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

July 27, 2011

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

SUBJECT: OCONEE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000269/2011003, 05000270/2011003, AND 05000287/2011003 AND TRADITIONAL ENFORCEMENT ACTION FOLLOW-UP INSPECTION REPORT 05000270/2011012 AND 05000287/2011012

Dear Mr. Gillespie:

On June 30, 2011, 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 11, 2011, with you and other members of your staff.

The inspection examined activities conducted under your licenses as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents two NRC-identified findings of very low safety significance, one of which was determined to be a violation of NRC requirements. However, because of the very low safety significance and because it is entered into your corrective action program, the NRC is treating this violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at Oconee. In addition, if you disagree with the characterization of any finding 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 Regional Administrator, Region II, and the NRC Resident Inspector at Oconee.

In accordance with 10 CFR 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/

Jonathan H. Bartley, Chief
Reactor Projects Branch 1
Division of Reactor Projects

Docket Nos.: 50-269, 50-270, 50-287, 72-04
License Nos.: DPR-38, DPR-47, DPR-55

Enclosure: NRC Integrated Inspection Report 05000269/2011003, 05000270/2011003, 05000287/2011003 and 05000287/2011003 and Traditional Enforcement Action Follow-up Inspection Report 05000270/2011012 And 05000287/2011012 w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to Preston Gillespie from Jonathan H. Bartley dated July 27, 2011

SUBJECT: OCONEE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT 05000269/2011003, 05000270/2011003, AND 05000287/2011003 AND TRADITIONAL ENFORCEMENT ACTION FOLLOW-UP INSPECTION REPORT 05000270/2011012 AND 05000287/2011012

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-269, 50-270, 50-287, 72-04
License Nos:	DPR-38, DPR-47, DPR-55
Report Nos:	05000269/2011003, 05000270/2011003, 05000287/2011003, 05000270/2011012, 05000287/2011012
Licensee:	Duke Energy Carolinas, LLC
Facility:	Oconee Nuclear Station, Units 1, 2 and 3
Location:	Seneca, SC 29672
Dates:	April 1, 2011, through June 30, 2011
Inspectors:	A. Sabisch, Senior Resident Inspector G. Ottenberg, Resident Inspector K. Ellis, Resident Inspector J. Hamman, Resident Inspector A. Vargas, Reactor Inspector (Section 1R08) R. Carrion, Senior Reactor Inspector (Section 1R08) B. Collins, Reactor Inspection (Section 1R08) C. Rapp, Senior Project Engineer (Section 4OA5.4)
Approved by:	Jonathan H. Bartley, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

Inspection Report (IR) 05000269/2011-003, 05000270/2011-003, 05000287/2011-003, 05000270/2011-012, 05000287/2011-012; 04/01/2011 – 06/30/2011; Oconee Nuclear Station Units 1, 2 and 3; Adverse Weather Protection, Other Activities

The report covered a three-month period of inspection by the resident inspectors and four Region-based reactor inspectors. Two Green findings were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Cross-cutting aspects are determined using IMC 0310, "Components Within The Cross-Cutting Areas." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process."

Cornerstone: Mitigating Systems

- Green: A self-revealing finding was identified for the licensee's failure to implement the requirements of the modification program to ensure the natural phenomenon barrier system (NPBS) borated water storage tank (BWST)/standby shutdown facility (SSF) trench foundation modification did not adversely impact the yard drain system's function. The condition was entered into the licensee's corrective action program (CAP) as problem investigation program (PIP) O-11-3285.

  The failure to implement the requirements of the modification program to verify the NPBS BWST/SSF trench foundation modification did not adversely impact flood protection features was a performance deficiency (PD). The PD was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Protection Against External Factors - Flood Hazard and adversely affected the cornerstone objective in that the design modification bypassed the yard drain system which was credited for external flood protection. The finding was of very low safety significance (Green) because the rainwater intrusion did not result in the loss of operability or functionality of safety-related structures, systems, and components (SSCs). The cause of the finding was directly related to the appropriately planning work activities cross-cutting aspect of the Work Control component in the area of Human Performance because the licensee failed to incorporate environmental conditions which may impact SSCs into the modification. [H.3(a)] (Section 1R01)

- Green: This finding was previously documented in NRC IR 05000269, 270, 287/2011002 as a potentially Greater than Green Apparent Violation (AV) pending completion of a Phase III SDP analysis. Based on a Phase III SDP analysis, the finding was determined to be of very low safety significance (Green). Therefore, the AV is updated as an NRC-identified Green NCV of 10 CFR 50, Appendix B, Criterion III, Design Control.

  The dominant accident sequence was a main feeder bus (MFB) bus duct fire combined with a loss of offsite power, failure of both Keowee hydro units (KHUs), and operators failing to transfer emergency feedwater. This sequence resulted in the finding being of very low safety significance. The PD was directly related to the cross-cutting area of Human Performance under the Procedural Compliance aspect of the Work Practices component because the licensee failed to ensure station modification program requirements were followed in the development of post-modification testing. [H.4(b)] (Section 4OA5.5)

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at approximately 100 percent rated thermal power (RTP). The unit was removed from service on April 2 for a refueling outage. The unit was restarted and reached 100 percent RTP on June 11 where it remained for the rest of the inspection period.

Unit 2 began the inspection period at approximately 100 percent RTP. On May 29, the unit was downpowered to 20 percent RTP to repair a steam leak. The unit was returned to 100 percent RTP on June 3 where it remained for the rest of the inspection period.

Unit 3 began the inspection period at approximately 100 percent RTP where it remained for the rest of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

Hot Weather Preparations: The inspectors reviewed the licensee's preparations for adverse weather associated with high ambient temperatures to ensure equipment used in the licensee's procedures was capable of functioning as intended. This included field walkdowns to assess the material condition and operation of ventilation and cooling equipment, as well as a review of procedures designed to align equipment to support operation during the summer months. Risk-significant systems and areas reviewed included the standby shutdown facility, the auxiliary building, portions of the turbine building and the Essential Siphon Vacuum Building. In addition, the inspectors conducted discussions with operations, engineering, and maintenance personnel in order to assess the licensee's ability to identify and resolve deficient conditions associated with hot weather protection equipment prior to actual hot weather being experienced at the site.

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 that 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.

Actual Adverse Weather Conditions: The inspectors assessed the licensee's response to the following adverse weather condition.

- On April 20, the licensee entered the abnormal procedure for Natural Disaster due to notification of a severe thunderstorm warning in the area. The inspectors reviewed licensee actions for severe weather onsite including high winds. The inspectors walked down external areas of the plant, including the transformer yard and ductbank area to verify the absence of debris that could become missiles due to high winds and that yard drains were free of debris and silt.

External Flooding- Operating Experience Smart Sample (OpESS) FY 2010-01, Recent Inspection Experience for Components Installed Beyond Vendor Recommended Service Life: The inspectors conducted a review of the licensee's control of below grade penetrations into the auxiliary building to determine if they were adequately protected from rain and groundwater intrusion and to determine if they were appropriately controlled as passive design features. Additionally, the inspectors reviewed the service life of the penetration sealant material using the guidance in Operating Experience Smart Sample (OpESS) FY 2010-01, "Recent Inspection Experience for Components Installed Beyond Vendor Recommended Service Life." The inspectors also reviewed the FSAR credited external flood protection features for preventing heavy rain from entering the Auxiliary Building. The inspectors conducted a walkdown of the below grade Auxiliary Building and the outside trenches to ensure they protected plant equipment from water intrusion. Documents reviewed are listed in the Attachment.

b. Findings

Introduction: A self-revealing Green finding was identified for the licensee's failure to implement the requirements of the modification program to ensure the NPBS BWST/ SSF trench foundation modification did not adversely impact the function of the yard drain system which was credited for external flood protection.

Description: During a walkdown of the auxiliary building (AB) following heavy rain on March 4 and March 9, 2011, the inspectors observed rainwater entering the shared Unit 1/Unit 2 spent fuel pool (SFP) cooler room and the Unit 2 "A" low pressure injection (LPI) and reactor building spray (RBS) pump room. The inspectors observed that the NPBS BWST/SSF trench foundation modification design sloped the new BWST foundation toward the AB West wall near the Unit 2 BWST piping trench. As a result, rainwater pooled against the AB outer wall, entered the external BWST piping trench. Contributing factors included missing sealant around the BWST piping trench covers and blockage in the trench drainage system which prevented water from draining. The trench overflowed inside the AB and allowed approximately 2,400 gallons of rainwater into the Unit 1/Unit 2 SFP cooler room and the Unit 2 "A" LPI/RBS pump room. EDM-601, Engineering Change Manual, Appendix Q, required a review to verify flood protection features were not affected by the planned modification. This was not identified by the licensee as having the potential to impact external flood protection features, including the yard drain system, as described in section 3.4.1.1 of the Oconee FSAR during field walkdowns. The condition was entered into the licensee's corrective action program as PIP O-11-3285.

