



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

May 2, 2013

Mr. Tom E. Tynan  
Vice President - Vogtle  
Southern Nuclear Operating Company, Inc.  
Vogtle Electric Generating Plant  
7821 River Road  
Waynesboro, GA 30830

**SUBJECT: VOGTLE ELECTRIC GENERATING PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000424/2013002 AND 05000425/2013002**

Dear Mr. Tynan:

On March 31, 2013, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Vogtle Electric Generating Plant, Units 1 and 2. The enclosed integrated inspection report documents the inspection findings, which were discussed on April 15, 2013, with Mr. G. Saxon and other members of your staff.

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

Three self-revealing findings of very low safety significance (Green) were identified during this inspection. These findings were determined to involve violations of NRC requirements. The NRC is treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the Vogtle Electric Generating Plant.

If you disagree with the cross-cutting aspect assignment in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II; and the NRC Resident Inspector at the Vogtle Electric Generating Plant.

T. Tynan

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In accordance with the 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosures, 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 the NRC's Agencywide Document Access and Management 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/***

Frank Ehrhardt, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Docket Nos.: 05000424, 05000425  
License Nos.: NPF-68 and NPF-81

Enclosures: Inspection Report 05000424/2013002 and 05000425/2013002  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

T. Tynan

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Reactor Projects Branch 2  
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Docket Nos.: 05000424, 05000425  
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cc w/encl: (See page 3)

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Letter to Tom E. Tynan from Frank Ehrhardt dated May 2, 2013

SUBJECT: VOGTLE ELECTRIC GENERATING PLANT - NRC INTEGRATED INSPECTION  
REPORT 05000424/2013002 AND 05000425/2013002

Distribution w/encl:

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**U. S. NUCLEAR REGULATORY COMMISSION**

**REGION II**

Docket Nos.: 50-424, 50-425

License Nos.: NPF-68, NPF-81

Report Nos.: 05000424/2013002 and 05000425/2013002

Licensee: Southern Nuclear Operating Company, Inc. (SNC)

Facility: Vogtle Electric Generating Plant, Units 1 and 2

Location: Waynesboro, GA 30830

Dates: January 1, 2013 through March 31, 2013

Inspectors: M. Cain, Senior Resident Inspector  
T. Chandler, Resident Inspector  
R. Williams, Reactor Inspector (4OA5, 1R08)  
M. Coursey, Reactor Inspector (1R08, 4OA5)  
R. Carrion, Senior Reactor Inspector (1R08, 4OA5)  
R. Hamilton, Senior Health Physicist (2RS1, 4OA1)  
J. Rivera, Health Physicist (2RS8)  
C. Abbott, Construction Resident Inspector (4OA5)  
P. Cooper, Reactor Inspector (4OA5)

Approved by: Frank Ehrhardt, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Enclosure



## SUMMARY OF FINDINGS

IR 05000424/2013-002, 05000425/2013-002; 01/01/2013 - 03/31/2013; Vogtle Electric Generating Plant, Units 1 and 2; Refueling and Other Outage Activities; Licensed Operator Requalification Program; Maintenance Rule Effectiveness

The report covered a three-month period of inspection by the resident inspectors and seven reactor inspectors. Three non-cited violations (NCVs) with very low safety significance (Green) were identified. The significance of inspection findings are indicated by their color (i.e., great than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" dated June 19, 2012. Cross-cutting aspects are determined using IMC 0310, "Components Within The Cross-Cutting Areas" dated October 28, 2011. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy dated January 28, 2013. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4.

### Cornerstone: Initiating Events

Green A self-revealing non-cited violation (NCV) of 10 CFR 50 Appendix B Criterion V, "Instructions, Procedures, and Drawings" was identified for failure to provide adequate work instructions in the operations procedure used to change out the reactor coolant system (RCS) filter. Specifically, operations procedure 13213-1/2, "Backflushable Filter System," which is used to change out the RCS filter, did not provide adequate instructions and/or precautions to prevent excessive air intrusion (and the subsequent localized crud burst within the chemical and volume control system (CVCS) late in core life) when flushing and venting the RCS filter housing. The licensee conducted a root cause investigation and entered the event into their corrective action program (condition report (CR) 597293). The licensee immediately created a Standing Order for Operation of CVCS in relation to RCP seals, and revised procedure 13213-1/2, "Backflushable Filter System" to provide instructions to significantly reduce the amount of air intrusion from changing out the RCS filter.

The finding was more than minor because it was associated with the procedure quality attribute of the reactor safety - initiating events cornerstone and it adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure to provide adequate work instructions to operations personnel resulted in a 'localized' crud burst at the reactor coolant pump (RCP) seals causing RCP seal leakoff flow rates to exceed administrative limits for continued pump operation and a subsequent manual reactor trip. Because the inspectors answered "No" to all of the IMC 0609 Appendix A (dated June 19, 2012) Exhibit 1, Section B, "Initiating Events Screening Questions," the inspectors concluded that the finding was of very low safety significance (Green). Since the inadequate procedures have existed since plant start-up, this violation is not indicative of current licensee performance and does not have an associated cross-cutting aspect assigned. (Section 1R11)

Enclosure

### Cornerstone: Mitigating Systems

Green: A self-revealing non-cited violation (NCV) of 10 CFR Part 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings" was identified for failure to provide appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, procedure 27080-C, "CCW Pump Maintenance", did not provide adequate direction as to the duration of and instrumentation required to properly perform a post-maintenance test that would detect a misalignment between the pump and motor shafts. The licensee entered this issue into their corrective action program as CR 526268, and revised maintenance procedure 27080-C to specify the proper post maintenance testing required after rebuilding CCW pumps.

The finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and it adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the post-maintenance test performed after rebuilding the Unit 1A component cooling water (CCW) pump #1 failed to identify excessive misalignment between the motor and pump shafts, which subsequently resulted in the catastrophic failure of the inboard pump bearing once the pump was returned to service. Because the inspectors answered "No" to all of the IMC 0609 Appendix A (dated June 19, 2012) Exhibit 2, Section A, "Mitigating Systems Screening Questions," the inspectors concluded that the finding was of very low safety significance (Green). The inspectors determined that the cause of this finding was related to the work control component of the human performance cross-cutting area due to less-than-adequate procedures. Specifically, the maintenance procedures used to reassemble the CCW pumps did not provide adequate direction as to the duration of and instrumentation required to properly perform an adequate post-maintenance test. [H.2(c)] (Section 1R12)

### Cornerstone: Barrier Integrity

Green. A self-revealing non-cited violation (NCV) for failure to meet the requirements of plant Technical Specification (TS) 5.4, Procedures was identified. While realigning equipment to support the filling and venting of the Unit 2 containment spray header the system operator inadvertently closed 1HV-9017A, refueling water storage tank (RWST) suction to Unit 1 containment spray (CS) pump A. As a result, the 1A CS pump was temporarily rendered inoperable. The valve was subsequently re-opened and the pump was declared operable. The licensee entered the issue into their corrective action program (CR 608718).

This finding is more than minor because it is associated with the human performance attribute of the barrier integrity cornerstone and it adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency is a human performance error which affected the availability, reliability, and capability of the Unit 1 "A" train containment spray system to limit and maintain post accident conditions to less

than containment design values. Because the inspectors answered “No” to all of the IMC 0609 Appendix A (dated June 19, 2012) Exhibit 3, Section B, “Barrier Integrity Cornerstone Screening Questions,” the inspectors concluded that the finding was of very low safety significance (Green). The inspectors determined that the cause of this finding was related to the work practices component of the human performance cross-cutting area due to less-than-adequate human error prevention techniques. Specifically, peer checking techniques were less than adequate. [H.4(a)] (Section 1R20)

## REPORT DETAILS

### Summary of Plant Status

Unit 1 operated at or near full rated thermal power (RTP) for the entire inspection period.

Unit 2 started the report period at full RTP and subsequently manually tripped from 94 percent RTP on February 26, 2013 due to excessive reactor coolant pump (RCP) seal leak-off flow rate on RCP #4. The unit was subsequently restarted on February 28 and attained 87 percent power on March 09, 2013. The unit was shutdown for a planned refueling outage on March 10, 2013. The unit remained shutdown for the remainder of the report period.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection (71111.01)

##### a. Inspection Scope

##### .1 Impending Adverse Weather Conditions

The inspectors reviewed the licensee's preparations to protect risk-significant systems from predicted high winds and severe thunderstorms expected on January 30, 2013. The inspectors evaluated the licensee's implementation of adverse weather preparation procedures and compensatory measures, including operator staffing, before the onset of and during the adverse weather conditions. The inspectors reviewed the licensee's plans to address the ramifications of potentially lasting effects that may result from high winds and severe thunderstorms. The inspectors verified that operator actions specified in the licensee's adverse weather procedure maintain readiness of essential systems. The inspectors verified that required surveillances were current, or were scheduled and completed, if practical, before the onset of anticipated adverse weather conditions. The inspectors also verified the licensee implemented periodic equipment walk-downs or other measures to ensure that the condition of plant equipment met operability requirements. Documents reviewed are listed in the Attachment.

##### b. Findings

No findings were identified.

Enclosure

## 1R04 Equipment Alignment (71111.04)

### a. Inspection Scope

#### .1 Partial Walkdown

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

- Unit 2 train “A” and “B” motor-driven auxiliary feedwater systems while the train “C” turbine-driven auxiliary feedwater pump was out of service due to a planned maintenance outage
- Unit 2 train “A” nuclear service cooling water (NSCW) system while the train “B” NSCW cooling tower was out of service for a planned maintenance outage on NSCW pump #6
- Unit 2 train “B” engineered safety features (ESF) chiller system while the train “A” ESF chiller was out of service for a planned maintenance outage

#### .2 Complete Walkdown

The inspectors verified the alignment of the Unit 2 125V DC 1E electrical distribution system. The inspectors selected this system for assessment because it is a risk-significant mitigating system. The inspectors determined the correct system lineup by reviewing plant procedures, drawings, the updated final safety analysis report, and other documents. In order to identify any deficiencies that could affect the ability of the system to perform its function(s), the inspectors reviewed records related to outstanding design issues and maintenance work requests. The inspectors verified that the selected system was correctly aligned by performing a complete walk down of accessible components.

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

### b. Findings

No findings were identified.

1R05 Fire Protection (71111.05AQ)a. Inspection ScopeQuarterly Inspection

The inspectors evaluated the adequacy of selected fire plans by comparing the fire plans to the defined hazards and defense-in-depth features specified in the fire protection program. In evaluating the fire plans, the inspectors assessed the following items: (1) control of transient combustibles and ignition sources, (2) fire detection systems, (3) water-based fire suppression systems, (4) gaseous fire suppression systems, (5) manual firefighting equipment and capability (6) passive fire protection features, (7) compensatory measures and fire watches, and (8) issues related to fire protection contained in the licensee's corrective action program. The inspectors toured the following five fire areas to assess material condition and operational status of fire protection equipment. Documents reviewed are listed in the Attachment.

