North Anna 2
4Q/2009 Plant Inspection Findings

Initiating Events

Significance: G Oct 15, 2009
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Determine Cause and Related Corrective Action Results in Loss of a Required Offsite Power Supply
A self-revealing finding was identified for the licensee's failure to comply with the standards established in their corrective action program (CAP) to determine the correct cause and take corrective action to preclude repetition (CAPR) which resulted in the loss of the required offsite circuit for the '2H' emergency bus and the consequent auto-start of the '2H' emergency diesel generator (EDG). The licensee entered this problem into their CAP as condition report 332636.

The inspectors determined the finding was more than minor because it 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, and the related attribute of equipment performance relative to offsite power reliability. The inspectors evaluated the finding using the significance determination process and determined that the finding was of very low significance or Green because the finding did not contribute to both the likelihood of a reactor trip and the likelihood of unavailability of mitigation equipment functions. 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 determine the appropriate root cause and commensurate corrective actions.
Inspection Report# : 2009004 *(pdf)*

Significance: G Mar 31, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Accomplish Procedures Renders Both Trains of High Head Safety Injection System Inoperable
A Green NCV of 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures, and Drawings," was identified by the NRC for multiple examples of a failure to accomplish a procedure for activities affecting quality which simultaneously rendered both trains of high head safety injection (HHSI) inoperable. The licensee entered this issue into their corrective action program (CAP) as CR114725.

This finding had a credible impact on safety because both trains of the HHSI were rendered inoperable, and manual operator action was required to place at least one train in service. The inspectors determined 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 human performance which involved the failure to adequately accomplish procedures. The inspectors evaluated the finding using the SDP and determined that a Phase III evaluation was required. A regional Senior Reactor Analyst performed a Phase 3 evaluation under the SDP. The performance deficiency was determined to be of very low safety significance (Green). The evaluation was accomplished using the NRC's probabilistic risk assessment computer model of the plant with Emergency Diesel Generator 1J and the Boron Injection Tank's inlet motor operated valve 1867A set to always fail. The model was quantified, assuming the configuration lasted for nine hours. The dominant accident sequences were Losses of Offsite Power as the initiating event followed by the failure through various mechanisms of the 1H emergency diesel generator and the Alternate Alternating Current Diesel Generator. Also, neither the failed Emergency Diesel Generators nor offsite power was recovered prior to core damage. The key assumptions were that Unit 2 was constructed similar enough that the Unit 1 probabilistic risk assessment model could be used and the duration of the configuration was nine hours.

This finding involved the cross-cutting area of human performance, the component of decision-making and the aspect of safety-significant decisions using a systematic process, especially when faced with uncertain or unexpected plant conditions, to ensure safety is maintained, because the personnel performing quality related activities involving 2-SI-MOV-2867A failed to make adequate decisions affecting nuclear safety while performing procedures (H.1.a).
Inspection Report# : 2009002 *(pdf)*

Mitigating Systems

Significance: G Nov 12, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Adequately Address the Potential for CO2 Over-pressurization within the Unit 2 Cable Vault & Tunnel
The inspectors identified a Green non-cited violation (NCV) of North Anna Nuclear Station Operating License Condition 2. (D), "Fire Protection," in that the licensee failed to adequately address the potential for carbon dioxide (CO2) over-pressurization within Fire Area (FA) 3-2, the Unit 2 Cable Vault & Tunnel (CV&T). The team determined that adequate CO2 venting did not exist, resulting in the potential failure of the CO2 gas boundary. This condition had the effect of allowing gas migration from the CV&T (Zone 2-2) into the CV&T electrical penetration room (Zone 2-4) due to the failure of the door between the two areas to remain closed. The licensee entered and tracked this issue in the corrective action program via Condition Report (CR) 019539, and Apparent Cause Evaluation, ACE000693.

This finding is a performance deficiency because the licensee did not consider the potential for CO2 over-pressurization within the Unit 2 CV&T (FA 3-2) according to the applicable industry code of record for the facility. The finding is more than minor because the CO2 system is required to provide primary suppression coverage for the Cable/Tunnel area of Fire Area 3-2, and the finding is associated with the reactor safety, mitigating systems, cornerstone attribute of protection against external factors, (i.e. fire), and it substantially affects the objective of ensuring reliability and capability of systems that respond to initiating events. The inspectors assessed the finding using Inspection Manual Chapter (IMC) 0609, Appendix F, "Fire Protection Significance Determination Process." The finding was assigned a low degradation rating since the issue screened as very low in the SDP Phase 2 evaluation. This was the case because the only creditable ignition sources in the CV&T are transients which are administratively controlled. Also, the safe shutdown analysis (SSD) already assumes that all cables in the CV&T are damaged; therefore a gas boundary failure within the fire area would affect the fire suppression component of defense-in-depth only and not the capability to safely shutdown. In addition, the CO2 system was backed up by a manual sprinkler system and a manual deluge system.