Analysis: The failure to implement the requirements of the modification program to verify the NPBS BWST/SSF trench foundation modification did not adversely impact flood protection features was a PD. The PD was more than minor because it was associated with the Mitigating Systems cornerstone attribute of Protection Against External Factors - Flood Hazard and adversely affected the cornerstone objective in that the design modification bypassed the yard drain system which was credited for external flood protection. The inspectors used IMC 0609, Attachment 4, and determined that the finding was of very low safety significance (Green) because the rainwater intrusion did not result in the loss of operability or functionality of safety-related SSCs. The cause of the finding was directly related to the appropriately planning work activities cross-cutting aspect of the Work Control component in the area of Human Performance because the licensee failed to incorporate environmental conditions which may impact plant structures into the implementation of the modification. [H.3(a)]

Enforcement: Because this finding does not involve a violation of regulatory requirements and has very low safety significance, it is identified as FIN 05000270/2011003-01, Inadequate Design Verification of the NPBS-BWST/SSF Trench Foundation.

1R04 Equipment Alignment

a. Inspection Scope

Partial Walkdown: The inspectors performed the four 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 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.

- Units 1 and 2 spent fuel pool cooling and recirculating cooling water systems following core offload during the refueling outage
- Protection of the temporary chiller and associated cooling lines with the “A” and “B” chillers removed from service for duplex strainer replacement
- Keowee Hydro Unit 1, CT-4 Blockhouse, and SSF with Keowee Hydro Unit 2 out of service
- SSF auxiliary service water guard pipe

Complete System Walkdown: The inspectors performed a walkdown of the Unit 1 high pressure injection (HPI) system. 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 and evaluate the overall material condition of the system. The inspectors reviewed maintenance work orders to determine if the licensee had properly identified and prioritized equipment problems that could cause initiating events or impact the capability of mitigating systems or barriers. 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 five 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.

- CT-1, CT-2 & CT-3 Transformer Area, 1T, 2T & 3T Transformer Area, Unit 1, 2 & 3 Main Transformer Area
- Unit 1/Unit 2 Main Control Room
- Unit 1 East & West Penetration Rooms
- 230kV/525kV switchyard areas (in conjunction with the grid stability Inspection Procedure)
- Unit 1 Reactor Building

b. Findings

No findings were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Internal Flood Protection: The inspectors reviewed the following activity to verify that the licensee's turbine building flood control measures were implemented while performing Unit 1 condenser maintenance during the 1EOC26 refueling outage. The inspectors reviewed the applicable portions of OP/1/A/1104/012 E, Isolation and Re-Flooding Condenser Circulating Water (CCW) Inlet Piping. The inspectors verified that Selected Licensee Commitments 16.9.11, Turbine Building Flood Protection Measures were met. Additionally, the inspectors observed inspection of the watertight doors between the

turbine building (TB) basement and the AB first floor to determine the adequacy of the protection provided by the door. The adequacy of penetration sealant on the TB/AB wall was also reviewed.

Submerged or Buried Cable Inspection: The inspectors inspected the condition of the following two cable trenches through direct observation. The inspectors verified the trenches contained no standing water and that the cables were intact and in good condition. Documents reviewed are listed in the Attachment.

- SSF Trench Duct bank Segment 11 Tie-in
- CT-21 Siphon Seal Water to Intake Trench

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) Activities

a. Inspection Scope

The inspectors conducted a review of the implementation of the licensee's ISI program for monitoring degradation of the reactor coolant system, steam generator (SG) tubes, emergency feedwater systems, risk-significant piping and components and containment systems. This review constituted one sample. Documents reviewed are listed in the Attachment.

Non-Destructive Examination (NDE) Activities and Welding Activities: The inspectors reviewed the seven records of non-destructive examinations (NDEs) listed in the Attachment to evaluate compliance with the American Society of Mechanical Engineers (ASME) Code Section XI and Section V requirements and to evaluate if any detected indications and defects were properly dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement.

The licensee did not identify any recordable indications that were accepted for continued service during non-destructive surface and volumetric examinations performed since the previous refuelling outage.

The inspectors reviewed the following three pressure boundary welds for risk-significant systems since the last Unit 1 refueling outage to evaluate if the licensee applied the pre-service NDEs and acceptance criteria required by the construction code and ASME Code Section XI. In addition, the inspectors reviewed the welding procedure specification, welder qualifications, welding material certification and supporting weld procedure qualification records to evaluate if the weld procedures were qualified in accordance with the requirements of construction code and ASME Code Section IX.

- Work Order 01871771-07, EC-91877/OD500932 U0 (Common) Protected Service Water (PSW) Large Bore Header Piping

- Work Order 01871775-04, EC-91877/OD500932 U0 (Common) PSW Large Bore Piping Supports
- Work Order 01871775-11, EC-91877/OD500932 U0 (Common) PSW Large Bore Piping Supports

In addition, the inspectors observed licensee activities associated with surveillance of tendon 24H39, end 1, to evaluate if the work was conducted in accordance with Subsection IWL of Section XI of the ASME Code using approved procedures and by qualified personnel. The inspectors also interviewed the licensee's responsible engineer for the tendon surveillance program and discussed the overall program and the results of the current surveillance to date. The inspectors also reviewed the 2006 tendon surveillance report for Unit 1 for compliance with the ASME Code. The unit was in the second interval of the containment ISI plan and the code of record was the 1998 Edition with the 1999 and 2000 Addenda of Subsection IWL, Requirements for Class CC Concrete Components of Light Water Cooled Power Plants, of Section XI, Division 1, of the ASME Code.

Unit 1Reactor Pressure Vessel Upper Head (RPVUH) Penetration Inspection Activities: No examination was required pursuant to 10 CFR 50.55 a.(g)(6)(ii)(D) for the current refueling outage.

Boric Acid Corrosion Control (BACC): The inspectors performed an independent walkdown of portions of the containment which recently received a licensee boric acid walkdown and evaluated if the licensee's BACC visual examinations emphasized locations where boric acid leaks could cause degradation of safety-significant components. The inspectors reviewed the following evaluations of and corrective actions for reactor coolant system components with boric acid deposits against ASME Code Section XI and 10 CFR Part 50, Appendix B, Criterion XVI to evaluate if degraded components were documented in the CAP.

- PIP O-11-03447, 1CF-LT-0013P Threaded Fitting Leak
- PIP O-09-08950, Reactor Coolant System High Point Vent
- PIP O-09-08960, Hanging Drop at Relief Outlet Port of 1SF-126

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

- Interviewed Eddy Current Testing (ET) data analysts and reviewed 10 samples of ET data.
- Compared the numbers and sizes of SG tube flaws/degradation identified, against the licensee's previous outage Operational Assessment predictions.
- Reviewed the SG tube ET examination scope and expansion criteria.
- Evaluated if the licensee's SG tube ET 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. No new degradation mechanisms were identified during the ET examinations.

- Reviewed the licensee's repair criteria and processes.
- Verified primary-to-secondary leakage (e.g., SG tube leakage) was below three gallons per day, or the detection threshold, during the previous operating cycle.
- Evaluated if the ET 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 the licensee's secondary side SG Foreign Object Search and Removal activities.
- Reviewed the licensee's evaluations and repairs for SG tubes damaged by foreign material or tubes surrounding inaccessible foreign objects left within the secondary side of the steam generators
- Reviewed ET personnel qualifications.

Problem Identification and Resolution: To evaluate compliance with 10 CFR 50, Appendix B, Criterion XVI requirements, the inspectors performed a review of ISI/SG-related problems entered into the CAP and interviewed licensee staff to verify the licensee had:

- established an appropriate threshold for identifying ISI/SG-related problems
- performed a root cause (if applicable) and taken appropriate corrective actions
- evaluated operating experience and industry generic issues related to ISI and pressure boundary integrity.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed one active simulator examination to assess the performance of licensed operators during a simulator training session. The scenario included an earthquake, a dropped rod, a steam generator tube leak, a second dropped rod, and a manual reactor trip followed by a loss of all main feedwater pumps. The inspection focused on high-risk operator actions performed during implementation of the abnormal and emergency operating procedures, and the incorporation of lessons learned from previous plant and industry events. The classification and declaration of the Emergency Plan by the Operations Shift Manager was also observed during the scenario. The post-scenario critique conducted by the training instructor and the crew was observed. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's effectiveness in performing the following corrective maintenance activity. This review 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. 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 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.

- Repair of the Unit 1 TDEFW Pump Turbine control valve, 1MS-95, not controlling speed correctly

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 six activities listed below: (1) the effectiveness 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.

- Review of the 1EOC26 Risk Assessment Report for the Unit 1 refueling outage
- Review of Complex Activity Plan and Heavy Lift Plan associated with the movement and placement of the cable raceway structure at Manhole #7
- Review of Critical Activity Plan and Risk Management Actions associated with the duplex strainer replacement for the "A" and "B" chillers
- Review of the unplanned Orange PRA condition due to OTS1-1, SSF AC Supply Breaker, tripping open on April 26, 2011
- Review of Complex Activity Plan associated with the repair of the East and West fuel upenders requiring diving in the refueling canal

- Review of Complex Activity Plan associated with replacement of the Keowee Supervisory System

b. Findings

No findings were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following four 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. Documents reviewed are listed in the Attachment.