- Unit 2 "A" train emergency diesel generator (EDG) building, fire zones 161 and 163.
- Unit 1 essential 4.16 kV switchgear rooms, the remote shutdown panel rooms, and the Unit 1 main control room, fire zones 91, 92, 97, 98, 103, and 105.
- Unit 1 "A" train and "B" train cable spreading rooms, fire zones 94, 95, 173, 174, 107, 108, 120, and 121
- Unit 1 "A" train and "B" train auxiliary feedwater pump house, fire zones 155, 156, 157A and 157B.
- Unit 2, level 3 emergency safeguards features chiller and normal AC rooms, fire zones 57A, 81A, 125B, 126B, 135, 153, 178 and 180

Annual Inspection

The inspectors evaluated the licensee's fire brigade performance during a drill and assessed the brigade's capability to meet Branch Technical Position CMEB 9.5-1, "Guidelines for Fire Protection for Nuclear Power Plants," requirements. The inspectors observed the following aspects of fire brigade performance: (1) capability of fire brigade members, (2) leadership ability of the brigade leader, (3) use of turnout gear and fire-fighting equipment, (4) team effectiveness, and (5) compliance with site procedures. The inspectors also assessed the ability of control room operators to combat potential fires, including identifying the location of the fire, dispatching the fire brigade, and sounding alarms. The inspectors evaluated the licensee's ability to declare the appropriate emergency action level and make required notifications in accordance with NUREG 0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants (FEMA-REP-1)" and 10 CFR 50. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R07 Heat Sink Performance (71111.07)

a. Inspection Scope

.1 Annual Review

The inspectors verified the readiness and availability of the Unit 1A CCW heat exchanger to perform its design function by observing performance tests or reviewing reports of those tests, verifying the licensee uses the periodic maintenance method outlined in Generic Letter 89-13, "Service Water System Problems Affecting Safety Related Equipment," observing the licensee's heat exchanger inspections and verifying critical operating parameters through direct observation or by reviewing operating data. Additionally, the inspectors verified that the licensee had entered any significant heat exchanger performance problems into their corrective action program and that the licensee's corrective actions were appropriate. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R08 Inservice Inspection (ISI) Activities (IP 71111.08P, Unit 2)

a. Inspection Scope

Non-Destructive Examination Activities and Welding Activities: From March 18, 2013 through March 22, 2013, the inspectors conducted an on-site review of the implementation of the licensee's ISI Program for monitoring degradation of the reactor coolant system, emergency feedwater systems, risk-significant piping and components, and containment systems in Unit 2. The inspectors' activities included a review of non-destructive examinations (NDEs) to evaluate compliance with the applicable edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (BPVC), Section XI (Code of record: 2001 Edition with Addenda 2003), 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 directly observed the following NDEs mandated by the ASME Code to evaluate compliance with the ASME Code Section XI and Section V requirements and, if any indications and defects were detected, to evaluate if they were dispositioned in accordance with the ASME Code or an NRC-approved alternative requirement.

- Visual Examination (VT) of Reactor Vessel Supports
- Ultrasonic Examination (UT) of 1.5 in. Safety Injection piping, 21204-245-30-RB
- UT of 6 in. Auxiliary Feedwater (AFW) piping, 21302-107-15-RB

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

- Replace valve 21208U4033, 2 in. Chemical and Volume Control check valve
- Work Order (WO) 324070, Pipe Seal Weld Plug on line 1208-95-3

During non-destructive surface and volumetric examinations performed since the previous refueling outage, the licensee did not identify any relevant indications that were analytically evaluated and accepted for continued service. Therefore, no NRC review was completed for this inspection procedure attribute.

PWR Vessel Upper Head Penetration (VUHP) Inspection Activities: For the Unit 2 vessel head, a bare metal visual (BMV) examination and a volumetric examination were required this outage pursuant to 10 CFR 50.55a(g)(6)(ii)(D). The inspectors observed portions of the Unit 2 BMV and ultrasonic (UT) examinations and reviewed NDE records for penetration Nos. 6, 14, 25, 43, 47, 56, 75, 78 for the BMV and penetration Nos. 7, 9, 20, 23, 28, 30 for the UT examinations, to evaluate if the activities were conducted in accordance with the requirements of ASME Code Case N-729-1 and 10 CFR 50.55a(g)(6)(ii)(D). In particular, the inspectors evaluated if the required visual examination and UT examination scopes/coverages were achieved and limitations (if applicable) were recorded in accordance with the licensee's procedures. Additionally, the inspectors evaluated if the licensee's criteria for visual and UT examination quality and instructions for resolving interference and masking issues were consistent with 10 CFR 50.55a.

The licensee did not identify any relevant indications that were accepted for continued service during the bare metal visual exam. Additionally, the licensee did not perform any welding repairs to the vessel head penetrations since the beginning of the last Unit 2 refueling outage.

Boric Acid Corrosion Control (BACC) Inspection Activities: The inspectors reviewed the licensee's BACC program activities to ensure conformance with commitments made in response to NRC Generic Letter 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary," and applicable industry guidance documents. Specifically, the inspectors performed an on-site record review of procedures and the results of the licensee's containment walkdown inspections performed during the current spring refueling outage. The inspectors also interviewed the BACC program owner, conducted an independent walkdown of containment to evaluate compliance with licensee's BACC program requirements, and verified that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee's BACC and corrective action program.



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

- Boric acid residue in packing area of CVCS injection filter #5
- Minor dry, white boric acid residue noted on packing area of 21205U4031
- Boron buildup on suction valve 2HV8471B

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 technical specifications, 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 2 samples of ET data
- Compared the numbers and sizes of SG tube flaws/degradation identified against the licensee's Operational Assessment of the previous outage
- Reviewed the SG tube ET examination scope and expansion criteria
- Evaluated whether 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 implementation of the extent of condition inspection scope and repairs for new SG tube degradation mechanisms
- Verified that primary-to-secondary leakage (e.g., SG tube leakage) was below three gallons per day, or the detection threshold, during the previous operating cycle
- Evaluated whether the ET equipment and techniques used by the licensee to acquire data from the SG tubes were qualified or validated to detect the known/expected types of SG tube degradation in accordance with Appendix H, Performance Demonstration for Eddy Current Examination, of EPRI Pressurized Water Reactor Steam Generator Examination Guidelines, Revision 7
- Reviewed the licensee's secondary side SG Foreign Object Search and Removal (FOSAR) activities
- Reviewed ET personnel qualifications

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

Enclosure

b. Findings

No findings were identified.

1R11 Licensed Operator Regualification Program (71111.11)

a. Inspection Scope

.1 Resident Inspector Quarterly Review of Licensed Operator Regualification

The inspectors observed an evaluated simulator scenario administered to an operating crew conducted in accordance with the licensee's accredited requalification training program. The inspectors assessed licensed operator performance, the ability of the licensee to administer the scenario and evaluate the operators, the quality of any post-scenario critique, any follow-up actions taken by the facility licensee, and the performance of the simulator. Documents reviewed are listed in the Attachment.

.2 Resident Inspector Quarterly Review (Licensed Operator Performance):

The inspectors observed licensed operator performance in the main control room on February 26, 2013, after a manual reactor trip of Unit 2 due to excessive RCP #4 seal leak-off flow rate in accordance with standard operating procedures. Inspectors observed licensed operator performance to assess the following:

- Use of plant procedures
- Control board manipulations
- Communications between crew members
- Use and interpretation of instruments, indications, and alarms
- Use of human error prevention techniques
- Documentation of activities
- Management and supervision

Documents reviewed are listed in the Attachment.

b. Findings

Introduction: A Green self-revealing non-cited violation (NCV) for failure to meet the requirements of 10 CFR 50 Appendix B Criterion V, "Instructions, Procedures, and Drawings" was identified for failure to provide adequate work instructions in the operations procedure used to change out the RCS filter. Specifically, operations procedure 13213-1/2, "Backflushable Filter System," which is used to change out the RCS filter, did not provide adequate instructions and/or precautions to prevent excessive air intrusion (and the subsequent localized crud burst within the CVCS late in core life) when flushing and venting the RCS filter housing.

Description: On February 26, 2013 with Unit 2 in Mode 1, 94 percent reactor power and in coast-down, at approximately 2120, maintenance mechanics along with station operators replaced the RCS filter and returned it to service in preparation for the upcoming refueling outage. At approximately 2249, control room operators observed rapidly increasing RCP seal leakoff flow rates on all four RCPs. During implementation of the annunciator response procedure for "RCP seal leakoff high flow", operators inserted a manual reactor trip when the seal leakoff flow rate on the #4 and #1 RCP exceeded the administrative limit of 5.5 gallons per minute (gpm). The plant was stabilized in Mode 3 and all safety related equipment responded as expected. RCP seal leakoff for all four RCP(s) returned to normal values shortly after the manual reactor trip. The licensee subsequently assembled an Issue Response Team (IRT) and a root cause team to investigate the cause of the increased RCP seal leakoff flow rates and to determine the required corrective actions. Further investigation revealed three instances of industry OE documenting the phenomenon of a "localized" crud burst caused by the addition of oxygenated water to the volume control tank (VCT) shortly after the RCS filter was changed late in core life. The "localized" crud burst effectively "wipes" or "cleans" any debris and/or crud from the RCP seal surface resulting in increased seal leakoff flow in the seal area. The licensee confirmed the OE with the Westinghouse RCP vendor. Once the licensee verified that no damage to the RCPs had occurred due to the high leakoff flow rates, the unit was subsequently restarted on February 28 with no additional RCP seal issues. The licensee immediately created a Standing Order for Operation of CVCS in relation to RCP seals, evaluated existing OE, and revised procedure 13213-1/2, "Backflushable Filter System" to provide instructions to significantly reduce the amount of air intrusion from changing out the RCS filter. The licensee entered this issue into their corrective action program as CR 597293.

Analysis: The failure to provide adequate work instructions in the operations procedures used to change out the RCS filter as required by 10 CFR 50 Appendix B Criterion V was a performance deficiency. The inspectors determined that the finding was more than minor because it was associated with the procedure quality attribute of the initiating events cornerstone and it adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during shutdown as well as power operations. Specifically, the failure to provide adequate work instructions resulted in a "localized" crud burst at the RCP seals causing RCP seal leakoff flow rates to exceed administrative limits for continued pump operation and a subsequent manual reactor trip. Using IMC 0609, Attachment 4, "Initial Characterization of Findings" dated June 19, 2012, the inspectors determined that the finding affected the initiating events cornerstone. The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012. Because the inspectors answered "No" to all the Exhibit 1, Section B, "Initiating Events Screening Questions," the inspectors determined that the finding was of very low safety significance (Green). Since the inadequate procedures have existed since plant start-up, this violation is not indicative of current licensee performance and no associated cross-cutting aspect was assigned.

