



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

January 27, 2011

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 05000424/2010005, 05000425/2010005, 05000424/2010502, AND  
05000425/2010502**

Dear Mr. Tynan:

On December 31, 2010, 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 January 24, 2011, with you and other members of your staff.

The inspection 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.

This report documents one NRC-identified finding of very low safety significance (Green) which was determined to be a violation of regulatory requirements. However, because of the very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with the NRC Enforcement Policy. If you contest this NCV, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-0001; 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. In addition, if you disagree with the cross-cutting aspect assigned to any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Senior Resident Inspector at the Vogtle facility. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

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In accordance with the Code of Federal Regulations 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 document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

***/RA/***

Scott M. Shaeffer, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Docket Nos.: 50-424, 50-425  
License Nos.: NPF-68 and NPF-81

Enclosures: Inspection Report 05000424/2010005, 05000425/2010005, 05000424/2010502,  
and 05000425/2010502  
w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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Sincerely,

**/RA/**

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Letter to Tom E. Tynan from Scott M. Shaeffer dated January 27, 2011

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REPORT 05000424/2010005, 05000425/2010005, 05000424/2010502, AND  
05000425/2010502

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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.: 05000424/2010005, 05000425/2010005,  
05000424/2010502, and 05000425/2010502

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

Facility: Vogtle Electric Generating Plant, Units 1 and 2

Location: Waynesboro, GA 30830

Dates: October 1, 2010, through December 31, 2010

Inspectors: M. Cain, Senior Resident Inspector  
T. Chandler, Resident Inspector  
B. Caballero, Senior Operations Engineer (Section 1R11)  
R. Williams, Reactor Inspector (Section 4OA5.3)  
W. Russell, Senior Reactor Technology Instructor  
(Inspector in Training)

Approved by: Scott M. Shaeffer, Chief  
Reactor Projects Branch 2  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000424/2010005, 05000425/2010005, 05000424/2010502, 05000425/2010502; 10/01/2010 - 12/31/2010; Vogtle Electric Generating Plant, Units 1 and 2; Identification and Resolution of Problems

The report covered a three-month period of inspection by the resident inspectors, one senior operations engineer, and one reactor inspector. One non-cited violation (NCV) with very low safety significance (Green) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, or Red) using Inspection Manual Chapter (IMC) 0609, Significance Determination Process (SDP). Findings for which the SDP does not apply may be Green or assigned a severity level after NRC management review. The cross-cutting aspect was determined using IMC 0310, "Components Within The Cross-Cutting Areas." The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, Reactor Oversight Process, Rev 4 dated December 2006.

Cornerstone: Barrier Integrity

- Green: An NRC identified non-cited violation (NCV) of 10 CFR Part 50, Appendix B, Criterion XVI, Corrective Action, was identified for the failure of the licensee to identify within their CAP to correct a condition adverse to quality. Plant personnel had knowledge of 480V ABB EMAX circuit breaker failures caused by the upper right hand screw holding down the front cover of the circuit breaker contacting the breaker's closing mechanism, preventing the breaker from closing. The failure to identify and correct the cause of the breaker failures resulted in Containment Cooler Fan #8 being inoperable when the fan's breaker failed to close. The licensee wrote a Condition Report (CR 2010113375) on the Containment Cooler Fan breaker. Corrective actions included a temporary modification to remove the upper right hand screw from all of the 1E 480V ABB EMAX circuit breakers. The licensee further plans to restore the breakers to their original configuration with new shorter screws and apply a maximum torque value for the screws.

The finding is more than minor because it had a direct impact on the Containment Cooler breaker's ability to perform its safety related function; resulted in containment cooling train B being inoperable for 22 hours. The finding affected the Barrier Integrity Cornerstone due to reduced containment heat removal capability with a containment cooler inoperable. The finding was determined to be of very low safety significance (Green) because the loss of the cooler did not meet the criteria identified in IMC 609.04, Phase 1 - Initial Screening and Characterization of Findings, for the containment barrier which would result in the finding being greater than green. The finding is indicative of current licensee performance and the cause of the finding was related to the Corrective Action Program component of the Problem Identification and Resolution cross-cutting area. Specifically, the licensee does not implement a corrective action program with a low threshold for identifying issues. The licensee did not identify the 480V ABB breaker issues completely, accurately, and in a timely manner commensurate with their safety significance (P.1(a)). (Section 4OA2.2)

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## REPORT DETAILS

### Summary of Plant Status

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

Unit 2 operated at essentially full RTP for the entire inspection period.

### 1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

#### 1R01 Adverse Weather Protection

##### a. Inspection Scope

Seasonal Readiness Review. The inspectors performed a walkdown of the following two systems to verify they would remain functional during low temperature conditions. The inspectors reviewed preventive maintenance activities associated with heat tracing and freeze protection systems to verify they were appropriately scheduled and completed prior to the onset of cold weather. The inspectors reviewed compensatory actions to verify they were implemented for degraded or inoperable heat trace and freeze protection equipment. Additionally, the inspectors reviewed the condition report (CR) database to verify that adverse weather related items were being identified and appropriately resolved. Documents reviewed are listed in the Attachment.