- PIP O-11-5004, No AC Power available at SSF
- PIP O-11-5353, Keowee-Potential Operability Issue of Designated Overhead Path following trip operations of Keowee air circuit breakers (ACBs) 1 & 2
- PIP O-11-6753, IDO/PDO associated with 2HP-21 and 3HP-21
- PIP O-11-4005, Grid Strap found on bottom grid in debris scan after offload

b. Findings

No findings were identified

1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications

a. Inspection Scope

Tornado/ High-Energy Line Break (HELB) Project Modification – Protected Service Water System Changes: The inspectors reviewed Engineering Change (EC) packages; construction documents, including isometric system drawings and support drawings; and interviewed licensee personnel related to the installation of the PSW System. The inspectors walked down selected sections of the installed PSW system piping in Unit 2 to verify that the installation was in accordance with the licensee's design documents. The inspectors reviewed locations of piping transitions, piping supports, valves, and other features. In addition, the inspectors reviewed several supports for compliance with approved licensee drawings, including material, member size, base plate size, weld size, anchor bolt size and location, and other associated items. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

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

Permanent Plant Modifications

- EC 91834, Unit 1 HPI Alternate Power Feed From PSW
- EC 91873, 4160V power cable 1XPSW run from Manhole 7 outside the Auxiliary Building through the raceway and then ductbank section 7 and into the PSW building (approximately 1000 feet)
- EC 91876, SSF Feed from PSW Switchgear

Temporary Plant Modifications

- EC 102445, Temporary NI to support reactor protection system (RPS)
- EC 106233 and 106237, Provide Air to Spring Side of Bettis Actuator for 2, 3HP-5

b. Findings

No findings were identified.

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.

- PT/0/A/0620/009, Keowee Hydro Operation, following Keowee Hydro Unit 2 ACB-4 relief valve replacement
- SSF diesel generator test following monthly preventive maintenance
- 3C LPI pump run following lubrication PM and boron cleaning

- Unit 1 letdown valve, 1HP-5, stroke test following actuator spring replacement
- Units 2 and 3 HP-5 stroke testing following air assist modification
- 2B LPI pump test after train maintenance

b. Findings

No findings were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors evaluated licensee outage activities associated with the Unit 1 refueling outage to determine if the licensee considered risk in developing outage schedules; adhered to administrative risk reduction methodologies they developed to control plant configuration; adhered to operating license, TS and Selected Licensee Commitment requirements and procedural guidance that maintained defense-in-depth; and developed mitigation strategies for losses of the key safety functions. The inspectors reviewed the licensee's outage risk control plan 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 also conducted portions of the following activities associated with the refueling outage. Documents reviewed are listed in the Attachment.

- Observed Just-in-Time training conducted for the shift involved in the removing the unit from service and unit cooldown which simulated bringing the unit from Mode 3 to Mode 5
- 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 3 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
- Observed the removal and reinstallation of the reactor vessel head and plenum assembly to ensure the lift was conducted in accordance the station procedures and heavy lift guidance
- Periodically reviewed the setting and maintenance of containment integrity, to establish that the reactor coolant system and containment boundaries were in place and had integrity when necessary
- Observed fuel handling operations during new fuel receipt, movement into the spent fuel pool, reactor core offload and reload including review of the videotape core loading verification and alignment to verify that those operations and activities were being performed in accordance with TS and procedural guidance

- 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 ten 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/1/A/0251/019, Unit 1 Main Steam Atmospheric Dump Valve Functional Test
- IP/0/A/0305/014 A, Unit 3 RPS Control Rod Drive Breaker Trip and Events Recorder Timing Test, Rev 11
- PT/0/A/0610/022, Degraded Grid and Switchyard Isolation Test, Rev 30
- IP/0/A/3010/011, Inspection of Electrical Penetration Enclosures, Rev 08
- PT/2/A/0202/011, High Pressure Injection Pump Test, Rev 81
- PT/1/A/0400/020, SSF RC Letdown Line Discharge Test

In-Service Tests
- PT/3/A/0203/006A, 3A Low Pressure Injection Pump Test

Containment Isolation Valve Tests
- PT/1/A/0151/024, Penetration 24 Leak Rate Test
- PT/1/A/0151/006, Penetration 6 Leak Rate Test

Reactor Coolant System Activity Sampling
- CP/2/A/2002/001, Unit 2 Primary Sampling System

b. Findings

No findings were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors participated in and evaluated an Emergency Response Organization drill held on June 14, 2011, which involved activation of the Oconee Technical Support Center, Operations Support Center and Emergency Operations Facility in Charlotte. The licensee's response to the simulated event was observed from the Technical Support Center. The staff's implementation of the Emergency Plan and offsite notifications were also observed. The drill involved a design basis earthquake resulting in an Alert declaration, followed by a large break loss of coolant accident (LOCA) leading to a Site Area Emergency. The drill was terminated following a General Emergency declaration due to loss of all three fission product barriers after the containment barrier was breached at the emergency hatch. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 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 5. Documents reviewed are listed in the Attachment.

Cornerstone: Mitigating Systems
- MSPI, High Pressure Injection (3 units)
- MSPI, Support Cooling Water Systems (3 units)

Cornerstone: Barrier Integrity
- RCS Activity (3 units)

For the period of April 1, 2010, through March 31, 2011, the inspectors reviewed Chemistry database data, 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 data reported for the nine PIs reviewed.

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

.1 Daily Screening of Corrective Action Reports

In accordance with IP 71152, Problem Identification and Resolution, 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, Problem Identification and Resolution, 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 repetitive equipment issues, 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 2011 through June 2011, 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 team lists, Independent Nuclear Oversight reports, system and component health 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

Control of Vehicles Within the Protected Area (PA): The inspectors identified a trend during the second half of 2009 associated with the failure to properly control vehicles within the PA. As a result of this NRC-identified trend, the licensee initiated PIP O-10-0225 which was closed to PIP O-10-0232 for corrective actions. Significant improvement in the number of uncontrolled vehicles was observed during the period of

January 1, 2011, to June 30, 2011. Accordingly, this trend statement will no longer be followed in subsequent integrated inspection reports.

Capturing Plant Issues in the Corrective Action Program: The inspectors identified a trend during the second half of 2009 associated with weaknesses in the implementation of the CAP program which was documented in IR 05000269, 270, 287/2009005. The trend focused on inconsistent initiation of PIPs when the criteria in the CAP was met and not fully describing the issue to allow appropriate corrective actions to be developed or trends codes applied to allow for adverse trends to be readily identified. Following identification of this trend, the licensee initiated PIP O-10-0182 in early 2010. The corrective actions developed in this PIP were narrowly focused. As a result, examples continue to be noted in both the inconsistent initiation of PIPs and describing the issue in sufficient detail and clarity. The licensee initiated another PIP which expanded the scope of the initial PIP and conducted an apparent cause evaluation to ensure appropriate corrective actions were developed and implemented in a timely manner. Improvement in these areas remains inconsistent and continuing examples have been noted by the inspectors over the past 6 months. The inspectors will continue to monitor the licensee's progress in this area.

4OA3 Event Follow-up

.1 Unit 2 Rapid Downpower to 50 percent RTP As a Result of Increased Steam Leakage on the 2B2 Moisture Separator Reheater (MSR) Expansion Joint

a. Inspection Scope

On May 29, 2011, the control room received notification that a previously identified steam leak on the Unit 2 B2 MSR drain line expansion joint increased considerably. The licensee entered the AP for Rapid Unit Shutdown to reduce the leakrate. The inspectors observed the transition into the AP and operator actions taken to verify the actions taken were according with procedural guidance. No operational issues were identified. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2 Unit 2 Dropped Control Rod

a. Inspection Scope

On May 31, 2011, Unit 2 control rod group 7 rod 1 unexpectedly dropped into the core. The AP for unit runback was entered and a cause investigation team was formed. The inspectors confirmed the AP actions taken. No operational issues were identified. The licensee confirmed the reason for the dropped rod was a failed stator output breaker. The breaker was replaced and the licensee returned to full power following breaker replacement and testing on June 3, 2011. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.3 Unit 1 RPS Declared Inoperable

a. Inspection Scope

On June 10, 2011, during startup and power escalation of Unit 1 following a refueling outage, the licensee determined the power range nuclear instrumentation was not responding adequately to power imbalance differences. It was discovered that wires associated with the nuclear instruments that input into the RPS channels were incorrectly terminated during modification work that occurred during the outage. As a result of this condition the licensee declared all four channels of RPS inoperable, and subsequently re-terminated the wires to restore the system to an operable state. The inspectors verified the actions required by the TS were completed. The licensee determined the event was reportable under 10 CFR 50.72(b)(3) due to a loss of safety function, and issued NRC Event Notification 46947 describing the event. The inspectors reviewed the content of the report to determine its accuracy. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.4 Notice of Enforcement Discretion (NOED) Review

a. Inspection Scope

The inspectors reviewed NOED 11-2-03 and related documents to determine the accuracy and consistency with the licensee's assertions. The inspectors also verified the implementation of the licensees' compensatory measures and commitments to (1) defer non-essential surveillances and other maintenance activities in the switchyard to reduce the likelihood of a loss of offsite power, (2) defer non-essential surveillances and other maintenance activities on risk-significant equipment including the Keowee Emergency Power System, the emergency feed water turbine-driven pumps, and the standby shutdown facility, (3) post a dedicated operator in the SSF for the NOED duration, (4) implement procedural steps that, from the control room, manually isolate letdown and valves downstream of HP-5, and (5) monitor grid conditions to ensure that the conditions of the severe weather NOED continue to exist.

b. Findings

Introduction: An unresolved item (URI) was identified for NOED 11-2-03.

