



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

January 28, 2010

Mr. David A. Baxter
Site Vice President
Duke Energy Carolinas, LLC
Oconee Nuclear Station
7800 Rochester Highway
Seneca, SC 29672

SUBJECT: OCONEE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT
05000269/2009005, 05000270/2009005, 05000287/2009005

Dear Mr. Baxter:

On December 31, 2009, 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 January 7, 2010, with 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.

The report documents two NRC-identified findings and two self-revealing findings of very low safety significance (Green). These findings were determined to be violations of NRC requirements. However, because of the very low safety significance and because they are entered into your Corrective Action Program (CAP), the NRC is treating these violations as non-cited violations (NCVs), consistent with Section VI.A.1 of the NRC Enforcement Policy. If you contest any NCV in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington, D.C. 20555-0001, with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, D.C. 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. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

DEC

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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 05000269/2009005, 05000270/2009005,
05000287/2009005 w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Letter to David A. Baxter from Jonathan H. Bartley dated January 28, 2010

SUBJECT: OCONEE NUCLEAR STATION - NRC INTEGRATED INSPECTION REPORT
05000269/2009005, 05000270/2009005, 05000287/2009005

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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: 05000269/2009005, 05000270/2009005, 05000287/2009005

Licensee: Duke Energy Carolinas, LLC

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

Location: Seneca, SC 29672

Dates: October 1, 2009, through December 31, 2009

Inspectors: A. Sabisch, Senior Resident Inspector
E. Riggs, Resident Inspector
G. Ottenberg, Resident Inspector
K. Ellis, Resident Inspector
C. Fletcher, Reactor Inspector (Sections 1R08 and 4OA5.3)
A. Vargas, Reactor Inspector (Sections 1R08 and 4OA5.3)
W. Loo, Senior Health Physicist (Sections 2OS2 and 4OA1)
H. Gepford, Senior Health Physicist (Sections 2OS1 and 4OA1)
L. Mahlahla, Health Physicist (Section 2PS2)

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

Enclosure

SUMMARY OF FINDINGS

IR 05000269/2009-005, 05000270/2009-005, 05000287/2009-005, 10/01/2009-12/21/2009, Oconee Nuclear Station Units 1, 2, and 3, Maintenance Risk Assessments and Emergent Work Control, Refueling and Outage Activities, Access Control to Radiologically Significant Areas, Other Activities

The report covered a three-month period of inspection by the resident inspectors, two reactor inspectors, and three health physicists. Four Green findings were identified, all of which were non-cited violations (NCVs). 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 0305, "Operating Reactor Assessment Program." 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 An NRC-identified NCV of 10 CFR 50.65(a)(4) was identified for the licensee's failure to effectively implement the risk mitigation actions contained in the approved complex activity plans associated with modifications on all three Borated Water Storage Tanks (BWST). This violation has been entered into the licensee's CAP as Problem Investigation Process report (PIP) O-10-0171.

The failure to properly implement the risk management actions of the complex activity plan was a performance deficiency. The finding was more than minor because the modification work on the BWSTs was performed in a manner that had the potential to adversely affect the Emergency Core Cooling Systems primary water source for all three units if left uncorrected by damaging level transmitters and associated cables supporting ECCS suction swap-over. The inspectors completed a Phase 1 screening using Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Significance Determination Process," Appendix K, and determined that the finding was of very low safety significance (Green) based on the Incremental Core Damage Probability resulting from the work activities being less than 1E-6. The finding directly involved the cross-cutting area of Human Performance under the "Work Activity Coordination" aspect of the "Work Control" component in that the licensee failed to appropriately coordinate work activities to ensure the increased risk was minimized in accordance with the approved Complex Activity Plan [H.3(b)]. (Section 1R13)

- Green An NRC-identified NCV of 10 CFR 26.205 was identified when the licensee excluded individuals working on BWST modifications from work hour controls. This violation has been entered into the licensee's corrective action program as PIP O-09-6989.

The exemption of workers involved in work on a safety-related system from work hours controls was a performance deficiency. The performance deficiency was more than minor because if left uncorrected, the exclusion of workers from work hour controls could have led

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to a more significant safety concern due to personnel exceeding work hour limits while

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performing modification work on the BWSTs that could have adversely affected the primary water supply to the emergency core cooling systems. In addition, more than 60 workers were improperly excluded from work hour controls over the 2.5-month period encompassed by the licensee's exclusion. This finding was determined to be of very low safety significance (Green) based on no deficiencies occurring due to worker fatigue which affected risk significant structures, systems, or components. This finding has a cross-cutting aspect of the licensee formally defining the authority and roles for decisions affecting nuclear safety and communicating these roles to applicable personnel as described in the Decision-Making component of the Human Performance cross-cutting area [H.1(a)]. The licensee failed to ensure that the roles of personnel involved in processing requests exempting workers from work hour restrictions were adequately defined and communicated to ensure implementation of the work hour limits. (Section 40A5.2)

Cornerstone: Barrier Integrity

- Green A self-revealing NCV of Technical Specification (TS) 5.4.1 was identified for failure to maintain procedure PT/0/A/0775/015, "Core Alignment Verification," which resulted in damage to three Unit 1 fuel assemblies. This violation has been entered into the licensee's corrective action program as PIP O-09-8444.

The inspectors determined that the failure to include all fuel vendor guidance as acceptance criteria was a performance deficiency. This performance deficiency was considered to be more than minor because it is associated with the Procedural Quality attribute and adversely affected the Reactor Safety/Barrier Integrity cornerstone objective in that one fuel assembly was damaged and removed from the reactor. This finding was determined to be of very low safety significance (Green) using Inspection Manual Chapter (MC) 0609, Appendix M. Appendix M was used because no other MC 0609 Attachments applied to refueling activities in containment. The key factors considered were 1) a qualitative barrier analysis of the plant by a senior reactor analyst which determined that the risk significance of the event/condition was low (i.e., equivalent to $< 1E-6$ conditional core damage probability operational event), 2) no failure of fuel pins resulting in release of radioactivity, 3) containment integrity was maintained, and 4) only one fuel assembly was affected. This finding has a cross-cutting aspect of implementing and incorporating operating experience into station procedures [P.2(b)], as described in the Operating Experience component of the Problem Identification and Resolution cross-cutting area. The licensee failed to incorporate revisions to the vendor guidance into the procedure used to perform core alignment verification. (Section 1R20)

Cornerstone: Occupational Radiation Safety

- Green A self-revealing non-cited violation of Technical Specification 5.4.1, Procedures, was identified for the failure to read and comply with all radiological postings and, prior to entering a high radiation area, attend a documented radiation protection briefing, know the radiological conditions in the area, and log onto a Radiation Work Permit that allows entry into a high radiation area, as required by procedure Nuclear Site Directive (NSD) 507, Radiation Protection (RP). The licensee has entered this violation into the corrective action program as PIP O-09-5609.

The failure to follow the requirements of NSD 507 with respect to radiological postings and entry into high radiation areas was a performance deficiency. This finding is greater than minor because it is associated with the Occupational Radiation Safety Cornerstone attribute of Program and Process (Exposure Control) and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. The finding was evaluated using the Occupational Radiation Safety Significance Determination Process and determined to be of very low safety significance (Green) because it was not related to As Low As Reasonably Achievable (ALARA) planning, did not involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. The cause of this finding was directly related to the cross-cutting aspect of human performance and error prevention under the work practices component in the area of Human Performance, because the security personnel failed to use self-checking prior to passing through the Unit 1/Unit 2 fuel receiving bay door into the posted high radiation area [H.4(a)]. (Section 2OS1)

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 October 9, 2009, for the Unit 1 End-of-Cycle (EOC) 25 refueling and maintenance outage. It returned to service on December 2, 2009, and reached 100 percent RTP on December 5, 2009. It operated there for the remainder of the inspection period.

Unit 2 began the inspection period at approximately 100 percent RTP and operated there for the duration of the inspection period, with the exception of a downpower to 88 percent RTP on December 19, 2009, to perform turbine valve movement testing.

Unit 3 began the inspection period at approximately 100 percent RTP and operated there for the duration of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

Readiness for Seasonal Extreme Weather Conditions: The inspectors reviewed the licensee's preparations for adverse weather associated with cold ambient temperatures for three risk significant systems listed below. This included field walkdowns to assess the material condition and operation of freeze protection equipment, as well as other preparations made to protect plant equipment from freeze conditions. In addition, the inspectors conducted discussions with operations, engineering, and maintenance personnel responsible for implementing the licensee's cold weather protection program to assess the licensee's ability to identify and resolve deficient conditions associated with cold weather protection equipment prior to cold weather events. Documents reviewed are listed in the Attachment.

- Essential Siphon Vacuum System
- Unit 1, 2 and 3 Borated Water Storage Tank Level Instrumentation
- Elevated Water Storage Tank Level Instrumentation

Actual Adverse Weather Conditions: On December 2, 2009, during a Flash Flood Watch, the inspectors toured the Turbine Building, Auxiliary Building and Standby Shutdown Facility (SSF) to verify that barriers to external flooding were intact, and that additional preparations for the forecasted weather conditions had been undertaken. The inspectors verified flood doors were properly closed and storm drains were clear of debris. Inspectors verified cable trenches were being pumped as necessary and building cable and piping penetrations were not leaking excessively. The inspectors also verified that the licensee identified problems and entered them into the CAP at the

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appropriate level. Documents reviewed are listed in the Attachment.

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b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

Partial Walkdowns: The inspectors performed partial system walkdowns of the three systems 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. Documents reviewed are listed in the Attachment.

- Protection of the Unit 1 low pressure injection (LPI) pump rooms and coolers during high decay heat conditions following entry into Mode 5
- Protection of the Unit 1/Unit 2 Spent Fuel Pool cooling pumps, re-circulating cooling water (RCW) pumps and heat exchangers in preparation, during and following core offload from the Unit 1 reactor
- Keowee Hydro Unit (KHU-1) and KHU-2 prior to performance of PT/1/A/0610/001J, Emergency Power Switching Logic Functional Test

Complete System Equipment Alignment: The inspectors conducted one detailed walkdown/review involving the alignment and condition of the Unit 1 Emergency Feedwater (EFW) System. The inspectors utilized licensee procedures and drawings, as well as licensing and design documents to verify that the system (i.e., pumps, valves, and electrical) alignment was correct. During the walkdowns, the inspectors verified that major portions of the system and components were correctly labeled, hangers and supports were correctly installed and functional, and that essential support systems were operational. In addition, CAP documents were reviewed to determine if the identified deficiencies significantly impacted the system's functions. Items included in this review were: the operator workaround list, System Health Reports, and outstanding maintenance work requests/work orders. A review of open PIPs was also performed to verify that the licensee had appropriately characterized and prioritized EFW related equipment problems for resolution in the CAP. This inspection sample was completed using the guidance listed in Operating Experience Smart Sample-OpESS FY2009-02, Negative Trend and Recurring Events Involving Feedwater Systems. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R05 Fire Protectiona. 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.

- Unit 1 and 2 Cable Penetration Rooms
- Unit 3 Main Control Room
- Unit 2 East and West Mechanical Penetration Rooms
- Unit 3 LPI, Reactor building Spray (RBS) and High Pressure Injection (HPI) Pump Rooms
- Keowee Hydro Units

Drill Observation: On December 14, 2009, the inspectors observed one graded fire drill conducted by the on-shift fire brigade members which involved a simulated fire in the 4160V Switchgear 1TC in the turbine building. The purpose of this inspection was to monitor the fire brigade's use of protective gear and fire fighting equipment; determine that fire fighting pre-plan procedure and appropriate fire fighting techniques were used; that the directions of the fire brigade leader were thorough, clear and effective; and that control room personnel responded appropriately to the simulated fire event. The inspectors also attended the subsequent drill critique to assess whether it was appropriately critical, included discussions of drill observations and identified any areas requiring corrective actions. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measuresa. Inspection Scope

Submerged or Buried Cables: The inspectors inspected the condition of the CT-5 transformer cable trench and verified the trench was absent of standing water and that the cables were intact and in good condition. The inspectors also reviewed the yard

trenches health report to ensure the condition of the trench drainage features was being trended. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection (ISI) Activities

a. Inspection Scope

Non-Destructive Examination (NDE) Activities and Welding Activities: The inspectors reviewed the implementation of the licensee's ISI program for monitoring degradation of the reactor coolant system (RCS) boundary and risk significant piping boundaries. The inspectors' activities consisted of an on-site review of NDE and welding activities to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI (Code of record: 1998 Edition with 2000 Addenda), and to verify that indications and defects (if present) were appropriately evaluated and dispositioned in accordance with the requirements of the ASME Code, Section XI acceptance standards. The inspectors observed the following NDEs mandated by the ASME Section XI Code to evaluate compliance with the ASME Code Section XI and Section V requirements and if any indications and defects detected were detected, to determine if these were dispositioned in accordance with the ASME Code or an NRC approved alternative requirement.