- Unit 2, nuclear service cooling water (NSCW) tower instrumentation rooms (both trains)
- Unit 1 and 2 refueling water storage tank instrumentation rooms

Impending Adverse Weather Condition Review. On November 5, the inspectors reviewed licensee procedure 11877-1 and 11877-2, Cold Weather Checklist, to verify the licensee had implemented actions to prepare the plant site for predicted severe weather conditions of sub-freezing temperatures. The inspectors walked down various safety-significant areas of the plant to verify the licensee's ability to respond to the predicted adverse weather conditions.

##### b. Findings

No findings were identified.

#### 1R04 Equipment Alignment

##### a. Inspection Scope

Partial System Walkdown. The inspectors performed partial walkdowns of the following three systems to verify correct system alignment. The inspectors checked for correct valve and electrical power alignments by comparing positions of valves, switches, and

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breakers to the documents listed in the Attachment. Additionally, the inspectors reviewed the condition report database to verify that equipment alignment problems were being identified and appropriately resolved.

- Unit 1 train A essential chilled water system during the Unit 1 train B essential chilled water system maintenance outage
- Unit 1 train B residual heat removal (RHR) system during Unit 1 train A RHR system maintenance outage
- Unit 1 train B containment spray (CS) system during Unit 1 train A CS system maintenance outage

Complete System Walkdown. The inspectors performed a complete walkdown of the accessible portions of the Unit 2 125V DC 1E electrical distribution system. The inspectors verified switch and breaker alignment, electrical power availability, labeling, and material condition of the distribution system. The inspectors also reviewed system health reports, maintenance rule monthly reports, condition reports, and outstanding maintenance work orders to verify that equipment discrepancies were being identified and properly resolved. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R05 Fire Protection

a. Inspection Scope

Fire Area Tours. The inspectors walked down the following five plant areas to verify the licensee was controlling combustible materials and ignition sources as required by procedures 92015-C, Use, Control, and Storage of Flammable/Combustible Materials, and 92020-C, Control of Ignition Sources. The inspectors assessed the observable condition of fire detection, suppression, and protection systems and reviewed the licensee's fire protection Limiting Condition for Operation log and CR database to verify that the corrective actions for degraded equipment were identified and appropriately prioritized. The inspectors also reviewed the licensee's fire protection program to verify the requirements of Updated Final Safety Analysis Report (UFSAR) Section 9.5.1, Fire Protection Program, and Appendix 9A, Fire Hazards Analysis, were met. Documents reviewed are listed in the Attachment.

- Unit 1 CS pump rooms
- Unit 2 engineered safety features (ESF) chiller and normal air conditioning rooms
- Unit 1 train A and B RHR rooms
- Unit 1 component cooling water (CCW) heat exchanger rooms
- Control Building Level 4

b. Findings

No findings were identified.

1R06 Flood Protection Measures

a. Inspection Scope

Internal Flood Review. The inspectors walked down the following area which contained risk-significant structures, systems and components below flood level to verify flood barriers were in place. Motor controllers and terminal boxes that could become potentially submerged were inspected to ensure that the sealing gasket material was intact and undamaged. The inspectors reviewed selected licensee alarm response procedures to verify alarm setpoints and setpoints for sump pump operation were consistent with the UFSAR, the setpoint index, and Technical Specifications (TSs).

- Unit 1 centrifugal charging pump rooms

b. Findings

No findings were identified.

1R07 Heat Sink Performance

a. Inspection Scope

Annual Review. The inspectors reviewed the licensee's records of the performance tests conducted on the Unit 1, A Train Emergency Diesel Generator (EDG) Jacket Water Heat Exchanger. The inspectors reviewed EPRI NP-7552, Heat Exchanger Performance Monitoring Guidelines, to ensure that the licensee's testing procedures were appropriate. Additionally, the inspectors reviewed the licensee's corrective action program (CAP) for heat exchanger performance issues to ensure that discrepancies were being identified and appropriately resolved. Documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

1R11 Licensed Operator Requalification

.1 Resident Quarterly Observation

a. Inspection Scope

The inspectors observed operator performance on November 15, during licensed operator simulator training described in Simulator Scenario V-RQ-SE-10702, Loss of all AC. The scenario began with a pressurizer safety valve (PSV8010A) failing open

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requiring a manual reactor trip and safety injection. The spray valve did not close requiring the crew to trip the Reactor and stop reactor coolant pump (RCP) #4. On the Reactor Trip, reserve auxiliary transformer (RAT) A tripped and EDG 1A failed to start requiring the crew to respond to a Loss of all AC. The inspectors specifically assessed the following areas utilizing guidance contained in Operating Experience Smart Sample (OpESS) FY2010-02, Sample Selections for Reviewing Licensed Operator Examinations and Training Conducted on the Plant-Referenced Simulator:

- Correct use of the abnormal and emergency operating procedures
- Ability to identify and implement appropriate actions in accordance with the requirements of the TS
- Clarity and formality of communications in accordance with procedure 10000-C, Conduct of Operations
- Proper control board manipulations including critical operator actions
- Quality of supervisory command and control
- Effectiveness of the post-evaluation critique

b. Findings

No findings were identified.