Description: On January 8, 2011, during Unit 1 ES digital channel 2 testing, valve 1HP-5 failed to fully close following an inadvertent close signal. A root cause investigation found that improper material selection for the gland ring in a 2003/2004 modification resulted in a loss of margin for the actuator for the valve, as well as similar valves on ONS Unit 2 and Unit 3. On May 31, 2011, discussions with valve vendor identified that the software used in the licensee's operability determination for the Unit 2 and Unit 3 valves may calculate non-conservative torque values resulting in a reduction in the valves' closing margin. Ongoing evaluations indicated the required spring closing forces were inadequate resulting in a negative closing margin at normal reactor coolant system pressures. On June 2, at approximately 12:10 p.m., containment isolation valves 2HP-5, 2HP-21, 3HP-5, and 3HP-21 were declared inoperable.

The licensee determined that placing Unit 2 or Unit 3 in MODE 5 would result in power delivery challenges during a period of significant grid demand and could result in adverse consequences to the health and safety of the public. On this basis the licensee requested a severe weather NOED, on June 2, 2011, for a period of 14 days or until electrical grid conditions are predicted to return to normal for a period of at least 10 days to ensure the safe and orderly shutdown of one or both ONS units to restore compliance with TS 3.6.3. An independent assessment by NRC staff with consultation with SERC Reliability Corporation confirmed the licensees' assertion of the grid stability conditions. The NRC verbally granted the NOED at 6:30 p.m., on June 2. The licensee returned 2HP-5, 2HP-21, 3HP-5, and 3HP-21 to operable status after performing a modification to add additional closing force to regain necessary margin on June 11, 2011. Additional inspection is required to conduct a review of the LER, root cause, and planned corrective actions. This is identified as URI 05000270, 287/2011003-02, Follow-up of NOED 11-2-03.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours. These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status reviews and inspection activities.

b. Findings

No findings were identified.

.2 (Closed) NRC Temporary Instruction 2515/183, Follow-up to the Fukushima Daiichi Nuclear Station Fuel Damage Event

a. Inspection Scope

The inspectors assessed the activities and actions taken by the licensee to assess its readiness to respond to an event similar to the Fukushima Daiichi nuclear plant fuel damage event. This included (1) an assessment of the licensee's capability to mitigate conditions that may result from beyond design basis events, with a particular emphasis on strategies related to the spent fuel pool, as required by NRC Security Order Section B.5.b issued February 25, 2002, as committed to in severe accident management guidelines, and as required by 10 CFR 50.54(hh); (2) an assessment of the licensee's capability to mitigate station blackout (SBO) conditions, as required by 10 CFR 50.63 and station design bases; (3) an assessment of the licensee's capability to mitigate internal and external flooding events, as required by station design bases; and (4) an assessment of the thoroughness of the walkdowns and inspections of important equipment needed to mitigate fire and flood events, which were performed by the licensee to identify any potential loss of function of this equipment during seismic events possible for the site.

b. Findings

Inspection Report 05000269/2011014, 05000270/2011014, 05000287/2011014 (ML111330175) documented detailed results of this inspection. Following issuance of the report, the inspectors conducted detailed follow-up on selected issues. No findings were identified during this follow-up inspection. Two issues documented in section 03.01e of IR 2011014 were further reviewed by the inspectors. A licensee-identified issue related to the Unit 2 Reactor Building vent path was determined to not be a violation of regulatory requirements. An issue the inspectors identified related to the electric submersible pumps was determined to be a minor violation of TS 5.4.1 because these pumps would not be used for mitigation of an AB flood. Therefore, this violation is not subject to formal enforcement action.

.3 (Closed) NRC Temporary Instruction 2515/184, Availability and Readiness Inspection of Severe Accident Management Guidelines (SAMGs)

On May 27, 2011, the inspectors completed a review of the licensee's severe accident management guidelines (SAMGs), implemented as a voluntary industry initiative in the 1990's, to determine (1) whether the SAMGs were available and updated, (2) whether the licensee had procedures and processes in place to control and update its SAMGs, (3) the nature and extent of the licensee's training of personnel on the use of SAMGs, and (4) licensee personnel's familiarity with SAMG implementation.

The results of this review were provided to the NRC task force chartered by the Executive Director for Operations to conduct a near-term evaluation of the need for agency actions following the Fukushima Daiichi fuel damage event in Japan. Plant-specific results for the Oconee Station were provided as an Enclosure to a memorandum

to the Chief, Reactor Inspection Branch, Division of Inspection and Regional Support, dated June 02, 2011 (ML111530328).

.4 (Closed) VIO 05000270, 287/2010007-02, Materially Inaccurate Information Provided To NRC Regarding SSF Event Mitigation Capability

a. Inspection Scope

By letter dated August 12, 2010, the NRC issued a Severity Level (SL) III violation of 10 CFR 50.9 when the licensee provided materially inaccurate information regarding the alternate method to control RCS inventory from the SSF. The inspectors conducted the following inspection activities. Documents reviewed are listed in the Attachment.

- Reviewed the root cause evaluation (RCE) for adequacy
- Verified that the licensee had assigned responsibility for implementing corrective actions
- Verified that the corrective actions (CAs) were either implemented or scheduled for implementation commensurate with safety significance

b. Findings and Observations

No findings were identified. The inspectors determined the root cause analysis used recognized methods, the corrective actions generally addressed the identified root causes, and the corrective actions and effectiveness reviews were appropriately scheduled for completion. The inspectors had the following observations which did not constitute violations of regulatory requirements:

- Due dates for CAs were being extended for various reasons including resources, scheduling conflicts, or reassignment to another group. Several corrective actions were to be included in effectiveness reviews which were scheduled for six months after the implementation of the CA. Extension of CA due dates would also extend the effectiveness review.
- One CA was to control work hours of the engineering department using the pre-10 CFR 26 work hour restrictions. However, this was implemented by communicating these restrictions using informal communications such as a departmental e-mail and posting them on the departmental webpage. These work hour restrictions were not placed in any administrative procedure nor was it clear if these restrictions were temporary or permanent.
- The licensee had earlier performed a high level apparent cause (PIP O-10-0561) for providing inaccurate information to NRC. The RCE took credit for several completed CAs in PIP O-10-0561; however, these CAs were not tracked in the RCE. In one case, a completed CA from PIP O-10-0561 was identified as a corrective action to prevent recurrence (CAPR) in the RCE. This CAPR was not tracked in the RCE and had been deleted from PIP O-10-0561.
- One CA, which was identified as a CAPR to modify Nuclear System Directive (NSD) 227, did not appear to address the root cause of not following NSD 227. The licensee determined that the CA was not intended as a CAPR, but instead as an

enhancement to NSD 227. The CAPR was to review NSD 227 which was completed as a corrective action for the high level apparent cause.

.5 Apparent Violation (AV) 05000269, 270, 287/2011002-02, Inadequate Post Modification Testing of SSF DG Modification

a. Inspection Scope

A regional SRA performed a Phase III SDP analysis to determine the safety significance of a condition that resulted in a lock out of the SSF DG. This condition was previously documented in NRC Inspection Report (IR) 05000269, 270, 287/2011002, Section 1R18, as a potentially Greater than Green finding.

b. Findings

Introduction: Based on a completed Phase III SDP analysis, the finding was determined to be of very low safety significance (Green). Therefore, the AV is updated as an NRC-identified Green NCV of 10 CFR 50, Appendix B, Criterion III, Design Control.

Description: This condition was previously documented as AV 05000269, 270, 287/2011002-02, Inadequate Post Modification Testing of SSF DG Modification.

Analysis: As documented in IR 05000269, 270, 287/2011002, the inspectors determined that a Phase III SDP analysis was required because this finding represented a potential loss of function for a single train system which was not addressed by either the Phase II pre-solved tables or the plant-specific worksheets.

The Combustion Engineering Owner's Group RCP Seal LOCA model was used for Units 2 & 3. The Westinghouse Owner's Group model was used for Unit 1. Recovery of the SSF diesel generator from the PD was not credited and a one year exposure time was used in the evaluation. The PD affected all three units.

