North Anna 2
3Q/2011 Plant Inspection Findings

Initiating Events

Significance: G 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 <1E-6/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 4OA5.4)

Inspection Report# : 2011004 *(pdf)*

Significance: G Mar 31, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Determine the Cause and Take Corrective Action to Preclude Repetition for Lightning Induced Reactor Trips
A non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the inspectors for the licensee's failure to determine the cause of a significant condition adverse to quality (SCAQ) involving an automatic reactor trip following a lightning strike on the Unit 2 containment building. This resulted in the Unit 2 automatic reactor trip on June 16, 2010, because of the insufficient corrective action to preclude repetition. The Licensee entered this issue into the Corrective Action Program as CR 384967.

The inspectors determined that the failure to determine the cause of a SCAQ was a performance deficiency (PD). The inspectors reviewed IMC 0612, Appendix B and determined the PD was more than minor because, if left uncorrected, it has the potential to lead to a more significant safety concern in that failing to identify the cause of SCAQs and thus failing to take corrective action to preclude repetition could result in additional initiating events or impacts on mitigating systems. In addition, the inspectors determined that it adversely impacted the Initiating Events cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations, specifically the attribute of Protection Against External Factors in that the removal of the Overtemperature Delta T lag function removed protection from lightning strikes on the reactor protection system. The inspectors reviewed IMC 0609, Attachment 4 and determined that the finding was of very low safety significance, or Green, because it did not contribute to both the likelihood of a reactor trip and the likelihood that mitigation equipment or functions will not be available. The cause of this finding involved the cross-cutting area of problem identification and resolution, the component of operating experience, and the aspect of evaluation of identified problems, P.1(c) because the licensee failed to thoroughly evaluate the cause of the 2005 reactor trip and conduct effectiveness reviews of corrective actions to ensure the problems are resolved.

Inspection Report# : 2011002 *(pdf)*

Significance: G Dec 31, 2010
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Maintain PM Procedures for Circuit Breakers Current with Industry Information and OE
A Green, self-revealing finding was identified for the failure to maintain a preventative maintenance (PM) procedure for circuit breakers current with industry information and operating experience (OE), as required by procedure, DNAP-2001, "Equipment Reliability Process," Revision 0. The licensee entered this problem into their corrective action program as condition report 331819.

The failure to maintain an adequate preventive maintenance (PM) procedure led to an age related failure of a motor starter (main contactor) causing a fire in safetyrelated breaker cubicle J1 of motor control center (MCC) 1J1-2S which supplied power to the D control rod drive mechanism cooling fan, 01-HV-F-37D. The failure to establish an adequate PM task for testing the main contactor of a circuit breaker to ensure that it is in good operating condition and will operate reliably until the next scheduled maintenance was determined to be a performance deficiency. Significance Determination Process (SDP) phase 1 screening of the finding was performed and the finding was determined to increase the likelihood of a fire external event and required a phase 3 SDP evaluation. A phase 3 SDP analysis was performed by a regional SRA in accordance with Inspection Manual Chapter 0609 Appendix F, NUREG /CR -6850 as amended by NUREG/CR -6850 supplement 1, with the NRC North Anna SPAR risk model used to determine the conditional core damage probability (CCDP) for the fire scenarios. The dominant sequence was a fire in MCC1J1-2S damaging MSIV cables resulting in a reactor trip transient with failure of high pressure recirculation and residual heat removal due to fire effects leading to core damage. The evaluation concluded that the core damage frequency (CDF) increase of the potential fire scenarios was characterized as of very low safety significance (Green). This finding involved the cross-cutting area of problem identification and resolution, the component of OE, and the aspect of implementation and institutionalization of OE through changes to station processes and procedures (P.2(b)), because the licensee failed to incorporate existing industry OE to ensure procedural guidance was adequate for testing of the main contactor.
Inspection Report# : 2010005 *(pdf)*

Mitigating Systems

Significance: G 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: G 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 APCSB 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 APCSB 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)*

Significance: G Mar 31, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Installation of Unit 2 Low Head Safety Injection Piping and Related Supports
A non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified by the NRC for the failure to accomplish the installation of Unit 2 low head safety injection (LHSI) piping and supports in accordance with prescribed drawings which resulted in no contact between piping and two different pipe supports and caused an operable but degraded and nonconforming condition. The licensee entered this problem into their corrective action program as condition reports 413315 and 418989.