.2 Annual Review of Licensee Requalification Examination Results

a. Inspection Scope

On August 13, 2010, the licensee completed administering the annual requalification operating tests and on December 31, 2010, the licensee completed administering the comprehensive biennial requalification written examinations. The annual operating test and biennial written examination are required to be administered to all licensed operators in accordance with 10 CFR 55.59(a)(2). The inspectors performed an in-office review of the overall pass/fail results of the written examinations, individual operating tests, and the crew simulator operating tests. These results were compared to the thresholds established in Manual Chapter 609 Appendix I, Operator Requalification Human Performance Significance Determination Process.

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors reviewed the following condition reports to evaluate the effectiveness of the licensee's handling of equipment performance problems and to verify the licensee's maintenance efforts met the requirements of 10 CFR 50.65 (the Maintenance Rule) and licensee procedure 50028-C, Engineering Maintenance Rule Implementation. The

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inspectors also reviewed the safety-significant system to verify that the licensee's maintenance efforts met the requirements of 10 CFR 50.65 and licensee procedure 50028-C. The reviews included adequacy of the licensee's failure characterization, establishment of performance criteria or 50.65(a)(1) performance goals, and adequacy of corrective actions. Other documents reviewed during these inspections included control room logs, system health reports, the maintenance rule database, and maintenance work orders. Also, the inspectors interviewed system engineers and the maintenance rule coordinator to assess the accuracy of identified performance deficiencies and extent of condition.

The inspection performed on the failure of the Unit 1 NSCW B tower fan #3 (ref. CR 2010109892) utilized OpESS FY 2010-01, Recent Inspection Experience for Components Installed Beyond Vendor Recommended Service Life.

- CR 2010109892
- CR 2010102639

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors reviewed the following five work activities to verify plant risk was properly assessed by the licensee prior to conducting the activities. The inspectors reviewed risk assessments and risk management controls implemented for these activities to verify they were completed in accordance with procedure 00354-C, Maintenance Scheduling, and 10 CFR 50.65(a)(4). The inspectors also reviewed the CR database to verify that maintenance risk assessment problems were being identified at the appropriate level, entered into the corrective action program, and appropriately resolved.

- Unit 1B ESF Chiller failure concurrent with a planned maintenance outage on the B train NSCW tower fan #1 and maintenance on the 1B EDG
- Unit 1 train B NSCW tower out of service (OOS) due to planned maintenance on NSCW B tower fans #1 and #3, and NSCW pump #4
- Unit 2 power operated relief valve (PORV) 2PV455A block valve closure due to PORV seat leakage
- Unit 1B containment cooler fan #8 OOS due to EMAX breaker failure
- Unit 1 train A motor-driven auxiliary feedwater pump maintenance outage

b. Findings

No findings were identified.

## 1R15 Operability Evaluations

### a. Inspection Scope

The inspectors reviewed the following five evaluations to verify they met the requirements of procedure NMP-GM-002, Corrective Action Program, 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.

- CR 2010112603, NSCW 2A fan #3 preventive maintenance could not be performed due to excessive algae growth
- CR 2010113222, During performance of 14825-2, did not initially receive proper light indication for 2HV-9454
- CR 2010114558, Maxi-bolt holes drilled for 1B NSCW tower modifications exceed the allowable hole diameter
- CR 2010113245, 1B EDG jacket water (JW) leaks
- CR 2010113375, 1B containment cooler fan #8 failed to start

### b. Findings

No findings were identified.

## 1R18 Plant Modifications

### a. Inspection Scope

Temporary Modifications. The inspectors reviewed temporary modifications (TMs) 11022210001 and 2102221301 as well as the associated 10CFR50.59 screening criteria against the system design bases documentation and procedure 00307-C, Temporary Modifications. These temporary modifications provided for the removal of the top right hand cover plate screw for all class 1E EMAX breakers installed on both units. The inspectors reviewed implementation, configuration control, post-installation test activities, drawing and procedure updates, and operator awareness for these TMs.

Permanent Modifications. The inspectors reviewed design change package (DCP) 1081982101, Unit 1 Train A and B NSCW Fans Electrical Restoration, against the system design bases documentation. This DCP replaces the raceways, conduits, pull boxes, terminal boxes, armored cables, and supports associated with the Unit 1 NSCW cooling towers with stainless steel equivalent components. The existing raceways, conduits, pull boxes, terminal boxes, armored cables, and supports are made of steel and have become corroded. The inspectors reviewed the design change package to verify that the modification did not degrade the system design bases, licensing bases, or equipment performance capability. Additionally, the inspectors verified that plant risk was not increased unnecessarily during implementation of the modification.

b. Findings

No findings were identified.