- 14" Pipe to Elbow Weld (1-53A-02-63L)

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

- Reactor Vessel Lower Head Penetrations Exam – N722 Exam
- Liquid Penetrant Exam on Valve to Pipe Weld (Valve 1LP-47), Class 2 Component
- Ultrasonic Testing (UT) Exam on Valve to Pipe Weld (Valve 1LP-47), Class 2
- Phased Array UT Exam on Reactor Coolant Pump 1B1 Suction Piping, Class 1
- Phased Array UT Exam on Reactor Coolant Pump 1A2 Suction Piping, Class 1

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee had not identified any recordable indications. Therefore, no NRC review was completed for this inspection procedure attribute.

The inspectors reviewed the following pressure boundary welds completed for risk significant systems during the last Unit 1 refueling outage to determine if the licensee applied the preservice NDEs and acceptance criteria required by the construction Code NRC approved Code Case, NRC approved Code relief request or the ASME Code

Section XI. Additionally, the inspectors reviewed the welding procedure specification and supporting weld procedure qualification records to determine if the weld procedure(s) were qualified in accordance with the requirements of Construction Code and the ASME Code Section IX.

- Reactor Coolant System Cold Leg Letdown Nozzle Weld Overlay

PWR Vessel Upper Head Penetration Inspection Activities: For the Unit 1 vessel head, no examination was required pursuant to 10 CFR 50.55a(g)(6)(ii)(D) for the current refueling outage. Therefore, no NRC review was completed for this inspection procedure attribute.

Boric Acid Corrosion Control (BACC) Inspection Activities: The inspectors performed an independent walkdown of containment which had received a recent licensee boric acid walkdown and determined whether the licensee's BACC visual examinations emphasized locations where boric acid leaks can cause degradation of safety significant components. The inspectors reviewed the following licensee evaluations of reactor coolant system components with boric acid deposits to determine if degraded components were documented in the corrective action system. The inspectors also evaluated corrective actions for PIP O-09-5456, Boric Acid Evaluation - Body to Bonnet Leak, to determine if they met the component Construction Code, ASME Section XI Code, and/or NRC approved alternative. The inspectors also reviewed PIP O-08-2115, Indication During VT-1 on Flange 1-51A-5-1B1-FLG, Class 1 Piping, to determine 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.

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

- Interviewed Eddy Current Testing (ET) data analysts and reviewed three samples of ECT Data
- 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.
- Reviewed the licensee's repair criteria and processes.
- Evaluated 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, Rev. 7
- Reviewed the licensee's secondary side SG Foreign Object Search and Removal activities.

- Reviewed ET personnel qualifications.
- Participated in the conference call between the NRC's Office of Nuclear Reactor Regulation and the Division of Construction Inspection staff and the licensee which detailed the licensee's SG tube examination activities and results.

Identification and Resolution of Problems: The inspectors performed a review of ISI/SG related problems entered into the licensee's CAP and conducted interviews with licensee staff to determine if;

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

The inspectors performed these reviews to evaluate compliance with 10 CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed an active simulator exam to assess the performance of licensed operators during a simulator training session. The scenario included a failure of the normal makeup valve in the closed position, a small break loss of coolant accident (LOCA) concurrent with: a failure of the 1C HPI pump to start on the engineered safeguards signal, a failure of the 1B reactor building cooling unit to transfer to slow speed, and a failure of the 1B motor driven emergency feedwater pump to start. The scenario progressed to a general emergency due to a large break LOCA. 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 Shift Technical Advisor 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 of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the licensee's effectiveness in performing routine and corrective maintenance for the three activities listed below. 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. For each item 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.

- Unit 1 HPI cyclone separator weld repair following modification installation
- Stabilization, removal and transfer of the R-8 fuel assembly from the Unit 1 reactor core to the Unit 1/Unit 2 spent fuel pool
- Removal of the Unit 1 SSF reactor coolant (RC) letdown line filter and valve backseat gasket to prevent future line blockage

b. Findings

No findings of significance 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.

- Critical Activity Plan for Unit 1 Electrical Generator Rotor Movement
- Review of Unit 1 EOC 25 Refueling Outage Risk Profile prior to the start of the outage
- Review of the procedural controls and training associated with lowering RCS inventory to mid-loop conditions following core reload
- Review of planned risk profiles for the weeks of November 22 and 29 based on the outage extension and potential impact of ongoing outage activities

- Critical Activity Plan/91-01 Evolution Activity Plan for the Offload of Damaged Fuel Assembly R-8 from the Unit 1 Reactor Core
- Complex Activity Plans for installation of the BWST Natural Phenomenon Barrier System

b. Findings

Introduction: An NRC-identified NCV of 10 CFR 50.65(a)(4) was identified for the licensee's failure to effectively implement the risk mitigation actions contained in the approved complex activity plans associated with modifications on all three BWSTs.

Description: The licensee was implementing modifications on all three BWSTs to mitigate the effects of a tornado event by designing and installing an integrated barrier protection system. These modifications required extensive excavation around the BWST foundations, installation of rebar and construction of concrete foundation structures surrounding the BWSTs, and the use of motorized equipment in close proximity to safety-related equipment. The licensee developed complex activity plans to minimize the risk associated with these modifications. The inspectors walked down the work areas and observed work in areas containing equipment that was identified as being sensitive and requiring protection. The inspectors observed the following deficiencies in the implementation of the complex activity plans:

- Protective covers were required over sensitive BWST support systems and equipment to protect against dropped items or contact from construction equipment. The inspectors observed that protective covers were not used in any of the work area surrounding the BWSTs.
- A Sensitive Equipment Monitor shall be assigned to observe work near level instrumentation and ensure no damage to installed equipment occurs. The inspectors observed repeated breakdowns in the implementation of the Sensitive Equipment Monitor role including monitors not being at the work site for extended periods, monitors not physically observing work in-progress, individuals being assigned as monitors without receiving the required training or briefings, and monitors not fully understanding what equipment was designated as sensitive and what their expected actions were if work was performed around that equipment.
- The BWST outlet valves on all three BWSTs were to be marked to provide appropriate sensitivity to their importance by workers in the area and maintain unobstructed access to the valves as they are designated as "Time Critical" components. The inspectors observed that these components were not marked as required and that unobstructed access to the Unit 2 BWST outlet valve was not maintained.
- Two-way radios were not permitted in the work area due to potential adverse interactions with the equipment inside the BWST instrument boxes. Inspectors observed workers in the work area with two-way radios which were subsequently removed by the licensee.

The inspectors provided these observations to the licensee who took actions to ensure the risk management measures were being implemented as intended and conducted routine inspections to ensure expectations were being met.

Analysis: The failure to properly implement the risk management actions of the complex activity plan was a performance deficiency. The finding was more than minor because the modification work on the BWSTs was performed in a manner that had the potential to adversely affect the Emergency Core Cooling Systems primary water source for all three units if left uncorrected by damaging level transmitters and associated cables supporting ECCS suction swap-over. The inspectors completed a Phase 1 screening using Inspection Manual Chapter 0609, "Maintenance Risk Assessment and Risk Significance Determination Process," Appendix K, and determined that the finding was of very low safety significance (Green) based on the Incremental Core Damage Probability resulting from the work activities being less than 1E-6. The finding directly involved the cross-cutting area of Human Performance under the "Work Activity Coordination" aspect of the "Work Control" component in that the licensee failed to appropriately coordinate work activities to ensure the increased risk was minimized in accordance with the approved Complex Activity Plan [H.3(b)].

Enforcement: 10 CFR 50.65(a)(4), Requirements for Monitoring the Effectiveness of Maintenance at Nuclear Power Plants, requires in part, that prior to performing maintenance activities, the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities. Nuclear System Directive (NSD) 415, Operational Risk Management (Modes 1-3) per 10 CFR 50.65(a)(4), implements the requirements of 10 CFR 50.65(a)(4) during power operation. NSD 213, Risk Management Process, defines the requirements of station personnel to identify, direct, control, and manage risk-significant activities at the station, including the development of Complex Activity Plans to manage and minimize the risk resulting from the planned activity. Contrary to the above, during the period from mid-September 2009 through late December 2009, the licensee failed to implement the requirements of 10 CFR 50.65(a)(4) to manage the increased risk associated with the modification activity on the BWSTs by failing to fully implement the risk management actions contained in the approved Complex Activity Plans. Because this violation is of very low safety significance and has been entered into the licensee's CAP as PIP O-10-0171, this violation is being treated as a NCV consistent with Section VI.A of the NRC Enforcement Manual: NCV 05000269,270,287/2009005-01, Inadequate Implementation of Risk Management Actions Associated With BWSTs Modification Activities.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed the following six operability evaluations 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

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(5) where continued operability was considered unjustified, the impact on TS limiting condition for operations. Documents reviewed are listed in the Attachment.

- PIP O-09-6709, KHU-2 Turbine Guide Bearing Oil Flow Low
- PIP O-09-8267, Spent Fuel Pool (SFP) Cooling System Contains Two Valves Used for Seismic Boundary Valves That do Not Appear to Meet the Criteria Contained in the Updated Final Safety Analysis Report (UFSAR)
- PIP O-09-8432, SSF "B" Diesel Engine Jacket Water Leak
- PIP O-09-7777, Operating Experience on Cracked Cruciform Hold Down Springs on Fuel Assembly at Another Nuclear Station
- PIP O-09-9199, A 4" HPI Pipe is in Contact With the Edge of the Split Body Flange of Check Valve 1LPSW-1116
- PIP O-09-7536, SSF RC Letdown Line Discharge Test Failed Due to Blocked Flow Path

b. Findings

Introduction: An unresolved item (URI) was identified related to the Unit 1 failure of PT/1/A/0400/020, SSF Reactor Coolant (RC) Letdown Line Discharge Test.

Description: The licensee conducted PT/1/A/0400/020 with Unit 1 at approximately 280 psig to verify an acceptable flow rate could be established through the SSF letdown line. No flow was evident based on pressurizer level remaining constant throughout the duration of the test. The licensee determined that foreign material was blocking a filter installed on the inlet side of a flow orifice in the letdown line. The majority of this foreign material was determined to be Grafoil gasket material from the backseat gasket of a valve upstream of the filter. Because the test was performed at a lower pressure than normal operating pressure, the licensee will conduct additional testing to determine if the SSF RC letdown line would have performed its safety function at normal operating pressure. The results of this test will be reviewed to determine if the SSF letdown line was capable of performing its design function. This is identified as URI 05000269,/ 2009005-002.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed two plant modifications, listed below, to verify the adequacy of the modification packages and 10 CFR 50.59 screenings and to evaluate the modifications for adverse affects on system availability, reliability and functional capability, or potential impact to fuel in the core. Documents reviewed are listed in the Attachment.

Permanent Plant Modifications

- EC91884, Protected Service Water, Replace valves 1CCW-104 & 108

Temporary Plant Modifications

- A/R 291728; Procedure to Transport Fuel Assembly R-8 to the SFP

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testinga. Inspection Scope

The inspectors reviewed the following five 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.

- TT/1/A/3117/003, LPSW Waterhammer Prevention System Leakage Accumulator Functional Test Following Installation of the System
- Startup Transformer Lockout Relay Testing and Subsequent Restoration
- PT/1/A/0251/024, HPI Full Flow Test Following 1A HPI Pump Motor replacement, 1B HPI Pump Replacement, and Cyclone Separator Installation
- PT/0/A/0620/009, Keowee Hydro Operation Following Relay Preventive Maintenance (PM) and Generator Inspection
- IP/0/A/3001/001, Limitorque Preventive Maintenance on 2LP-21, Rev. 75

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activitiesa. Inspection Scope

The inspectors evaluated licensee outage activities 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 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 unit cooldown which simulated bringing the unit from Mode 3 to Mode 5
- observed power reduction process, removing the reactor from service and 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 were not present
- observed the cooldown process to verify that TS cooldown restrictions and administrative guidelines were followed
- 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 to ensure the lift was conducted in accordance the station procedures and heavy lift guidance
- observed fuel handling operations during new fuel receipt, movement into the spent fuel pool, and reactor core offload 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
- observed refueling activities to substantiate that the location of the fuel assemblies was tracked through core offload including review of the videotape core loading verification with Reactor Engineering personnel
- observed Just-in-Time training covering the approach to criticality and Zero Power Physics Testing for the personnel involved in these activities
- 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
- conducted containment walkdown to inspect for overall cleanliness and material condition of plant equipment after the licensee completed their closeout inspection
- 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

Introduction: A Green self-revealing NCV of TS 5.4.1 was identified for failure to maintain procedure PT/0/A/0775/015, "Core Alignment Verification," which resulted in damage to three Unit 1 fuel assemblies.

