

# Vogtle 1

## 3Q/2014 Plant Inspection Findings

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### Initiating Events

**Significance:**  Sep 30, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Correctly Implement a Condensate and Feedwater Systems Procedure for Startup**

Green: A self-revealing non-cited violation (NCV) of Technical Specification (TS) 5.4.1.a, "Procedures," was identified for the licensee's failure to implement system operating procedure (SOP) 13615-1, "Condensate and Feedwater Systems," Version 84. Specifically, on July 30, 2014, the licensee conducted a power increase from Mode 2 (approximately 3 percent reactor power) to Mode 1 (approximately 8 percent reactor power) with main condenser hotwell level control in "manual" versus "automatic" as directed by procedure. This resulted in a main feedwater transient and a subsequent reactor shutdown. The licensee initiated an incident response team and entered this event into their corrective action program as condition report (CR) 847734. Additional corrective actions included revising the SOP to include specific instructions for the control of main condenser hotwell level with corresponding number of operating condensate pumps.

The performance deficiency was more than minor because it was associated with the human performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Specifically, the performance deficiency was associated with a human error during implementation of SOP 13615-1, resulting in a main feedwater transient event (i.e. loss of condensate pump net positive suction head (NPSH) in the condenser hotwell resulting in lowering steam generator water levels), that subsequently upset plant stability. The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process (SDP) for Findings At-Power," issued June 19, 2012. The finding screened as Green because it did not cause a reactor trip. The inspectors determined the finding had a cross-cutting aspect of "procedure adherence" in the human performance area because the unit operator did not implement SOP 13615-1 procedure Step 4.1.1.5, which required the UO to 'verify' condenser hotwell control, 1LIC-4415, is in 'auto' maintaining normal level. [H.8] (Section 1R11)

Inspection Report# : [2014004](#) (*pdf*)

**Significance:**  Sep 30, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to Correctly Implement a Chemical and Volume Control System Procedure for Reactor Water Makeup**

Green: A self-revealing NCV of TS 5.4.1.a, "Procedures," was identified for the licensee's failure to implement SOP 13009-1, "CVCS Reactor Makeup Control System," Version 50.1. Specifically, on July 9, 2014, the licensee conducted a blended makeup to the volume control tank (VCT) at a boric acid concentration lower than what the procedure required, which resulted in an inadvertent boron dilution of the reactor coolant system (RCS), and caused a subsequent power excursion. Upon recognition, the unit operator took immediate actions to reduce power to an acceptable level. The licensee entered this issue into their corrective action program as 837899.

The performance deficiency was more than minor because it was associated with the human performance attribute of the initiating events cornerstone and adversely affected the cornerstone objective to limit the likelihood of events that upset plant stability and challenge critical safety functions during power operations. Specifically, the performance deficiency was associated with a human error during implementation of SOP 13009-1, resulting in a reactivity event (i.e. inadvertent boron dilution), that subsequently upset plant stability. The inspectors evaluated the finding using IMC 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” issued June 19, 2012. The finding screened as Green because it did not cause a reactor trip. The inspectors determined the finding had a cross-cutting aspect of “avoid complacency” in the human performance area because the reactor operator did not implement error reduction tools, such as ‘STAR’ (Stop, Think, Act, Review), as self-check to ensure that work activities were performed safely. [H.12]

Inspection Report# : [2014004](#) (*pdf*)

**Significance:**  Jun 30, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

**Inadequate Maintenance Procedure Results in a Failed MSIV and a Manual Reactor Trip**

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 maintenance procedure used for main steam isolation valve (MSIV) maintenance. Specifically, maintenance procedure 26854-C, “Main Steam Isolation Valve Actuator Maintenance,” used to perform maintenance on Rockwell MSIV(s), did not provide adequate instructions for installing the lower manifold/cylinder O-ring during reassembly. This resulted in a ‘pinched’ O-ring on 1HV3006B, a subsequent failure of the O-ring causing the MSIV to fail closed, and a manual reactor trip. The licensee conducted a root cause investigation and entered the event into their corrective action program (condition report (CR) 800018). The licensee replaced the O-ring, performed an extent of condition evaluation for all other MSIVs, and revised the maintenance procedure to include specific instructions for the installation of the lower manifold/cylinder O-ring.