1R19 Post-Maintenance Testinga. 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 TS operability requirements.

- WO C092128401, CPSV7914 Inspect/Test Fire Pump #1 Discharge Relief Valve and WO C092128501, CPSV7946 Inspect/Test Fire Pump #2 Discharge Relief Valve
- WO 1102263501, Failure of 1B CREFS chilled water supply valve 1TV-12125 to stroke
- Unit 1 loop 1 atmospheric relief valve 1PV3000 outage
- WO 2102361901, Unit 2 loop 3 main feed regulating valve (MFRV) feedback potentiometer replacement
- Unit 1 and 2 EMAX breaker TM 1102221001 and 2012221301 implementation
- Unit 2 NSCW fan #3 gearbox accelerometer installation

b. Findings

No findings were identified.

1R22 Surveillance Testinga. Inspection Scope

The inspectors reviewed the following five surveillance test procedures and either observed the testing or reviewed test results to verify that testing was 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

- 14980A-2 Rev 22.3, Diesel Generator 2A Operability Test
- 14980B-2 Rev. 22.3, Diesel Generator 2B Operability Test, Fast Speed Start
- 14980A-1 Rev. 23.3, Diesel Generator 1A Operability Test, 24 Hour

In-Service Tests (IST)

- 14805A-1 Rev. 3, Train A Residual Heat Removal Pump IST and Response Time Test

RCS Leak Detection

- 14905-1 Rev. 65.3, RCS Leakage Calculation (Inventory Balance)

b. Findings

No findings were identified.

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 November 10, the licensee conducted an emergency preparedness drill involving an asphyxiated individual in the auxiliary building, followed by a loss of heat sink due to a loss of both main and auxiliary feedwater, followed by containment failure due to a failed containment isolation valve. The technical support center, emergency operations facility and operations support center were activated and the site participated in the exercise.

b. Findings

No findings were identified.

## 4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verificationa. Inspection Scope

The inspectors sampled licensee submittals for the listed PIs during the period from October 1, 2009, through September 30, 2010, 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 procedures 00163-C, NRC Performance Indicator and Monthly Operating Report Preparation and Submittal, and Nuclear Energy Institute (NEI) 99-02, Regulatory Assessment Indicator Guideline.

Mitigating Systems Cornerstone

- Emergency AC Power Systems
- Cooling Water Systems
- Safety System Functional Failures

The inspectors reviewed Unit 1 and Unit 2 operator log entries, the CR data base, the Vogtle MSPI 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.

40A2 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 CR which addressed the failure of a Unit 1 containment cooler fan #8 to start on demand. The goal of the review was to verify that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors evaluated the CR 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.

- CR 2010113375, Unit 1 containment cooler fan #8 failed to start

b. Findings and Observations

Introduction: An NRC identified, Green NCV of 10 CFR 50 Appendix B, Criterion XVI, Corrective Action, was identified for the failure of the licensee to identify within their CAP to correct a condition adverse to quality. Specifically, plant personnel knew that 480V ABB EMAX circuit breakers had the potential to fail due to a screw holding down the front cover of the circuit breaker coming in contact with the breaker's closing mechanism, preventing the breaker from closing. The failure to identify and correct the cause of the screw coming in contact with the closing mechanism on breakers resulted

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in a failure of a containment cooler fan to operate when its handswitch was taken to the start position.

Description: On October 24, 2010, the licensee attempted to manually start Containment Cooling Unit #8 in low speed during the performance of a Containment Cooling System Operability and Response Time Test and the cooling unit did not start. Technical Specification limiting condition for operation (LCO) 3.6.6 Action B was entered at 2:49 p.m., which required the cooler to be restored to operable status within 72 hours (the last time the Containment Cooling Unit #8 low speed breaker was operated successfully was on September 26, 2010 for a Containment Cooling System Operability and Response Time Test). A work order (1102198301) was generated to initiate repairs. The work order investigation identified that the circuit breaker had two breaker cover mounting holes that were cracked. This allowed the top right hand side screw to come in contact with the breaker's closing mechanism, thus preventing the breaker from closing. The front breaker cover was replaced, the breaker was tested successfully and LCO 3.6.6 Action B was exited on October 25 at 12:36 p.m. The licensee wrote a Condition Report (CR 2010113375) on the failed breaker which placed the condition into their corrective action program.

The inspectors identified through interviews with plant personnel that this condition on this type of breaker had been previously observed. The inspectors concluded that plant personnel knew of one instance in the field during a functional test of an ABB EMAX 480V breaker after installation (approximately 1 year ago) where it failed to close and one instance in the shop where an ABB EMAX 480V breaker would not close (approximately 2 months ago). In both cases, the breakers were prevented from closing due to the top right hand side screw coming in contact with the closing mechanism. The breakers were repaired and tested to verify that they would close. Since the failures were not documented, the dates of the failures and the breaker functions are not known. No previous CRs were written to address the root cause of these occurrences.