The accident sequences associated with the PD involved losses of offsite power with a KHU initially re-powering critical loads without load shedding the Unit 2 main feeder bus (MFB) #2 which was the normal power source for the SSF. KHUs can power the MFBs through an underground or an overhead line; however, KHUs powering MFBs through the underground line were excluded from the analysis. The KHU powering MFB #2 must fail and the other KHU must have previously failed or fail during the mission time such that the SSF would be required. System design includes a load shed of the normal SSF power supply breaker when the underground line powers the MFBs. Therefore, the 86 relay would not lockout the SSF diesel generator from operating because the recorder would not be re-powered. The dominant accident sequence began with a MFB bus duct fire with the switchyard isolating on a hot short of a cable impacted by the fire which resulted in a loss of offsite power. Also, as a result of cables being damaged by the fire, the underground path locked out such that the only available path for the KHUs was the overhead path. However, after successful KHU operation, the overhead path to Unit 2 also locked out due to cable damage from the fire. This created the condition for the PD to actuate the 86 relay and prohibit the SSF diesel generator from starting. Initially

secondary side heat removal was accomplished via the turbine driven emergency feedwater train; however, operators were unsuccessful in transferring the pump's suction to its long term source. Also, operators failed to cross-tie to another unit's emergency feedwater system. Finally, operator attempts to use the SSF with its diesel for electrical power to provide secondary side heat removal failed due to the PD. Without core cooling, core damage occurred. The probability of a MFB bus duct fire combined with a loss of offsite power, failure of both KHUs, and operators failing to transfer emergency feedwater resulted in the finding being of very low safety significance (Green).

The PD was directly related to the cross-cutting area of Human Performance under the Procedural Compliance aspect of the Work Practices component because the licensee failed to ensure station modification program requirements were followed in the development of post-modification testing. [H.4(b)]

Enforcement: 10 CFR 50, Appendix B, Criterion III, Design Control, required, in part, that design control measures shall ensure the adequacy of design be verified or checked, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program. EDM 601, Engineering Change Manual, required that post-modification testing for design changes, should assure the functionality of the modified system, structure or component. Contrary to the above, from October 2008 to May 2010, design control measures did not ensure that the adequacy of the SSF DG main bearing digital chart recorder modification was verified or checked. Post modification testing of the new digital chart recorder on the SSF DG did not ensure the modification had not adversely affected the design function of the SSF DG. As a result, the SSF DG would not have started during certain events described in the UFSAR. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program as PIP O-10-3882, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy: NCV 05000269, 270, 287/2011002-02, Inadequate Post Modification Testing to Ensure SSF DG Functionality.

.6 (Closed) Unresolved Item (URI) 05000287/2010005-04, Potential Inoperability of the Unit 3 Standby Shutdown Facility Reactor Coolant Makeup Pump

A URI was documented in Inspection Report 05000287/2010005 to determine if seat leakage identified during testing of the Unit 3 SSF Reactor Coolant Makeup (RCM) pump discharge relief valve, 3HP-404, affected the safety function of the SSF RCM system. The licensee performed testing to determine if the leakage would increase over time resulting in the SSF RCM pump failing to meet its minimum design flow rate over the 72-hour mission time of the SSF. The testing demonstrated that the SSF RCM subsystem would have remained operable for its required mission time. The associated performance deficiency was determined to be minor. The issue was entered in the licensee's CAP as PIP O-10-6613.

.7 Administrative Correction of Tracking Number

In IR 2011002, the List of Report Items incorrectly listed NCV 2011002-001 as applicable to all three units instead of only Unit 2 as stated in Section 1R13. Also, the title provided did not match the title in Section 1R13. The corrected entry is provided in the List of Report Items for this report.

4OA6 Management Meetings (Including Exit Meeting)

Exit Meeting Summary

The resident inspectors presented the inspection results to Mr. Gillespie, and other members of licensee management on July 11, 2011. The licensee acknowledged the findings presented. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary and no proprietary information was identified.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee
K. Alter, Regulatory Compliance Manager
S. Batson, Station Manager
J. Bohlmann, Organization Effectiveness Manager
S. Boggs, Emergency Services Coordinator
E. Burchfield, Superintendent of Operations
P. Downing, Steam Generator Maintenance & Engineering
P. Fisk, Mechanical/Civil Engineering Manager
P. Gillespie, Site Vice President
R. Hester, IWL Responsible Engineer
E. Hurley, Steam Generator Maintenance & Engineering
T. King, Security Manager
D. Mayes, Steam Generator Maintenance & Engineering
B. Meixell, Regulatory Compliance Engineer
T. Patterson, Safety Assurance Manager
J. Pounds, OMP Tornado/HELB QA Oversight
T. Ray, Engineering Manager
D. Robinson, Radiation Protection Manager
J. Smith, Regulatory Compliance

NRC
J. Stang, Project Manager, NRR

LIST OF REPORT ITEMS

Opened and Closed		
05000270/2011003-01	FIN	Inadequate Design Verification of the NPBS-BWST/SSF Trench Foundation (Section 1RO1)
05000269, 270, 287/2011002-02	NCV	Inadequate Post Modification Testing to Ensure SSF DG Functionality (Section 4OA5.5)
05000270/2011002-01	NCV	Inadequate Risk Management Associated with the Removal of the Unit 2 West Penetration Room Girts (Section 4OA5.7)
Opened		
05000270, 287/2011003-02	URI	Follow-up of NOED 11-2-03 (Section 4OA3.4)
Closed		
2515/183	TI	Follow-up to the Fukushima Daiichi Nuclear Station Fuel Damage Event (Section 4OA5.2)

Attachment

2515/184	TI	Availability and Readiness Inspection of Severe Accident Management Guidelines (Section 4OA5.3)
05000270, 287/2010007-02	VIO	Materially Inaccurate Information Provided To NRC Regarding SSF Event Mitigation Capability (Section 4OA5.4)
05000287/2010005-04	URI	Potential Inoperability of the Unit 3 Standby Shutdown Facility Reactor Coolant Makeup Pump (Section 4OA5.6)

DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

AP/0/A/1700/006, Natural Disaster, Rev. 21
AP/1/A/1700/034, Degraded Grid, Rev. 7
COP-NUC-P01, TCC/SOC Response to Nuclear Switchyard Low Voltage
NSD 417, Nuclear Facilities/Generation Status Communications, Rev. 13
PT/0/A/0610/022, Degraded Grid and Switchyard Isolation Test, Rev. 30
PIP O-11-4989, Complete Operational turnover of the ONS 525kV swyd with PD
PIP O-11-2716, Update for 2011 Degraded Grid Voltage alarm values for the OAC
PIP O-11-3711, All 3 Units entered AP/34 Degraded Grid
OP/0/A/1104/019, Control Room Ventilation System, Rev. 26
PT/0/A/0110/018, Hot Weather Protection, Rev. 1
OP/0/B/1106/041, Turbine Building Ventilation, Rev. 10
OP/0/A/1104/041, Auxiliary Building Ventilation, Rev. 32
PIP O-11-5785, AHU 0-105 is not running while AHU 3-7 is in operation
OP/0/A/1600/002, SSF Heating Ventilation and Air Conditioning System Operation, Rev. 30
OP/1/A/1104/051, ESV System, Rev. 23
PIP O-11-3285, A concern exists that SD 3.2.16 (Control of Passive Design Features) may not adequately address below grade external penetrations
PIP O-06-3325, This PIP was initiated to facilitate an Oconee review of the root cause and CAPRs (once completed) associated with Catawba PIP C-06-3902- “Unit 2 RC Cooling Tower Overflow Caused 1A DG Room Flooding”
PIP O-11-2631, Need to Evaluate Developing Heavy Rain Response Program
PIP O-11-2782, U2 Cask Decon Room trench floor drains appear to have been clogged during recent heavy rains
PIP O-11-2619, Rainwater has leaked through the south block wall of the HMS into the RCP seal room. The contaminated area boundary was breeched containing appx. 40 square foot of clean area.
PIP O-11-2603, Rainwater intrusion into U1&2 Spent Fuel Cooler room and LPI pump room
PIP O-11-2427, Rainwater intrusion into U1&2 Spent Fuel Cooler room and LPI pump room
NRC Regulatory Guide 1.102, Flood Protection for Nuclear power Plants
Operating Experience Smart Sample (OpESS) FY 2010-01, Recent Inspection Experience for Components Installed Beyond Vendor Recommended Service Life
EC 97950, OD202152- NPBS- Unit 2 BWST / SSF Trench Foundation, Rev. 4
Oconee FSAR Section 3.4.1, Flood Protection

NSD 301, Engineering Change Program, Rev. 37
EDM-601, Engineering Change Manual, Rev. 14
WO 01789727, U2 Inspect and Repair Caulking at BWST Trench Covers
OM 159.--0003.015, Unit 2 BWST / SSF Trench Protection Foundation Plan at Elevation 796'-6", Rev. 5
OM 159.--0003.18, Unit 2 BWST / SSF Trench Protection Foundation Sections, Rev. 3

Section 1R04: Equipment Alignment

OFD-104A-1.1, Flow Diagram of Spent Fuel Cooling System, Rev. 49
OFD-104A-1.2, Flow Diagram of Spent Fuel Cooling System (Purification Loop), Rev. 16
OFD-125A-1.1, Flow Diagram of Recirculating Cooling Water System (Surge Tank, Pumps, and Heat Exchangers), Rev. 14
Critical Activity Plan for the replacement of the "A" and "B" chiller duplex strainer
Protected Equipment log for the "A" and "B" chiller duplex strainer replacement work
High Pressure Injection System Health Report
Report of PIP's initiated on the HPI system for the period of July 2009 to May 2011
Reports of Work Orders issued for the Unit 1 HPI system for the period of July 2009 to May 2011
OP/1/A/1104/002; High Pressure Injection, Rev. 152
Drawing OFD-101A-1.1; High Pressure Injection, letdown section, Rev. 44
Drawing OFD-109A-1.1; Purification Demineralizers, Rev. 17
Drawing OFD-101A-1.2; High Pressure Injection, storage section, Rev. 40
Drawing OFD-101A-1.4; High Pressure Injection, charging section, Rev. 40
Drawing OFD-101A-1.3; High Pressure Injection, charging section, Rev. 24

