

# North Anna 1

## 1Q/2012 Plant Inspection Findings

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### Initiating Events

**Significance:** SL-IV Dec 31, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Adverse Changes to the Fire Protection Program Involving Inadequate Control of Transient Combustibles**

The inspectors identified a Severity Level IV Non-cited Violation (NCV) of the North Anna Power Station, Unit 1 and Unit 2 Renewed Facility Operating Licenses, NPF-4 and NPF-7, Condition 2.D, Fire Protection Program (FPP) leading to inadequate controls of transient combustibles. The licensee initiated condition reports CR342754, "Failed to submit request for transient fire loading in U-2 safeguards," Cr 397441, "Appendix R fire wrap in Unit 2 Containment," and CR 396368, "Appendix R fire wrap in Unit 1 Containment."

The inspectors determined that the adverse changes to the FPP involving the control of transient combustibles was a violation involving traditional enforcement because it impacted the NRC's ability to perform its regulatory function. The finding was determined to be more than minor because the relaxation of transient combustible controls described in the revisions to VPAP-2401, constituted a change which adversely affected the ability to adequately control and evaluate transient combustibles would present potential fire scenarios involving significant, non-liquid transient combustibles that would adversely affect safety-related and safe shutdown components to achieve and maintain safe shutdown in the event of a fire. This violation is characterized at Severity Level (SL) IV in Supplement I of the NRC Enforcement Policy, in that actual fire did not occur, and the potential consequences were limited given that defense in depth was maintained with the existence of auto fire detection and suppression capability and the availability of fire response teams. Although the licensee failed to meet regulatory requirements that have more than minor safety or environmental significance, the inspectors were unable to confirm the introduction of excessive transient combustibles into the plant other than the problem identified on July 27, 2009, which was determined to have very low safety significance. This lack of information was due to the licensee FPP changes that did not require a permit for evaluation and documentation. Because the issue is in the licensee's corrective action program as CR382725, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. This violation was not screened for associated cross-cutting aspects because it dealt with traditional enforcement. (Section 40A5.4)

Inspection Report# : [2011005](#) (*pdf*)

**Significance:**  Sep 30, 2011

Identified By: NRC

Item Type: FIN Finding

#### **Failure to Take Adequate Corrective Action to Preclude a Fire in the Units 1 and 2 Control Room Complex**

• Green. A self-revealing finding was identified for the failure to take adequate corrective action for degradation of annunciator card resistors in accordance with the standards as established by the licensee's corrective action program procedure which resulted in a fire in the respective annunciator cabinet located in the Units 1 and 2 control room complex. The licensee entered the problem into their corrective action program as condition report 412487.

The finding was more than minor because it could be reasonably viewed as a precursor to a significant event based on fire development leading to an evacuation of the control room. The finding was screened using phase 1 of the SDP and was determined to be a fire initiator contributor within the initiating events cornerstone and required a phase 3 fire SDP risk assessment in as it represented a fire within the main control room (MCR). A regional SRA performed an SDP phase 3 fire risk assessment for this finding in accordance with NRC Inspection Manual Chapter (IMC) 0609 Appendix F, NUREG/CR 6850 and NUREG/CR 6850 supplement 1. . The SDP phase 3 risk evaluation determined that the risk of the finding was an increase in core damage frequency of <math><1E-6</math>/year, a Green finding of very low safety significance. The inspectors determined there were no cross-cutting aspects because the performance deficiency was not representative of current licensee performance. (Section 40A5.4)

## Mitigating Systems

**Significance:** **W** Dec 31, 2011

Identified By: NRC

Item Type: VIO Violation

### **Failure to Provide Adequate Guidance for Installation of 2H EDG Jacket Water Cooling Inlet Jumper**

A self-revealing Apparent Violation of Technical Specifications 5.4.1.a was identified for the licensee's failure to establish and maintain emergency diesel generator (EDG) maintenance procedures as required by Regulatory Guide 1.33, Appendix A, Section 9, Procedures for Performing Maintenance. The licensee initiated condition report CR439091, "02-EE-EG-2H Emergency Diesel Generator manually secured," and subsequently completed root cause evaluation (RCE) 001062.

The inspectors determined that the failure to adequately establish and maintain procedure 0-MCM-0701-27 was a performance deficiency. The inspectors reviewed IMC 0609, Appendix B, and determined that the finding was more than minor because it adversely affected the procedure quality 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. Specifically the failure to establish and maintain EDG maintenance procedures led to the inability of the 2H EDG to perform its safety function. The inspectors reviewed IMC 0609, Attachment 4, and determined that since the finding represented an actual loss of safety function of a single train for greater than its Technical Specification allowed outage time, a phase 2 analysis was required. A phase 2 analysis was performed by a resident inspector and resulted in a potentially greater than green significance. Therefore, a phase 3 analysis is required to be performed by a regional SRA in accordance with the guidance of IMC 0609 Appendix A. The cause of this finding involved the cross-cutting area of problem identification and resolution, the component of operating experience, and the aspect of implementing operating experience, P.2(b), because the licensee failed to properly incorporate operating experience into station procedures. (Section 40A5.3)

Choice Letter Inspection Report 05000338, 339/2012008 (ML12082A045) associated with Greater than Finding for both units was issued on 3/21. A Regulatory Conference was scheduled for 4/20.