To address aging and obsolescence issues with GE AKR 480V circuit breakers, the licensee had been routinely replacing them with ABB EMAX series 480V circuit breakers in accordance with DCP 2060337001. As part of the CR investigation it was determined that there have been 98 ABB EMAX circuit breakers installed since mid 2007 used in safety-related circuits. ABB was contacted concerning the failures of the breakers; they stated that the cover plate screws were installed incorrectly. When the breakers were installed, the screws holding the cover plates in place were tightened down using too much torque. The stress to the cover plate from the screws caused the plates to crack after being cycled during routine use and allowed the upper right hand screw to come in contact with the closing mechanism.

The licensee wrote temporary modification installation work orders (TMs 1102221001 and 2012221301) to remove the upper right hand screw from the breakers. When the TMs were being worked, there were several breakers found that had upper left or right hand screw mounts broken or cracked. All breakers which had broken or cracked cover plates were cycled open and closed to verify operability. Per Vogtle Document of Engineering Judgment (DOEJ VX2010113442-C001 and C002), the breakers would maintain their seismic qualification with the upper right hand screw removed and if any of

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the other three (3) screw mounts (upper left, bottom left and bottom right) had installation issues, such as being broken or cracked, duct tape would be used to secure the cover and the breaker would maintain its seismic qualification (this is a compensatory measure for the broken cover and the breaker is to be restored to its design configuration when the broken cover is replaced with a new cover). The licensee further plans to restore the breakers to their original configuration with new shorter screws and apply a maximum torque value for the screws.

Analysis: The failure of the licensee to identify within their CAP to correct a condition adverse to quality (known failures of 1E ABB EMAX 480V circuit breakers) led to the #8 Containment Cooler being inoperable due to its breaker failing to close during the performance of a Containment Cooling System Operability and Response Time Test. The finding is considered more than minor because it had a direct impact on the breaker's ability to perform its safety related function. The finding affected the Barriers Cornerstone due to reduced containment heat removal capability with a containment cooler inoperable. In accordance with IMC 0609.04, Phase 1 – Initial Screening and Characterization of Findings, this finding was determined to be of very low safety significance (Green) because: 1) The finding does not only represent a degradation of the radiological barrier function provided for the control room, or auxiliary building, or spent fuel pool; 2) There was no degradation of the barrier function of the control room against smoke or a toxic atmosphere; 3) It does not cause an actual open pathway in the physical integrity of reactor containment; and 4) It does not involve an actual reduction in the function of hydrogen igniters in reactor containment.

The deficiency is indicative of current licensee performance and the cause of the finding was related to the Corrective Action Program component of the Problem Identification and Resolution cross-cutting area, specifically in this case, the licensee did not implement a corrective action program with a low threshold for identifying issues. The licensee did not identify the 480V ABB breaker issues completely, accurately, and in a timely manner commensurate with their safety significance (P.1(a)). Plant personnel were aware of an outstanding issue with the ABB EMAX 480V circuit breakers which affected 1E circuit breakers' ability to perform their safety functions and did not take the actions required to place the issue into their corrective action program.

Enforcement: Title 10 of the Code of Federal Regulations, Part 50, Appendix B, Criterion XVI, Corrective Action, requires, in part that "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and non-conformances are promptly identified and corrected." Contrary to this requirement, failures of ABB EMAX 480V circuit breakers previously occurred and the licensee failed to identify it within their CAP and therefore, failed to take the actions to correct it. The failure to determine the cause of the condition and take corrective actions led to a failure of the 480V circuit breaker for the Containment Cooling Unit #8 at 2:49 p.m. on October 24, 2010. The Containment Cooling Unit was restored operable at 12:36 p.m. on October 25, 2010. The licensee investigated the failure of the cooling unit's breaker to close and repaired the breaker. Corrective actions included inspection of all the 1E 480 V ABB EMAX breakers in the plant, and removing the screws which could cause the breakers to fail. The issue of failing to determine the cause of breaker failures and failing to correct the condition

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existed from approximately October 2009 to November 2010. Because this finding was of very low safety significance (Green) and the licensee has entered it into their corrective action program as CR 2010113375, this violation is being treated as a Non-Cited Violation (NCV) consistent with the NRC Enforcement Policy, it is identified as NCV 05000424,425/2010005-01, Failure to Utilize The Corrective Action Program to Identify a Condition Adverse to Quality.