Description: On November 2, 2009, the licensee was unable to couple a control rod drive mechanism with its associated control rod assembly during vessel reassembly. The licensee removed the reactor head and found damage to the upper end fittings on three adjacent fuel assemblies. The damage to one fuel assembly resulted in bowed fuel pins and detachment of pieces of two grid straps. This fuel assembly was removed from the reactor and placed in the spent fuel pool. The other two assemblies had only minor damage limited to the upper end fitting. The licensee determined that the fuel assemblies were damaged from contact with the upper plenum during installation as a result of fuel assembly misalignment.

Procedure PT/0/A/0775/015 directed verification that there were no more than five fuel assembly-to-fuel assembly or fuel assembly-to-reactor core barrel interfaces in any row or column with zero clearance. The licensee determined that the acceptance criteria were met and proceeded with vessel reassembly. However, the procedure did not include an additional acceptance criterion of no gaps greater than 3/8" as specified by fuel vendor Document 64-5000454, "Fuel Handling Limits and Precautions for Mark B 15x15 Design Fuel." A subsequent review of the core verification by fuel vendor personnel determined that a gap greater than 3/8" existed between a fuel assembly and the reactor core barrel.

Analysis: The inspectors determined that the failure to include all fuel vendor guidance as acceptance criteria was a performance deficiency. This performance deficiency was considered to be more than minor because it is associated with the Procedural Quality attribute and adversely affected the Reactor Safety/Barrier Integrity cornerstone objective in that one fuel assembly was damaged and removed from the reactor. This finding was determined to be of very low safety significance (Green) using Inspection Manual Chapter (MC) 0609, Appendix M. Appendix M was used because no other MC 0609 Attachments applied to refueling activities in containment. The key factors considered were 1) a qualitative barrier analysis of the plant by a senior reactor analyst which determined that the risk significance of the event/condition was low (i.e., equivalent to < 1E-6 conditional core damage probability operational event), 2) no failure of fuel pins resulting in release of radioactivity, 3) containment integrity was maintained, and 4) only one fuel assembly was affected. This finding has a cross-cutting aspect of implementing and incorporating operating experience into station procedures [P.2(b)], as described in the Operating Experience component of the Problem Identification and Resolution cross-cutting area. The licensee failed to incorporate revisions to the vendor guidance into the procedure used to perform core alignment verification.

Enforcement: TS 5.4.1 requires in part that procedures shall be maintained covering the applicable procedures recommended in Regulatory Guide 1.33. Regulatory Guide 1.33, Appendix A, Section 2, includes procedures for refueling and core alterations. Contrary to the above, between 1994 and November 2, 2009, the licensee failed to maintain

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Procedure PT/0/A/0775/015 as required by TS 5.4.1 in that the licensee failed to include vendor guidance which would have prevented fuel assembly damage during reactor reassembly. Because the finding was determined to be of very low safety significance and has been entered into the licensee's CAP as PIP O-09-8444, this violation is being treated as a NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000269/2009005-03, Inadequate Procedure for Performing Core Alignment Verification.

1R22 Surveillance Testing

a. Inspection Scope

The inspectors either observed the test or reviewed test data for the six surveillance tests listed below to assess if the SSCs met TS, 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/0/A/0620/009, Keowee Hydro Operation, Rev. 43
- PT/0/A/0600/021, Standby Shutdown Facility Diesel-Generator Operation, Rev. 10
- PT/1/A/0610/001J, Emergency Power Switching Logic Functional Test, Rev. 41
- MP/0/A/1150/030, Reactor Vessel – Lower Head Penetrations – Visual Inspection, Rev. 3

In-Service Tests

- PT/1/A/0400/007, SSF RC Makeup Pump Test, Rev. 54

Containment Isolation Valve

- PT/1/A/0151/011B, Penetration 11B Leak Rate Test, Rev. 12

b. Findings

No findings of significance were identified.

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors participated in and evaluated the October 2, 2009, Emergency Response Organization Call-Out drill which was combined with an unannounced fire brigade drill. The licensee's response to the initial fire and resulting simulated equipment damage was observed from the Technical Support Center. The staff's implementation of the Emergency Plan following notification of the simulated fire was also observed. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstone: Occupational Radiation Safety

2OS1 Access Control To Radiologically Significant Areas

a. Inspection Scope

Access Control: The inspectors evaluated licensee performance in controlling worker access to radiologically significant areas and monitoring jobs in-progress associated with the Unit 1 EOC 25 refueling outage. The inspectors directly observed implementation of administrative and physical radiological controls; evaluated radiation worker (radworker) and radiation protection technician (RPT) knowledge of and proficiency in implementing radiation protection requirements; and assessed worker exposures to radiation and radioactive material.

During facility tours, the inspectors directly observed postings and physical controls for radiation areas, high radiation areas (HRA), locked-high radiation areas (LHRA) and potential airborne radioactivity areas established within the radiation control area (RCA) of the Unit 1 containment, the auxiliary building, turbine building, radioactive waste (radwaste) processing areas, and radioactive material storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. Results were compared to current licensee surveys and assessed against established postings and Radiation Work Permit (RWP) controls. Licensee key control and access barrier effectiveness were evaluated for selected LHRA and very high radiation area (VHRA) locations. Changes to procedural guidance for LHRA and VHRA controls were discussed with radiation protection (RP) supervisors. Controls and their implementation for storage of irradiated material within the spent fuel pool (SFP) were reviewed and discussed in detail. In addition, licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations were reviewed and discussed.

Established radiological controls were evaluated for selected Unit 1 EOC 25 tasks including Unit 1 reactor head lift, Unit 1 letdown nozzle overlay work, radiography activities, low pressure service water cutout and hangar replacement, scaffolding support, and shielding. For selected tasks, the inspectors attended pre-job briefings and reviewed RWP details to assess the communication of radiological control requirements to workers. Occupational workers' adherence to selected RWPs and RPT proficiency in providing job coverage were evaluated through direct observations and interviews with licensee staff. Electronic dosimeter (ED) alarm set points and worker stay times were evaluated against area radiation survey results for containment and refuel floor activities.

The inspectors evaluated the effectiveness of radiation exposure controls, including air sampling, barrier integrity, engineering controls, and postings through a review of both internal and external exposure results. Worker exposure as measured by ED and by licensee evaluations of personnel contamination events were reviewed and assessed. For HRA tasks involving significant dose rate gradients, the inspectors evaluated the procedural guidance for use and placement of whole body and extremity dosimetry to monitor worker exposure. The inspectors also reviewed and discussed selected whole-body count analyses and internal dose assessments.

The inspectors walked-down the Independent Spent Fuel Storage Installation (ISFSI) facility, observing the physical condition of the casks, radiological postings, and barriers. The inspectors performed independent gamma radiation surveys of the area and reviewed gamma/neutron radiation surveys of the ISFSI facility performed by licensee personnel. Inspectors compared the independent survey results to previous surveys and against procedural and TS limits. The inspectors evaluated implementation of radiological controls, including labeling and posting, and discussed controls with RP staff. Environmental monitoring results for direct radiation from the ISFSI were reviewed and inspectors observed the placement and physical condition of thermoluminescent dosimeters around the facility.

Radiation protection activities were evaluated against the requirements of UFSAR Section 12; TS Section 5.7; 10 CFR Parts 19 and 20; and approved licensee procedures. Radiological control activities for ISFSI areas were evaluated against 10 CFR Part 20, 10 CFR Part 72, and TS details. Documents reviewed are listed in the Attachment.

Problem Identification and Resolution: Licensee CAP documents associated with access control to radiologically significant areas were reviewed and assessed. This included review of selected problem evaluation reports related to radworker and RPT performance. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure NSD 208, Problem Investigation Process, Rev. 31. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results. Documents reviewed are listed in the Attachment.

The inspectors completed the 21 required samples.

b. Findings

Introduction: A self-revealing Green NCV of TS 5.4.1, Procedures, was identified for a failure to read and comply with all radiological postings and, prior to entering a high radiation area, attend a documented radiation protection briefing, know the radiological conditions in the area, and log onto an RWP that allowed entry into a high radiation area, as required by procedure Nuclear Site Directive (NSD) 507, Radiation Protection.

Description: Two security personnel entered the Unit 1/Unit 2 fuel receiving bay area through the hot machine shop. Neither of the individuals recognized that the radiological posting on the bay door had changed from Radiation Area to High Radiation Area, with an insert in the posting stating Notify Health Physics Prior to Entry. The security personnel were on RWP 22, Task 1, Security Activities, with an ED dose alarm setpoint of 10 millirem (mrem) and a dose rate setpoint of 25 mrem per hour (mrem/hr). Upon entering the area, the individuals passed through a radiation field posted as 10 to 70 mrem/hour general area. Radiological survey data indicated that dose rates as high as 160 mrem/hr gamma and 140 mrem/hr neutron at 30 cm from the transfer cask and 85 mrem/hr gamma and 100 mrem/hr neutron general area were present in the area. Both individuals received dose rate alarms on their EDs and immediately exited the area.

Review of the incident by the licensee determined that at approximately 1500 hours on August 8, the area was upgraded to a high radiation area subsequent to moving a loaded spent fuel cask into the bay. RP added inserts to the radiological posting to indicate the area was a high radiation area and to notify RP prior to entry. No notification to the security organization was required. The security patrol was conducted at approximately 21:30 that night; one of the individuals had conducted this same patrol the previous two nights, while the second individual had asked to accompany on the patrol to increase familiarity with the station. Although the first individual later stated that he had seen the insert indicating that RP should be called prior to entry (and proceeded without contacting RP), neither noticed that the posting had changed to a high radiation area. Both individuals failed to observe the procedural requirement to read and comply with all radiological postings, and, as a result, also failed to meet the procedural requirements for entry into a high radiation area.

Analysis: The failure to follow the requirements of NSD 507 with respect to radiological postings and entry into high radiation areas was a performance deficiency. This finding was greater than minor because it was associated with the Occupational Radiation Safety Cornerstone attribute of Program and Process (Exposure Control) and adversely affected the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. The finding was evaluated using the Occupational Radiation Safety SDP and determined to be of very low safety significance (Green) because it was not related to ALARA planning, did not involve an overexposure or substantial potential for overexposure, and the ability to assess dose was not compromised. The cause of this finding was directly related to the cross-cutting aspect of human performance and error prevention under the work practices component in the area of Human Performance, because the security personnel failed to use self-checking prior to passing through the Unit 1/Unit 2 fuel receiving bay door into the posted high radiation area [H.4(a)].

Enforcement: Technical Specification 5.4.1, Procedures, requires the licensee to implement the procedures contained in Regulatory Guide (RG) 1.33, Rev. 2, Appendix A. RG 1.33, Appendix A, Section 7.e. requires written procedures for Radiation Protection, including access control to radiation areas and a radiation work permit system. Licensee procedure NSD 507, Radiation Protection, Rev. 14, requires individuals to read and comply with all radiological postings and, prior to entering a high radiation area, attend a documented radiation protection briefing, know the radiological

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conditions in the area, and log onto an RWP that allows entry into a high radiation area. Contrary to this, on August 8, 2009, two security personnel entered the Unit 1/Unit 2 fuel receiving bay area into a high radiation area without complying with the radiological posting indicating the area was a high radiation area and to contact Health Physics prior to entry. In addition, the individuals had not received a high radiation area briefing, were unaware of the radiological conditions, and were on an RWP that did not allow entry into a high radiation area. Because this finding was determined to be of very low safety significance and has been entered into the licensee's CAP (PIP O-09-5609), this violation is being treated as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000269,270,287/2009005-04, Improper Entry into a Posted High Radiation Area.

2OS2 Occupational ALARA Planning and Controls

a. Inspection Scope

ALARA: The inspectors reviewed ALARA program guidance and its implementation for ongoing Unit 1 EOC 25 job tasks. The inspectors evaluated the accuracy of ALARA work planning and dose budgeting, observed implementation of ALARA initiatives and radiation controls for selected jobs in-progress, assessed the effectiveness of source-term reduction efforts, and reviewed historical dose information.