Final SDP letter Inspection Report 05000338, 339/2012010 with White finding and Notice of Violation for both units was issued on May 10, 2012.

Inspection Report# : [2011005](#) (pdf)

**Significance:** **G** Jun 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

### **Failure to Control Transient Fire Loads in a Safety-Related Area**

The inspectors identified a non-cited violation of the North Anna Power Station, Unit 1 Renewed Facility Operating License, NPF-4, Condition 2.D, Fire Protection, which involved a failure to comply with transient fire load procedure requirements that resulted in transient fire loads improperly located in a safety-related area, the Unit 1 motor driven auxiliary feedwater (MDAFW) room, contrary to transient fire load report requirements. The licensee entered the problem into their corrective action program as condition report 423054.

The finding was more than minor because it impacted 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 factors such as fire. This finding had a credible impact on safety because the transient fire load exceeded the limit of Class B liquid transient loads. In accordance with NRC IMC 0609, "Significant Determination Process," Appendix F, the inspectors performed a Phase 1 analysis and determined that the finding was of very low safety significance or Green because although the combustible controls program element was of high degradation due to oily rags in an unapproved container, the Unit 1 MDAFW room had a low fire frequency of 1E-6 and the duration of the violation was less than 3 days, which resulted in a

screening check frequency of 1E-8 which was less than the screening criteria of 1E-6. The cause of this finding involved the cross-cutting area of human performance, the component of work practices, and the aspect of procedural compliance, H.4(b), because the licensee failed to follow procedural requirements for the control of transient fire loads in a safety-related area. (Section 1R05.1)

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Jun 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Maintain Fire Doors in Accordance with the Fire Protection Program**

The inspectors identified a non-cited violation of the North Anna Power Station, Units 1 & 2 Renewed Facility Operating Licenses, NPF-4 & 7, Condition 2.D, Fire Protection, which involved a failure to comply with the requirements for maintaining the operability of fire door, 02-BLD-STR-S71-18, "2H Emergency Diesel Gen Room Door SB Elev 271." The inspectors also identified an additional example of this violation which involved fire door, 01-BLD-STR-S07-3, "Unit 1/Unit 2 Switchgear Door Service Building EL 307." The licensee entered the problems into their corrective action program as condition reports 417750 and 418705 for 02-BLD-STR-S71-18, and 430445, 01-BLD-STR-S07-3.

The inspectors identified a performance deficiency (PD) for the failure to maintain the fire doors operable per the requirements of the Fire Protection Program and consequently failing to declare the fire doors inoperable with appropriate compensatory measures. The PD was more than minor because it impacted 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 factors such as fire. This finding had a credible impact on safety because the inoperability of the fire doors would have an adverse impact on the functionality of the gaseous suppression systems. In accordance with NRC IMC 0609, "Significant Determination Process," Appendix F, the inspectors performed a Phase 1 analysis and determined the finding resulted in very low significance, Green, because although the fire confinement program element was of high degradation, the fire frequencies related to the rooms were 1E-6 and the duration of the component inoperability was less than three days, which resulted in screening check frequency of 1E-8 which was less than the screening criteria of 1E-6. The cause of this finding involved the cross-cutting area of human performance, the component of resources, and the aspect of adequate equipment, H.2(d), because the licensee failed to ensure that fire door closures were adequate for the protection of equipment important to safety. (Section 1R05.2)

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Jun 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

**Failure to Comply with Technical Specifications for Alignment of the Refueling Water Storage Tank to the Non-Seismic Refueling Purification System**

The inspectors identified a non-cited violation of Technical Specification (TS) 3.5.4, "Refueling Water Storage Tank (RWST)," for the failure to comply with the Limiting Conditions for Operation (LCO), while the Units 1 and 2 RWSTs were aligned to the non-seismic Refueling Purification (RP) system for purification during Mode 1, causing the RWSTs to be inoperable. Specifically, when the RP system was aligned to the RWST, the licensee did not declare the RWST inoperable. The licensee entered the problem into their corrective action program as condition report 397144 and suspended the use of procedures, 1-OP-16.4, "Purification Operations of Unit 1 Storage Tank," and 2-OP-16.4, "Purification Operations of Unit 2 Storage Tank," for purification of the RWST in Modes 1-4 until further review has been completed. The licensee had originally modified their procedures to allow this activity in 1996.