### .3 Semi-Annual Trend Review

#### a. Inspection Scope

The inspectors performed a review of the licensee's Corrective Action Program and associated documents to identify trends which could indicate the existence of a more significant safety issue. The review was focused on repetitive equipment issues, but also considered the results of inspector daily CR screening and the licensee's trending efforts. The review nominally considered the six month period of April 2010 through September 2010 although some examples extended beyond those dates when the scope of the trend warranted. The inspectors also reviewed several CRs associated with operability determinations which occurred during the period. The inspectors compared and contrasted their results with the results contained in the licensee's latest Integrated Performance Assessment (IPA). Corrective actions associated with a sample of the issues identified in the licensee's trend reports were reviewed for adequacy. The inspectors also evaluated the trend reports against the requirements of the licensee's corrective action program as specified in licensee procedure NMP-GM-002, Corrective Action Program, and 10 CFR 50, Appendix B.

#### b. Findings and Observations

No findings were identified. The inspectors compared the licensee IPA with the results of the inspectors' daily screening and did not identify any discrepancies or potential trends in the data that the licensee had failed to identify.

### 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.

#### b. Findings and Observations

No findings were identified.

## .2 Depressurization of Main Firewater Header

### a. Inspection Scope

The inspectors performed a detailed review of CR 2010113782 which addressed the inadvertent depressurization of the main firewater header. The goal of the review was to verify that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized.

### b. Findings and Observations

Introduction: The resident inspectors identified an unresolved item (URI) related to the inadvertent depressurization of the main firewater header. On November 1, 2010, Plant Vogtle operations personnel inadvertently depressurized the main firewater header. For a period of 13 hours and 21 minutes, the facility lost all automatic sprinkler system capability. If there had been an automatic actuation of the sprinkler system or a demand from any of the hose stations in the facility during that time period, there would have been no water available for fire suppression.

Description: At 0339 on November 1, 2010, both of the diesel firewater pumps and the north jockey pump were placed out of service and danger tagged to permit replacement of the relief valves on the diesel-driven pumps. As part of the tagout, the remote indicator in the control room for fire header pressure was also removed from service. The licensee entered the appropriate 7-day fire protection LCO action statement at that time. When the operators secured the north jockey pump for the tagout, they incorrectly assumed that the south jockey pump was in operation.

In reality, the south jockey pump was also not operating and its hand switch was in the off position. This was in accordance with the governing procedure as the facility only needs to run one of the two jockey pumps to maintain 120 psig in the firewater header. As pressure in the firewater header began to decrease, the motor-driven firewater pump failed to start automatically at 100 psig. It was later discovered that the auto-start pressure switch had failed on demand. Two independent firewater header low pressure alarms were received in the control room, but the operators incorrectly assumed that the alarms were due to the tagout of the diesel-driven pumps.

At approximately 1700 on November 1, a third party inspector, who was inspecting the fire protection system as part of an assistance team, noticed that several of the local firewater header pressure gauges were reading very low. He brought this fact to the attention of a system operator who immediately contacted the control room. The shift supervisor immediately dispatched an operator to the south firewater station, where he reported that the firewater header was depressurized, and neither the south jockey pump nor the motor-driven firewater pump were running. The shift supervisor directed that the operator start the jockey pump, and within a few minutes system pressure was restored. Several minutes after that, the shift supervisor directed that the motor-driven firewater pump be started manually to verify operability. The motor-driven firewater pump was started and ran for several minutes while maintenance personnel tried to determine why the pump had failed to automatically start at 100 psig.

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This issue will remain under review pending coordination with regional fire protection inspectors to appropriately identify the fire protection standard, apparent root cause and determine if a performance deficiency exists. This issue is being documented as URI 05000424,425/2010005-02, Depressurization of Main Firewater Header.

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

a. Inspection Scope

The inspectors conducted a review of the licensee's activities regarding licensee dissimilar metal butt weld (DMBW) mitigation and inspection implemented in accordance with the industry self imposed mandatory requirements of Materials Reliability Program (MRP) 139, Primary System Piping Butt Weld Inspection and Evaluation Guidelines. Temporary Instruction (TI) 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds, Revision 1 was issued May 27, 2010, to support the evaluation of the licensees' implementation of MRP-139.

On December 8, 2010, the inspectors performed a review in accordance with TI 2515/172, Revision 1 as described in the Observation Section below.

b. Findings

No findings were identified.

c. Observations

The licensee has met the MRP-139 deadlines for baseline examinations of all welds scoped into the MRP-139 program. TI 2515/172, Revision 1 is considered closed. In accordance with requirements of TI 2515/172, Revision 1, the inspectors evaluated the following areas:

(1) Implementation of the MRP-139 Baseline Inspections

This portion of the TI was not inspected during the period of this inspection report, but was previously covered in NRC Inspection Report 05000424/2008003.

(2) Volumetric Examinations

This portion of the TI was not inspected during the period of this inspection report, but was previously covered in NRC Inspection Report 05000424/2008003.

(3) Weld Overlays

This portion of the TI was not inspected during the period of this inspection report, but was previously covered in NRC Inspection Report 05000424/2008003.

(4) Mechanical Stress Improvement (SI)

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

(5) Application of Weld Cladding and Inlays

There were no weld cladding nor inlay activities performed or planned by this licensee to comply with their MRP-139 commitments.