ALARA planning documents, procedural guidance, and dose reduction initiatives were reviewed, and projected completion times and dose estimates were compared to actual expenditures for selected Unit 1 EOC 25 activities. Differences between budgeted dose and actual exposure received were discussed with cognizant ALARA staff, as well as changes to dose budgets relative to changes in radiation source term and/or job scope. The inspectors attended pre-job briefings and evaluated the communication of ALARA goals, RWP requirements, and industry lessons-learned to job crew personnel.

The inspectors also evaluated whether the work tasks were reasonably grouped into specific jobs and whether the benefits of good scheduling were used to plan the work during times when dose rates would be lowest. In addition, the inspectors reviewed the minutes from the last two ALARA Review Committee meetings.

The inspectors made direct field or closed-circuit video observations of job tasks involving the Unit 1 reactor head lift, Unit 1 letdown nozzle overlay work, radiography activities, low pressure service water cutout and hangar replacement, Steam Generator mockup training, and other selected Unit 1 EOC 25 activities. For the selected tasks, the inspectors evaluated radworker and RPT job performance (e.g., use of low dose waiting areas and adequate supervisory oversight of work crews); individual and collective dose expenditure versus percentage of job completion; surveys of the work areas; appropriateness of RWP requirements; and adequacy of implemented engineering controls. For those selected activities the inspectors interviewed radworkers and job sponsors regarding understanding of dose reduction initiatives and their current and expected accumulated doses at completion of the job tasks. The inspectors also interviewed Operations and Maintenance department managers to evaluate the interface between different licensee organizations and ALARA planning staff.

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Implementation and effectiveness of selected program initiatives with respect to source-term reduction were evaluated. Chemistry program ALARA initiatives and their effect on Unit 1 reactor building dose rate trends were reviewed. The effectiveness of temporary shielding installed for the current outage was assessed through review of shielding request packages and pre-shielding versus post-shielding dose rate data. In addition, the inspectors reviewed the current hot spot database and discussed reduction of tracked plant exposure sources with ALARA staff.

Plant exposure history for calendar year (CY) 2007 through CY 2008, and data reported to the NRC pursuant to 10 CFR 20.2206 were reviewed, as were established goals for reducing collective exposure during the current Unit 1 EOC 25 outage. The inspectors reviewed procedural guidance for dosimetry issuance and exposure tracking. Guidance for calculation and assignment of internal dose due to alpha emitting radionuclides was reviewed and discussed with RP staff. The inspectors also examined dose records of declared pregnant workers to evaluate assignment of gestation dose.

ALARA program activities and their implementation were reviewed against 10 CFR Part 20 and approved licensee procedures. In addition, licensee performance was evaluated against guidance contained in RG 8.8, Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be As Low As Reasonably Achievable and RG 8.13, Instruction Concerning Prenatal Radiation Exposure. Documents reviewed are listed in the Attachment.

Problem Identification and Resolution: Selected PIPs in the area of exposure control were reviewed in detail and discussed with licensee personnel. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with procedure NSD 208, Problem Investigation Process, Rev. 31. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent self-assessment results. Documents reviewed are listed in the Attachment.

The inspectors completed the 15 required samples. In addition, 14 optional samples were completed for plants with three-year rolling average collective exposures in excess of the top quartile.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation

a. Inspection Scope

Waste Processing and Characterization: The inspectors reviewed the liquid and solid radioactive waste processing systems as described in UFSAR Section 11 and in the licensee's Process Control Program (PCP). The inspectors walked down portions of the liquid and solid radioactive waste processing systems to assess that the current system configuration for consistency with the UFSAR and PCP. Administrative and physical

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controls for abandoned and non-operational equipment and systems were reviewed. Licensee personnel were interviewed regarding equipment functionality and operability to assess their knowledge of radwaste system processing operations.

The most recent radiological effluent release report was reviewed for information on the types and amounts of waste disposed of in 2007 and 2008. The inspectors observed activities at the radwaste storage facility including the interim storage of radwaste for future shipments. The licensee's audit program was reviewed to verify that it met the requirements of 10 CFR 20.1101(c).

The inspectors reviewed licensee waste stream characterizations for dry active waste, primary resin, demineralization resin, and filters. The licensee's program was evaluated for compliance with 10 CFR 61.55 and 10 CFR 61.66 as required by Appendix G of 10 CFR Part 20. The licensee's most recent 10 CFR Part 61 samples were reviewed to evaluate radionuclide composition and scaling factors used to account for difficult-to-measure radionuclides. The inspector verified implementation of the most recent analyses for shipments from 2007 to 2009 and discussed the annual review including any changes with licensee personnel.

Transportation: The inspectors evaluated the licensee's activities related to transportation of radioactive material. This evaluation included a review of shipping records and procedures, assessment of worker training and proficiency, and direct observation of shipping activities. The inspectors assessed shipping-related procedures for compliance to applicable regulatory requirements. Select shipping records were reviewed for completeness and accuracy, and for consistency with licensee procedures. Training for individuals qualified to ship radioactive material was evaluated.

The inspectors observed receipt of a Radioactive, Surface Contaminated Object and shipment of two limited quantity radioactive material packages offsite. During the receipt observation, the inspector observed package and vehicle surveys, placarding and labeling, and evaluated the completeness and accuracy of the paperwork. The inspectors observed packaging, surveys, and completed shipping papers for the two limited quantity and one low specific activity shipments.

A sample of shipment packages from 2007 to 2009 was reviewed for compliance with NRC and Department of Transportation requirements. Responsible individuals directly involved with shipping were interviewed to assess their knowledge of the radioactive shipping requirements.

Transportation program guidance and implementation were reviewed against regulations detailed in 10 CFR 71, 49 CFR 170-189, and documents listed in the Attachment.

Problem Identification and Resolution: Select PIPs and self-assessments were reviewed in detail and discussed with licensees. The inspectors assessed the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with licensee's procedure. Documents reviewed are listed in the Attachment.

The inspectors completed the six required samples.

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b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verificationa. Inspection Scope

The inspectors sampled licensee data to confirm the accuracy of reported PI data for the nine indicators during periods listed below. 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, Rev. 5. Documents reviewed are listed in the Attachment.

Cornerstone: Mitigating Systems

- Mitigating System Performance Index, Emergency AC Power (3 units)
- Mitigating System Performance Index, High Pressure Injection (3 units)
- Mitigating System Performance Index, Support Cooling Water Systems (3 units)

For the period October 1, 2008, through September 30, 2009, 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: Mitigating Systems

- Safety System Functional Failures (3 units)

For the period July 1, 2008, through September 30, 2009, the inspectors reviewed operating logs, train unavailability data, and Licensee Event Reports, to verify the accuracy of the PI data reported for each PI.

Cornerstone: Occupational Radiation Safety

- Occupational Exposure Control Effectiveness

The inspectors reviewed PI data collected from April 1, 2008, through September 30, 2009. 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 period. In addition, the inspectors reviewed selected personnel contamination event data, internal dose assessment results, and ED alarms for cumulative doses and/or dose rates exceeding established set-points. The reviewed data were assessed against guidance contained in NEI 99-02, Regulatory Assessment Indicator Guideline, Rev. 5. Documents reviewed are listed in the Attachment.

Cornerstone: Public Radiation Safety

- Radiological Control Effluent Release Occurrences

The inspectors reviewed the PI results for the period of April 1, 2008, through September 30, 2009. For the assessment period, the inspectors reviewed cumulative doses to the public, gaseous and liquid effluent release permits, and selected PIPs related to effluent control. The inspectors also reviewed licensee procedural guidance for collecting and documenting PI data. The reviewed data were assessed against guidance contained in NEI 99-02, "Regulatory Assessment Indicator Guideline," Rev. 5. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

.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 Focused Review

a. Inspection Scope

The inspectors performed an in-depth review of PIP O-08-7110, Oconee Unit 3 Reactor Trip. The sample was within the initiating events cornerstone and involved risk significant systems. The inspectors reviewed the actions taken to determine if the licensee had adequately addressed the following attributes:

- Complete, accurate and timely identification of the problem
- Evaluation and disposition of operability and reportability issues
- Consideration of previous failures, extent of condition, generic or common cause implications
- Prioritization and resolution of the issue commensurate with safety significance
- Identification of the root cause and contributing causes of the problem
- Identification and implementation of corrective actions commensurate with the safety significance of the issue.

b. Findings and Observations

No findings of significance were identified.

.3 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 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 July 2009 through December 2009, 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. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings of significance were identified. In general, the licensee has identified trends and has appropriately addressed the trends with their CAP. However, the inspectors identified the following three trends that the licensee had not previously recognized. The inspectors will continue to monitor this area and assess the effectiveness of the licensee's corrective actions.

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 PIP program. The trend was related to the initiation of PIPs when the criteria in the licensee CAP implementing guidance document was met or not fully describing the issue to allow appropriate corrective actions to be developed. Specifically, PIPs were not written for some events or issues that were immediately corrected and corrective action documents that described issues or events meeting the initiation criteria were not consistently written in a manner that allowed individuals responsible for screening the PIPs to assign them to the appropriate group for resolution or the Work Group Trend Evaluators to proactively identify adverse trends. Also, human performance issues were noted to be captured in processes outside of the CAP. As a result of this NRC-identified trend, the licensee initiated PIP O-10-0182.

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 that the licensee had not previously recognized. This trend was identified based on inspector observations of multiple occurrences of vehicles left unsecured or unattended within the PA and review of the documents listed in the Attachment. As a result of this NRC-identified trend, the licensee initiated PIP O-10-0225.

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Contractor Activities Impacting Plant Security Measures: The inspectors identified a trend during the second half of 2009 associated with the failure of Oconee Major Project vendors to comply with site security requirements. This trend was identified based on inspector observations of plant activities and review of the documents listed in the Attachment. As a result of this NRC-identified trend, the licensee initiated PIP O-10-0232.

Coordination Of Outage Activities: The inspectors identified a trend during the second half of 2008 that the licensee had not previously recognized associated with the coordination of outage activities. During the fall 2008 Unit 2 outage, the inspectors noted three examples where outage activities were not adequately coordinated or communicated between work groups which resulted in unintended system interactions or incomplete operational awareness of plant configurations. The inspectors also noted similar examples of outage work coordination or communication issues during the previous two outages. The licensee initiated PIP O-09-0150 to evaluate outage work/activity coordination and communication performance through their trending program. While some improvement was noted during the recent 2009 Unit 3 and Unit 1 refueling outages, the inspectors will continue to monitor this area during the Unit 2 refueling outage and assess the effectiveness of corrective actions.

40A3 Event Follow-up

.1 Loss of Primary Instrument Air Compressor

a. Inspection Scope

The inspectors responded to a trip of the Primary Instrument Air Compressor on high discharge temperature, and subsequent entry into AP-22, Loss of Instrument Air, on November 5, 2009. As appropriate, the inspectors observed plant parameters and status, including the response of the backup instrument air, auxiliary instrument air, and service air systems; determined alarms/conditions preceding or indicating the event; and evaluated the actions of the operations crew in response to the event. The cause of the trip was determined to be an intermittent failure in the high temperature trip circuit, and Work Order (WO) 01897620 was generated. This event was documented in PIP O-09-08403, Primary Instrument Air Compressor Trip. Documents reviewed are listed in the Attachment.

b. Findings

No findings of significance were identified.

.2 Unit 1 SSF Letdown Line Found Blocked During Testing

a. Inspection Scope

On October 11, 2009, flow through the SSF RC letdown line could not be demonstrated through testing intended to quantify flow in the line. The inspectors observed the removal of the letdown line filter and disassembly of an upstream valve as part of the

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licensee's investigation. A debris filter was found to be blocked with Grafoil gasket material, pieces of an epoxy-based material, and stainless steel shavings. Upon disassembly of the upstream valve, a backseat gasket made from Grafoil was found to be missing. The licensee flushed the letdown line, removed the debris filter, and implemented a permanent modification to remove the backseat gasket from the upstream valve. The licensee also revised the test procedure to use ultrasonic measuring equipment attached to the letdown line to measure the flow. Inspectors observed the performance of the revised test prior to unit restart and the verified that the acceptance criterion was satisfied which demonstrated current operability of the Unit 1 SSF RC letdown line. Past operability of the Unit 1 SSF reactor coolant system letdown line was reviewed and remaining issues are documented in Section 1R15.

b. Findings

No findings of significance were identified.

