

## North Anna 1 1Q/2013 Plant Inspection Findings

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### Initiating Events

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### Mitigating Systems

**Significance:** G Mar 31, 2013

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Failure to Ensure Opposite Unit's Service Water Pumps Were Free of Fire Damage for a Postulated Fire in Either Unit's ESWGR**

An NRC-identified non-cited violation was identified for the licensee's failure to meet the requirements of North Anna Power Station (NAPS) Renewed Operating License Conditions 2.D, and the approved Fire Protection Program for Units 1 and 2. Specifically, the licensee failed to ensure that fire damage to cables associated with the opposite unit's service water (SW) pumps, located in each unit's emergency switchgear (ESWGR) room, would not prevent operation of the unaffected unit's SW pumps as described in Section 4.4.3.5 of the NAPS Appendix R Report. Postulated fire scenarios were identified in which the SW pumps for both units could be compromised due to a single fire in either unit's ESWGR room. The licensee had previously entered this issue in the NAPS corrective action program as condition report 500152 to evaluate this SW pump control circuit vulnerability and had implemented hourly roving fire watches in each unit's ESWGR room.

Failure to perform an adequate safe shutdown (SSD) analysis as required by the NAPS FPP is a performance deficiency. This finding was determined to be more than minor because it was associated with the reactor safety mitigating systems cornerstone attribute of protection against external events (i.e. fire), and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding had the potential to affect the ability to achieve post-fire SSD in the event of a fire in either unit's ESWGR. The finding was screened in accordance with NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated June 2, 2011, Attachment 4, "Initial Characterization of Findings," dated June 19, 2012, which determined that an IMC 0609 Appendix F, "Fire Protection Significance Determination Process," dated February 28, 2005, review was required as the finding affected fire protection safe shutdown. The inspectors evaluated this finding using the guidance in IMC 0609, Appendix F.

The inspectors performed Phase 1 and Phase 2 SDP screening assessments using IMC 0609, Appendix F, Attachments 1 and 2, and were not able to screen out this issue in the SDP Phase 1 or Phase 2. A senior reactor analyst from the Region II office performed a Phase 3 SDP analysis to assess the significance of this finding. The analyst determined that this finding was of very low safety significance (i.e., Green) because the risk was mitigated by the availability of at least one SW pump and the fire growth scenarios were mitigated by the gaseous suppression system. The inspectors determined that there was no cross-cutting aspect associated with this finding because it was not reflective of current licensee performance. (Section 1R05.2)

Inspection Report# : [2013002](#) (*pdf*)

**Significance:** G Dec 14, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Emergency Lighting Not Installed as Required by 10 CFR 50 Appendix R Section III.J**

An NRC identified non-cited violation of 10 CFR 50, Appendix R, Section III.J, and the North Anna Power Station (NAPS) approved Fire Protection Program, was identified for the licensee's failure to install fixed emergency lighting units (ELUs) in all areas where local operator manual actions (OMAs) were being performed to support post-fire safe shutdown (SSD). Specifically, a fixed ELU was not installed in the Unit 1 auxiliary building in the vicinity where an OMA to close valve 1-CC-757 was specified by fire contingency action (FCA) procedures for a fire in the main control room (MCR) or the Unit 1 emergency switchgear room (ESWGR). The licensee entered this issue in the corrective action program as condition reports 499353 and 500023.

The licensee's failure to comply with the requirements of 10 CFR 50, Appendix R, Section III.J, and the NAPS approved FPP, was a performance deficiency. The finding was more than minor because it was associated with the reactor safety Mitigating Systems cornerstone attribute of protection against external factors (i.e., fire), and it negatively affected the objective of ensuring the reliability and capability of systems that respond to initiating events. Specifically, the finding had the potential to affect the feasibility of performing the OMA required for SSD in the event of a fire in either the MCR or ESGR-1. Using IMC 0609, Appendix F, Fire Protection SDP Phase 1 Qualitative Screening Approach, Step 1.3, the inspectors concluded that the finding, given its low degradation rating, was of very low safety significance (Green) because the FCA procedures required the operators performing the SSD actions to carry a portable lantern, and the operators had a high likelihood of completing the tasks using the portable lanterns. The inspectors determined that no cross cutting aspect was applicable to this performance deficiency because this finding was not indicative of current licensee performance. (Section 1R05.08)