The inspectors reviewed guidance contained in IMC 0305 to determine if any cross-cutting aspects existed. The inspectors concluded that because the licensee's failure to address the potential for CO2 over-pressurization in the Unit 2 CV&T (FA 3-2) resulted from lack of original CO2 test data and occurred during initial plant start-up, it did not reflect current licensee performance and no cross-cutting aspect was identified.
Inspection Report# : 2009008 *(pdf)*

Significance: G Oct 15, 2009
Identified By: NRC
Item Type: FIN Finding
Degradation of a Flood Protection Feature
A finding was identified by the NRC for the licensee's failure to maintain the functionality of an internal flood protection feature which was installed to reduce core damage frequency based on evaluations performed for the plant. The licensee entered this problem in their corrective action program as condition reports 337066 and 339918.

The finding is more than minor because if left uncorrected the finding has the potential to lead to a more significant safety concern because degradation of the internal flood protection feature for extended periods of time would

unacceptably increase the risk of core damage. The inspectors evaluated the finding using the significance determination process (SDP) and determined a Phase III evaluation was required. A regional senior reactor analyst performed a Phase III evaluation under the SDP, and the performance deficiency was determined to be of very low safety significance (Green).

The dominant accident sequences consisted of service water ruptures in the chiller room that were not isolated before water impacted the IRR and ESGR. Significant assumptions were the flooding frequency, duration of the performance deficiency (3days), and that water reaching a height of 24 inches in the relay room and reaching the ESGR would be considered to cause core damage. A human reliability analysis
was performed to determine the probability of the operator failing to implement leak isolation before the flood impacted the ESGR which assumed that the operator would be responding to level alarms in the affected spaces and have obvious diagnosis of the problem and considerable time to implement leak isolation. There
was no cross-cutting aspect due to the legacy aspect related to the finding (not indicative of current licensee performance).
Inspection Report# : 2009004 *(pdf)*

Significance: G Oct 15, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Adequately Design and Install Oil Collection Devices for Reactor Coolant Pump Motor Stator Air Coolers
The inspectors identified a non-cited violation of the North Anna Power Plant Facility Renewed Operating Licensee NPF-4 & 7, Condition D, Fire Protection Program, which involved a failure to ensure an adequate design of the Units 1 and 2 reactor coolant pumps (RCP) oil collection system associated with the motor stator
air coolers. The licensee entered the problem into their corrective action program as condition report 325879.

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 has a credible impact on safety because the inadequate design of the oil collection system presented a degradation of a fire confinement component which has a fire prevention function of not allowing an oil leak to reach hot surfaces. The finding was of very low safety significance or Green because of the low degradation rating of the fire confinement category related to the as found condition of oil accumulation at the motor stator air coolers, the extremely low frequency of RCP oil leaks, minor actual RCP oil leaks during the past operating cycle, and other area fire protection defensein-depth features such as automatic fire detection, manual suppression capability (fire brigade), and safe shutdown capability from the main control room. There was
no cross-cutting aspect due to the legacy aspect related to both examples (not indicative of current licensee performance).
Inspection Report# : 2009004 *(pdf)*

Significance: G Jun 30, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Promptly Identify and Correct a Condition Adverse to Quality Involving Inadequate Tornado Missle Protection for the EDG Day Tank Vents
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 associated with inadequate tornado missile protection for the emergency diesel generator (EDG) fuel oil day tank vents on each train for Units 1 and 2. The licensee entered this problem into their corrective action program as condition report 335031.

The inspectors reviewed IMC 0612, Appendix B, and determined 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 design control for the initial structure, system, component design. The inspectors evaluated the finding using the significance determination process and determined that the finding was of very low significance because the design deficiency did not result in

the loss of functionality and the finding did not screen as potentially risk significant due to a 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 identify inadequate tornado missile protection for the EDG day tank vents during an extent of condition evaluation and review.

Inspection Report# : 2009003 *(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 Feb 06, 2009
Identified By: NRC
Item Type: FIN Finding
North Anna PI&R Summary
The team concluded that, in general, problems were 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 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. However, the team identified examples where the priority of condition reports was lowered without a documented basis. Overall, corrective actions developed and implemented for issues were generally effective and implemented in a timely manner.

The team 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. 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 team found examples where operating experience was not adequately utilized to prevent problems.

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# : 2009006 *(pdf)*

Last modified : March 01, 2010