.3 Unit 1 Fuel Assembly Damaged During Reactor Vessel Reassembly

a. Inspection Scope

The inspectors reviewed the licensee's actions in response to the damage to three fuel assemblies in the Unit 1 reactor core that occurred during plenum installation following refueling. The inspectors reviewed outage control center decision making, reviewed engineering analyses and 10 CFR 50.59 screening determinations related to the use of a special tool for removal of a damaged fuel assembly from the reactor core, and observed the transport of the R-8 fuel assembly from the reactor core to the spent fuel pool. The event description and licensee's root cause report was documented in PIPs O-09-8444 and PIP 09-8284. Additional details related to this event are documented in Section 1R20.

b. Findings

No findings of significance were identified.

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 of significance were identified.

.2 Review of the Processing of Requests to Exclude Workers and Work Activities from the 10 CFR 26 Work Hour Controls

a. Inspection Scope

During the inspection period the inspectors reviewed the licensee's process used to evaluate work being performed within the PA and determine if the work or individual groups of workers can be excluded from the 10 CFR 26 work hour controls. The activities associated with the work on the BWST and the request to remove the work from the work hour limitations were reviewed. Documents reviewed are listed in the Attachment.

b. Findings

Introduction: An NRC-identified Green NCV of 10 CFR 26.205 was identified when the licensee excluded individuals working on BWST modifications from work hour controls.

Description: The licensee was implementing modifications on all three BWSTs which required extensive excavation around the BWST foundations, exposure of BWST piping and cabling, and installation of rebar and construction of concrete foundation structures surrounding the BWSTs. The inspectors determined the work directly impacted risk significant BWST piping and cabling during excavation and subsequent concrete placement. On October 15, 2009, the licensee exempted workers involved in the BWST modifications from the work hour restrictions contained in 10 CFR 26.205. The basis for the exemption was that the work being performed did not involve interfacing with existing plant systems or components and that the BWSTs were not on the High Safety Significance system list. The inspectors reviewed the exemption and noted that the BWSTs were the primary water supply for emergency core cooling systems on the High Safety Significance system list. Following discussions with the inspectors, the licensee rescinded the exemption and reclassified all of the workers assigned to the BWST modifications as covered workers until the piping and cables were encased in concrete. Workers on the project were required to track their time and meet the work hour limitations as defined in 10 CFR 26.205.

Analysis: The exemption of workers involved in work on a safety-related system from work hours controls was a performance deficiency. The performance deficiency was more than minor because if left uncorrected, the exclusion of workers from work hour controls could have led to a more significant safety concern due to personnel exceeding work hour limits while performing modification work on the BWSTs that could have adversely affected the primary water supply to the emergency core cooling systems. In addition, more than 60 workers were improperly excluded from work hour controls over the 2.5-month period encompassed by the licensee's exclusion. This finding was determined be of very low safety significance (Green) based on no deficiencies occurring due to worker fatigue which affected risk significant structures, systems, or

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components. This finding has a cross-cutting aspect of the licensee formally defining the authority and roles for decisions affecting nuclear safety and communicating these roles to applicable personnel as described in the Decision-Making component of the Human Performance cross-cutting area [H.1(a)]. The licensee failed to ensure that the roles of personnel involved in processing requests exempting workers from work hour restrictions were adequately defined and communicated to ensure the appropriate implementation of the work hour limits.

Enforcement: 10 CFR 26.205(a) stated that individuals who perform duties identified in 10 CFR 26.4(a)(1) through (a)(5) shall be subject to the requirements of this section. 10 CFR 26.205(d)(1) stated that licensees shall ensure that any individual's work hours do not exceed the limits specified in 10 CFR 26.205(d)(1)(i) thru (iii). Contrary to the above, during the period from October 15, 2009, through December 31, 2009, individuals working on modifications to the BWSTs who performed duties identified in 10 CFR 26.4(a)(1) through (a)(5) were not subject to the requirements of 10 CFR 26.205(a). The licensee had inappropriately excluded them from the work hour limits specified in 10 CFR 26.205(d)(1)(i) thru (iii). Because this violation is of very low safety significance and has been entered into the licensee's corrective action program as PIP O-09-6989, this violation is being treated as a NCV consistent with Section VI.A of the NRC Enforcement Manual: NCV 05000269,270,287/2009005-05, Inappropriate Removal of Workers Associated With Modification Work Activities on the BWST's from Work Hour Controls.

3. Reactor Coolant System Dissimilar Metal Butt Welds (TI 2515/172, Rev. 1)

a. Inspection Scope

The inspectors conducted a review of the licensee's activities regarding licensee dissimilar metal butt weld (DMBW) mitigation and inspection implemented in accordance with the industry self-imposed mandatory requirements of Materials Reliability Program (MRP)-139, "Primary System Piping Butt Weld Inspection and Evaluation Guidelines." Temporary Instruction (TI) 2515/172, "Reactor Coolant System Dissimilar Metal Butt Welds" was issued February 21, 2008, to support the evaluation of the licensees' implementation of MRP-139. Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings of significance were identified. Oconee Unit 1 is a Babcock and Wilcox two loop designed plant. The licensee had identified a population of DMBWs susceptible to primary water stress corrosion cracking in accordance with MRP-139 guidelines. The licensee has completed pressurizer weld overlays to augment the margin to safety on these welds. Shortly after the completion of this inspection, the licensee completed weld overlays on the cold leg letdown nozzles. The licensee also completed phased array UT on the remaining MRP-139 cold leg nozzles, which will serve as their baseline inspections. In accordance with requirements of TI 2515/172, Rev. 0, the inspectors evaluated and answered the following questions:

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(1) Implementation of the MRP-139 Baseline Inspections

1. a. Have the baseline inspection been performed or are they scheduled to be performed in accordance with MRP-139 guidance? Yes
 - b. Were the baseline inspections of the pressurizer temperature DMBW's of the nine plants listed in 03.01.b completed? Yes
2. Is the licensee planning to take any deviations from the MRP-139 baseline inspection requirements of MRP-139? If so, what deviations are planned, what is the general basis for the deviation, and was the NEI-03-08 process for filing a deviation followed? No

(2) Volumetric Examinations

1. Were the examinations performed in accordance with the MRP-139, Section 5.1 guidelines and consistent with NRC staff relief request authorization for weld overlaid welds? Yes
2. Were examinations performed by qualified personnel? (Briefly describe the personnel training/qualification process used by the licensee for this activity.) Yes
3. Were examinations performed such that deficiencies were identified, dispositioned, and resolved? Yes

(3) Weld Overlays

This portion of the TI was not inspected during the period of this report.

(4) Mechanical Stress Improvement

There was no stress improvement activities performed or planned by this licensee to comply with their MRP-139 commitments.

(5) Application of Weld Cladding and Inlays

This portion of the TI was not inspected during the period of this report.

(6) Inservice Inspection Program

1. Has the licensee prepared an MRP-139 inservice inspection program? If not, briefly summarize the licensee's basis for not having a documented program and when the licensee plans to complete preparation of the program. Yes
2. In the MRP-139 inservice inspection program, are the welds appropriately categorized in accordance with MRP-139? If any welds are not appropriately categorized, briefly explain the discrepancies. Yes
3. In the MRP-139 inservice inspection program, are the inservice inspection frequencies, which may differ between the first and second intervals after the MRP-139 baseline inspection, consistent with the inservice inspections frequencies called for by MRP-139? Yes

4. If any welds are categorized as H or I, briefly explain the licensee's basis of the categorization and the licensee's plans for addressing potential PWSCC. Not applicable
5. If the licensee is planning to take deviations from the MRP-139 inservice inspection guidelines, what are the deviations and what are the general bases for the deviations? Was the NEI 03-08 process for filing deviations followed? Not applicable

4OA6 Management Meetings (Including Exit Meeting)

Exit Meeting Summary

On January 7, 2010, the inspection results were presented to Mr. Rich Freudenberger and other members of licensee management. 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, MCE/BOP Supervisor and Regulatory Compliance Manager
E. Anderson, Superintendent of Operations
S. Batson, Engineering Manager
D. Baxter, Site Vice President
R. Bowser, Senior Scientist, Radiation Protection (RP)
D. Brewer, Safety Assessments Manager
R. Brown, Emergency Preparedness Manager
E. Burchfield, Reactor and Electrical Systems Manager
P. Culbertson, Maintenance Manager
C. Curry, Mechanical/Civil Engineering Manager
P. Downing, SG Manager
J. Eaton, ISI Program Coordinator
R. Freudenberger, Safety Assurance Manager
P. Gillespie, Station Manager
M. Glover, General Manager of Projects
J. Kammer, Modification Engineering Manager
T. King, Security Manager
B. Lynch, Engineer/BA Program Owner
B. Meixell, Regulatory Compliance
G. Moss, ISI Task Manager
V. Owens, Radioactive Material Control General Supervisor, RP
W. Pursley, General Supervisor, RP
D. Robinson, Manager, RP
S. Severance, Regulatory Compliance
J. Smith, Regulatory Compliance
S. Spear, Surveillance and Control, RP
D. Williams, Engineer/RPVH Inspections

NRC

J. Stang, Project Manager, NRR

ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000269/2009005-02	URI	SSF Reactor Coolant Letdown Line Discharge Test (Section 1R15)
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Opened and Closed

05000269,270,287/2009005-01	NCV	Inadequate Implementation of Risk Management Actions Associated With Modification Work Activities on the BWSTs for all Three Oconee Units (Section 1R13)
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05000269/2009005-03	NCV	Failure to Establish and Implement an Adequate Procedure for Performing Core Alignment Verification (Section 1R20)
05000269,270,287/2009005-04	NCV	Failure to Comply with Radiological Postings and the Requirements for Entering a Posted High Radiation Area (Section 2OS1)
05000269,270,287/2009005-05	NCV	Inappropriate Removal of Workers Associated With Modification Work Activities on the BWST's from Work Hour Controls (Section 4OA5.2)

DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

Cold Weather Preparations

OP/1,2,3/A/1102/020, Control Room Rounds, Enclosure 5.5, Cold Weather Checklist, Rev. 121
 OP/1,2,3/A/1102/020 A, Primary Rounds, Rev. 30
 OP/1,2,3/A/1102/020 C, Turbine Building Third and Fifth Floor Rounds, Rev. 06
 OP/2/A/1102/020 D, SSF and Outside Rounds, Rev. 39
 CSM, 4.14, Chemistry Area Rounds and Equipment Status, Rev. 37
 RP/0/B/1000/035, Severe Weather Preparations, Rev. 4
 IP/0/B/1606/009, Preventive Maintenance and Operational Check of Freeze Protection, Rev. 3
 Nuclear System Directive (NSD) 317, Freeze Protection Program, Rev. 3
 Category C - Electrical Heat Trace Health Reports for 2009
 Freeze Protection Health Reports for 2009
 PIP O-09-1077, Cold Weather/Freeze Protection program enhancements
 PIP O-09-7297, Received OAC Alarm 03D2298 Borated Water Storage Tank Instrument HTR Fail
 PIP O-09-8939, AHU 3-7 found tripped due to freeze state during operator rounds
 PIP O-09-8988, Turbine Building East side dampers need to be closed
 WO 01860578, PM, Annual, Outside Freeze Protection
 PIP O-09-8882, Damaged and missing insulation on EWST HPSW piping/heat trace
 PIP O-09-9119, BWST Instrument Heater OAC Alarm
 PIP O-09-9292, Unit 2 BWST Level transmitter Heat Trace Controllers set incorrectly
 PIP O-09-9412, AHU-10 Plant Heating outlet temp found at ambient during Cold Weather Checklist
 PIP O-09-9464, East side emulsifier blockhouse strip heaters not on (Cold Weather Checklist concern)

External Flooding

OSS-0254.00-00-4016, Design Basis Specification for the Flooding from External Sources, Rev.0
 Flash Flood Watch for December 2, 2009 and issued by the National Weather Service on 12/1/09

Section 1R04: Equipment Alignment**Partial Walkdowns**

PIP O-09-7422, Protected Equipment program lists too general to determine specific components requiring protection
 ST2 Safety Tagging Tagout 09-02267, Protection for High Heat Load Conditions in the Spent Fuel Pool
 KFD-109A-1.1, Flow Diagram of Service Water System, Rev. 9
 KFD-101A-1.1, Flow Diagram of Turbine Guide Bearing Oil System, Rev. 5
 KFD-101A-2.1, Flow Diagram of Turbine Guide Bearing Oil System, Rev. 5
 KFD-105A-1.1, Flow Diagram of Governor Oil System, Rev. 5
 KFD-106A-3.0, Flow Diagram of Lube Oil System, Rev. 4