Enforcement: 10 CFR 50 Appendix B Criterion V requires, in part, that procedures shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Contrary to the above, the operations procedure used to change the RCS filter did not provide appropriate quantitative or qualitative acceptance criteria for determining that flushing and venting of the RCS filter had been satisfactorily accomplished, thus preventing a “localized” crud burst within the CVCS. Specifically, operations procedure 13213-1/2, “Backflushable Filter System,” did not provide adequate instructions and/or precautions to prevent excessive air intrusion (and the subsequent localized crud burst within the CVCS late in core life) when flushing and venting the RCS filter housing. This violation has existed since initial startup (for the past 25 years). As a result of the violation, RCP seal leakoff flow rates exceeded administrative limits for continued operation and the reactor was manually tripped on February 26, 2013. The licensee immediately created a Standing Order for Operation of CVCS in relation to RCP seals, and revised procedure 13213-1/2 to provide instructions to significantly reduce the amount of air intrusion from changing out the RCS filter. This violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. The violation was entered into the licensee’s corrective action program as CR 597293. (NCV 05000425/2013002-01, “Inadequate Operations and Maintenance Procedures Results in High RCP Seal Leakoff Flow and Manual Reactor Trip”)

1R12 Maintenance Effectiveness (71111.12)

a. Inspection Scope

The inspectors assessed the licensee’s treatment of the two issues listed below in order to verify the licensee appropriately addressed equipment problems within the scope of the Maintenance Rule (MR) (10 CFR 50.65). The inspectors reviewed procedures and records in order to evaluate the licensee’s identification, assessment, and characterization of the problems as well as their corrective actions for returning the equipment to a satisfactory condition. The inspectors also interviewed system engineers and the maintenance rule coordinator to assess the accuracy of performance deficiencies and extent of condition. Documents reviewed are listed in the Attachment.

- CR 526268, Fire alarm on panel 1F15 (Failure of the inboard bearing on the Unit 1 “A” train CCW pump #1)
- CR 598661, Maintenance rule performance criteria exceeded

b. Findings

Introduction: A Green self-revealing non-cited violation (NCV) of 10 CFR 50 Appendix B Criterion V, “Instructions, Procedures, and Drawings” was identified for failure to provide appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Specifically, procedure 27080-C, “CCW Pump Maintenance,” did not provide adequate direction as to the duration of and instrumentation required to properly perform a post-maintenance test that would detect a

misalignment between the pump and motor shafts. The failure to perform an adequate post-maintenance test that would have identified the excessive misalignment between the motor and pump shafts was a performance deficiency.

Description: On September 30, 2012 at 04:20, the inboard bearing on the Unit 1 train "A" CCW pump #1 catastrophically failed. In late August 2012, the pump had been repaired due to excessive leakage from the outboard mechanical seal. As part of those maintenance activities, both the inboard and outboard bearings were raised to center the pump assembly within the casing. However, during the final alignment of the pump and motor (performed in accordance with maintenance procedure 25219-C, "Shaft Alignment Optalign Smart Laser Method"), the licensee did not adjust the motor since all parameters were within tolerance. The licensee subsequently performed procedure 14803A-1, "Train "A" CCW Pumps and Check Valve IST and Response Time Test", determined the pump was operable, and returned the pump to service on September 14, 2012. Between September 14 and September 30, 2012, the pump was operated for approximately 21.5 before the inboard pump bearing catastrophically failed.

After the bearing failure, investigations showed that the PMT performed on September 14 did not meet the requirements of procedure NMP-MA-014-001 Rev. 3.0, "Post Maintenance Testing Guidance", which requires mechanics to verify that no excessive vibrations or abnormal bearing temperatures are present following work on a pump coupling. Specifically, while performing the in-service test (IST), the pump was only operated for approximately 45 minutes before it was secured. Data from the plant computer indicated that bearing temperatures had not reached equilibrium when the pump was stopped. Additionally, vibration data was taken on the bearing housings but proximity probes were not installed to measure shaft displacement.

The licensee root cause team subsequently determined that the root cause of the failure was excessive misalignment between the pump and motor shafts following completion of the maintenance in August 2012. This misalignment resulted in "pinching" the inboard bearing orbit and prevented proper formation of an oil wedge, resulting in subsequent bearing failure. The team also determined that the major contributing cause of the event was that the post maintenance test that was performed after rebuilding the CCW pump was inadequate to detect this type of failure. The root cause team determined that maintenance procedure 27080-C, "CCW Pump Maintenance", did not adequately specify the proper post maintenance testing required after rebuilding CCW pumps. Specifically, the maintenance procedure did not provide adequate direction as to the duration of and instrumentation required to properly perform a post-maintenance test that would detect a misalignment between the pump and motor shafts. The results of the root cause team are documented in ACD 196054. The licensee entered this issue into their corrective action program as CR 526268. The Unit 1 CCW pump #1 was returned to service on December 12, 2012. Inspectors reviewed the root cause determination and concurred with the findings.

Analysis: The failure to perform an adequate post-maintenance test that would have identified the excessive misalignment between the motor and pump shafts as required by 10 CFR 50 Appendix B Criterion V was a performance deficiency. Licensee procedure NMP-MA-014-001 Rev. 3.0, "Post Maintenance Testing Guidance", specifies

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the required post maintenance test following work on a pump coupling. The inspectors determined that the finding was more than minor because it was associated with the equipment performance attribute of the mitigating systems cornerstone and it adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage). Specifically, the post-maintenance test performed following the rebuild of the Unit 1A CCW pump #1 failed to identify the excessive misalignment between the motor and pump shafts, which subsequently resulted in the catastrophic failure of the inboard pump bearing once the pump was returned to service.

Using IMC 0609, Attachment 4, "Initial Characterization of Findings" dated 06/19/12, the inspectors determined that the finding affected the mitigation systems cornerstone. As directed by Attachment 4, the inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated 06/19/12. Because the inspectors answered "No" to all the Exhibit 2, Section A, "Mitigating Systems Screening Questions," the inspectors concluded that the finding was of very low safety significance (Green).

The primary cause of the performance deficiency, as determined by the inspectors, was inadequate directions in the maintenance procedures for post-maintenance testing. The inspectors determined that the cause of this finding was related to the work control component of the human performance cross-cutting area due to less-than-adequate procedures. Specifically, the maintenance procedures used to reassemble the CCW pumps did not provide adequate direction as to the duration of and instrumentation required to properly perform an adequate post-maintenance test. [H.2(c)]

Enforcement 10 CFR 50 Appendix B Criterion V, "Instructions, Procedures, and Drawings" requires, in part, that procedures shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished. Procedure 27080-C, "CCW Pump Maintenance," contains instructions for maintenance and post maintenance testing of CCW pumps.

Contrary to the above, procedure 27080-C did not provide appropriate quantitative or qualitative acceptance criteria for determining that the alignment of the pump shaft had been satisfactorily accomplished. Specifically, the procedure did not provide adequate direction as to the duration of and instrumentation required to properly perform a post-maintenance test that would detect a misalignment between the pump and motor shafts. As a result of the violation, the inboard bearing on the Unit 1A CCW pump #1 catastrophically failed soon after the pump was started on September 30, 2013. The violation existed for 89 days (September 14 to December 12, 2012). The licensee revised maintenance procedure 27080-C to specify the proper post maintenance testing required after rebuilding a pump. This violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. The violation was entered into the licensee's corrective action program as CR 526268. (NCV 05000424/2013002-2, "Inadequate Maintenance Procedures Results in Failure of the Inboard Bearing on the Unit 1A CCW pump #1")

1R13 Maintenance Risk Assessments and Emergent Work Control (71111.13)a. Inspection Scope

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

- Week of 1/14: Unit 2 "A" train NSCW cooling tower fan #3 inoperable to perform maintenance activities on NSCW pump #5
- Week of 1/21: Testing of the Unit 2A EDG concurrent with maintenance activities in the high-voltage switchyard
- Week of 2/4: Unplanned inoperability of the Unit 2A MDAFW pump
- Week of 2/25: Unit 2 manual reactor trip
- Week of 3/18: Unplanned inoperability of the Unit 1A containment spray pump

b. Findings

No findings were identified.

1R15 Operability Evaluationsa. Inspection Scope

The inspectors reviewed the following six evaluations to verify they met the requirements of procedure NMP-GM-002, "Corrective Action Program," NMP-AD-012, "Operability Determinations" and NMP-GM-002-001, "Corrective Action Program Instructions." The scope of these inspections included a review of the technical adequacy of the evaluations, the adequacy of compensatory measures, and the impact on continued plant operation. Inspectors reviewed licensee procedures and conducted walkdowns to ensure that the licensee properly interpreted technical specification bases, properly developed operability determinations, and adhered to the NRC's guidance on the temporary use of manual actions to support operability determinations. Documents reviewed are listed in the Attachment.

- CR 566472, Unit 2A sequencer test monitor screen is blank
- CR 577277, UNSAT operator rounds readings - piping upstream of auxiliary feedwater (AFW) stop check valve 2-1302-U4-116 was hot to the touch
- CR 545916, Unit 1A EDG jacket water pump leak
- CR 590272, Found cracks on top of cells while performing battery inspection on 2AD1B

- CR 596318, Unanalyzed safety-related seismic 1 tubing configuration on ESF chillers
- CR 573327, Strong backs found not-installed on piping penetration area filtration and exhaust system (PPAFES) pressure boundary

b. Findings

No findings were identified.

1R18 Plant Modifications

a. Inspection Scope

Temporary Modification The inspectors reviewed minor design change (MDC) package SNC445295 which provides a temporary power source for Unit 2 MCC 2NBJ from Unit 1 switchgear 1NB27. Installation of this temporary modification results in the loss of the fuel handling building negative pressure boundary for both units. Inspectors also reviewed the associated 10 CFR 50.59 screening criteria against the system design bases documentation and NMP-ES-054-001, "Temporary Modification Processing." The inspectors reviewed implementation, configuration control, post-installation test activities, drawing and procedure updates, and operator awareness for this temporary modification.

Permanent Modification The inspectors reviewed minor design change package SNC470866/1.0 which provides design details for drilling inspection holes in the seal encapsulation devices for valves 2-1208-U6-035, 036, and 038. Inspectors also reviewed the associated 10 CFR 50.59 screening criteria against the system design bases documentation and NMP-ES-041, "Minor Design Change Packages." The inspectors reviewed implementation, configuration control, post-installation test activities, drawing and procedure updates, and operator awareness for this plant modification.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors either observed post-maintenance testing or reviewed the test results for the following six maintenance activities to verify that the testing met the requirements of procedure 29401-C, "Work Order Functional Tests," for ensuring equipment operability and functional capability was restored. The inspectors also reviewed the test procedures to verify the acceptance criteria were sufficient to meet the technical specifications operability requirements.



- Maintenance Work Order (MWO) SNC133197 – 2A SIP Swap Breaker and MWO SNC129989 – 2A SIP Install Freedom Series Starters and Overload Relays
- MWO SNC419944 – Unit 2 TDAFW trip and throttle valve adjust and lube
- MWOs SNC135679 and SNC134999 – Unit 2A ESF chiller maintenance outage work orders
- MWO SNC409192 – 2A NSCW P5 162-1/162-2 Agastat Relay Cal/Replace
- MWOs SNC412424 – Clean, inspect, and lubricate RHR pump motor, SNC351976 – change oil in RHR motor upper bearing, and SNC135067 – 2A RHR pump swap breaker
- MWOs SNC465044 – Replace power range 2N41 NC-304 bistable card, and SNC363210 - solid state protection system (SSPS) cabinet (QSPA) calibration

b. Findings

No findings were identified.