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 an adequate procedure with adequate instructions for ensuring proper O-ring installation resulted in the failure of the Unit 1 loop 1 outboard MSIV hydraulic actuator causing the loop 1 MSIV to fail closed and a subsequent manual reactor trip due to lowering steam generator water level. 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). The inspectors determined the finding had a cross-cutting aspect of “resources” in the human performance area, because the maintenance procedure used to install manifold/cylinder O-ring did not provide adequate instructions for the proper installation of the O-ring. [H.1] (Section 1R12)

Inspection Report# : [2014003](#) (*pdf*)

## Mitigating Systems

**Significance:**  Dec 31, 2013

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Failure to meet the conditions of TS LCO 3.8.4**

A Green, self-revealing non-cited violation (NCV) of plant Technical Specification (TS) 3.8.4, “DC Sources - Operating,” was identified for failure to meet the conditions of TS limiting condition for operation (LCO) 3.8.4. Specifically, placing the 1AD1CA battery charger out of service during performance of the 18 month load test surveillance, concurrent with the failure of the 1AD1CB battery charger, caused the 1A train chargers to be unable to fulfill their specified safety function. As a result, the 1AD1 safety-related 1E 125 VDC source was inoperable. The 1AD1CB battery charger was repaired, functionally tested, and placed back in service. This violation was entered into the licensee’s corrective action program as condition report (CR) 735160.

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, removing the 1AD1CA battery charger from service to conduct a 18 month load test while the 1AD1CB battery charger was not capable of performing its specified safety function resulted in the loss of a single train for greater than its TS allowed outage time. The inspector evaluated the finding in accordance with IMC 0609 Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” dated June 19, 2012. Since the inspectors answered “Yes” to the question A.3 of the Mitigating Systems Screening Questions, “Does the finding represent an actual loss of function of at least a single Train for greater than its TS allowed outage time,” a detailed risk evaluation was required. A detailed risk evaluation was performed by resident inspectors and reviewed by a regional senior reactor analyst in accordance IMC 0609 Appendix A guidance using the NRC Vogtle Standardized Plant Analysis Risk (SPAR) model and the NRC Sapphire 8 risk analysis code. An SDP Module Condition Analysis was run with the Unit 1 A train battery chargers, 1AD1CA and 1AD1CB failed with no recovery allowed for a 14 hour exposure period. The dominant sequence was a transient consisting of a reactor trip coincident with the common cause failure of auxiliary feed pumps (AFW) to run and the inability of an operator to restore main feedwater (MFW). The detailed risk evaluation determined that the risk due to the performance deficiency was an increase in core damage frequency (?CDF) of  $<1E-7$ /year, a GREEN finding of very low safety significance. Because the increase in ? CDF was  $<1E-7$ /year no external events analysis was required. The risk was mitigated by the availability of alternate trains of components and the short exposure period. The detailed risk evaluation was reviewed by a regional senior reactor analyst. The inspectors determined that the cause of this finding was related to the corrective action program (CAP) component of the problem identification and resolution (PI&R) cross-cutting area due to less-than-adequate problem evaluation techniques. Specifically, licensee failed to adequately investigate why the wires were rolled during initial functional testing. [P.1(c)] (Section 1R19)

Inspection Report# : [2013005](#) (*pdf*)

## **Barrier Integrity**

**Significance:**  Sep 30, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

#### **Inoperability of Unit 1 Emergency Containment Coolers due to Incorrect Tagout**

Green: A self-revealing NCV of TS 5.4.1.a, “Procedures,” was identified for the licensee’s failure to specify and verify the correct unit designation in clearance and tagout instructions for removing the Unit 2 nuclear service cooling water (NSCW) system “B” train from service, as required by Administrative Procedure NMP-AD-003, “Equipment Clearance and Tagging,” Ver. 17.4. As a result, on September 23, 2014, operators isolated the NSCW supply valve to the “B” train containment coolers on the wrong unit (i.e. Unit 1), rendering it inoperable. Following closure of the valve, operators in the Unit 1 control room received containment coolers low flow alarms and took actions to

reposition the valve and restored NSCW flow. The licensee entered this issue into their corrective action program as CR 870005.

The performance deficiency was more than minor because it was associated with the SSC and barrier performance attribute of the barrier integrity cornerstone and adversely affected the cornerstone objective to provide reasonable assurance that the containment barrier to protects the public from radionuclide releases caused by accidents or events. Specifically, the performance deficiency affected the availability of the “B” train of the emergency containment coolers which support the capability of the containment barrier to protect the public from radionuclide releases caused by accidents or events. The inspectors evaluated the finding using IMC 0609, Appendix A, “The Significance Determination Process (SDP) for Findings At-Power,” issued June 19, 2012. The finding screened as Green because it did not represent an actual open pathway in the physical integrity of reactor containment, containment isolation system, or heat removal components, and it did not involve a reduction in function of hydrogen igniters in the reactor containment. The inspectors determined the finding had a cross-cutting aspect of “challenge the unknown” in the human performance area because neither of the individuals that reviewed the tagout documentation stopped, after questioning appropriateness of manipulating 1HV-11689, and evaluated the situation before proceeding. [H.11] (Section 1R20)