Section 1R05: Fire Protection

Fire Area Tours
SLC 16.9.2, Sprinkler and Spray Systems
SLC 16.9.4, Fire Hose Stations
SLC 16.9.6, Fire Detection Instrumentation
Fire Pre-Plan for Unit Penetration Rooms

Section 1R06: Flood Protection Measures

MP/0/A/1400/031, Door- Presray Watertight- Preventive Maintenance and Repair, Rev. 13
WO 01941187, U3 Annual Insp of Presray Watertight Door
PIP O-11-5167, AB/TB Penetration #3-TB-30 Sealant Potential Issue
PIP O-11-5176, Some wall thicknesses listed in MP/*/A/1705/018 do not agree with structural drawings

Section 1R08: Inservice Inspection Activities

Procedures
MP/0/A/1400/022, Tendon – Reactor Building – Surveillance, Revision 018
MP/0/A/1400/034, Tendon – Inspection – Corrosion, Revision 007
MP/0/A/1400/035, Tendon Surveillance & Maintenance – Controlling Procedure For Interfacing Vendor Procedures, Revision 001
MP/0/A/1800/134, Hilti Concrete Anchor – Installation
MP/0/A/3019/004, Hangers – QA Condition 1 and 4 – Removal, Installation or Modification
MP/0/A/8140/001, QA and Non-QA Welding, Rev. 001

MP-0-A-1800-132, Inspection and Clean Up of Boric Acid on Plant Materials, Rev. 007
NDEMAN-NDE-25, "NDE Procedures Manual – Volume 3 – NDE-25 Magnetic Particle Examination," Rev. 025
NDEMAN-NDE-35, "NDE Procedures Manual – Volume 3 – NDE-35 Liquid Penetrant Examination," Rev. 023
NDEMAN-NDE-68, "NDE Procedures Manual – Volume 1 – VT-2, Visual Examination for Leakage and Boric Acid Corrosion Control NDE-68," Rev. 003
NSD 322, "Boric Acid Corrosion Control Program," Rev. 002
PDI-UT-8, "generic Procedure for the Ultrasonic Examinations of Weld Overlaid Similar and Dissimilar Metal Welds," Rev. F
SM/0/A/8140/001, Welding of QA and Non-QA Piping, Valves and Components, Rev. 011

Piping System NDE Records
Liquid Penetrant (PT) examination of 1HP-277-52, High Pressure Injection system pipe-to-elbow weld
PT examination of 1RC-261-226, Reactor Coolant System pipe-to-valve weld
Ultrasonic Testing (UT) examination of 1-RPV-25-203-45, Reactor Vessel Closure Stud
UT examination of 1-RPV-25-203-45, Reactor Vessel Closure Stud
UT examination of 1RC-289-5V, Reactor Coolant system pipe-to-nozzle weld
UT examination of Steam Generator B nozzle-to-pipe weld
UT examination of Pressurizer Surge Nozzle weld overlay

Corrective Action Documents
PIP O-11-4500, Possible Loose Part Detected During ET of 1A SG
PIP O-11-4540, ZR100 Robot in 1B SG Had One Foot Stuck in a Tube End
PIP O-11-4702, 1EOC26 Steam Generator Inspection Documentation
PIP O-11-4721, Roll Expander Broke and Got Stuck in Tube 11-45 of 1A SG
PIP O-11-4810, Several Pieces of Spiral Wound Gasket Material Found in 1A SG

Other
0-1436-500932-08, Isometric Piping Layout Protected Service Water Pipe Header, Rev. B
0-1436-500932-09, Isometric Piping Layout Protected Service Water Pipe Header, Rev. A
0-PSW-0012, Protected Service Water System from PSW to Steam Gen and HPI Motor Cooling, Rev. 2
0-PSW-1436D-H5006, Rev. A
Babcock & Wilcox Eddy Current Examination Technique Specification Sheet #1, Rev. 0
Babcock & Wilcox Eddy Current Examination Technique Specification Sheet #2, Rev. 0
Babcock & Wilcox Eddy Current Examination Technique Specification Sheet #3, Rev. 0
Boric Acid Corrosion Control Program & Walkdown Effectiveness, dated April 6 – May 29, 2009
GTSM0101-01, Weld Procedure Specification, Rev. 6
GTSM0808-02, Weld Procedure Specification, Rev. 3
O-0AB-4PSW02-02, Auxiliary Building – Unit 0 – Pipe Support Isometric, Rev. A
WO 01871771-07, EC-91877/OD500932 U0 (Common) PSW Large Bore Header Piping
WO 01871775-04, EC-91877/OD500932 U0 (Common) PSW Large Bore Header Supports
WO 01871775-11, EC91877/OD500932 U0 (Common) PSW Large Bore Header Supports
Oconee Nuclear Station, Unit 1 EOC23, IWL Year 35 Tendon Surveillance Summary and Evaluation Report
Second Interval Containment Inservice Inspection Plan, Document #O-ISIC2-62-0001, Rev. 6

Section 1R11: Licensed Operator Requalification

ASE-32, Active simulator Exam
EP/1/A/1800/001, EOP- IMAs and SAs, Rev. 38
RP/0/B/1000/001, Rev. 29

Section 1R12: Maintenance Effectiveness

WO 01982223, 1MS-95 I/R will not control turbine speed
OFD-122A-1.4, Flow Diagram of Main Steam System (Emergency FDW Pump Turbine Steam Supply and Exhaust), Rev. 23
MP/0/A/1320/012, Valve- G.E. - Control and Trip/Throttle- EFWPT- Disassembly, Cleaning, Inspection, Repair, and Assembly, Rev. 13
MP/0/A/1320/005, Turbine- General Electric- Emergency Feedwater- Disassembly, Repair, and Assembly, Rev. 32
PIP O-11-6047, Resolution of overspeed testing issues on U1 TDEFWP
PIP O-11-5952, The Unit 1 TDEFW Pump is not being properly controlled by (speed) 1MS-95
PIP O-11-5928, PT/1/A/0600/009, U1 Overspeed Testing not meeting acceptance criteria
PIP O-10-7462, As a result of the issues associated with the slow stroke time of 1MS-95 documented in PIP O-10-5931, the basis for inclusion of MS-95 in the supplemental testing program was questioned.
PIP O-10-6112, 1MS-87 not controlling properly due to 1TO-145 limit switches not being set correctly.
PIP O-10-5963, Possible Legacy FME
PIP O-10-5962, 1MS-87 controller would not control pressure during U1 TDEFWP run per PT/1/A/0600/012
PIP O-10-5931, 1MS-95 stroke time was outside of acceptable range.
PIP O-10-5810, U2 TDEFWP Governor Valve did not operate smoothly and freely during testing
PIP O-11-6189, While performing PT/1/A/0600/012, TDEFW Test, pump speed could not be adjusted into acceptable range.
Units 1, 2, 3 Main Steam System Health Reports for 2011 Q1
AP/0/A/1700/025, Standby Shutdown Facility Emergency Operating Procedure, Rev. 49
IP/0/A/0200/037A, Pressurizer Heater Group B Surveillance, Rev. 12
WO 01985093, EC 106231 Unit 1 Replace SSF Pzr Heater Panelboard Breakers
IP/0/A/3011/015, Removal and Replacement of Motor Control Center, panelboards and Remote Starter Components, Rev. 17
EC 106229, Replace SSF Pzr Heater Panelboard Breakers, Rev. 0
EC 106230, Replace SSF Pzr Heater Panelboard Breakers, Rev. 0
EC 106231, Replace SSF Pzr Heater Panelboard Breakers, Rev. 0
PIP O-11-6700, SSF pressurizer panel boards inside containment could potentially trip on high ambient temperature
O-726, Interconnection Diagram Pressurizer Heaters, Rev. 21
OEE-149-8, Elementary Diagram SSF Press. Htr Group B Bank 2, Rev. 23
OEE-149-12, Elementary Diagram SSF Press. Htr Group C Bank 2, Rev. 2
OEE-249-10, Elementary Diagram SSF Press. Htr Bank 2 Group B, Rev. 23
OEE-249-15, Elementary Diagram SSF Press. Htr Group C Bank 2, Rev. 2
OEE-349-10, Elementary Diagram SSF Press. Htr Bank 2 Group 3B, Rev. 23
OEE-349-15, Elementary Diagram SSF Press. Htr Group C Bank 2, Rev. 5

