTAW, Rev. 0  
 SII006-12-01-02145-1, Laboratory Testing, Inc. Certified Test Report: UT Couplant  
 UT-14-1210, Duke Energy UT Calibration/Examination Report: 3RC-212-53V, dated 4/23/2014  
 Zetec Certificate of Personnel Qualification: Eddy Current LIII/QDA (Larsen)  
 Zetec Eye Examination Certification (Larsen)

**Section 1R11: Licensed Operator Requalification**

RP/0/A/1000/001, Emergency Classification Rev 1  
 Active Simulator Exam OP-OC-ASE-02A, Rev 0

**Section 1R12: Maintenance Effectiveness**

PIPs O-97-00012, O-13-00311, O-13-02689, O-13-04498, O-13-04907, O-13-05147, O-13-05461, O-13-06474, O-13-09388, O-14-01798, O-14-01885, O-14-02573, O-14-03213, O-14-03348, O-14-03753, O-14-04945, O-14-05375, O-14-05502  
 Work Order 02105784  
 Work Requests 01108058; 01110615

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Procedures:

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 System Health Report – Reactor Coolant System, 2nd Quarter 2014

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

SSF Monthly Inspection  
 SY1/SY2 Quarterly Surveillance  
 Unit-3 Reduced Inventory  
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O-EE-355-31, Elementary Diagram of High Pressure Injection Isolation Valve 3HP-409. Rev 10  
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**Section 1R17: Evaluation of Changes, Tests, and Experiments and Permanent Plant Modifications**Drawings:

K-700, One Line Diagram Relays and Meters 13.8 – 230kv, Rev. 38  
 KEE-0119, Elementary Diagram PSW Emergency Power 13.8kv Feeder Bkr. KPF-9 Control  
 Circuit, Rev. 0

KEE-0219, Elementary Diagram PSW Emergency Power 13.8kv Feeder Bkr. KPF-10 Control Circuit, Rev. 0

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O-EE-352-14, Elementary Diagram Return Block Valve 3LP-2 3/53/40, Rev 014

O-EE-352-14-0A, Elementary Diagram Contact Developments for Valve 3LP-2 3/53/40, Rev 008

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MP/0/A/1800/132, Inspection, Assessment, and Cleaning of Boric Acid on Plant Materials, Rev 009

MP/0/A/1840/040A, Pump Motor – Miscellaneous Component – Lubrication Post Maintenance test, Rev 003

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IP/0/3001/011 K, Testing Motor Operated Valves using VIPER, Rev 013

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**Section 2RS1: Radiological Hazard Assessment and Exposure Controls**  
Procedures, Guidance Documents and Manuals

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 HP/0/B/1000/054, Radiation Protection Routines, Rev. No. 042  
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 HP/0/B/1000/060 A, Waste Gas Decay Tank Sampling and Release Requirements, Rev. 059  
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#### Procedures and Guidance Documents:

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ENRAD-PROC-702, Airborne Radioiodine and Airborne Particulate Sampling at Oconee Nuclear Station, Rev. 9

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Procedures and Guidance Documents:

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