1R20 Refueling and Other Outage Activities

a. Inspection Scope

The inspectors performed the inspection activities described below for the 2R16 refueling outage that started on March 10, 2013. The inspectors confirmed that, when the licensee removed equipment from service, the licensee maintained defense-in-depth commensurate with the outage risk control plan for key safety functions and applicable technical specifications and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan.

- Reviewed the licensee's integrated risk control plan prior to the outage to verify that activities, systems, and/or components which could cause unexpected reactivity changes were identified in the plan
- Observed portions of the plant shutdown and cooldown to verify that the technical specification cooldown restrictions were followed. RCS integrity was verified by reviewing RCS leakage calculations
- Verified that the licensee reviewed their controls and administrative procedures governing mid-loop operation, and conducted training for mid-loop operation
- Verified that procedures were in use for containment closure capability for mitigation of radioactive releases; identified unexpected RCS inventory changes and verified an adequate RCS vent path existed during RCS drain down to mid-loop; and emergency/abnormal operation during reduced inventory
- Verified that indications of core exit temperature and RCS water level were operable and periodically monitored; RCS perturbations were avoided; means of adding inventory to the RCS were available; reasonable assurance was obtained that all hot legs were not simultaneously blocked by nozzle dams unless the upper plenum was vented; and contingency plans existed to repower vital electrical busses from an alternate source if the primary source was lost

- Reviewed reactor coolant system pressure, level, and temperature instruments to verify that the instruments provided accurate indication and that allowances were made for instrumentation errors
- Verified that outage work did not impact the operation of the spent fuel cooling system
- Reviewed the status and configuration of electrical systems to verify that those systems met technical specification requirements and the licensee's outage risk control plan
- Observed decay heat removal parameters during hot mid-loop operations to verify that the system was properly functioning and providing cooling to the core
- Reviewed system alignments to verify that the flow paths, configurations and alternative means for inventory addition were consistent with the outage risk plan
- Reviewed selected control room operations to verify that the licensee was controlling reactivity in accordance with the technical specifications
- Observed the licensee's control of containment penetrations to verify compliance with technical specifications
- Reviewed plans for changing plant configuration to verify that technical specifications, license conditions, and other requirements, commitments, and procedure prerequisites were met prior to changing plant configuration
- Observed refueling activities for compliance with technical specifications, to verify proper tracking of fuel assemblies from the spent fuel pool to the core, and to verify foreign material exclusion was maintained
- Performed containment closure activities, including a detailed containment walkdown prior to startup, to verify no evidence of leakage and that debris had not been left which could affect the performance of the containment sump

b. Findings

Introduction. A Green, self-revealing NCV of plant Technical Specification 5.4, "Procedures," was identified for failure to follow procedures when operating safety related equipment. Specifically, while realigning equipment to support the filling and venting of the Unit 2 containment spray header, the system operator inadvertently closed 1HV-9017A, refueling water storage tank (RWST) suction to Unit 1 containment spray (CS) pump "A". As a result, the "1A" CS pump was temporarily rendered inoperable.

Description. On March 18, 2013, while filling and venting the Unit 2 CS header per station procedure 14806-C, "Containment Spray Pump and Check Valve Refueling Comprehensive Full Flow Inservice Test," Rev. 5.1, a system operator was dispatched to close 2HV-9017A, RWST suction to CS pump "A," however, he inadvertently went to the wrong unit and closed 1HV-9017A, RWST suction to CS pump "A." The control room operators on Unit 1 received an unexpected alarm in the main control room, ALB05B05, "Group 2 Monitor Light Comp Off Normal," and observed the green closed light indication for 1HV-9017A. The operators then placed the "1A" CS pump hand switch in the pull-to-lock position due to loss of the suction source and directed the system operator to stop work. The operators implemented procedure NMP-OS-007-GL01, "Misposition Event Guideline," reopened 1HV-9017A, and declared the "1A" CS pump operable within 4 hours.

Analysis. The failure to follow procedures when operating safety related equipment, which resulted in unplanned inoperability, was contrary to Technical Specification 5.4 and was a performance deficiency. Inspectors determined that the finding was more than minor because it was associated with the human performance attribute of the barrier integrity cornerstone and it adversely affected the cornerstone objective to provide reasonable assurance that physical design barriers (fuel cladding, reactor coolant system, and containment) protect the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency was a human performance error which affected the availability, reliability, and capability of the Unit 1 "A" train containment spray system to limit and maintain post accident conditions to less than containment design values.

Using IMC 0609, Attachment 4, "Initial Characterization of Findings," dated June 19, 2012, the inspectors determined that the finding affected the barrier integrity cornerstone. The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," dated June 19, 2012. Because the inspectors answered "No" to all of the Exhibit 3, Section B, "Reactor Containment Screening Questions," the inspectors determined that the finding was of very low safety significance (Green). The inspectors determined that the cause of this finding was related to the work practices component of the human performance cross-cutting area due to less-than-adequate human error prevention techniques. Specifically, peer checking techniques were less than adequate. [H.4(a)]

Enforcement. Technical Specification 5.4, "Procedures," requires that written procedures, specified in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978, shall be established, implemented, and maintained. Contrary to the above, on March 18, 2013, operations personnel did not correctly implement procedures and inadvertently closed 1HV-9017A, "RWST suction to CS pump A." The operators implemented procedure NMP-OS-007-GL01, "Misposition Event Guideline," reopened 1HV-9017A, and declared the "1A" CS pump operable. As a result of the error, the "1A" CS pump was rendered inoperable for 3 hours and 50 minutes. Because this violation was of very low safety significance and it was entered into the licensee's corrective action program (CR 608718), this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. This finding will be tracked as NCV 05000425/2013002-03, "Human Performance Error Renders "1A" CS Pump Inoperable."

## 1R22 Surveillance Testing

### a. Inspection Scope

The inspectors reviewed the following six surveillance test procedures and either observed the tests or reviewed test results to verify that tests were conducted in accordance with the procedures and that the acceptance criteria adequately demonstrated that the equipment was operable. Additionally, the inspectors reviewed the CR database to verify that the licensee had adequately identified and implemented appropriate corrective actions for surveillance test problems.

Surveillance Tests

- 14805B-2 Rev. 3.1, "Train "B" Residual Heat Removal Pump IST and Response Time Test"
- 14670B-2 Rev. 1.2, "Diesel Generator "2B" Hot Restart Test"
  
- 24812-1 Rev. 43.1, "Delta T/TAVG Loop 3 Protection Channel III 1T 431 Channel Operational Test and Channel Calibration"
- 14810-1 Rev. 47.2, "TDAFW Pump Operability, Response Time and Check Valve IST"

Containment Isolation Valve

- 24939-2 Rev. 15, "Containment Penetration No. 39 Train "A" Containment Spray Encapsulation Vessel Leak Rate Test"

In-Service Tests

- 14810-2 Rev. 41.2, "TDAFW Pump Operability, Response Time and Check Valve IST"

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluationa. Inspection Scope

The inspectors reviewed the facility activation exercise guide and observed the following emergency response activity to verify the licensee was properly classifying emergency events, making the required notifications, and making appropriate protective action recommendations in accordance with procedures 91001-C, "Emergency Classifications," and 91305-C, "Protective Action Guidelines."

- On February 20, 2013, the inspectors observed an emergency preparedness drill conducted on the simulator. The drill involved actuation of the technical support center, the operation support center, and the emergency operation facility. The drill scenario began with a steam generator tube rupture, followed by a failed open steam generator relief valve on the ruptured steam generator. The inspectors observed the initial declaration and emergency notifications.

b. Findings

No findings were identified.

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## 2. RADIATION SAFETY

Cornerstones: Public Radiation Safety and Occupational Radiation Safety

### 2RS1 Radiological Hazard Assessment and Exposure Controls

#### a. Inspection Scope

Hazard Assessment and Instructions to Workers: During facility tours, the inspectors directly observed labeling of radioactive material and postings for radiation areas, high radiation areas (HRA)s, Very High Radiation Areas (VHRA)s and airborne radioactivity areas established within the radiologically controlled area (RCA) of the auxiliary building, and radioactive waste (radwaste) processing and storage locations. The inspectors independently measured radiation dose rates or directly observed conduct of licensee radiation surveys for selected RCA areas. The inspectors reviewed survey records for several plant areas including surveys for alpha emitters, discrete radioactive particles, airborne radioactivity, gamma surveys with a range of dose rate gradients, and pre-job surveys for upcoming tasks. The inspectors also discussed changes to plant operations that could contribute to changing radiological conditions since the last inspection. For selected outage jobs, the inspectors attended pre-job briefings and reviewed radiation work permit (RWP) details to assess communication of radiological control requirements and current radiological conditions to workers.

Hazard Control and Work Practices: The inspectors evaluated access barrier effectiveness for selected Locked High Radiation Area (LHRA) locations and discussed changes to procedural guidance for LHRA and VHRA controls with health physics (HP) supervisors. The inspectors reviewed implementation of controls for the storage of irradiated material within the spent fuel pool (SFP). Established radiological controls (including airborne controls) were evaluated for selected Unit 2 refueling outage 16 (2R16) tasks including maintenance activities in the upper reactor cavity, steam generator nozzle dam installation and steam generator eddy current testing. In addition, the inspectors reviewed licensee controls for areas where dose rates could change significantly as a result of plant shutdown and refueling operations.

Through direct observations and interviews with licensee staff, inspectors evaluated occupational workers' adherence to selected RWPs and HP technician (HPT) proficiency in providing job coverage. Electronic dosimeter alarm set points and worker stay times were evaluated against area radiation survey results for selected 2R16 job tasks. The inspectors also evaluated worker responses to dose and dose rate alarms during selected work activities.

Control of Radioactive Material: The inspectors observed surveys of material and personnel being released from the RCA using small article monitor (SAM), personnel contamination monitor (PCM), and portal monitor (PM) instruments. The inspectors reviewed the last two calibration records for selected release point survey instruments and discussed equipment sensitivity, alarm setpoints, and release program guidance with licensee staff. The inspectors compared recent 10 Code of Federal Regulations (CFR) Part 61 results for the dry active waste (DAW) radioactive waste stream with

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radionuclides used in calibration sources to evaluate the appropriateness and accuracy of release survey instrumentation. The inspectors also reviewed records of leak tests on selected sealed sources and discussed nationally tracked source transactions with licensee staff.

Problem Identification and Resolution: The inspectors reviewed and assessed CRs associated with radiological hazard assessment and control. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure NMP-GM-002, "Corrective Action Program", Ver. 12.1. The inspectors also reviewed recent self-assessment results.

Radiation protection activities were evaluated against the requirements of Final Safety Analysis Report (FSAR) Section 12; Technical Specifications Sections 5.4, "Procedures" and 5.7, "High Radiation Areas"; 10 CFR Parts 19 and 20; and approved licensee procedures. Licensee programs for monitoring materials and personnel released from the RCA were evaluated against 10 CFR Part 20 and IE Circular 81-07, "Control of Radioactively Contaminated Material." Documents reviewed are listed in Section 2RS1 of the Attachment.

b. Findings

No findings were identified.