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

1EOC26 IRT Outage Risk Profile and Assessment
Complex Activity Plan for the placement of the cable raceway structure at Manhole #7
Critical Activity Plan for the replacement of the "A" and "B" chiller duplex strainer
Protected Equipment log for the "A" and "B" chiller duplex strainer replacement work
PIP O-11-5003, SSF lost power when OTS1-1 opened unexpectedly
PIP O-11-5004, No AC power available at the SSF
Complex Activity Plan for Diving in the Fuel Transfer Canal for Upender Repair
Work Order 01971958; Repair of Fuel Upender
Complex Activity Plan, EC98548 / OE502286 Replace Keowee Supervisory System

Section 1R15: Operability Evaluations

PIP O-09-1638, KHU-1 ACB-1 leak rate greater than 5 psi/hr; leak rate found at 6.8 psi/hr
PIP O-09-5536, Recurring Keowee ACB statalarms result in operations become desensitized to occurrences
PIP O-11-5392, Keowee- Operator Workaround associated with recurring ACB related Statalarms following trip operations of Keowee ACBs (1-4).
OSS-0254.00-00-1048, Keowee Hydro Air Circuit Breaker (AB) Air System, Rev. 8
OSC-10298, Pzr Ambient Heat Loss Exceeds SSF Controlled Pzr Heaters Capacity, Rev. 0
AP/0/A/1700/025, Standby Shutdown Facility Emergency Operating Procedure, Rev. 49
AP/0/A/1700/025, Standby Shutdown Facility Emergency Operating Procedure, Rev. 51
EC106229, Replace SSF Pzr Heater Panelboard Breakers
Test Procedure for Testing of Circuit Breaker Panels- Phase I for Duke Oconee, June 21, 2011
PIP O-11-6700, SSF pressurizer panel boards inside containment could potentially trip on high ambient temperature
PIP O-11-7635, test specimens of SSF Pressurizer Heater Breakers Installed by EC-106229, 106230, 106231 tripped during qualification testing.
Oconee Nuclear Station- NRC Special Inspection Report 2002008, dated April 22, 2002

Section 1R17: Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications

Design Documents

Engineering Change (EC) Package 91817 (OD 500932), Install Protected Service Water System Header
EC Package 91817 (OD 500934), Install Protected Service Water Test Line/Min. Flow Using Lake Water

Drawings

2-PSW-2436C-H5587, Support Drawing, Sheets 1, 2, and 3, Revision 0
2-PSW-2436C-H5588, Support Drawing, Sheets 1, 2, and 3, Revision 0
2-PSW-2436C-H5589, Support Drawing, Sheets 1, 2, and 3, Revision 0
2-PSW-2436C-H5590, Support Drawing, Sheets 1, 2, and 3, Revision 0
2-PSW-2436C-H5591, Support Drawing, Sheets 1, 2, 3, and 4, Revision 0
O-2AB-4PSW01-01, Auxiliary Building – Unit 2 – Pipe Support Isometric, Revision 0
O-152 B, Auxiliary Building – Units 1 & 2 – Plan at EL 771+0 – Concrete, Revision 32
O-152 G, Auxiliary Building – Units 1 & 2 – Sections at EL 771+0 – Concrete, Revision 16
O-152 K, Auxiliary Building – Units 1 & 2 – Wall Elevation at EL 771+0 – Reinforcing, Revision 8

O-152 Y, Auxiliary Building – Units 1 & 2 – Wall Elevations at EL 771+0 & EL 776+0 – Reinforcing, Revision 4
O-333, Condenser Cooling Water – Units 1, 2, & 3 – Intake Pipe Layout & Details, Revision 11
O-1436A, Piping Layout – Plan Elevation 771'-0" – Auxiliary Building, Revision 69
O-2436C, Piping Layout – Plan Elevation 771'-0" – Auxiliary Building, Revision 69
O-2436E, Piping Layout – Plan Elevation 771'-0" – Auxiliary Building, Revision 51
O-1436-200934-01, Isometric Piping Layout – Protected Service Water CCW Mini-Flow, Revision C
O-1436-500932-01, Isometric Piping Layout – Protected Service Water CLG to HPI Pump MTR Bearing, Revision B
O-1436-500932-02, Isometric Piping Layout – Protected Service Water CLG to HPI Pump MTR Bearing, Revision B
O-1436-500932-03, Isometric Piping Layout – Protected Service Water CLG to HPI Pump MTR Bearing, Revision A
O-1436-500932-04, Isometric Piping Layout – Protected Service Water CLG to HPI Pump MTR Bearing, Revision A
O-1436-500932-05, Isometric Piping Layout – Protected Service Water CLG to HPI Pump MTR Bearing, Revision A
O-1436-500932-07, Isometric Piping Layout – Protected Service Water Pipe Header, Revision B
O-1436-500932-08, Isometric Piping Layout – Protected Service Water Pipe Header, Revision B
O-1436-500932-09, Isometric Piping Layout – Protected Service Water Pipe Header, Revision A
O-1436-500932-10, Isometric Piping Layout – Protected Service Water Pipe Header, Revision A
O-1436-500932-11, Isometric Piping Layout – Protected Service Water Pipe Header, Revision B
O-1436-500932-12, Isometric Piping Layout – Protected Service Water Pipe Header, Revision A
PO12-712120-N01, Velan 8" (DN 200) Bolted Bonnet Gate Valve (Forged), Sheets 1 and 2, Revision DE

Section 1R18: Plant Modifications

TN1/A/EC102445, EC102445 Temporary NI to Support RPS
EC102445, Temporary NI's
91-01, Temporary Nis-EC102445
91-01, 1EOC26 Pre-Outage RPS-ES Mod Implementation
PIP O-11-2794, During 1NI1 post mod testing for temp mod EC102445 the Dixon indicator in the control room failed to operate properly
IP/0/A/301/3A-1,
WO 01899943-38
PIP O-11-2798, Need procedure change for 1NI-1
PIP O-11-2834, Uncommunicated results during performance of IP/0/A/0301/003 A1 in support of Temp NI TN/1/A/EC102445/001
PIP O-11-2633, Wrong type Coax Cable for temp NI was purchased
PIP O-11-2725, While performing installation of Temp NI in preparation for U1 ES/RPS a possible isolation issue was discovered
Final Scope Description for EC91834 Unit 1 HPI Pump and backup Power, Rev. 4
TI/1/A/0500/002, HPI/RC Alternate Power Circuit Testing from Temporary Power, Rev. 1
Post Modification Testing Plan for EC 91834, Rev. 2
TN/1/A/EC91834.AL2, Unit 1 HPI Pump Transfer Switches, Rev. 0
10 CFR 50.59 Screen, EC 91834 (OD100950), Revision 005, U1 HPI Alternate Power Feed from PSW, Rev. 2

O-1422X-29, Instrument Detail Letdown Isolation Valve Control 2HP-5, Rev. 15F
O-2422X-29, Instrument Detail Letdown Isolation Valve Control 3HP-5, Rev. 9E
EC 106233, Provide Air to Spring Side of Bettis Actuator for 2HP-5, Rev. 5
EC 106237, Provide Air to Spring Side of Bettis Actuator for 3HP-5, Rev. 1
OSC-10176, AOV Design Basis Capability Valves HP-0005, 0021, Rev. 2
AR00359337, 000106237, Provide Air to Spring Side of Bettis Actuator for 3HP-5 to Improve Closing Torque, Rev. 1
AR00359404, 000106233, Provide Air to Spring Side of Bettis Actuator for 2HP-5 to Improve Closing Torque, Rev. 3
PT/3/A/0152/011, High Pressure Injection System Valve Stroke Test, Rev. 28
IP/0/A/2001/003A, Inspection and Maintenance of 4.16kV and 6.9 kV ACB

PT/2/A/0203/006A, Low Pressure Injection Pump Test – Recirculation, Rev. 80
WO 01934948, PM 2TD-10 4160V Breakers and Relays

Section 1R19: Post-Maintenance Testing

PT/0/A/0620/009, Keowee Hydro Operation, Rev. 45
KFD-107A-1.1, Flow Diagram of Air Circuit Breaker Air System, Rev. 16
WO 01977784, ACB-4: Failed Leak Rate Test
PIP O-11-4198, ACB-4 Failed its leak rate test per PT/1/A/2000/020
MP/0/A/1840/040A, Pump-Motors-Miscellaneous Components-Lubrication Post Maintenance Testing, Rev. 1
PT/3/A/0204/007, Reactor Building Spray Pump Test, Rev. 89
WO 01930204, 3C LPI Pump: Perform Lubrication PM
PT/0/A/0600/021, Standby Shutdown Facility Diesel-Generator Operation, Rev. 10
OP/0/A/1600/010, Operation of the SSF Diesel-Generator, Rev. 64
PT/0/A/0400/011, SSF Diesel Generator Test, Rev. 14
PT/0/A/0600/023, Standby Shutdown Facility Fuel Oil Inventory, Rev. 6
MP/0/A/5050/017, Diesels – SSF - Operational Inspection and Checks
PIP O-11-4698, Vibration of the “A” Diesel Engine’s Diesel Lube Oil drain valve line was noticed during the Diesel Run
PT/1/A/0152/011, High Pressure Injection Valve Stroke Test, Rev. 27
OFD-101A-1.1, Flow Diagram of High Pressure Injection System (Letdown Section), Rev. 44
WO 01977423, EC105851 Replace 1HP-CV-5 Act Spring SR60 with SR100 Spring
PT/3/A/0152/011, 3HP-5 Stroke with HPI in Service, Rev.029
PT/1/A/0251/019, Unit 1 Main Steam Atmospheric Dump Valve Functional Test, Rev. 13
IP/0/A/0305/014 A, Unit 3 RPS Control Rod Drive Breaker Trip and Events Recorder Timing Test, Rev 11
IP/0/A/3010/011, Inspection of Electrical Penetration Enclosures, Rev 08
PT/2/A/0202/011, High Pressure Injection Pump Test, Rev 81