A performance deficiency was identified by the NRC for the failure to adequately install Unit 2 LHSI pipe supports in accordance with prescribed drawings. This PD had a credible impact on safety due to the loss of design basis margin resulting in a reasonable doubt regarding reliability and capability during a seismic event. The PD was more than minor because 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 support configurations had been impacted by the reduction in design margin. In accordance with NRC IMC 0609, "Significant Determination Process," the inspectors performed a Phase 1 analysis and determined the finding was of very low safety significance or Green due to a design deficiency confirmed not to result in a loss of operability or functionality. The finding had no cross-cutting aspects due to its legacy nature.

Inspection Report# : 2011002 *(pdf)*

Significance: G Mar 31, 2011
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Post Maintenance Test Program Instructions for Safety-Related Instrument and Control Preventative Maintenance
A Green, non-cited violation of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the NRC for failure to adequately prescribe the correct program instructions to ensure safety-related instrument and control (I&C) preventative maintenance (PMs) received the appropriate post maintenance testing (PMT). The licensee entered this problem into their corrective action program as condition report 417730.

A performance deficiency was identified by the NRC for the failure to adequately prescribe programmatic PMT instructions to ensure safety-related I&C PMs had proper PMT. The inspectors reviewed Inspection Manual Chapter (IMC) 0612, Appendix B, and determined the finding was more than minor because if left uncorrected it would have the potential to result in a more significant safety event. In accordance with IMC 0609, “Significant Determination Process,” the inspectors performed a Phase 1 analysis and determined that the finding was of very low significance because the finding was not a design deficiency, did not represent a loss of safety function and did not screen as potentially risk significant due to a seismic, flooding or severe weather initiating event. This finding involved the cross-cutting area of human performance, the component of the resources, and the aspect of complete documentation, H.2(c), because the licensee failed to adequately prescribe programmatic PMT instructions to ensure safety-related I&C PMs had proper PMT.
Inspection Report# : 2011002 *(pdf)*

Significance: G Dec 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Corrective Action for Fatigued Fuse Clips in Safety-Related Breakers
A Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," was identified by the NRC for failure to promptly identify and correct a condition adverse to quality regarding fatigued fuse clips associated with safety-related breakers. The licensee entered this problem into their corrective action program as condition report 400128.

The inspectors determined that the failure to promptly initiate corrective actions for fatigued fuse clips was a performance deficiency (PD) which resulted in two safetyrelated breaker failures. The inspectors reviewed IMC 0612, Appendix B, and determined 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 design control for the initial structure, system, component design. In accordance with NRC Inspection Manual Chapter (IMC) 0609, “Significance Determination Process,” the inspectors performed a Phase 1 analysis and determined that the finding was of very low significance because the finding was not a design deficiency, did not represent a loss of safety function and did not screen as potentially risk significant due to a seismic, flooding or severe weather initiating event. This finding involved the cross-cutting area of problem identification and resolution, the component of the corrective action program, and the aspect of thorough evaluation of problems such that resolutions address extent of condition, P.1(c), because the licensee failed to initiate adequate corrective actions to address extent of condition for fatigued fuse clips.
Inspection Report# : 2010005 *(pdf)*

Significance: G Dec 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Design Control Measures for Field Changes Affecting Station Battery Cables
The inspectors identified a non-cited violation of 10 CFR 50, Appendix B,

Criterion III, “Design Control,” for the failure to ensure that design control measures for field changes impacting the support of station battery cables were commensurate with those applied to the original design requirements. The licensee entered this problem into their corrective action program as condition report 358461.
The inspectors determined that the failure to adhere to the requirements of Criterion III for field changes involving the support of station battery cables was a performance deficiency (PD). This PD had a credible impact on safety due to an increase in battery post loading not analyzed by the vendor for a seismic event impacting the unsupported cables. 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 design controls due to changes made to battery cable supports which created a condition adverse to quality. In accordance with NRC Inspection Manual Chapter (IMC) 0609, “Significant Determination Process,” the inspectors performed a Phase 1 analysis and determined that the finding was of very low significance (Green) because the design deficiency did not result in the loss of functionality. The finding had no cross-cutting aspects because it is not indicative of current licensee performance.
Inspection Report# : 2010005 *(pdf)*

Barrier Integrity

Emergency Preparedness

Occupational Radiation Safety

Public Radiation Safety

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.

Miscellaneous

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)*

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