The failure to comply with the actions of TS LCO 3.5.4 while the Units 1 and 2 RWSTs were aligned to the non-seismic RP system for purification on September 4, 2010, and January 7, 2010, respectively, resulting in the inoperability of the RWSTs was a performance deficiency (PD). The PD was more than minor because it affected the design control attribute of the mitigating system cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences. In accordance with NRC

IMC 0609, "Significant Determination Process," the inspectors performed a Phase 1 analysis and determined that this finding was within the mitigating systems cornerstone and was potentially risk significant due to a seismic external event and therefore required a Phase 3 SDP analysis. A phase 3 risk assessment was performed by a regional SRA using the NRC SPAR model. A bounding one year exposure period was utilized. The non-seismic RP piping was assumed to fail at the same seismic input as that assumed for a loss of offsite power. The dominant sequence was a seismically induced non-recoverable loss of offsite power with a failure of the AFW system due to loss of the emergency condensate storage tank and failure of feed and bleed due to loss of the RWST leading to core damage. The risk was mitigated by the low probability of a seismic event and the use of a dedicated operator for isolation of the non-seismic piping. The analysis determined that the risk increase of the performance deficiency was an increase in core damage frequency less than 1E-6/year yielding a GREEN finding of very low safety significance. The finding had no cross-cutting aspects due to its legacy nature. (Section 1R18,2)

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Jun 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Cause Evaluation of Scaffolding Affecting Unit 1 'A' Charging Pump**

The inspectors identified a non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the failure to identify a condition adverse to quality involving noncompliance with a licensee procedure during an apparent cause evaluation (ACE) for scaffolding adversely affecting the Unit 1 'A' charging pump. The licensee entered this problem into their corrective action program as condition report 416488.

The inspectors determined that the failure to identify a condition adverse to quality involving noncompliance with a licensee procedure during an ACE was a performance deficiency (PD). The PD was more than minor because (1) if left uncorrected it would have the potential to result in a more significant safety event, and (2) it impacted the mitigating systems cornerstone objective to ensure the reliability and capability of systems which respond to initiating events and the related attribute of equipment performance because the reliability of the affected safety related components would be adversely impacted during a seismic event. In accordance with NRC Inspection Manual Chapter 0609, "Significant Determination Process," the inspectors performed a Phase 1 analysis and determined the finding was of very low safety significance or Green because the affected equipment would not result in a total loss of a safety function during a seismic event. This finding involved the cross-cutting area of human performance, the component of the resources, and the aspect of procedure use and adherence, H.4(b), because the licensee failed to adequately follow procedures for the identification of seismic deficiencies involving scaffolding. (Section 40A2.3)

Inspection Report# : [2011003](#) (pdf)

**Significance:**  Jun 30, 2011

Identified By: NRC

Item Type: NCV NonCited Violation

#### **Inadequate Qualification Testing of Fire Barrier Penetration Seals**

The inspectors identified a non-cited violation of North Anna Power Station, Units 1 & 2 Renewed Facility Operating Licenses, NPF-4 & 7, Condition 2.D, Fire Protection, for failure to maintain in effect all provisions of their NRC-approved fire protection program. Specifically, the licensee failed to have adequate qualification testing results for installed aluminum conduits that penetrate fire barriers separating fire areas containing equipment required for safe shutdown. The requirement to have adequate qualification testing for such fire barrier penetrations is contained in Appendix A to Branch Technical Position APCS 9.5-1, which is part of the licensee's NRC-approved fire protection program. As part of the corrective actions, the licensee performed testing to determine the qualification of aluminum conduit penetrations, and performed modifications, as appropriate, to restore compliance.

The finding is more than minor because it is associated with the reactor safety Mitigating Systems cornerstone attribute of protection against external factors (i.e., fire) and it affects the cornerstone objective of ensuring the reliability and capability of systems that respond to initiating events. Specifically, not having qualification testing results for aluminum conduits that penetrate fire rated barriers adversely affected the fire confinement capability

defense-in-depth element, because subsequent testing revealed that some conduits did not meet the penetration seal criteria established in BTP APCS 9.5-1. In accordance with NRC IMC 0609, "Significant Determination Process," Appendix F, the inspectors determined that the performance deficiency represented a finding of very low safety significance (Green). Specifically, the fire barriers in question either provided a 2-hour or greater fire endurance rating, or the barriers separated rooms that did not contain equipment credited for fire safe shutdown of the plant. Inspectors determined that no cross cutting aspect was applicable to this performance deficiency because this finding was not indicative of current licensee performance. (Section 4OA5.4)

Inspection Report# : [2011003](#) (*pdf*)

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## Barrier Integrity

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## Emergency Preparedness

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## Occupational Radiation Safety

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## Public Radiation Safety

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## Physical Protection

Although the NRC is actively overseeing the Security cornerstone, the Commission has decided that certain findings pertaining to security cornerstone will not be publicly available to ensure that potentially useful information is not provided to a possible adversary. Therefore, the [cover letters](#) to security inspection reports may be viewed.