Inspection Report# : [2012012](#) (*pdf*)

**Significance:** G Sep 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Promptly Identify and Correct a Condition Adverse to Quality Involving Inadequate Tornado Missile Protection for a Pipe Penetration in the SWP**

The inspectors identified a non-cited violation of 10CFR 50, Appendix B, Criterion XVI, "Corrective Action", for the failure to promptly identify and correct a condition adverse to quality associated with inadequate tornado missile protection for a vent line penetration into the service water pump house (SWPH). The licensee initiated condition report CR479566, "SWPH Tornado Missile Protection Vulnerability," installed a temporary missile shield, and initiated design change NA-12-00056 to implement long-term corrective action.

The inspectors reviewed the issue of concern in accordance with IMC 0612, Appendix B, "Issue Screening." The inspectors determined that the failure to identify and correct a condition adverse to quality associated with inadequate tornado missile protection for pipe penetrations into the SWPH was a performance deficiency (PD). The PD is more than minor, and therefore a finding, because it adversely affected the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and the related attribute of protection against external events. . Specifically, a tornado could potentially affect the operation of one train of the safety-related SWPH ventilation system due to inadequate tornado missile protection for pipe penetrations. The inspectors evaluated the finding using IMC 0609, Appendix A, "The Significance Determination Process for Findings At-Power," because the affected system, service water, supports long term heat removal. The inspectors determined that the finding was of very low safety significance, Green, because it did not represent an actual loss of function of one or more non-technical specification required trains of equipment designated as high safety-significant in accordance with the licensee's maintenance rule program for greater than 24

hrs. In addition, this finding involved the cross-cutting area of problem identification and resolution, the component of the corrective action program, and the aspect of, evaluation of identified problems, P.1(c), because the licensee failed to identify inadequate tornado missile protection for a pipe penetration into the SWPH during multiple extent of condition evaluations. (Section 1R01.2)

Inspection Report# : [2012004](#) (*pdf*)

**Significance:** N/A Sep 14, 2012

Identified By: NRC

Item Type: FIN Finding

### **95001 Supplemental Inspection**

The NRC staff performed this supplemental inspection in accordance with Inspection Procedure (IP) 95001, "Inspection for One or Two White Inputs in a Strategic Performance Area," to assess the licensee's evaluation associated with the Unit 2 'H' (2H) emergency diesel generator's (EDG) failure to perform its safety function on August 23, 2011. The NRC staff previously characterized this issue as having low to moderate safety significance (White), as documented in NRC IR 05000338/2012010 and 05000339/2012010.

During this supplemental inspection, the inspectors determined that the licensee performed a comprehensive evaluation of the excessive leak in the jacket coolant mechanical joint and subsequent EDG failure to run, which occurred during an automatic start following a loss of offsite power as a result of seismic event. The licensee identified the root cause of the issue to be insufficient procedural guidance in procedures 0-MCM-0701-27 and 0-MPM-0701-02. The two maintenance procedures failed to provide adequate detailed instructions on proper installation of the gasket between the exhaust belt and the coolant inlet bypass fitting. Specifically, the procedures lacked critical guidance on RTV cure time and details regarding how to tighten the adjusting fastener without impacting the gasket joint. In addition, the licensee identified three contributing causes. Corrective actions to address the root cause included updating EDG maintenance procedures to include guidance on proper bypass fitting gasket installation and appropriate RTV cure time, and updating maintenance procedures for making and verifying proper adjustments on the coolant inlet bypass fitting during installation.

Given the licensee's acceptable performance in addressing the inoperable EDG, the (White) finding associated with this issue will only be considered in assessing plant performance for a total of four quarters in accordance with the guidance of IMC 0305, "Operating Reactor Assessment Program." As a result, the NRC determined the performance of North Anna Power Station Units 1 and 2 to be in the Licensee Response Column of the Reactor Oversight Process Action Matrix in the 4th quarter of 2012. The implementation and effectiveness of the licensee's corrective actions will be reviewed during future inspections.