Complete System Equipment Alignment

OFD-121D-1.1, Flow Diagram of Emergency Feedwater System, Rev. 35
 OFD-121A-1.7, Flow Diagram of Condensate System (Upper Surge tanks 1A & 1B, Upper Surge tank Dome, & Condensate Storage Tank), Rev. 38
 OFD-121A-1.8, Flow Diagram of Condensate System (Condensate Make-up & Emergency FDW Pump Suction), Rev. 23
 G-08-00912, NRC Information Notice 2008-13: Main Feedwater System Issues and Related 2007 Reactor Trip Data
 EP/1/A/1800/001M, Enclosure 5.9; Extended EFDW Operation, Rev. 36
 OP/1/A/1106/006, Emergency FDW System, Rev. 119
 WO 0148418702, Place U-1 TD EFDWP Oil in Purification
 WO 0189610001, PT/1/A/0600/012 TDEFW Pump Test

Section 1R05: Fire Protection**Unit 1 & 2 Cable Penetration Rooms**

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 Zone 106, Unit 1 Cable Room, Auxiliary Building Room 403
 Fire Pre-Plan for Zone 105, Unit 2 Cable Room, Auxiliary Building Rooms 404 and 405

Unit 3 Main Control Room

Fire Pre-Plan for Zone 112, Unit 3 Control Room, Auxiliary Building Rooms 550 – 560

Unit 2 East and West Mechanical Penetration Rooms

Fire Pre-Plan for Zone 102, Unit 2 West Penetration Rom, Auxiliary Building Room 410
 Fire Pre-Plan for Zone 103, Unit 2 East Penetration Rom, Auxiliary Building Rooms 406, 407 and 519

Unit 3 LPI, RBS and HPI Pump Rooms

Fire Pre-Plan for Zone 49, Unit 3 A LPI and RBS Pumps, Auxiliary Building Rooms 82 and 83
 Fire Pre-Plan for Zone 49, Unit 3 B/C LPI and RBS Pumps, Auxiliary Building Room 81
 Fire Pre-Plan for Zone 50, Unit 3 C HPI Pump, Auxiliary Building Room 76
 Fire Pre-Plan for Zone 50A, Unit 3 A/B HPI Pumps, Spent Resin, L/H AWT and Comp. Drain Pumps, Auxiliary Building Rooms 77, 78, 79 and 80

Keowee Hydro Unit

Fire Pre-Plan for Elevation 645', Draft Tube Gallery
 Fire Pre-Plan for Elevation 660' and 675'-3", Spiral Case Gallery and Battery Room
 Fire Pre-Plan for Elevation 683'-6", Mechanical Equipment Gallery
 Fire Pre-Plan for Elevation 702', Operating Floor

Fire Drill

PIP O-09-9275, Delta Shift Fire Brigade drill conducted on 12/14/09
 Oconee Nuclear Station Fire Drill Planning Guide and Critique Form for Delta Shift Fire Drill conducted on 12/14/09

Section 1R06: Flood Protection Measures

WO 01881608, CT5 Cable Trench Sump Pump: (PM) Inspect/Replace As Needed

Section 1R08: Inservice Inspection (ISI) Activities

NSD 322, Duke Energy Corrosion Control Program, Rev. 1
 Duke Energy Oconee Nuclear Station Inspection and Clean Up of BA on Plant Materials MP/O/A/1800/132, Rev. 6
 NDE Procedures Manual-Vol 4, PDI-UT-2, Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds, Rev. C
 NDE Procedures Manual-Vol 3-NDE-35, Liquid Penetrant Exam, Rev. 22
 Oconee Nuclear Station Reactor Vessel Lower Head Penetrations Visual Inspection Procedure MP/O/A/1150/030, Rev. 3
 PIP O-08-2115, Indication during VT-1 on Flange 1-51A-5-1B1-FLG, Class 1 piping
 PIP O-08-2894, Unit 1 Limited Coverage List during UTs
 PIP O-09-4541, BACCP 2009 Assessment deficiency
 PIP O-09-4554, BACCP 2009 Assessment deficiency
 PIP O-09-4556, BACCP 2009 Assessment deficiency
 PIP O-09-4569, BACCP 2009 Assessment deficiency
 PIP O-09-5223, BACCP 2009 Assessment deficiency
 PIP O-09-7046, Unit 1 Mode 3 Hot Shutdown RB Boric Acid walkdown tour
 PIP O-09-7131, Unit 1 Reactor Vessel Upper Head bare metal walkdown
 PIP O-09-5456, BA Evaluation for body to bonnet leak
 Duke Energy Automated Reading and Training for Generic Boric Acid Recognition, 4/14/2008
 Oconee Unit 1, Relief Request 09003, Installation of Full Structural Weld Overlay on Cold Leg MRP-139 Nozzles.
 Oconee Unit 1, Relief Request 09005, Alternate NDE methods for MRP-139 Welds.
 Oconee Unit 1, 2009 BACCP Assessment, April 6 - May 29, 2009
 Oconee Unit 1, active boric acid leaks list, 10/19/09
 Oconee Unit 1, Fourth Ten year Interval Inspection Status, EOC 24 Refueling Outage Report, Rev. 0
 Oconee Nuclear Station Boric Acid Inspector Training TTC545N
 UT exam results for valve 1LP-47 (Cast SS) to pipe weld, weld #1-53A-02-65L
 Phased Array UT exam report and calibration report for RCP1A2 suction piping, weld#1-PIA2-7
 Phased Array UT exam report and calibration report for RCP1B1 suction piping, weld#1-P1B1-7
 PT exam results for valve 1LP-47 (Cast SS) to pipe, class 2 weld, Report # PT-09-208
 Various qualification records for UT, VT, and PT inspectors.
 ONS 1 EOC 24 Steam Generator Inspection Post-Outage Critique
 NSD 607, Self Assessments, Benchmarking and Observations, Rev. 14

Forth Interval Steam Generator Inservice Inspection Plan Oconee Nuclear Station Unit 1, Rev. 0
 51-908-0450-000, A CMOA Evaluation of Wear Scars for Oconee Unit 1 at EOC 24
 SGMEP 105, ROTSG Specific Assessment of Potential Degradation Mechanisms, Rev. 9

Section 1R11: Licensed Operator Requalification

EP/1/A/1800/001, EOP- IMAs and SAs, Rev. 36
 ASE-36, Active Simulator Exam, dated 8/25/09

Section 1R12: Maintenance Effectiveness

PIP O-09-8383, Leakage observed from Unit 1 "A" and "B" HPI cyclone separators
 PIP O-09-8444, Investigation of the failure of CRDM #60 to latch following core reload on Unit 1
 PIP O-09-8533, Opening of Equipment Hatch delayed due to movement of R-8 fuel assembly
 from the Unit 1 core
 PORC Meeting to address the offload of the R-8 fuel assembly from the Unit 1 core held on
 11/14/09
 91-01 Evolution Activity Plan for Fuel Assembly R-8 Offload
 MP/0/A/1500/009, Defueling / Refueling Procedure, Rev. 058
 TT/1/A/0750/019, Removal of Damaged Fuel Assembly R-8, Rev. 00
 OP/0/A/1506/001, Fuel and Component Handling, Rev. 102
 OSC-9883, Damaged Fuel Assembly Extraction Tool Functionality, Rev. 0
 91-01 Activity Plan, Fuel Assembly R-8 Offload
 NUMARC 93-01, Industry Guideline for Monitoring the Effectiveness of Maintenance at Nuclear
 Power Plants, Rev. 2

Section 1R13: Maintenance Risk Assessments and Emergent Work Control

PIP O-08-2904, INOS Assessment of Heavy Lift Issues
 PIP O-09-7171, Documenting the PORC approval of the Unit 1 Electrical Generator Rotor Lift
 Plan during 1 EOC 25
 PIP O-09-7349, Need to revise Duke Lift Program to clarify definition of a "Lift" for purposes of a
 "planned engineered lift" in accordance with ASME B30.2
 NUREG-0612, Control of Heavy Loads at Nuclear Power Plants
 1 EOC 25 Oconee Nuclear Station Generator Rotor Lift Plan
 Unit 1 EOC-025 Refueling Outage Window Status Report
 ONS 1 EOC 25 RFO Supplemental Risk Review; 8/17/09 ORAM SENTIEL run
 NSD 403, Shutdown Risk Management (Modes 4, 5, 6 and No Mode) per 10 CFR 50.65(a)(4),
 Rev. 19
 91-01 Briefing covering Unit 1 Reduced Inventory Conditions
 SLC 16.9.16, Reactor Building Polar Crane and Auxiliary (Control Rod Drive) Hoist- (RCS
 System Open)
 Letter from J.F. Stolz (NRC) to H.B. Tucker (Duke) dated April 20, 1983. Subject: Control of
 Heavy Loads [Safety Evaluation Report]
 Letter from M.S. Tuckman (Duke) to Document Control Desk (NRC) dated May 13, 1996.
 Subject: Response to NRC Bulletin 96-02: Movement of Heavy Loads Over Spent Fuel,
 Over Fuel in the Reactor Core, or Over Safety Related Equipment
 PIP O-09-8671, PORC Meeting Minutes- November 15, 2009 / 1500 Re-PORC Infrequently
 Performed Evolution Plan – Offload of Fuel Assembly R-8

Section 1R15: Operability Evaluations

PIP O-09-7536, SSF RC Letdown Line Discharge Test Failed Due to Blocked Flow Path Engineering Change, Removal of Backseat Gasket for 1/2/3HP-426

PT/1/A/0400/020, SSF RC Letdown Line Discharge Test, Rev. 001

Letter from B. H. Hamilton (Duke) to Document Control Desk (NRC) dated March 15, 2007.

Subject: Reply to a Notice of Violation

Memorandum from K. Redmond (Duke) to P.E. Mabry (Duke) dated November 3, 2009.

Subject: Analysis of ONS Unit 1 SSF Letdown System Foreign Material, Addendum 2

Memorandum from K. Redmond (Duke) to P.E. Mabry (Duke) dated October 23, 2009. Subject:

Analysis of ONS Unit 1 SSF Letdown System Foreign Material, Addendum

Memorandum from K. Redmond (Duke) to W.K. Grayson (Duke) dated October 20, 2009.

Subject: Analysis of ONS Unit 1 SSF Letdown System Foreign Material

PIP O-09-7066, During performance of PT/1/A/0400/020 SSF Letdown Line Discharge Test acceptance criteria was not met

Letter from F. A. Bensinger (Flowserve) to J. Turner (Duke) dated November 27, 2009. Subject Backseat Gasket Information

DWG No 7814-5-DFA, Drain Flange Assembly 1" NPS, Rev D

WO 18931500, Flush portions of the Unit 1 SSF Letdown Line

OM 245.-1866 001, 1" – 1878 Socket Ends Stainless Steel Globe Valve with Threaded Backseat, Rev 9

OFD-100A-1.1, Flow Diagram of Reactor Coolant System, Rev. 37

OFD-101A-1.1, Flow Diagram of High Pressure Injection System (Letdown Section), Rev. 44

OFD-101A-1.5, Flow Diagram of High Pressure Injection System (SSF Portion), Rev. 20

OFD-104A-1.1, Flow Diagram of Spent Fuel Cooling System, Rev. 48

Section 1R18: Plant Modifications

PIP O-04-4733, Level 2 Assessment from Regulatory Brainstorming Workshop

PIP O-09-1960, Ensure that affected design documents are updated in accordance with EDM-601

OFD-121D-1.2, Flow Diagram of Emergency Feedwater System (Auxiliary Feedwater)

O-439A, Unit 1 Piping Layout East Penetration Layout Elevation 809' -3" – 821' -6" Auxiliary Building

O-439E, Unit 1 Piping Layout Sections - Penetration Room Auxiliary Building

WO 01838160, EC-91884/OD100929 Unit 1 Steam Generator Piping Tie-ins

OSS-0243.00-00-0001, Mechanical Piping Installation Specification

MP/0/A/1720/017, System Leakage Test Controlling Procedure, Rev. 0

MO/0/A/1800/061, Structural Steel – Bolted and Welded – Pre-Fabrication – Removal and Installation, Rev. 27

MP/0/A/3019/004, Hangers- QA1 Condition 1 and 4 – Removal, Installation, or Modification, Rev. 63