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## Miscellaneous

**Significance:** N/A Nov 29, 2011

Identified By: NRC

Item Type: FIN Finding

### Startup Monitoring Inspection

The team concluded that your processes ensured that the plant licensing bases had not been degraded and the structures, systems, and components (SSC) of the North Anna Power Station could perform their safety functions following the earthquake event on August 23, 2011, and would support a return to safe power operation without undue risk to the health and safety of the public. The inspection team completed this verification through observation of control room activities and direct inspection of startup activities; including, mode changes, heatup, reactor startup, and power ascension from Mode 5 to rated thermal power. It also included direct inspection of surveillance testing, operability determinations, maintenance risk assessment, emergent work control, modifications, post-maintenance testing, review of corrective action program documents, partial system walkdowns of selected SSC's, including secondary systems, and other activities as applicable.

Inspection Report# : [2011013](#) (*pdf*)

**Significance:** N/A Nov 07, 2011

Identified By: NRC

Item Type: FIN Finding

### **Restart Readiness Inspection**

The team concluded that your staff adequately inspected plant structures, systems and components (SSCs) to ensure that any damage from the August 23, 2011, seismic event was identified and, if found, would have been properly evaluated and corrected prior to initiating restart activities. As a result of the inspections performed by Dominion, industry and NRC personnel, no significant seismically-induced damage was identified which could affect the operability or functionality of plant SSCs. However, during the inspection, some examples of minor problems were identified, including: issues that had not been entered into the corrective action or work control programs as required; opportunities to enhance the root cause evaluations conducted following the seismic event; committed actions that were not being processed in accordance with program requirements; and areas which had not been inspected or evaluated before the Restart Readiness Inspection Team engaged your staff. One non-seismic issue associated with a penetration that was found to not be sealed as required is discussed in this report and will be dispositioned in the resident inspector's quarterly inspection report following further review by NRC staff.

Inspection Report# : [2011012](#) (*pdf*)

**Significance: N/A** Oct 03, 2011

Identified By: NRC

Item Type: FIN Finding

### **AIT**

An Augmented Inspection Team (AIT) was dispatched to the site on August 30, 2011, to assess the facts and circumstances surrounding an earthquake event, dual unit trip, and loss of offsite power that occurred on August 23, 2011. The AIT was established in accordance with NRC Management Directive 8.3, "NRC Incident Investigation Program," and implemented using Inspection Procedure 93800, "Augmented Inspection Team."

The inspection was conducted by a team of inspectors from the NRC's Region II office, senior resident inspectors from North Anna and Construction Projects Branch 4, one Seismologist from the NRC Office of Nuclear Reactor Regulation (NRR), and two Structural Engineers from the NRC Office of New Reactors (NRO.) The team identified 7 issues that will require additional NRC inspection. These issues are tracked as unresolved items in this report

Inspection Report# : [2011011](#) (*pdf*)

**Significance: N/A** Apr 29, 2011

Identified By: NRC

Item Type: FIN Finding

### **PI&R inspection results**

The inspectors concluded that, in general, problems were properly identified, evaluated, prioritized, and corrected. The licensee was effective at identifying problems and entering them into the corrective action program (CAP) for resolution, as evidenced by the relatively few number of deficiencies identified by external organizations (including the NRC) that had not been previously identified by the licensee, during the review period. Generally, prioritization and evaluation of issues were adequate, formal root cause evaluations for significant problems were adequate, and corrective actions specified for problems were acceptable. Overall, corrective actions developed and implemented for issues were generally effective and implemented in a timely manner. However, the inspectors did identify minor performance deficiencies associated with the CAP in the areas of problem identification, prioritization and evaluation of identified problems, and effectiveness of corrective actions.

The inspectors determined that overall; audits and self-assessments were adequate in identifying deficiencies and areas for improvement in the CAP, and appropriate corrective actions were developed to address the issues identified. However, the inspectors identified a minor performance deficiency associated with the self-assessment program. Operating experience usage was found to be generally acceptable and integrated into the licensee's processes for performing and managing work, and plant operations. However, the inspectors identified minor performance deficiencies associated with the licensee's use of operating experience.

Based on discussions and interviews conducted with plant employees from various departments, the inspectors determined that personnel at the site felt free to raise safety concerns to management and use the CAP to resolve those concerns.

Inspection Report# : [2011008](#) (*pdf*)

Last modified : May 29, 2012