Inspection Report# : [2012011](#) (*pdf*)

**Significance:**  Aug 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Develop an Adequate Procedure to Test the Quench Spray and Outside Recirculation Spray Pump Discharge Check Valves**

The team identified a non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings" for the licensee's failure to develop an adequate test procedure which demonstrated that the quench spray and outside recirculation spray pumps' discharge check valves were capable of performing their design basis function. The licensee entered this issue into their corrective action program as condition report 479661.

The licensee's failure to develop an adequate test procedure which demonstrated that the quench spray and outside recirculation spray pumps' discharge check valves were capable of performing their design bases functions was a performance deficiency. This performance deficiency was more than minor because it was associated with the procedure quality attribute of the mitigating system cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems to respond to initiating events to prevent undesirable consequences. Specifically, the failure to measure the torque required to cycle the check valves and compare these with established limits could result in the failure to detect degraded valve performance and prevent it from performing as designed. In accordance with Nuclear Regulatory Commission Inspection Manual Chapter 0609.04, "Initial Screening and Characterization of Findings", the team conducted a Phase 1 Significance Determination Process screening and determined the finding to be of very low safety significance (Green) because it was not a design deficiency, did not represent the loss of a system safety function, did not result in exceeding a Technical Specification allowed outage time, and did not screen as potentially risk-significant due to a seismic, flooding, or severe weather initiating event. The team identified a cross-cutting aspect in the decision making component of the human performance area [H.1(b)]  
 Inspection Report# : [2012007](#) (*pdf*)

**Significance:** G Aug 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure To Implement Design Control Measures For The Service Water Air System**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to implement design control measures involving two examples. In the first example, the licensee failed to translate the updated final safety analyses report single failure design bases criteria into the service water (SW) air system specifications. In the second example, the licensee failed to verify the SW air system receiver capacity was adequate to support its design basis function. The licensee entered these issues into their corrective action program as condition reports 477213, 478531, 478957, and 478137.

The licensee's failure to establish design control measures to translate the updated final safety analyses report single failure design basis criteria into SW air system specifications and failure to verify or check the adequacy of the SW air receiver capacity was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Design Control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, if the screen wash system was required to mitigate the effects of a severe weather initiating event, the performance deficiency could have resulted in a common mode failure of the SW system. In accordance with NRC IMC 0609.04, "Initial Screening and Characterization of Findings," the team conducted a Phase 1 Significance Determination Process screening and determined that a Phase 3 assessment was required because the finding

screened as potentially risk-significant due to a severe weather initiating event which could plug the SW traveling screens requiring the screen wash function. A bounding Significance Determination Process Phase 3 analysis was performed by a regional senior risk analyst which determined the performance deficiency was a Green finding of very low safety significance. The finding was reviewed for cross-cutting aspects and none were identified since the performance deficiency was not indicative of current licensee performance.

Inspection Report# : [2012007](#) (pdf)

**Significance:**  Aug 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Testing of the SW Air System**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to test the Service Water (SW) air subsystem capability to perform its design bases function. Specifically, the licensee was not testing the air receiver inlet valves' (1-SW-343 and 1-SW-105), or system integrity to ensure the system's capability to maintain header pressure without crediting the non-safety related air compressors. The licensee entered this issue into their corrective action program as condition report 478568.

The licensee's failure to test the safety related SW air system's capability to maintain adequate header pressure when the SW air compressors are not available was a performance deficiency. The performance deficiency was more than minor because it was associated with the equipment performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to perform testing of the SW air system resulted in a lack of reasonable assurance of the system's capability to maintain adequate header pressure and could have resulted in a premature or complete loss of the screen wash system. If the screen wash system was required to mitigate the effects of a severe weather initiating event, the performance deficiency could have resulted in a common mode failure of the SW system. In accordance with Nuclear Regulatory Commission Inspection Manual Chapter 0609.04, "Initial Screening and Characterization of Findings," the team conducted a Phase 1 Significance Determination Process screening and determined that a Phase 3 assessment was required because the finding screened as potentially risk-significant due to a severe weather initiating event which could plug the SW travelling screens requiring the screen wash function. A bounding Significance Determination Process Phase 3 analysis was performed by a regional senior risk analyst which determined the performance deficiency was a Green finding of very low safety significance. The finding was reviewed for cross-cutting aspects and none were identified since the performance deficiency was not indicative of current licensee performance.