PT/1/A/0152/006, Condenser Circulating Water System Valve Stroke Test, Rev. 15

10 CFR 50.59 Screen for A/R 291728, Procedure to Transport Fuel Assembly R-8 to the SFP

ONEI-0400-324, Damaged Fuel Assembly Extraction Tool Functionality, Rev. 0

OSC-9883, Damaged Fuel Assembly Extraction Tool Functionality, Rev. 0

TT/1/A/0750/019, Removal of Damaged Fuel Assembly R-8, Rev. 0

Section 1R19: Post-Maintenance Testing

OSC-8144, Mechanical Design Input Calculation for NSM ON-x3117, Rev. 5
 OFD-124B-1.1, Flow Diagram of Low Pressure Service water System (Auxiliary Building Services), Rev. 61
 TT/1/A/3117/001, LPSW Waterhammer Prevention System Pneumatic Valves Air Accumulator Leakage Test, Rev. 0
 TT/1/A/3117/002, LPSW Waterhammer Prevention System Boundary Valve Leakage Test, Rev. 1
 PT/1/A/0251/024, HPI Full Flow Test, Rev. 34
 OFD-101A-1.1, Flow Diagram of High Pressure Injection System (Letdown Section), Rev. 44
 OFD-101A-1.2, Flow Diagram of High Pressure Injection System (Storage Section), Rev. 40
 OFD-101A-1.3, Flow Diagram of High Pressure Injection System (Charging Section), Rev. 23
 OFD-101A-1.4, Flow Diagram of High Pressure Injection System (Charging Section), Rev. 38
 OFD-101A-1.1, Flow Diagram of High Pressure Injection System (Letdown Section), Rev. 44
 OFD-102A-1.1, Flow Diagram of Low Pressure Injection System (Borated Water Supply & LPI Pump Suction), Rev. 55
 OFD-102A-1.2, Flow Diagram of LPI Pump Discharge), Rev. 49
 TT/1/A/0610/041, Startup Transformer Lockout Relay Test, Rev. 000
 OP/1/A/1107/021, Removal and Restoration of CT1 Transformer
 PIP O-09-8417, PT/1/A/0251/024 (HPI Full Flow Test) Stopped Due to 1LT-5 Decrease Following 1B HPI Pump Start
 PIP O-09-8423, 1B HPIP Developed Head Data Needs Rebaselining
 PIP O-09-8427, 1C HPIP Developed Head Data Needs Rebaselining
 WO 01877695, PM Keowee Under/Over Freq/Volt Relays

Section 1R20: Refueling and Other Outage Activities

Unit 1 EOC 25 Refueling Outage Window Status Report
 ONS 1 EOC 25 RFO Supplemental Risk Review; 8/17/09 ORAM SENTIEL run
 NSD 403, Shutdown Risk Management (Modes 4, 5, 6 and No Mode) per 10 CFR 50.65(a)(4), Rev. 19
 OP/1/A/1102/010, Controlling Procedure for Unit Shutdown, Rev. 194
 MP/0/A/1150/002, Reactor Vessel – Closure Head – Removal, Rev. 46
 MP/0/A/1150/002A, Reactor Vessel – Closure Head – Installation, Rev. 35
 MP/0/A/1500/009, Defueling / Refueling Procedure, Rev. 54
 MP/0/A/1150/006A, Reactor Vessel – Plenum Assembly – Installation, Rev 030
 PT/0/A/0750/017, Defueling Activities, Rev. 18
 PT/0/A/0775/015, Core Alignment Verification, Rev. 008
 PT/0/A/0750/002, Core Inspections Procedure, Rev. 027
 PT/0/A/0750/018, Refueling Activities, Rev. 18
 MP/0/A/1500/009, Defueling/Refueling Procedure, Rev. 054
 OP/1/A/1502/009, Containment Closure Control, Rev. 035
 OP/1/A/1102/001, Controlling Procedure for Unit Startup, Rev. 276
 91-01 Activity Plan, Core Reload
 PIP O-09-7292, Wording wrong in procedure for aligning pendants on tri-pod to reactor vessel head
 ODMI Covering 1 EOC 25 RCP Strategy For Shutdown (to address PIP O-09-6672)
 Unit Shutdown / Cooldown Depressurization JITT, Rev. 2
 Zero Power Physics Testing (ZPPT) and Reactor Startup Following ZPPT (SNO-L11), Rev. 13
 PIP O-09-7026, CRD Group 7, Rods 5 and 6 lost API indication

PIP O-09-7040, Unit 1 Reactor Building Tour Results – Mode 3
 PIP O-09-7046, 1 EOC 25 Engineering Mode 3 Hot Shutdown Reactor Building Tour
 PIP O-09-7084, Small Puddle of Oil Found Under the Unit 1 Reactor Vessel
 PIP O-09-7133, Unit 1 Reactor Vessel Lower Head Penetration Inspection Results

Section 1R22: Surveillance Testing

OFD-104A-1.1, Flow Diagram of Spent Fuel Cooling System, Rev. 48
 OFD-101A-1.5, Flow Diagram of High Pressure Injection System (SSF Portion), Rev. 20
 PT/1/A/0620/009, Keowee Hydro Operation, Rev. 43
 PT/0/A/0600/021, Standby Shutdown Facility Diesel-Generator Operation, Rev. 010
 OP/0/A/1600/010, Operation of the SSF Diesel-Generator, Rev. 60
 PT/1/A/0610/001J, Emergency Power Switching Logic Functional Test, Rev. 041
 OSS-0254.00-00-2000, Design Basis Specification for the 4kV Essential Auxiliary Power System, Rev 15
 O-09-07947, Problems noted during the performance of PT/1/A/0610/001J Emergency Power Switching Logic Functional Test
 PIP O-02-2149, US NRC Information Notice 2002-13, Possible Indicators of On-going Reactor Pressure Vessel Head Degradation
 OM 201.-3153-001, Arrangement Reactor Vessel Longitudinal Section, Rev. D-18
 OM 201.-0017-001, Reactor Building Functional Requirements Elevation Section W-W, Rev. D-7
 OM 2271.-0006-001, Reactor Building Functional Requirements Elevation Section Z-Z, Rev. D2
 OM 271.-0065-001, Reactor Building Functional Requirements Elevation Section X-X, Rev. D4
 O-69D, Reactor Building Primary & Secondary Shield Walls Sections & Elevations Concrete, Rev. 16
 O-68A, Reactor Building Unit 1 Reactor Foundation Concrete, Rev. 18
 WO 01855321-01, Perform a VT-2 Exam on 1-RPV-BMI-Nozzles
 WO 01855889-01, Unit 1 Inspect Rx. Vessel Lower Head Bare Metal
 NDE-68, VT-2, Visual Examination for Leakage and Boric Acid Corrosion Control, Rev. 2
 RP Survey M-101109-22
 TI2515/152, Reactor Pressure Vessel Lower Head Penetration Nozzles (NRC Bulletin 2003-02), Rev. 1
 NRC Bulletin 2003-02, Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity

Section 1EP6: Drill Evaluation

PIP O-09-06848, ERO drill participant did not properly perform frisk prior to entering TSC.
 PIP O-09-06846, Rx Engineer did not make the required response time for ERO drill by 23 minutes.
 PIP O-09-06941, Station ERO Response to after-hours augmentation drill did not meet expectations.

Section 2OS1: Access Controls to Radiologically Significant Areas

Procedures, Guidance Documents, and Manuals

HP-0-B-1000/054, Radiation Protection Routines, Rev 40
 HP-0-B-1000/097, Radiological Protection Requirements for Independent Spent Fuel Storage Installation Phase V, Rev. 10
 SH/0/B/2000/003, Preparation of a Radiation Work Permit, Rev. 9
 SH/0/B/2000/005, Posting of Radiation Control Zones, Rev. 7

SH/0/B/2000/007, Placement of Personnel Dosimetry for Non-Uniform Radiation Fields, Rev. 1
 SH/0/B/2000/012, Access Controls for High, Locked High, and Very High Radiation Areas,
 Rev. 11
 SH/0/B/2001/001, Internal Dose Assessment, Rev. 4
 SH/0/B/2001/002, Investigation of Unusual Dosimetry Occurrence or Possible Overexposure,
 Rev. 6
 SH/0/B/2001/003, Investigation of Skin and Clothing Contaminations, Rev. 10
 SRPMP 4-5, Sentinel Rad Access Management, Rev. 0

Records and Data

ISFSI TLD Boundary Study (1st Quarter 2007 through 1st Quarter 2009)

Radiation Work Permits (RWPs)

RWP 31, Task 1, Radwaste Chemistry Activities
 RWP 27, Task 1, Compaction, Packing, Shipping, and Receipt of Radioactive Waste
 RWP 3010, Task 1, Install and Remove Scaffolding, General Area DR < 100 mrem/hr
 RWP 3004, Task 1, Misc. PM and Corrective Maintenance, General Area DR < 100 mrem/hr
 RWP 1107, Task 1, Remove/Replace 1RC2 & 1RC3/Assoc Piping/Components & Assoc Work,
 General Area DR < 100 mrem/hr
 RWP 5008, Task 1, Valve Line-ups/Filter Change Set-up
 RWP 5007, Task 2, Filter Change Activities Including Transport
 RWP 5134, Task 4, DSC activities: LHRA entries associated with ISFSI to include RAM Access
 Cover Removal, Installation of Seismic Restraint, and Emergent Need Entries
 RWP 1063, Task 4, Weld Overlay (Layout, Prep, NDE, Weld Inspect)
 RWP 22, Task 1, Security Activities

Radiation Surveys

M-102909-24, M-051409-8, M-100909-8, M-022509-7, M-041109-3, M-041609-9, M-091105-3,
 M-102909-24, M-061205-1, M-091403-1, M-102709-21, M-101809-5, M-101909-48, M-102709-
 17, M-101109-21, M-080809-10, M-101909-20, M-101909-3, M-101406-8, M-102209-33, M-
 102809-35, M-101509-21

Corrective Action Program (CAP) Documents

Problem Investigation Process (PIP) O-08-4541, RP posting was not in place, allowing
 maintenance technicians to enter/exit an RCZ at a point not intended
 PIP O-08-7861, Keys missing from key storage box
 PIP O-08-4706, Exposure for DSC 100 exceeded estimated exposure by > 25% due to neutron
 dose rates
 PIP O-09-6231, Personnel broke lock and entered RCZ without notifying RP
 PIP O-09-5562, Adverse trend in recent OMP RP boundary and dosimetry violations
 PIP O-09-5245, Individuals entered RCA without electronic dosimetry and RWP
 PIP O-09-4994, Contract employee entered the ISFSI gate without dosimetry and being signed
 into a RWP
 PIP O-09-3362, Unexpected dose rate alarm, access control issue
 PIP O-09-5609, Two security personnel entered a high radiation area without notifying RP
 RPS-09-SA-03, 2009 Year-to-Date PCE Assessment

Section 20S2: Occupational ALARA Planning and Controls**Procedures, Manuals, and Guidance Documents**

Duke Energy, Fleet ALARA Manual, Section III, ALARA Program, Rev. 15
 Duke Energy, Fleet ALARA Manual, Section IV, ALARA Planning, Rev. 18
 Duke Energy, Fleet ALARA Manual, Section VIII, Station ALARA Committee, Rev. 17
 HP/0/B/1000/054, Radiation Protection Routines, Rev. 40
 HP/0/B/1000/106, Crudburst Posting, Monitoring and Access Controls, Rev. 0
 NSD 208, Problem Investigation Process, Rev. 31
 SH/0/B/2000/003, Preparation of a Radiation Work Permit, Rev. 9
 SH/0/B/2002/003, Declared Pregnant Worker, Rev. 4

Records and Data

1EOC24, 2EOC23, and 3EOC24 Shutdown Chemistry Reports
 1EOC25 Source Term Reduction Team Script
 2EOC23 Outage Report
 ALARA Committee Meeting Minutes, Dated 12/15/08, 03/15/09 and 06/08/09
 ALARA Planning Worksheet, "A" & "B" S/G Plugging and Associated Activities, Dated 10/25/09
 ALARA Planning Worksheet, "A" & "B" SG Install and Remove Nozzle Dams, Dated 09/02/09
 ALARA Planning Worksheet, "A" & "B" SG Remove and Install Hand Holes and Manways,
 Dated 09/02/09
 ALARA Planning Worksheet, Replace LPSW/Raw Water Piping to all RCP Motor Coolers
 (Rev. 1), Dated 10/12/09
 ALARA Planning Worksheet, Unit 1 Letdown Nozzle Overlay & Support Work, Dated 08/24/09
 Declared Pregnant Worker Dosimetry Records, April 2007 - October 2009
 Hot Spot Database Source Term Tracking Report
 Oconee VSDS, Unit 1 "A" S/G Lower Playpen, Survey No. M-102409-38, Dated 10/24/09
 Oconee VSDS, Unit 1 "A" S/G Upper Playpen, Survey No. M-102409-37, Dated 10/24/09
 Oconee VSDS, Unit 1 "B" S/G Lower Playpen, Survey No. M-102409-22, Dated 10/24/09
 Oconee VSDS, Unit 1 "B" S/G Upper Playpen, Survey No. M-102409-20, Dated 10/24/09
 Oconee VSDS, Unit 1 Letdown Cooler Room, Survey Nos. M-101309-55, Dated 10/13/09; and
 M-101509-2, Dated 10/13/09
 ONS 2007 and 2008 ALARA Summary Report
 OTSG Channel Head Survey Form, RWP No. 1216, Dated 10/12/09
 OTSG Manway Removal Survey Form, RWP No. 1216, Dated 10/12/09
 Radiation Work Permit (RWP) Number (No.) 1003, Unit 1 Rx Bldg Install and Remove Lead
 Shielding, Rev. 19
 RWP No. 1010, Unit 1 Rx Bldg Install and Remove Scaffolding, Rev. 20
 RWP No. 1032, Unit 1 Rx Bldg Radiography Testing and Associated Work, Rev. 11
 RWP No. 1063, Unit 1 Rx Bldg – Letdown Nozzle Weld Overlay & Associated Work, Rev. 1
 RWP No. 1293, Unit 1 Aux Bldg – Remove/Repair/Replace HPI Pump, Rev. 09
 Unit 1 ALARA Updates, Dated 10/13 – 10/16/09 and 10/26 – 10/30/09
 Work Order No. 01843875 21, Unit 1 EOC 25 Install/Remove Temp. Lead Shielding in Unit 1
 Rx/Aux Bldg