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

a. Inspection Scope

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

The 2011 Annual Radioactive Effluent Release Report (ARERR) and 2012 radionuclide waste characterizations for DAW and resin beads were reviewed and discussed with radwaste staff. For DAW and resin beads, the inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined quality assurance comparison results between licensee waste stream characterizations and outside laboratory data. Waste stream mixing, concentration averaging methodology, and monitoring of changes in isotopic mixtures were evaluated and discussed with radwaste staff.

Radioactive Material Storage: During walk-downs of indoor and outdoor radioactive material storage areas, the inspectors observed the physical condition and labeling of storage containers and the posting of Radioactive Material Areas. The inspectors also reviewed licensee procedural guidance for storage and monitoring of radioactive material.

Transportation: Selected shipping records were reviewed for consistency with licensee procedures and compliance with NRC and Department of Transportation (DOT) regulations. The inspectors reviewed emergency response information, DOT shipping package classification, waste classification, and radiation survey results. In addition, training records for selected individuals currently qualified to ship radioactive material were reviewed. The inspectors observed shipment preparation for an Excepted Package of Limited Quantity, containing pressurizer code safety valves. There was a lack of other outgoing shipments during the week of inspection.

Problem Identification and Resolution: The inspectors reviewed CRs in the area of radwaste/shipping. The inspectors evaluated the licensee's ability to identify and resolve the issues in accordance with procedure NMP-GM-002, "Corrective Action Program", Ver. 12.1. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent assessment results.

Radwaste processing, radioactive material handling, and transportation activities were reviewed against the requirements contained in the licensee's process control program, UFSAR Chapter 11, 10 CFR Part 20, 10 CFR Part 61, 10 CFR Part 71, and 49 CFR Parts 172-178. Licensee activities were also evaluated against guidance provided in the Branch Technical Position on Waste Classification (1983) and NUREG-1608, "Categorizing and Transporting Low Specific Activity Materials and Surface Contaminated Objects." Documents reviewed during the inspection are listed in Section 2RS8 of the Attachment.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems Cornerstone

a. Inspection Scope

The inspectors sampled licensee submittals for the listed PIs during the period from January 1, 2012 through December 31, 2012, for Unit 1 and Unit 2. The inspectors verified the licensee's basis in reporting each data element using the PI definitions and guidance contained in procedure 00163-C, "NRC Performance Indicator and Monthly Operating Report Preparation and Submittal," and Nuclear Energy Institute document NEI 99-02, "Regulatory Assessment Indicator Guideline."

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- Unplanned Scrams per 7,000 Critical Hours
- Unplanned Scrams with Complications
- Unplanned Power Changes per 7,000 Critical Hours

The inspectors reviewed Unit 1 and Unit 2 operator log entries, the Vogtle Electric Generating Plant Unit 1 and Unit 2 NRC Mitigating System Performance Index Basis Document, the monthly operating reports and monthly PI summary reports to verify that the licensee had accurately submitted the PI data.

b. Findings

No findings were identified.

.2 Occupational Radiation Safety Cornerstone

a. Inspection Scope

The inspectors reviewed the occupational exposure control effectiveness PI results for the occupational radiation safety cornerstone from September 2012 through February 2013. For the assessment period, the inspectors reviewed electronic dosimeter alarm logs and CRs related to controls for exposure significant areas. Documents reviewed are listed in sections 2RS1 and 4OA1 of the Attachment. The inspectors completed one of the two required samples specified in IP 71151.

b. Findings

No findings were identified.

4OA2 Identification and Resolution of Problems

- .1 Daily Condition Report Review. As required by Inspection Procedure 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 a daily screening of items entered into the licensee's corrective action program. This review was accomplished by either attending daily screening meetings that briefly discussed major CRs, or accessing the licensee's computerized corrective action database and reviewing each CR that was initiated.



.2 Focused Review

a. Inspection Scope

The inspectors performed a detailed review of the following two CRs:

- 580535, Incorrect limit switch being installed on NSCW pump #6 discharge valve
- 599790, Unit 2 “B” train NSCW transfer pump 7 inoperable

One CR addressed an incorrect limit switch being installed on the NSCW pump #6 discharge valve and the second CR addressed the failure of the Unit 1 “B” train NSCW transfer pump #7 to pass its in-service test. The goal of the reviews was to verify that the full extents of the issues were identified, appropriate evaluations were performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the CRs against the licensee’s corrective action program as delineated in licensee procedure NMP-GM-002, “Corrective Action Program,” and 10 CFR 50, Appendix B, Criterion XVI, “Corrective Action.” Documents reviewed are listed in the Attachment.

b. Findings and Observations

No findings were identified.

4OA3 Event Follow-up

.1 (Closed) Licensee Event Report (LER) 05000424/2012-004-00: Unplanned Auxiliary Feedwater Actuation

On October 5, 2012 with Unit 1 in Mode 5 and the residual heat removal (RHR) system in service for decay heat removal, the licensee was making preparations for entering Mode 4. While restoring the steam generator level instrumentation from a bypassed condition, a steam generator lo-lo level actuation was received, both motor-driven AFW pumps started, and two of the turbine-driven AFW pump discharge valves stroked fully open. Due to system alignment, no water was injected into the steam generators. Licensee’s investigation showed that while restoring the plant from engineered safety features actuation system (ESFAS) testing, the licensee had failed to properly align the AFW system to prevent inadvertent actuations. The inspectors reviewed this LER and did not identify any findings or violations of NRC requirements. This LER is closed.

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 and Observations

No findings were identified.

.2 (Closed) Temporary Instruction 2515/187 – Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns

a. Inspection Scope

Inspectors verified that the following licensee's walkdown packages contained the elements as specified on NEI 12-07 Walkdown Guidance document:

- VEGP-F-2012-001, Site Topography
- VEGP-F-2012-055, Auxiliary Building Level D – Inside Exterior Walls/Penetrations

The inspectors accompanied the licensee on their walkdowns of the above listed areas and verified that the licensee confirmed the following flood protection features:

- External visual inspection of the flood protection feature for indications of degradation that would prevent its credited function from being performed
- Critical SSC dimensions were measured
- Available physical margin, where applicable, was determined
- Flood protection feature functionality was determined using either visual observation or by review of other documents

The inspectors independently performed their walkdown of the "100 year flood ditch" and verified that the flood protection features described in the FSAR were in place of this area.

The inspectors verified that noncompliances with current licensing requirements, and issues identified in accordance with the 10 CFR 50.54(f) letter, Item 2.g of Enclosure 4, were entered into the licensee's corrective action program. In addition, issues identified in response to Item 2.g that could challenge risk significant equipment and the licensee's ability to mitigate the consequences will be subject to additional NRC evaluation.

b. Findings and Observations

No NRC-identified or self-revealing findings were identified.

.3 (Discussed) Temporary Instruction (TI) -2515/182 - Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase 1

a. Inspection Scope

Leakage from buried and underground pipes has resulted in ground water contamination incidents with associated heightened NRC and public interest. The industry issued a guidance document, Nuclear Energy Institute (NEI) 09-14, "Guideline for the Management of Buried Piping Integrity," (ADAMS Accession No. ML1030901420), to describe the goals and required actions (commitments made by the licensee) resulting from this underground piping and tank initiative. On December 31, 2010, NEI issued Revision 1 to NEI 09-14, "Guidance for the Management of Underground Piping and Tank Integrity," (ADAMS Accession No. ML110700122), with an expanded scope of components which included underground piping that was not in direct contact with the soil and underground tanks. On November 17, 2011, the NRC issued TI-2515/182 "Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks," to gather information related to the industry's implementation of this initiative.

The inspectors reviewed the licensee's programs for buried pipe and underground piping and tanks in accordance with TI-2515/182 to determine if the program attributes and completion dates identified in Sections 3.3 A and 3.3 B of NEI 09-14, Revision 1 were contained in the licensee's program and implementing procedures. For the buried pipe and underground piping program attributes, with completion dates that had passed, the inspectors reviewed records to determine if the attribute was in fact complete and to determine if the attribute was accomplished in a manner which reflected good or poor practices in program management.

b. Findings

No findings were identified.

.4 On-Site Fabrication of Components and Construction of an ISFSI (60853)

a. Inspection Scope

The inspectors conducted a review of licensee and vendor activities in preparation for the concrete placement for the independent spent fuel storage installation (ISFSI) pad upon which 16 Holtec HI-STORM 100 vertical storage modules will be sited to house spent fuel generated by the licensee. The inspectors walked down the construction area of the ISFSI pad and examined the rebar installation. The inspectors verified that the rebar size, spacing, splice length, and concrete coverage on the top, side, and bottom complied to licensee-approved drawings, specifications, procedures, and other associated documents. Additionally, the inspectors verified compliance with applicable American Concrete Institute (ACI) codes, American Society for the Testing of Materials (ASTM) standards, the Certificate of Compliance (CoC), and Technical Specifications. The inspectors also evaluated the concrete formwork installation for depth, straightness, and horizontal bracing and verified the overall dimensions and orientation for compliance to the licensee-approved drawings. In addition, the inspectors walked down the heavy

load haul path from the fuel building to the ISFSI pad inside of the protected area (PA) as well as outside of the PA to the support building where the HI-STORM 100 overpacks will be fabricated and the multi-purpose canisters (MPCs) loaded into the overpacks prior to being transported inside of the PA for loading, to verify compliance to licensee-approved drawings. The inspectors interviewed licensee and contract personnel to verify knowledge of the planned work. The inspectors also observed concrete delivery, placement, and vibration of the first half of the ISFSI slab and observed tests for concrete slump and air content, temperature measurements, and the collection/preparation of concrete cylinder samples for later compression tests to verify that the work was implemented according to licensee-approved specifications and procedures, and referenced industry codes and standards. The inspectors observed appropriate quality control oversight of pad construction activities. The inspectors also examined certified material/mill test reports (CMTRs) to determine whether the concrete constituents received by the Southern Nuclear Operating Company, Inc. (SNC) met both the ISFSI concrete specification VC-S-11-003 and applicable ASTM requirements. The inspectors also reviewed the independent laboratory 7-day and 28-day compression test results of the concrete placements to verify that the acceptance criteria, as defined by the Final Safety Analysis Report, were met.

b. Findings and Observations

No findings were identified.