(6) Inservice Inspection Program

This portion of the TI was not inspected during the period of this inspection report, but was previously covered in NRC Inspection Report 05000424/2008003.

4OA6 Meetings, Including Exit

.1 Exit Meeting

On January 24, the resident inspectors presented the inspection results to Mr. Tom Tynan and other members of his 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:

R. Brigdon, Training Manager  
C. Buck, Chemistry Manager  
R. Dedrickson, Plant General Manager  
K. Dyar, Security Manager  
M. Hickox, Regulatory Compliance Engineer  
I. Kochery, Health Physics Manager  
L. Mansfield, Site Engineering Director  
D. McCary, Operations Manager  
T. Petrak, Engineering Support Manager  
D. Puckett, Performance Analysis Supervisor  
J. Robinson, Work Control Superintendent  
S. Swanson, Site Support Manager  
T. Tynan, Site Vice-President

#### NRC personnel:

S. Shaeffer, Chief, Region II Reactor Projects Branch 2

### **LIST OF ITEMS OPENED AND CLOSED**

#### Opened and Closed

05000424,425/2010005-01	NCV	Failure to Utilize The Corrective Action Program to Identify a Condition Adverse to Quality (Section 4OA2.2)
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#### Opened

05000424,425/2010005-02	URI	Depressurization of Main Firewater Header (Section 4OA5.2)
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#### Closed

Temporary Instruction 2515/172 (Revision 1)	TI	Reactor Coolant System Dissimilar Metal Butt Welds (Section 4OA5.3)
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## LIST OF DOCUMENTS REVIEWED

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

#### Procedures

- 11877-1, Rev. 19, Cold Weather Checklist, Unit 1
- 11877-2, Rev. 18, Cold Weather Checklist, Unit 2
- 11901-1, Rev. 17.2, Heat Tracing System Alignment, Unit 1
- 11901-2, Rev. 12.3, Heat Tracing System Alignment, Unit 2

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

#### Procedures

- 11744-1, Rev. 14.2, Essential Chilled Water System Alignment
- 11405-2, Rev. 6.1, 125V DC 1E Electrical Distribution System Alignment
- 13405-2, Rev. 34, 125V DC 1E Electrical Distribution System
- 11011-1, Rev. 14.1, Residual Heat Removal System Alignment Unit 1
- 11115-1, Rev. 10.1, Containment Spray System Alignment
- 11315-1, Rev. 18.5, Containment Spray System

#### Drawings

- 1X4DB221, Rev. 26.0, P&I Diagram Safety Related (Essential) Chillers, Unit 1 Trains A&B, System No. 1592
- 1X4DB233, Rev. 26.0, P&I Diagram Essential Chilled Water Cooling Coils, Unit 1 Train A, System No. 1592
- 1X4DB234, Rev. 25.0, P&I Diagram Essential Chilled Water Cooling Coils, Unit 1 Train B, System No. 1592
- 2X3D-AA-G01A, Rev. 7.0, Main One Line Class 1E 125V DC and 120V Vital AC Systems
- 1X4DB122, Rev. 51, P&I Diagram Residual Heat Removal System No. 1205
- 1X4DB131, Rev. 34, P&I Diagram Containment Spray System No. 1206
- 1X4DR003, Rev. 0, Fill and Vent Diagram Containment Spray System No. 1206

#### System Health Reports

- Vogtle 125 Volt Direct Current System 1806 3<sup>rd</sup> QTR 2010

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

#### Procedures

- 92704-1, Rev. 2.2, Zone 4 – Auxiliary Building Wing Area Fire Fighting Preplan
- 92705-1, Rev. 4.2, Zone 5 – Auxiliary Building – Level D Fire Fighting Preplan
- 92709-1, Rev. 3.2, Zone 9 – Auxiliary Building – Level D RHR Train B Fire Fighting Preplan
- 92710-1, Rev. 4.2, Zone 10 – Auxiliary Building – Level D RHR Train A 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

92736-1, Rev. 5.0, Zone 36 Auxiliary Building Level A CCW Pumps Train A Fire Fighting Preplan

92737-1, Rev. 5.0, Zone 37 Auxiliary Building Level A CCW Pumps Train B Fire Fighting Preplan

**Section 1R06: Internal Flooding**

Documents

X6CXC-26, Rev.9, Flooding Analysis Auxiliary Building Level C

Drawings

AX4DJ8011, Rev. 6.0, Fire Areas Auxiliary Building Floor Plan El. 143 ft 6 in Level C

**Section 1R07: Heat Sink Performance**

Procedures

83310-C, Rev. 5.7, Emergency Diesel Generator Jacket Water Heat Exchanger Testing