Inspection Report# : [2012007](#) (pdf)

**Significance:**  Aug 01, 2012

Identified By: NRC



Item Type: NCV NonCited Violation

### **Inadequate Design Control Measures for Thermal Overload Relays**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion III, "Design Control," for the licensee's failure to verify the adequacy of thermal overload relay settings for motor operated valves and continuous duty motors. The licensee entered this issue into their corrective action program as condition reports 479217, 479281, 479535, 479552, and 480755.

The licensee's failure to verify or check the adequacy of thermal overload relay settings for motor operated valves and continuous duty motors was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Design Control attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, there was reasonable doubt as to whether safety related motors would continue to operate without tripping during design basis conditions. In accordance with Nuclear Regulatory Commission Inspection Manual Chapter 0609.04, "Initial Screening and Characterization of Findings", the team conducted a Phase 1 Significance Determination Process screening and determined the finding to be of very low safety significance (Green) because it was a design deficiency confirmed not to have resulted in the loss of operability or functionality. The team identified a crosscutting aspect in the corrective action program component of the problem identification and resolution area [P.1(c)].

Inspection Report# : [2012007](#) (*pdf*)

**Significance:**  Aug 01, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

### **Inadequate Procedures and Procedure Compliance For Thermal Overload Relay Testing**

The team identified a non-cited violation of 10 CFR Part 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," involving two examples. In the first example, the licensee failed to ensure that appropriate acceptance criteria was included in procedures for testing motor control center thermal overload relays. In the second example, the licensee failed to ensure that testing was accomplished in accordance with the procedures. The licensee entered these issues into their corrective action program as condition reports 479217, 479281, 479535, 479552, and 480755.

The licensee's failure to ensure that appropriate criteria was included in procedures for testing motor control center thermal overload relays, and the failure to ensure that testing was accomplished in accordance with the procedures was a performance deficiency. The performance deficiency was determined to be more than minor because it was associated with the Procedure Quality attribute of the Mitigating Systems Cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, there was reasonable doubt as to whether safety related motors would continue to operate without tripping during design basis conditions. In accordance with Nuclear Regulatory Commission Inspection Manual Chapter 0609.04, "Initial Screening and Characterization of Findings," the team conducted a Phase 1 Significance Determination Process screening and determined the finding to be of very low safety significance (Green) because it was not a design deficiency, did not represent the loss of a system safety function, did not result in exceeding a TS allowed outage time, and did not screen as potentially risksignificant due to a seismic, flooding, or severe weather initiating event. The team identified a crosscutting aspect in the work practices component of the human performance area [H.4(b)].

Inspection Report# : [2012007](#) (*pdf*)

**Significance:**  May 04, 2012

Identified By: NRC

Item Type: FIN Finding

**Failure to Provide Required Power for the Seismic Instrumentation Annunciators**

An NRC-identified, Green, finding (FIN) was identified by the inspectors for the licensee's failure to provide continuous standby power and sufficient power for a minimum 25 minutes of system operation for seismic instruments as required by a licensee self-imposed standard documented in the licensee's Updated Final Safety Analysis Report (UFSAR) which resulted in required seismic alarms and indications not being received in the main control room. Specifically, the licensee failed to provide the required power for both a triaxial response-spectrum recorder capable of providing signals for immediate control room indication and for the control room annunciator for the seismic switch. The licensee entered this issue into their corrective action program as CR468442. Immediately following the August 23, 2011 seismic event the licensee completed a temporary modification to connect an uninterruptible power supply to the seismic monitoring panel. In addition, the licensee is executing a design change to upgrade the site seismic monitoring equipment.