Inspection Report# : [2014004](#) (*pdf*)

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## Emergency Preparedness

**Significance:** **W** Jun 30, 2014

Identified By: Licensee

Item Type: VIO Violation

### Calculation Error Results in Significantly Non-Conservative EAL Threshold Values

White: A finding and associated violation of 10 CFR 50.54(q)(2) was identified by the licensee for the failure to follow and maintain the effectiveness of emergency plans which use a standard emergency classification and action level scheme. Specifically, the licensee's emergency plan emergency action level (EAL) Category R – Abnormal Radiological RG1 (General Emergency) and RS1 (Site Area Emergency) specified threshold values which were sixty times too high due to a calculation error. As immediate corrective action, the licensee provided the corrected threshold values to appropriate management and decision-makers (shift managers/emergency directors). The licensee entered this issue into the corrective action program as CR 648248.

The performance deficiency was determined to be more than minor because it was associated with the emergency preparedness cornerstone attribute of procedure quality. It impacted the cornerstone objective because it was associated with inappropriate EAL and emergency plan changes and their adequacy to protect the health and safety of the public in the event of a radiological emergency. Specifically, the licensee's ability to declare a Site Area Emergency and General Emergency based on effluent radiation monitor values was degraded in that event classification using these radiation monitors would be delayed. The finding was assessed for significance in accordance with NRC Manual Chapter 0609, Appendix B, “Emergency Preparedness Significance Determination Process,” which states, “Failure to comply means that a program is noncompliant with a Regulatory requirement.” The inspector determined that the issue of concern constituted a degraded rather than lost risk-significant planning standard (RSPS). The issue of concern was similar to the example in Table 5.4.1 (Degraded RSPS) and was determined to be of low to moderate safety significance (White). The violation was determined to meet the IMC 0305 criteria for enforcement discretion as an old design issue. A cross-cutting aspect was not assigned based on the elapsed time since the performance deficiency occurred and because the inspectors determined it was not reflective of current licensee performance. (Section 4OA2)

Inspection Report# : [2014003](#) (*pdf*)

Inspection Report# : [2014008](#) (*pdf*)

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## Occupational Radiation Safety

**Significance:** G Jun 30, 2014

Identified By: Self-Revealing

Item Type: NCV NonCited Violation

### **Unauthorized entry into a High Radiation Area**

Green. A self-revealing NCV of Technical Specification (TS) 5.7.1, “High Radiation Area”, was identified for an entry into a high radiation area (HRA) without meeting the entry requirements as specified therein. Specifically, on March 17, 2014, an operator was authorized to enter an HRA on Unit 1 under conditions where dose rates were known to be changing. This allowed the operator entry into an HRA without knowledge of actual radiological conditions. He was not provided with a radiation monitoring device that continuously indicated dose rates in the area, nor was he accompanied by an individual qualified in radiation protection procedures with a radiation monitoring device providing positive control over his activities. Upon discovery of the condition, the licensee secured access to the area, performed follow-up surveys and convened a human performance review board to examine causal factors and identify corrective actions. The licensee entered this issue into the corrective action program as CR 787908.

This finding was more than minor because it was associated with the occupational radiation safety cornerstone attribute of human performance and adversely affects the cornerstone objective of ensuring adequate protection of worker health and safety from exposure to radiation from radioactive material during routine civilian nuclear reactor operation. Specifically, workers permitted entry into HRAs with inadequate knowledge of current radiological conditions could receive unintended occupational exposures. The finding was evaluated using IMC 0609, Appendix C, “Occupational Radiation Safety Significance Determination Process (SDP)”, dated August 19, 2008. The finding was not related to As Low As Reasonably Achievable (ALARA) planning, nor did it involve an overexposure or substantial potential for overexposure and the ability to assess dose was not compromised. Therefore, the finding was determined to be of very low safety significance (Green). This finding had a cross-cutting aspect of “avoid complacency” in the human performance area because health physics (HP) personnel failed to verify plant conditions through available means when an evolution was in progress that was known to increase area dose rates prior to authorizing entry into an HRA. [H.12] (Section 2RS1)

Inspection Report# : [2014003](#) (*pdf*)

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## Public Radiation Safety

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### Security

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary.

Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

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