CAP Documents

Assessment No. RP-SA-2009-0007, Annual Radiation Protection Program Review (10 CFR
 Part 20 Program)
 PIP O-08-07626, Exposures associated with RWP 2302 (Cutout and replace 2 LP6 & 7) have
 exceeded estimated exposure by >24%

- PIP O-09-00922, Work order to remove one board from 3A Bleed Hold Up Tank Room would cause unnecessary excessive dose to workers
- PIP O-09-07367, The dose estimate to remove reactor vessel and place on head stand was exceeded by 154 mrem
- PIP O-09-07374, ALARA – Use of temp fencing versus boundary guards offers exposure reduction opportunity

Section 2PS2: Radioactive Material Processing and Transportation

Procedures, Manuals, and Guidance Documents

- CP/O/B/5400/001, Radwaste Dewatering & Operations Guidelines, Rev. 28
- HP/O/B/1006/002, Procedure for Receiving and Opening Packages Containing Radioactive, Rev. 22
- MP/O/A/1701/015, Cask –CNS 14-2125H – Handling Procedure, Rev. 22
- Policy IV-08, 10 CFR Part 61 Waste Class Implementation Program, Rev. 0
- Policy IV-5, Shipment and Disposal of Radioactive Material, Rev. 1
- Radioactive Waste Process Control Program, Rev. 15
- SH/O/B/2004/001, Preparation and Shipment of Radioactive Material, Rev. 6

Records and Data

- 10 CFR Part 61 Sample Analysis Results including data base comparison update reports for data base sample values, percent abundance, and scaling factors for the following waste stream types: Dry Active Waste, 12/18/08; Filter Media, 01/07/09; Powdex Resin, 12/18/08; Primary Resins, 12/18/08; Demin Resins, 12/18/08
- Oconee Nuclear Station Annual Radwaste Report 02/10/08
- Oconee Nuclear Site, Solid Waste Disposal Report
- Radioactive Shipment Record (RSR) ONS 08-2041, Radioactive Material, Low Specific Activity (LSA I), 7, UN2912
- RSR ONS 08-2056, Radioactive Material, Low Specific Activity (LSA-II), 7, UN3321
- RSR ONS 08-2083, Radioactive Material, Low Specific Activity (LSA I), 7, UN2912
- RSR ONS 09-1094, Not Radioactive Per 49 CFR 173.436
- RSR ONS 09-1097, Radioactive Material, Excepted Package - Limited Quantity of Material, 7, UN2910
- RSR ONS 09-2025, Radioactive Material, Type A Package, Fissile Excepted, UN 2915
- RSR ONS 09-2038, Radioactive Material, Type B (U) package, 7, Fissile Excepted, UN 2916
- RSR ONS 09-2041, Radioactive Material, Low Specific Activity (LSA-1), 7, UN2912
- RSR ONS 09-2046, Radioactive Material, Low Specific Activity (LSA-1), 7, UN2912
- RQ-Radionuclides, USA/9168/B(U) Type B Shipping Cask
- Receipt 09-1-130, Radioactive material, surface contaminated objects, (SCO-II), 7, Fissile Excepted, Box, UN 2913

CAP Documents

- Annual Radiation Protection Program Review (09/11/08 - 01/15/09)
- PIP G-09-00265, RP Annual Self Assessment
- PIP O-09-01214, Primary Resin Shipment Rescheduled
- PIP O-09-02471, Damaged O ring on Shipping Cask
- PIP O-09-05265, Unplanned Radwaste

Section 40A1: Performance Indicator VerificationProcedures

SRPMP 10-1, NRC Performance Indicator Data Collection, Validation, Review, and Approval, Rev. 3

SRPMP 8-2, Investigation of Unusual Radiological Occurrence, Rev. 3

Records and Data Reviewed

Electronic Dosimeter Dose and Dose Rate Alarm Log, 01/01/09 – 10/21/09

NRC Performance Indicator Data Review for April 2008 through September 2009

CAP Documents

PIP O-09-7493, Worker received ED dose alarm

PIP O-09-1294, Worker received a dose rate alarm while performing task

PIP O-09-3362, Unexpected dose rate alarm – access control issue – worker(s) entered high radiation area on incorrect RWP task

PIP O-09-9363, Documentation of Assessment ENG-09-SA-26 – AFI ER.2.-1 Effectiveness Review Assessment (Emergency AC Power)

PIP O-09-9392, Update to January 2009 MSPI reporting data

PIP O-09-0079, ACB-2 did not close during startup for System Generation

PIP O-09-1564, The Actual Unavailable Hours are higher than Baseline Unavailable Hours for the Emergency Power System causing the UAI (Unavailability Indicator) within the total MSPI indicator to be White

Section 40A2: Identification and Resolution of ProblemsControl of Vehicles within the Protected Area Trend Statement

PIP O-09-0032, Unsecured vehicle inside the PA

PIP O-09-2434, Driver unsure of vehicle control requirements

PIP O-09-3171, Vehicle not secured inside PA

PIP O-09-4467, Unsecured vehicle in the PA

PIP O-09-5364, During routine patrol of the PA officer # 1 discovered keys that had been left in a vehicle. Officer removed the keys and stored them in the proper storage location.

PIP O-09-6440, Unsecured Vehicle inside PA

PIP O-09-6508, Uncontrolled vehicle in the PA

PIP O-09-8449, Vehicle not properly secured

Plant Awareness Note dated September 17, 2009, Control of Vehicles inside the PA

Contractor Activities Impacting Plant Security Measures Trend Statement

PIP O-09-0925, Tailgate CAD 531

PIP O-09-1100, Stop Work Implemented by Security for the Tornado/HELB Project "W8 I-Beam Work" Scheduled for 2/20/2009

PIP O-09-1722, Stop Work Implemented by Security for the Tornado/HELB Project "Segment # 3 of the PSW Ductbank"

PIP O-09-1777, Security PIP Trending: Three (3) Events Within an Approximate Five (5) Week Period in Which the Violation of Security Requirements is Attributable to the Tornado/HELB Project

PIP O-09-2434, Driver unsure of vehicle control requirements

PIP O-09-6440, Unsecured Vehicle inside PA

PIP O-09-6508, Uncontrolled vehicle in the PA

PIP O-09-8654, Security Barrier left open and unattended. (This is not a PA Barrier)

PIP O-09-8660, Uncontrolled badge in the PA
 PIP O-09-8830, Security delay barrier moved without prior authorization from Security
 PIP O-09-8864, Vacuum truck placed in an unauthorized area
 PIP O-09-8884, Unapproved Excavation Work
 PIP O-09-9151, Adverse Trend on Security Issues

Coordination of Outage Activities Trend Statement

PIP O-09-0150, Oconee (ONS) NRC Senior Resident Inspector notified ONS of a potential concern associated with issues related to the coordination of work during outages. (PIPs: O-07-7374, O-07-7674, O-08-2056, O-08-2086, O-08-6643, O-08-7023, and O-08-6998)
 PIP O-08-7753, LPI system fill, vent and startup revision technically inaccurate
 PIP O-08-6643, Loss of process fluid during Fill of Unit 2 S/G from Unit 1 using 1 A MDEFWP
 PIP O-08-7023, SLC commitment not met during mod installation with proper communication to Operations
 PIP O-08-7024, SLC 16.9.11.a entry required for LPSW piping removal in 2EOC-23 refueling outage
 PIP O-08-6998, Control Room not made aware of heavy lift over Unit 1 Turbine Building 3rd Floor Equipment
 PIP O-08-2086, MCC 1XP lost power and did not re-energize as expected when power transferred from 1T Transformer to CT-1 Transformer
 PIP O-08-2056, Unit 1 Loss of Power
 PIP O-07-7674, During the performance of RCS makeup from 3B BHUT the incorrect volume was added
 PIP O-07-7374, RCS level decreasing at a higher rate than expected
 PIP O-07-7371, Online schedule of KHU maintenance could prevent MODE change to MODE 4
 PIP O-07-6852, Loss of RCW system header pressure with RCW system cross-connected
 PIP O-07-2504, Disposing of 2B EHC Pump Suction Strainer without oil being drained
 PIP O-07-1569, Inadvertent unrecognized entry into SLC 16.9.1.A

Section 4OA3: Event Follow-up

PIP O-09-8403, Primary Instrument Air Compressor Trip
 WO 01897620, U0, IA, CP0005, I/R IA High Temp Trip Circuit
 PIP O-09-9346, PORC Meeting Minutes - Dec. 16, 2009 / 1300 Loss of Main Feedwater Licensee Event Report

Section 4OA5: Other Activities

NSD 200, Work Hour Guidelines and Limits, Rev. 10
 Regulatory Guide 5.73, Fatigue Management for Nuclear Power Plant Personnel
 NEI 06-11, Managing Personnel Fatigue at Nuclear Power Reactor Sites, Rev. 1
 10 CFR 26, Fitness for Duty Programs
 PIP O-09-6989, Exemption for Activities Performed by Contractor in the Construction for the Tornado / HELB Project from "Covered Work" as detailed in NSD-200

LIST OF ACRONYMS

ALARA	-	As Low As Reasonably Achievable
ASME	-	American Society of Mechanical Engineers
BACC	-	Boric Acid Corrosion Control
CAP	-	Corrective Action Program
CFR	-	Code of Federal Regulations
CY	-	Calendar Year
DMBW	-	Dissimilar Metal Butt Welds
ED	-	Electronic Dosimeter
EFW	-	Emergency Feedwater
EOC	-	End-of-Cycle
EOP	-	Emergency Operating Procedure
ET	-	Eddy Current Testing
HPI	-	High Pressure Injection
HRA	-	High Radiation Area
IP	-	Inspection Procedure
IR	-	Inspection Report
ISFSI	-	Independent Spent Fuel Storage Installation
ISI	-	Inservice Inspection
KHU	-	Keowee Hydro-electric Unit
LHRA	-	Locked High Radiation Area
LOCA	-	Loss of Coolant Accident
LPI	-	Low Pressure Injection
MC	-	Manual Chapter
MRP	-	Materials and Reliability Program
NCV	-	Non-cited Violation
NDE	-	Non-Destructive Examination
NEI	-	Nuclear Energy Institute
PA	-	Protected Area
PARS	-	Publicly Available Records
PCP	-	Process Control Program
PI	-	Performance Indicator
PIP	-	Problem Investigation Process
PM	-	Preventive Maintenance
RBS	-	Reactor Building Spray
RCA	-	Radiologically Controlled Area
RCS	-	Reactor Coolant System
RCW	-	Recirculating Cooling Water
Rev.	-	Revision
RG	-	Regulatory Guide
RSR	-	Radioactive Shipment Record
RTP	-	Rated Thermal Power
RWP	-	Radiation Work Permit
SDP	-	Significance Determination Process
SFP	-	Spent Fuel Pool
SG	-	Steam Generator
SH	-	Shared Health Physics Procedure
SSC	-	Structures, Systems, and Components
SSF	-	Standby Shutdown Facility

TI	-	Temporary Instruction
TS	-	Technical Specification
UFSAR	-	Updated Final Safety Analysis Report
UT	-	Ultrasonic Testing
VHRA	-	Very High Radiation Area
WO	-	Work Order