4OA6 Meetings, Including Exit

.1 Exit Meeting

On April 15, the resident inspectors presented the inspection results to Mr. G. Saxon, Plant Manager, and members of the licensee's staff, who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### **Licensee personnel:**

C. Bourne, Health Physics Support Supervisor  
R. Brown, Training Manager  
C. Channell, Dry Cask Storage Engineering Supervisor  
D. Cheek, Site Project Lead Engineer  
J. Churchwell, ISI Coordinator  
R. Collins, Chemistry Manager  
D. Cordes, NDE Level III  
J. Dixon, Fleet Health Physics Manager  
K. Dyar, Security Manager  
E. Groves, Corporate ISI Engineer  
G. Gunn, Sr. Licensing Specialist  
C. Hartfield, Nuclear Oversight Specialist  
I. Kochery, Health Physics Manager  
H. Lundsford, Site BACCP Owner  
D. McCary, Maintenance Manager  
A. Morgan, NDE Level III  
D. Puckett, Performance Analysis Supervisor  
T. Reeves, Health Physics Specialist  
J. Robinson, Engineering Project Manager  
F. Santiago, Engineer  
G. Saxon, Plant Manager  
T. Sides, Principal Licensing Engineer  
D. Sutton, Site Project Manager  
S. Swanson, Site Support Manager  
J. Thomas, Operations Director  
T. Tynan, Site Vice-President  
K. Walden, Licensing Engineer  
S. Waldrup, Site Engineering Director  
A. Wesley, Site Project Lead Engineer

#### **NRC personnel:**

F. Ehrhardt, Chief, Region II Reactor Projects Branch 2

## LIST OF ITEMS OPENED AND CLOSED

### OPEN AND CLOSED

05000425/2013002-01	NCV	Inadequate Operations and Maintenance Procedures Results in High RCP Seal Leakoff Flow and Manual Reactor Trip (Section 1R11)
05000424/2013002-02	NCV	Inadequate Maintenance Procedures Results in Failure of the Inboard Bearing on the Unit 1A CCW pump #1 (Section 1R12)
05000424/2013002-03	NCV	Human Performance Error Renders 1A CS Pump Inoperable (Section 1R20)

### CLOSED

05000424/2012-004-00	LER	Unplanned Auxiliary Feedwater Actuation (Section 4OA3)
05000424,425/2515/187	TI	Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns (Section 4OA5)

### DISCUSSED

05000424,425/2515/182	TI	Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks, Phase 1 (Section 4OA5)
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## LIST OF DOCUMENTS REVIEWED

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

#### Procedures

11889-C Rev. 20, Severe Weather Checklist

### **Section 1R04: Equipment Alignment**

#### Procedures

11610-2 Rev. 21.3, Auxiliary Feedwater System Alignment  
11150-2 Rev. 23.3, Nuclear Service Cooling Water System Alignment,  
11744-2 Rev. 14.3, Essential Chilled Water System Alignment  
11405-2 Rev. 6.1, 125V DC 1E Electrical Distribution System Alignment  
13405-2 Rev. 39.2, 125V DC 1E Electrical Distribution System

#### Drawings

2X4DB161-1, P&I Diagram Rev. 35.0, Auxiliary Feedwater System Condensate Storage & Degasifier System, System No. 1302  
2X4DB161-2, P&I Diagram Rev. 24.0, Auxiliary Feedwater System, System No. 1302  
2X4DB161-3, P&I Diagram Rev. 38.0, Auxiliary Feedwater Pump System, (Aux Feedwater Pump Turbine Driver) System No. 1302  
2X4DB168-3, P&I Diagram Rev. 36.0, Condensate and Feedwater System, System No. 1305  
2X4DB170-1 Rev. 40, P&I Diagram Diesel Generator System, Train A System No. 2403  
2X4DB170-2 Rev. 42, P&I Diagram Diesel Generator System, Train B System No. 2403  
2X4DB133-1 Rev. 54, P&I Diagram Nuclear Service Cooling Water System, System No. 1202  
2X4DB133-2 Rev. 53, P&I Diagram Nuclear Service Cooling Water System, System No. 1202  
2X4DB134 Rev. 31, P&I Diagram Nuclear Service Cooling Water System, System No. 1202  
2X4DB135-1 Rev. 28, P&I Diagram Nuclear Service Cooling Water System, System No. 1202  
2X4DB135-2 Rev. 29, P&I Diagram Nuclear Service Cooling Water System, System No. 1202  
2X4DB221 Rev. 25.0, P&I Diagram Safety Related (Essential) Chillers, Unit 2 Trains A&B, System No. 1592  
2X4DB233 Rev. 24.0, P&I Diagram Essential Chilled Water Cooling Coils, Unit 2 Train A, System No. 1592  
2X4DB234 Rev. 25.0, P&I Diagram Essential Chilled Water Cooling Coils, Unit 2 Train B, System No. 1592  
2X3D-AA-G01A Rev. 7, Main One Line Class 1E 125V DC and 120V Vital AC Systems

#### System Health Reports

System 1302 AFW System, 4<sup>th</sup> quarter 2012 system health report  
System 1806 Vogtle 125 Volt Direct Current System, 4<sup>th</sup> quarter 2012 system health report

### **Section 1R05: Fire Protection**

#### Procedures

92000-C Rev. 224.0, Fire Protection Program  
92005-C Rev. 29.4, Fire Response Procedure  
NMP-TR-425 version 5.0, Fire Drill Program  
17103A-C Rev. 36.0, Annunciator Response Procedures for the Fire Alarm Computer  
92916-1 Rev. 4.0, Zone 516 – Low Voltage Switchyard Fire Fighting Preplan  
92791-1, Rev. 4.1, Zone 91 – Control Building Level A Fire Fighting Preplan  
92792-1, Rev. 3.1, Zone 92 – Control Building Level A Fire Fighting Preplan

92797-1, Rev. 2.2, Zone 97 – Control Building – Level A Fire Fighting Preplan  
 92798-1, Rev. 2.2, Zone 98 – Control Building – Level A Fire Fighting Preplan  
 92803-1, Rev. 2.1, Zone 103 – Control Building – Level A Fire Fighting Preplan  
 92805-1, Rev. 4.2, Zone 105 – Control Building – Level 1 Fire Fighting Preplan  
 92794-1 Rev. 2.1, Zone 94 – Control Building – Level A Fire Fighting Preplan  
 92795-1 Rev. 3.0, Zone 95 – Control Building – Level A Fire Fighting Preplan  
 92873-1 Rev. 2.2, Zone 173 – Control Building – Level A Fire Fighting Preplan  
 92874-1 Rev. 2.2, Zone 174 – Control Building – Level A Fire Fighting Preplan  
 92807-1 Rev. 5.1, Zone 107 – Control Building – Levels 1 and 2 Fire Fighting Preplan  
 92808-1 Rev. 5.1, Zone 108 – Control Building – Levels 1 and 2 Fire Fighting Preplan  
 92820-1 Rev. 6.0, Zone 120 – Control Building – Level 2 Fire Fighting Preplan  
 92821-1 Rev. 4.1, Zone 121 – Control Building – Level 2 Fire Fighting Preplan  
 92855-1, Rev. 2.2, Zone 155 – Auxiliary Feedwater Pumphouse – Train B Fire Fighting Preplan  
 92856-1, Rev. 3.1, Zone 156 – Auxiliary Feedwater Pumphouse Fire Fighting Preplan  
 92857A-1, Rev. 2.2, Zone 157A – Auxiliary Pumphouse – Train C Fire Fighting Preplan  
 92857B-1, Rev. 1.2, Zone 157B – Auxiliary Feedwater Pumphouse Fire Fighting Preplan  
 92757A-1 Rev. 4.1, Zone 57A – Control Building – Levels B, A, 1, 2, and 3 Fire Fighting Preplan  
 92781A-1 Rev. 5.0, Zone 81A – Control Building – Levels B, A, 1, 2, and 3 Fire Fighting Preplan  
 92825B-1 Rev. 4.1, Zone 125B – Control Building – Level 3 Fire Fighting Preplan  
 92826B-1 Rev. 3.1, Zone 126B – Control Building – Level 3 Fire Fighting Preplan  
 92835-1 Rev. 4.1, Zone 135 – Control Building – Level 3 Fire Fighting Preplan  
 92853-2 Rev. 0.2, Zone 153 – Control Building – Level B Fire Fighting Preplan  
 92878-2 Rev. 1.1, Zone 178 – Control Building – Level 3 Fire Fighting Preplan  
 92880-2 Rev. 0.2, Zone 180 – Control Building – Level 3 Fire Fighting Preplan

### **Section 1R07: Heat Sink Performance**

#### Procedures

83306-C Rev. 7.3, CCW and ACCW Heat Exchanger Inspection

#### Other

Calculation X4C1203E05, CCW Heat Exchanger Fouling Factor

### **Section 1R08: Inservice Inspection (ISI) Activities**

#### Calculations

X4C1201V57, Reactor Pressure Vessel Closure Head, Rev. 1

#### Corrective Action Documents

547078 dated 11/12/2012

Technical Evaluation (TE) 506159 dated 8/28/2012

TE 528407 dated 10/3/2012

196453 dated 11/12/2012

TE 509642 dated 8/30/2012

TE 570599 dated 1/9/2013

TE 253514 dated 8/12/2011

TE 280005 dated 8/20/2011

TE 253669 dated 8/12/2011



Drawings

DWG 1X6AA06-363-3, Swing Check Valve Mod, 03001CS8800000  
 DWG S13V2V141, Containment Internals Primary Shield Liner Plate Sections & details Sheet 2 of 4, Rev. 12  
 DWG S13V2V141, RCS Equipment Supports Reactor Vessel Supports, Sheet 3 of 4, Rev. 00  
 E-7372-161-004-01, Closure Head As-Builts

Procedures

NMP-ES-019, Boric Acid Corrosion Control Program, Version 9.0  
 NMP-ES-019-001, Boric Acid Corrosion Control Program Implementation, Version 8.0  
 NMP-ES-019-004, Boric Acid Corrosion Control Program – Corrosion Assessment, Version 2.0  
 PDI-UT-1, PDI Generic Procedure for the Ultrasonic Examination of Ferritic Pipe Welds, Rev. E  
 PDI-UT-2, PDI Generic Procedure for the Ultrasonic Examination of Austenitic Pipe Welds, Rev. F  
 NMP-ES-024-208, Visual Examination of Reactor Vessel Head Penetrations and Base Material (Remote and Direct), Rev. 5  
 NMP-ES-029-GL01, Alloy 600 Program Strategic Plan, Rev. 6  
 WDI-STD-1040, Procedure for Ultrasonic Examination for Reactor Vessel Head Penetrations, Rev. 9  
 WDI-STD-1041, Reactor Vessel Head Penetration Ultrasonic Examination Analysis, Rev. 8  
 35210-C, Southern Nuclear Operating Company, Inc, Revision 38.1  
 35220-C Southern Nuclear Operating Company, Inc, Revision 37.1  
 MRS 2.3.2 GPC-13, Mechanical Ribbed Plug Installation, Revision 6