The inspectors reviewed IMC 0612, Appendix B and determined that the performance deficiency was more than minor because it adversely impacted the Design Control attribute of the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The inspectors reviewed IMC0609, Attachment 4 and determined that the finding was of very low safety significance, Green, because it did not screen as potentially risk significant using the seismic screening criteria contained in Attachment 4. The cause of this finding did not involve a cross-cutting aspect as it is not indicative of current licensee performance. (Section 40A3)

Inspection Report# : [2012002](#) (*pdf*)

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## Barrier Integrity

**Significance:**  Jun 30, 2012

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to identify PWSCC in the Unit 1 B SG hot leg safe-end weld**

A self revealing non-cited violation (NCV) of the required augmented ISI examinations identified in 10 CFR 50.55a (g)(6)(ii)(F), Examination requirements for Class 1 piping and nozzle dissimilar metal butt welds, which implements ASME Code Case N-770-01, that covers alternative examination requirements and acceptance standards for Class 1 PWR Piping and Vessel Butt Welds Fabricated with Alloy 82 and 182 Filler Material was identified for the licensee's failure to identify unacceptable PWSCC indications in the Unit 1 B SG hot leg nozzle safe-end weld. These requirements require in-service examinations to be performed using qualified techniques and with qualified personnel capable to identify primary water stress corrosion cracking (PWSCC) indications. The licensee entered this issue into its corrective action program as condition report CR467649.

The inspectors determined that the failure to identify the PWSCC indications in the Unit 1 B steam generator (SG) hot leg safe-end weld was a self-revealing performance deficiency that was within the licensee's ability to foresee and correct. Using IMC 0612, the inspectors determined that this finding was of more than minor significance because the failure to identify the PWSCC could have resulted in the potential to allow degradation of the safe-end to proceed undetected. Unchecked PWSCC degradation could have resulted in more significant degradation of the safe-end weld

with subsequent degradation of the primary system pressure boundary. The finding is associated with the design control attribute of the Barrier Integrity Cornerstone and affected the cornerstone objective of providing reasonable assurance that physical design barriers protect the public from radionuclide releases caused by accidents or events. Specifically, examinations of the SG safe-end welds provide assurance that the structural boundary of the reactor coolant system remains capable of performing its intended safety function. The inspectors used IMC 0609, "Significance Determination Process," Attachment 0609.04, "Initial Characterization of Findings," and determined that the finding was of low safety significance (Green) because it did not represent an actual failure of the safe-end pressure retaining boundary. The inspectors identified a cross-cutting aspect in the Human Performance Work Practices cross cutting area, H.4 (c). Specifically, the licensee failed to conduct an adequate briefing with NDE technicians prior to the examination to ensure its successful execution. (Section 1R08)

Inspection Report# : [2012003](#) (*pdf*)

## Emergency Preparedness

**Significance:**  Sep 30, 2012

Identified By: NRC

Item Type: FIN Finding

### Challenges to Personnel Accountability Following Declared Alert

The inspectors identified a self-revealing Green finding for the licensee's failure to follow posted manual personnel accountability instructions, which resulted in delays in completing the accounting process. Specifically, the licensee failed to perform manual accountability as expected which required locating a large number of individuals reported as missing thereby causing delays in completing the personnel accounting process. The licensee's Emergency Plan Implementing Procedure (EPIP) 1.03, "Response to Alert," instructed the Station Emergency Manager to verify all personnel are accounted for in accordance with EPIP 5.03, "Personnel Accountability," which instructed Security personnel to maintain continuous protected area accountability until event termination. Accountability system card-readers normally used to establish and maintain continuous personnel accountability were unavailable, and some assembly area leaders were not familiar with instructions posted in assembly areas for manual accountability of personnel. The degraded manual personnel accounting process resulted in expending over four hours to locate a large number of individuals reported as missing. The licensee entered the issue into their corrective action program as condition report, CR-439343.

The inspectors determined that the licensee's failure to follow posted manual personnel accountability instructions was a performance deficiency. The performance deficiency was determined to be more than minor because it adversely impacted the Emergency Preparedness Cornerstone attribute of Emergency Response Organization Performance. The finding impacted the cornerstone objective because it is associated with actual event response. The finding was assessed for significance in accordance with NRC Inspection Manual Chapter (IMC) 0609, using the Phase I SDP worksheets for emergency preparedness and IMC 0609 Appendix "B" and was determined to be of very low safety significance (Green) because the finding was not associated with an emergency preparedness planning standard. The cause of this finding involved the cross-cutting area of human performance, the component of resources, and the aspect of training of personnel [H.2(b)]. (Section 4OA2.2)

Inspection Report# : [2012004](#) (*pdf*)

## Occupational Radiation Safety



## 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

Last modified : June 04, 2013