Work Orders

10900999

**Section 1R12: Maintenance Effectiveness**

Engineering Documents

Enhanced ACD for CR 2010109892

System Health Report for the NSCW system 3<sup>rd</sup> Quarter 2010

Condition Reports

2010101129, 2009110742

Procedures

50028-C, Rev. 18.0, Engineering Maintenance Rule Implementation

**Section 1R15: Operability Evaluations**

Condition Reports

2010112603, 2010113222, 2010113274, 2010109700, 2010114558, 2010113375, 2010113245

Work Orders

1081982105 Install embed plates on roof of NSCW tower B

**Section 1R18: Plant Modifications**

Condition Reports

2010114558, 2010113375, 2010113944

Work Orders

1102221001, 2012221301

Other

DCP 1081982101, Rev. 5.0, Unit 1 Train A and B NSCW Fans Electrical Restoration

TM 1102221001, Unit 1 EMAX breaker top right hand screw removal

TM 2012221301, Unit 2 EMAX breaker top right hand screw removal

DOEJ VX2010113442-C001, Unit 1 EMAX breaker screw removal seismic evaluation  
 DOEJ VX2010113442-C002, Unit 2 EMAX breaker screw removal seismic evaluation

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

#### Procedures

14951-C, Rev. 28, Fire Suppression System Operability Tests  
 22292-1, Rev. 9.2, CREFS Linear Electro-Hydraulic Actuator 1TV12124 and 1TV12125  
 Calibration  
 14809B-1, Train B ESF Chilled Water Pump In-Service Test  
 14825-1, Rev. 90.1, Quarterly Inservice Valve Test  
 22412-C, Rev. 10.1, Replacement of Feedback Units on Main Feed Regulating Valves  
 22287-C, Rev. 8, Diagnostics Data Retrieval for Digital Valve Controllers using Valvelink  
 Software  
 83600-2, Rev. 1.0, MFRV Potentiometer Test

#### Other

Unit 1 operator logs for 11/27/10  
 1PV3000 outage fragnet

### **Section 1R22: Surveillance Testing**

#### Procedures

14980A-2, Rev 22.3, Diesel Generator 2A Operability Test  
 14805A-1, Rev. 3, Train A Residual Heat Removal Pump IST and Response Time Test  
 14905-1, Rev. 65.3, RCS Leakage Calculation (Inventory Balance)  
 NMP-OS-009, Version 2.0, RCS Unidentified Leakage Monitoring Program

### **Section 4OA1: Performance Indicator (PI) Verification**

#### Condition Reports

2009111111, 2009111224, 2009111412, 2009111422, 2009111938, 2009111975, 2009112488,  
 2010100009, 2010100108, 2010100301, 2010101502, 2010102537, 2010103361, 2010105994,  
 2010108510, 2010108718, 2010108838, 2010109892, 2010110593, 2010110699, 2010110732,  
 2010110930

#### Documents

MSPI Cooling Water System Unavailability Index, Unit 1, MSPI Derivation Report, October 2010  
 MSPI Cooling Water System Unreliability Index, Unit 1, MSPI Derivation Report, October 2010  
 MSPI Cooling Water System Unavailability Index, Unit 2, MSPI Derivation Report, October 2010  
 MSPI Cooling Water System Unreliability Index, Unit 2, MSPI Derivation Report, October 2010  
 MSPI Emergency AC Power System Unavailability Index, Unit 1, MSPI Derivation Report,  
 October 2010  
 MSPI Emergency AC Power System Unreliability Index, Unit 1, MSPI Derivation Report,  
 October 2010  
 MSPI Emergency AC Power System Unavailability Index, Unit 2, MSPI Derivation Report,  
 October 2010  
 MSPI Emergency AC Power System Unreliability Index, Unit 2, MSPI Derivation Report,  
 October 2010  
 PI Summary for Vogtle Unit 1 Safety System Functional Failures (SSFF) October 2010  
 PI Summary for Vogtle Unit 2 Safety System Functional Failures (SSFF) October 2010

LER 1-2009-001  
LER 2-2009-001  
LER 1-2009-002  
LER 1-2009-003  
LER 2-2010-001  
LER 2-2010-002

System Health Reports

Component Cooling Water System  
Emergency Diesel Generator Systems  
Nuclear Service Cooling Water System

**Section 4OA2: Identification and Resolution of Problems**

Procedures/Calculations/Engineering Documents

NMP-GM-002 Rev. 10.0, Corrective Action Program  
NMP-GM-013 Rev. 2.0, Integrated Performance Assessment

**Section 4OA3: Event Follow-up**

Procedures

92005-C, Rev. 29.1, Fire Response Procedure  
17103A-C, Rev. 34.1, Annunciator Response Procedures for Fire Alarm Computer  
17103B-C, Rev. 13, Annunciator Response Procedures for Fire Alarm Computer  
NMP-EP-110, Rev. 1.0, Emergency Classification Determination and Initial Action

Condition Reports

2010115719, 2009104277

Documents

VEGP Unit 2 Sequence of Events Log  
Unit 1 Operator Logs

**Section 4OA5: Other Activities**

Other Records

Security logs