Section 1R20: Refueling and Outage Activities

OP/1/A/1102/004; Operation at Power
OP/1/A/1102/010, Controlling Procedure for Unit Shutdown, Rev. 206
Site Directive 1.3.5; Shutdown Protection Plan
OP/1/A/1103/011m Draining and Nitrogen Purging RCS, Enclosure 4.1; Dropping RCS Loops and Draining to 145” Pzr Level and Enclosure 4.3; Draining RxV to 80” on 1LT-5

OP/0/A/1102/026, Pre-Job Brieflings, Enclosure 4.3, Pre-job Briefing for Dropping RCS Loops and Draining RxV to 80" on LT-5
91-01 Activity Cover Sheet for Dropping RCS Loops and Draining to RxV to 80" on LT5
OP/1/A/1102/028; Reactor Building Tour
NSD 403, Risk Management in Modes 3, 4, 5, 6 and No Mode
Supply Chain Directive 320, Receipt Inspection of Nuclear Fuel and Core Components
MP/0/A/1500/008, New Fuel Assembly – Receipt, Inspection and Storage, Rev. 31
MP/0/A/1500/009, Defueling/Refueling Procedure, Rev 62
MP/0/A/1500/020, Refueling Canal FME Controls, Rev. 7
PT/0/A/0750/017, Defueling Activities, Rev. 18
OP/1/A/1502/007, Operations Defueling / Refueling Responsibilities, Rev. 87
PT/0/A/0750/018; Refueling Activities, Rev. 19
Unit Shutdown/ Cooldown Depressurization JITT Day Shift
OP/0/A/1108/001, Curves and General Information, Rev. 92
OP/1/A/1104/049, Low Temperature Overpressure Protection (LTOP), Rev. 44
RE/WPM/5.3, Reactor Engineering Work Process Manual, Section 5 Fuel Reliability, New Fuel Receipt and Inspections, Rev. 18
OP/1/A/1104/004, Low Pressure Injection System, Rev. 136
MP/0/A/1150/002, Reactor Vessel – Closure Head – Removal, Rev. 50
OM 201.-2394, Closure Head and Plenum Assembly Handling, Rev. D02
OP/1/A/1502/009, Containment Closure Control, Rev 38
PT/0/A/0750/013, Miscellaneous Visual Inspections of Fuel Assemblies, Rev. 20
PT/0/A/0775/015, Core Alignment Verification Procedure, Rev. 12
PT/0/A/0750/002, Core Inspections Procedure, Rev. 029
MP/0/A/1150/006A, Reactor Vessel- Plenum Assembly- Installation, Rev. 33
PT/0/A/0711/001, Zero Power Physics Test, Rev. 061
SOMP 01-02, Reactivity Management, Rev 7
OP/1/A/1102/001, Controlling Procedure for Unit Startup, Rev. 288
OP/1/A/1106/001, Turbine Generator, Rev. 117
PT/1/A/1103/015, Reactivity Balance Procedure, Rev 69
OP/0/A/1506/001, Fuel and Component Handling, Rev. 104
NDE-69, Visual Examination of Reactor Pressure Vessel Bottom Mounted Instrument Penetrations, Rev. 0

Section 1R22: Surveillance Testing

PT/3/A/0203/006A, Low Pressure Injection Pump Test- Recirculation, Rev. 86
ONTC-3-102A-0030-01, LPI Pump Performance Test Acceptable and Required Action Setpoints For Pump Total Developed Head, Rev. 0
OFD-102A-3.1, Flow Diagram of Low Pressure Injection System (Borated Water Supply and LPI Pump Suction), Rev. 58
OFD-102A-3.2, Flow Diagram of Low Pressure Injection System (LPI Pump Discharge), Rev. 38
PT/1/A/0151/024, Penetration 24 Leak Rate Test, Rev. 7
OFD-110A-1.3, Flow Diagram of Chemical Addition System (Post Accident Gas Sampling), Rev. 8
IP/0/A/0305/014 A, RPS control Rod Drive Breaker Trip and Events Recorder Timing Test, Rev 11
IP/0/B/0350/004, CRD System Checkout Prior to Maintenance/Testing, Rev 13
OP/3/A/1105/019, Control Rod Drive System, Rev 20

WO 01976195-01, U3 RPS A, B, C, D CRD Breaker Test
WO 0194613202; Electrical Penetration Enclosure Inspection
PT/2/A/0202/011, High Pressure Injection Pump Test, Rev 81
CP/2/A/2002/001, Unit 2 Primary Sampling System, Rev. 52
HP/0/B/1000/091, Evaluation of Germanium Detector Gamma Spectroscopic Results, Rev. 4
HP/0/B/1001/026, Operation of the Count Room Analysis System, Rev. 3
CSM 3.10, Primary Lab Sampling Frequencies, Specifications, and Corrective Actions, Rev. 42
PIP O-11-4506, During a look ahead for Degraded Grid and Switchyard Isolation Test discovered Matrix lights out
PIP O-11-4565, Keowee Emergency Start Signals failed to reset during PT/0/A/0610/022
PT/1/A/0151/006, Penetration 6 Leak Rate Test, Rev. 10
OFD-101A-1.1, Flow Diagram of High Pressure Injection System (Letdown Section), Rev. 44
PT/1/A/0400/020, SSF RC Letdown Line Discharge Test, Rev. 3
OFD-101A-1.5, High Pressure Injection System (SSF Portion), Rev. 23
PIP O-11-7708, PIP not originated when loose wires were found in Penetration Box 1RX PN EA11
WO 01980644, 1RX PN EA11, Repair opening in Viking Penetration enclosure

Section 1EP6: Drill Evaluation

ONS Drill 2011-01, Drill Package
RP/0/B/1000/001, Emergency Classification, Rev. 29
AP/0/A/1700/005, Earthquake, Rev. 23
PIP O-11-8061, ONS Emergency Planning Drill 2011-01 was conducted on June 14, 2011. This PIP contains weaknesses, Low Level Problems and Other comments from that drill

Section 4OA1: Performance Indicator Verification

Chemistry Desktop- Datasheets for April 1, 2010- March 30, 2011
CSM 3.10, Primary Lab Sampling Frequencies, Specifications, and Corrective Actions, Rev. 42

Section 4OA3: Event Follow-up

PIP O-11-5394, U1 entered AP/1&2/A/1700/036 “Degraded Control Room Area Cooling”
AP/1&2/A/1700/036, Degraded Control Room Area Cooling, Rev. 8
AP/2/A/1700/029, Rapid Unit Shutdown, Rev. 11
PIP O-11-6544, AP/2/A/1700/029 Rapid unit Shutdown was performed on Unit 2
PIP O-11-7081, Power Range NIs do not appear to be adequately tracking power imbalance relative to incore imbalance.
EN 46947, NRC Event Notification Worksheet, June 10, 2011
PIP O-11-6583, U2 Group 7 Rod 1 Dropped

LIST OF ACRONYMS

AB	-	auxiliary building
ACB	-	air circuit breaker
ADAMS	-	Agency Wide Documents Access and Management System
AP	-	Abnormal Operating Procedure
ASME	-	American Society of Mechanical Engineers
BACC	-	Boric Acid Corrosion Control
CAP	-	corrective action program

CAPR	-	correction action to prevent recurrence
CCW	-	condenser circulating water
CFR	-	Code of Federal Regulations
ET	-	Eddy Current Testing
HPI	-	high pressure injection
IMC	-	Inspection Manual Chapter
IP	-	Inspection Procedure
IR	-	Inspection Report
ISI	-	Inservice Inspection
KHU	-	Keowee hydro unit
LOCA	-	loss of coolant accident
LPI	-	low pressure injection
MSR	-	moisture separator reheater
NCV	-	non-cited violation
NRC	-	Nuclear Regulatory Commission
NSD	-	Nuclear System Directive
OpESS	-	Operating Experience Smart Sample
PARS	-	Publicly Available Records
PD	-	performance deficiency
PI	-	Performance Indicator
PIP	-	problem investigation program
PSW	-	protected service water
PT	-	liquid penetrant
RCE	-	root cause evaluation
RPS	-	reactor protection system
RTCA	-	Real Time Contingency Analysis
RTP	-	rated thermal power
SDP	-	Significance Determination Process
SG	-	steam generator
SSC	-	structures, systems, and components
TB	-	turbine building
TS	-	Technical Specifications
UFSAR	-	Updated Final Safety Analysis Report
UT	-	ultrasonic testing