Other Documents

Visual Examination of Pipe Hanger, Support or Restraint (VT-3) for 21201-V6-001-RS1, Vessel Support dated 3-20-2013  
 Visual Examination of Pipe Hanger, Support or Restraint (VT-3) for 21201-V6-001-RS2, Vessel Support dated 3-20-2013  
 Visual Examination of Pipe Hanger, Support or Restraint (VT-3) for 21201-V6-001-RS3, Vessel Support dated 3-20-2013  
 Visual Examination of Pipe Hanger, Support or Restraint (VT-3) for 21201-V6-001-RS4, Vessel Support, dated 3-20-2013  
 OG-12-330, Generic Guidance for Valves that Have Seal Encapsulation Devices Installed  
 UT Calibration/Examination for 21204-245-30-RB, 1.5" Valve to Pipe, dated 3-20-2013  
 UT Calibration/Examination for 21204-245-31-RB, 1.5" Pipe to Elbow, dated 3-20-2013  
 UT Calibration/Examination for 21204-243-30-RB, 1.5" Valve to Pipe, dated 3-20-2013  
 UT Calibration/Examination for 21204-243-31-RB, 1.5" Pipe to Elbow, dated 3-20-2013  
 UT Calibration/Examination for 21208 U6 035, Bolting, dated 3-17-2013  
 UT Calibration/Examination for 21208 U6 036, Bolting, dated 3-17-2013  
 UT Calibration/Examination for 21208 U6 037, Bolting, dated 3-17-2013  
 UT Calibration/Examination for 21208 U6 038, Bolting, dated 3-17-2013  
 Visual Examination of Pressure Retaining Bolting (VT-1) for 21208 U6 035, Bolting, dated 3-17-2013  
 Visual Examination of Pressure Retaining Bolting (VT-1) for 21208 U6 036, Bolting, dated 3-17-2013  
 Visual Examination of Pressure Retaining Bolting (VT-1) for 21208 U6 037, Bolting, dated 3-17-2013

Visual Examination of Pressure Retaining Bolting (VT-1) for 21208 U6 038, Bolting, dated 3-17-2013

UT Calibration/Examination for 21302-107-13-RB, Penetration to 6" Pipe, dated 3-15-2013

UT Calibration/Examination for 21302-107-14-RB, Pipe to Valve, dated 3-16-2013

UT Calibration/Examination for 21302-107-15-RB, 6" Valve to Pipe, dated 3-16-2013

UT Calibration/Examination for 21302-107-16-RB, 6" Pipe to Elbow, dated 3-16-2013

Certificate of Conformity for Krautkramer Transducer Nos.: 01F3WP, SC0220, SC1515

Examiner Qualification Records for: D. Cordes, G. Lofthus, M. Grell, P. Kunze, J. Kilpela, C. Wyffels, W. Holasek, T. Atcheson, R. Flakes, W. Dawes, T. Carpenter

Report S13V2V163, Visual Examination Report for Leakage (VT-2) for Reactor Vessel Head

Ultrasonic instrument calibration data record and certification for Krautkramer USN60SW No. 022PPM

Ultrasonic Report Data Sheet for Penetrations: 7, 9, 20, 23, 28, 30

Work Order (WO) 324070, Pipe Seal Weld Plug on line 1208-95-3"

Welder Qualification Records for: A. Allen, M. Spicer, D. Leonard

Certified Material Test Report for ARCOS 308/308L, Lot DF7995 dated 04/08/04

Welding Procedure Specification for GTSM-88-O-1, Rev. 5

Electric Power Research Institute (EPRI) Pressurized Water Reactor Steam Generator Examination Guidelines, Revision 7

EPRI Steam Generator Management Program: Steam Generator Integrity Assessment Guidelines, Revision 3

MRS-TRC-2196, Use of Appendix H and I Qualified Techniques at Vogtle Unit 2 16th Refueling, Revision 0

Nuclear Energy Institute (NEI) 97-06 Steam Generator, Program Guidelines, Revision 2

Nuclear Management Guideline (NMG) NMP-CH-008-GL02, Vogtle Secondary Water Chemistry Strategic Plan, Version 2.0

NMP-GM-003-F04, Focused Area Self-Assessment of the Steam Generator Program, dated 9/9/2011

NRC Generic Letter 97-05, Steam Generator Tube Inspection Techniques

NRC Generic Letter 97-06, Degradation of Steam Generator Internals

SG-SGMP-11-25, Vogtle 2R15 Steam Generator Condition Monitoring and Operational Assessment, Revision 0

SG-SGMP-12-21, Vogtle 2R16 Steam Generator Degradation Assessment, Revision 0

Site Specific Performance Demonstration (SSPD) Training Manual, Vogtle Unit 2 2R16 Refueling Outage, Revision 0

Vogtle Unit 2 Cycle 15, Feedwater Corrosion Product Mass Balance Report, dated December 8, 2011

Vogtle Unit 2 Cycle 15 Hideout Return Evaluation, dated October 25, 2011

### **Section 1R11: Licensed Operator Regualification Program**

#### **Procedures**

10006-C Rev. 29.1, Reactor Trip Review

#### **Other**

V-RQ-SE-13102 Rev. 1.0, Simulator Exercise Guide: Rx Vessel Head Leakage

**Section 1R12: Maintenance Rule Effectiveness**Condition Reports and Action Items

526268, Fire alarm on panel 1F15 (failure of CCW pump #1 inboard bearing)  
 526417, IRT initiated for Unit 1 CCW pump #1  
 526434, CCW pump #1 bearing failure – alarm disabled  
 598661, Maintenance rule performance criteria exceeded

Work Orders

SNC12209 – Replace CCW pump #1 outboard mechanical seal

Other Records

ACD 196054, CCW pump #1 bearing failure  
 BCD 196066, CCW pump disabled annunciator investigation  
 BCD 196727, Unit 1 CCW pump #1 oil level low after start  
 TE 527961, TE to maintenance rule evaluation  
 TE 541304, MPFF call for CCW pump 1A

**Section 1R15: Operability Evaluations**Condition Reports

566472, Unit 2A sequencer test monitor screen is blank  
 577277, UNSAT operator rounds readings - piping upstream of AFW stop check valve 2-1302-U4-116 was hot to the touch  
 545916, Unit 1A EDG jacket water leak  
 590272, Found cracks on top of cells while performing battery inspection on 2AD1B  
 596318, unanalyzed safety-related seismic tubing configuration on ESF chillers  
 573327, strong backs found not-installed on piping penetration area filtration and exhaust system (PPAFES) pressure boundary  
 593642, PPAFES pressure boundary seismic evaluation  
 595084, calculation X2CK04.08.22B enhancements

Other Records

TE 566210, Unit 2A sequencer test monitor screen is blank  
 TE 577247, UNSAT operator rounds readings  
 TE 545917, Unit 1A EDG jacket water leak  
 TE 596375, unanalyzed safety-related seismic tubing configuration on ESF chillers  
 X2CK04.08.22B, seismic evaluation of block wall plug for A2108R106R122

**Section 1R18: Plant Modifications**Procedures

NMP-ES-054-001 Rev. 1.2, Temporary Modification Processing  
 NMP-ES-041 Rev. 10.0, Minor Design Change Packages

Work Orders

SNC445295 – Temporary power during 2NB27 system outage

Other

SNC470866 Rev. 1.0, design details for drilling inspection holes in the seal encapsulation devices for valves 1-1208-U6-035, 036, and 038

**Section 1R19: Post Maintenance Testing**Procedures

14804A-2 Rev. 5, Safety Injection Pump A Inservice and Response Time Test  
 27568-C Rev. 4.3, Terry Turbine Trip Throttle Valve Maintenance  
 22332-C Rev. 9.7, Temperature Switch Calibration  
 22336-C Rev. 5.3, Differential Pressure Switch Calibration  
 14802A-2 Rev. 4.1, NSCW Pump and Check Valve IST and Response Time Test  
 14805A-2 Rev. 3.1, Train A Residual Heat Removal Pump IST and Response Time Test  
 24990-2 Rev. 10.6, Protection Input Relay Test Group I SSPS  
 24700-2 Rev. 39, Nuclear Instrumentation System Power Range Channel 2N41 Channel Calibration  
 20429-C Rev. 33.1, Plant Equipment Component Configuration Control  
 22408A-C Rev. 3.1, Circuit Board Removal, Inspection Cleaning and Reinstallation

Work Orders

SNC133197 – 2A SIP swap breaker  
 SNC129989 – 2A SIP install freedom series starters and overload relays  
 SNC419944 – Unit 2 TDAFW trip and throttle valve adjust and lube  
 SNC409192 – 2A NSCW P5 162-1/162-2 Agastat relay cal/replace  
 SNC412424 – clean, inspect, and lubricate RHR pump motor  
 SNC351976 – change oil in RHR motor upper bearing  
 SNC135067 – 2A RHR pump swap breaker  
 SNC465044 – replace power range 2N41 NC-304 bistable card  
 SNC363210 - solid state protection system (SSPS) cabinet (QSPA) calibration

Other Records

Unit 2 operator logs for 1/15/13  
 Unit 2 operator logs for 1/17/13

**Section 1R22: Surveillance Testing**Procedures

14805B-2 Rev. 3.1, Train B Residual Heat Removal Pump IST and Response Time Test  
 14670B-2 Rev. 1.2, Diesel Generator 2B Hot Restart Test  
 24939-2 Rev. 15, Containment Penetration No. 39 Train A Containment Spray Encapsulation Vessel Leak Rate Test  
 24812-1 Rev. 43.1, Delta T/TAVG Loop 3 Protection Channel III 1T 431 Channel Operational Test and Channel Calibration  
 88016-C Rev. 16, Determination and Verification of Delta T/TAVG Protection Channel Calibration  
 14810-2 Rev. 41.2, TDAFW Pump Operability, Response Time and Check Valve IST  
 14810-1 Rev. 47.2, TDAFW Pump Operability, Response Time and Check Valve IST

Work Orders

SNC443059, 2HV-9002A Encapsulation Vessel LLRT  
 SNC 358168, Loop 3 Protection Channel III 1T 431 Channel Operational Test and Channel Calibration  
 SNC415429, TDAFW Pump Operability, Response Time and Check Valve IST

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

43007-C, Issuance Use and Control of Radioactive Work Permits, Ver.26.6  
 43014-C, Special Radiological Controls, Ver. 47.3  
 43019-C, Spent Filter Handling Special Radiological Controls, Ver. 20.3  
 43029-1, Health Physics Responsibilities for Resin Sluices and Transfers in Unit 1 and Common, Ver. 2.5  
 43031-C, Steam Generator Job Coverage, Ver. 5.3  
 43032-C, Reactor Head and Upper Internals Movements, Ver. 3.1  
 46017-C, Control and Monitoring of Materials in Radiation Controlled Areas, Ver. 36.1  
 46024-C, Release of Materials from the RCA, Ver. 9.3  
 NMP-HP-303, Personnel Decontamination, Ver. 2.1  
 NMP-HP-001, Radiation Protection Standard Practices, Ver. 5.2  
 NMP-HP-202, Radiological Controls for Highly Radioactive Objects, Ver. 1.0  
 NMP-HP-206, Issuance, Use and Control of Radiation Work Permits, Ver. 2.0  
 NMP-HP-300, Radiation and Contamination Surveys, Ver. 2.1  
 NMP-HP-302-001, Radiological Key Control, Ver. 1.2  
 NMP-HP-302, Restricted Area Classification, Postings, and Access Control, Ver. 4.0  
 NMP-CH-013, RCS Chemistry Control During Scheduled Plant Shutdowns with Fuel Defects Suspected, Ver. 1.0  
 NMP-GM-002, "Corrective Action Program", Ver. 12.1  
 NMP-GM-002-001, Corrective Action Program Instructions, Version 30.1

**Records and Data**

US NRC National Source Tracking System Annual Inventory Reconciliation Report, 1/30/2013  
 Radioactive Sealed Source Leak Test Certifications for sources 0177, 413, and 497, 12/17-18/2013  
 Inventories of Non-Fuel Items Stored in Unit 1 and Unit 2 Spent Fuel Pools  
 Contingency Plan for Health Physics Controls for high Noble Gas activity during Code Safety Valve Removal During 2R16  
 RWP 13-0113, All Sluices from Demins to Spent Resin Storage Tank  
 RWP 13-0124, HP Job Coverage and Surveys in Locked High Radiation Areas  
 RWP 13-2004, Installation and Removal of Scaffolding in Unit 2 Containment  
 RWP 13-2104, Waste and Decon Activities in Unit 2 Containment  
 RWP 13-2408, Thermocouple Work in Unit 2 Containment  
 RWP 13-2506, Snubber Work inside Unit 2 Containment  
 Radiological Survey 125533, S/G 2 Channel Head Cold Leg  
 Radiological Survey 125535, S/G 2 Channel Head Hot Leg  
 Radiological Survey 157505, Unit 2 Containment 220'  
 Radiological Survey 157646, Unit 2 RHR Pump Room Train A  
 Radiological Survey 157728, RCP #4 Seal Platform  
 Radiological Survey 157738, Unit 2 RHR Pump Room Train B  
 Radiological Survey 157755, Unit 2 Upper Reactor Cavity  
 Air Sample 13-0123, U-2 Containment 220'  
 Air Sample 13-0133, U-2 Containment 220' Col. 26  
 Air Sample 13-0157, U-2 S/G #3 Platform  
 Air Sample 13-0159, U-2 S/G #3 Platform

CAP Documents

NOSCPA-HP-2012, Health Physics Fleet Performance Summary Report, 11/26/2012

434498  
 434496  
 515936  
 516834  
 519863  
 523976  
 524183  
 525192  
 525411  
 525336  
 525431  
 552145  
 557417  
 563362  
 569843  
 572031  
 604563

**Section 2RS8: Radioactive Material Processing and Transportation**Procedures, Manuals, and Guides

NP-HP-405, "Shipment of Radioactive Waste and Radioactive Material", Ver. 1.2  
 NP-HP-406, "Performing Surveys for Shipments of Radioactive Containers", Ver. 1.0  
 NP-HP-408, "Solid Radioactive Waste Scaling Factor Determination and Implementation and Waste Classification", Ver. 1.0  
 NP-HP-415, "Storage of Radwaste in Outdoor Process Shields", Ver. 1.0  
 46201-C, "Storage of Radioactive Materials in the Outage Storage Building", Rev. 2.2  
 Process Control Program (PCP), Rev. 10  
 NMP-GM-002, "Corrective Action Program", Ver. 12.1  
 NMP-GM-002-001, Corrective Action Program Instructions, Version 30.1

Shipping Records and Radwaste Data

Shipment 12-0-015, Refueling Equipment, SCO-II  
 Shipment 13-03-005, Pressurizer Code Safety Valves, LQ  
 Shipment RVRS-12-001, DAW Membranes (TUFS Filters), LSA-II  
 Shipment RVRS-12-012, RPF Resin Beads, LSA-II  
 Shipment RVRS-13-001, Used OREX, LSA-II  
 10 CFR Part 61 Analysis, DAW, 9/8/12  
 10 CFR Part 61 Analysis, BTRS Resin, 11/13/12

CAP Documents

335517  
 441296  
 539937  
 541044  
 546228  
 562240

**Section 40A1: Performance Indicator (PI) Verification**Procedures

00163-C, Rev. 14.3, NRC Performance Indicator and Monthly Operating Report Preparation and Submittal

**Section 40A2: Identification and Resolution of Problems**Condition Reports

599790, Unit 2 B train NSCW transfer pump 7 inoperable

580535, incorrect limit switch being installed on NSCW pump #6 discharge valve

**Section 40A5: Other Activities**Corrective Action Documents Reviewed

318871, Develop an asset management plan or plans addressing buried piping by December 31, 2013, as required per NEI 09-14

513826, Underground Pipe and Tanks Monitoring Program CHECK-IN Self Assessment

552648, Revise fleet NMP-ES-036 and NMP-ES-036-001 as needed to incorporate new guidance in new issue of NEI 09-14 Rev 2

578721, Add into NMP-ES-036 the requirement that once the latest version of EPRI's BPWorks 2.1 is installed and operational for each site that all inspection data from each site shall be uploaded into the site's database

2010200463, Complete Risk Ranking of buried piping segments for Vogtle in accordance with NEI 09-14 and EPRI TR 1016456

2011107893, Focused Self-Assessment of the Buried Pipe Program

2011202618, Create line groups for piping segments included in the Buried Pipe and Tanks Monitoring Program per NEI 09-14 (Rev2) Appendix C

586957, ISFSI Small Pad – General Note Clarification for Rebar

587250, ISFSI Small Pad Concrete Placement Rescheduled Due to Impacts from Heavy Rains

594004, ISFSI Small Pad Concrete Placement Observation from 2/20/13

Corrective Action Documents Generated

578706, Modify NMP-ES-036-001 Item 4.1 Scope, to further explain the statement "Non-risk significant piping and tanks may be inspected and monitored at the discretion of each site's Program Coordinator"

Procedures

NMP-ES-036, Underground Pipe and Tanks Monitoring Program, Rev. 5

NMP-ES-036, Underground Pipe and Tanks Monitoring Program, Rev. 8

NMP-ES-036, Underground Pipe and Tanks Monitoring Program, Rev. 9

NMP-ES-036-001, Underground Pipe and Tanks Monitoring Program Implementation, Rev. 6

NMP-ES-036-002, Underground Pipe and Tanks Monitoring Program Health Reports and Program Notebooks, Rev. 5

25016-C, Earthwork, Version 7

25026-C, Southern Nuclear Operating Company, Inc, Revision 3.1

Codes and Standards

American Concrete Institute (ACI) 349-06 Code Requirements for Nuclear Safety-Related Concrete Structures

American Society for Testing and Materials (ASTM) C33, Standard Specification for Concrete Aggregates

ASTM C143, Standard Test Method for Slump of Hydraulic Cement Concrete

ASTM C150, Standard Specification for Portland Cement

ASTM C172, Standard Practice for Sampling Freshly Mixed Concrete

ASTM C231, Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method

ASTM C260, Standard Specification for Air-Entraining Admixtures for Concrete

#### Worksheets (Drawings)

C100867501C002, Unit 1 & 2 ISFSI Small Pad & Cask Transfer Facility (CTF) Grading and Fencing Plan, Version 1.0

C100867501C003, Unit 1 & 2 ISFSI Small Pad & Cask Transfer Facility (CTF) Grading Sections, Version 1.0

C100867501C026, ISFSI Small Pad Sections and Details, Sheet 1 of 4, Version 1.0

C100867501C027, ISFSI Small Pad Sections and Details, Sheet 2 of 4, Version 1.0

C100867501C028, ISFSI Small Pad Sections and Details, Sheet 3 of 4, Version 1.0

#### Specifications

X2AP01, Division C2, Section C2.2, Earthwork and Related Site Activities, Revision 20

VC-S-11-003, Furnishing and Placing Concrete for the Independent Spent Fuel Storage Installation Cask Support Pad, Version 1.0

#### Other Documents

EPRI TR 1016456, Recommendations for an Effective Program to Control the Degradation of Buried Pipe

Plant Vogtle Underground Piping and Tanks Inspection Plan

Nuclear Energy Institute (NEI) 09-14, Guideline for the Management of Buried Piping Integrity, Rev. 1

10 CFR 50.59 Screening/Evaluation: DCP C100868001, Version 3.0, ISFSI Haul Road Inside Protected Area

10 CFR 50.59 Screening/Evaluation: DCP C100868001, Version 3.0, ISFSI Haul Road Outside Protected Area

Aggregates USA letter, dated January 2, 2013, certifying that the course aggregate conforms to GDOT Standard Specifications of Construction of Transportation System, 2001 Edition

Argos Cement USA letter, dated January 3, 2013, certifying the Type I/II cement

Boral Material Technologies letter, dated January 7, 2013, certifying that Boral flyash meets ASTM C-618, Class C, Specifications

csra Testing and Engineering Co., Inc., Concrete Compressive Strength Results for 7-days and 28-days

DCP C100867501, Version 1.0, Vogtle Independent Spent Storage Installation (ISFSI) Dry Cask Storage Pad ("Small Pad") and the associated Cask Transfer Facility (CTF)

Euclid Chemical letter, dated January 2, 2013, certifying that chemical admixtures satisfy ASTM requirements

Evans Concrete, LLC, letter, dated January 1, 2012, certifying that concrete sand meets ASTM C-33 Specifications



Georgia Department of Transportation (GDOT) Certification of the Evans Mobile Plant Ready Mixed Concrete Plant at 6057 River Road, Waynesboro, Georgia, dated 01/01/2013

Letter from NRC to SNC granting Approval of Southern Nuclear Operating Company, Inc.'s Quality Assurance Topical Report, dated June 21, 2007

MACTEC Data Report for Geotechnical Exploration and Laboratory Testing for ISFSI Pads Outside of the Protected Area, including:

Table 1 - Boring Summary Information

Table 2 – Cone Penetration Test (CPT) Summary Information

Table 3 – Laboratory Testing Summary

Table 4 – Formation Descriptions

Table 5 – Legend for Soil Description

Attachment A.1.a – Rock Coring Record

Attachment A.2 – Standard Penetration Test (SPT) Energy Measurement Reports (two reports)

Attachment A.3 – Sonic Boring Records

Attachment B – CPT Test Report

Attachment C – Geophysical Logging

Attachment C.1 – Modified Borehole Preparation Procedure and Logging

Sequence

Attachment C.2 – Geophysical Logging Reports

Attachment D – Laboratory Test Reports

Attachment D.1 – Classification Test Reports

Attachment D.2 – Chemistry Test Reports

MACTEC letter, dated May 13, 2011, discussing the Plate Load Test Report, including:

Figure 1 – Test Location Plan

Attachment A.- Plate Load Test Data

Attachment A.1 – Sally Port Area (12-inch plate)

Attachment A.2 - Sally Port Area (18-inch plate)

Attachment A.3 – ISFSI Small Pad Area (12-inch plate)

Attachment A.4 - ISFSI Small Pad Area (18-inch plate)

Attachment B – Field Soil Test Reports

Attachment B.1 – Report of Field Tests

Attachment B.2 – Hand Auger Boring Records

Attachment C – Laboratory Test Reports

Attachment C.1 – Sally Port Area Test Reports

Compaction Test Report (Modified Proctor)

Grain Size Distribution Report

Atterberg Limits Report

Attachment C.2 – ISFSI Small Pad Area Test Reports

Compaction Test Report (Modified Proctor)

Grain Size Distribution Report

Atterberg Limits Report

Purchase Order for Independent Testing Laboratory

Purchase Order, Receipt Inspections, and Chemical and Physical Test Reports for rebar and 6x6x3/8 angles

Quality Control Inspection Reports

Proctor Density Lab Results for Category I Backfill for ISFSI Pads