North Anna 1
1Q/2010 Plant Inspection Findings

Initiating Events

Significance: G Mar 31, 2010
Identified By: Self-Revealing
Item Type: FIN Finding
Failure to Follow Procedures Results in Loss of Offsite Power to 1H and 2J Emergency Buses
The inspectors determined that the failure to follow the aforementioned procedures to successfully accomplish nuclear switchyard relay maintenance was a PD. The PD had a credible impact on safety due to the loss of a TS required offsite power supply and the start of the respective EDGs to restore power to the affected emergency buses. The inspectors determined the PD 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 human performance due to human error in the implementation of a non-safety nuclear switchyard related procedures. In accordance with NRC IMC 0609, "Significant Determination Process," the inspectors performed a Phase 1 risk analysis and determined the finding was of very low safety significance (Green) because the finding did contribute to a reactor trip but did not contribute to the likelihood that mitigation equipment or functions would not be available. This finding involved the cross-cutting area of human performance, the component of the work
practices, and the aspect of personnel use human error prevention techniques commensurate with risk for the assigned task, H.4(a), because a licensee technician's failure to use proper human error prevention techniques resulted in a partial loss of offsite power on both units.
Inspection Report# : 2010002 *(pdf)*

Significance: G Dec 31, 2009
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Procedure Results in Excess Letdown Heat Exchanger Leakage
A Green, self-revealing, non-cited violation of TS 5.4.1a was identified for the failure to adequately establish procedural requirements for component cooling (CC) water flow through the Unit 1 excess letdown heat exchanger (Hx) which resulted in a cracked Hx tube and excessive reactor coolant system (RCS) leakage when placing the Hx in service. The licensee entered this problem into their corrective action program as condition report 354523.

This finding had a credible impact on safety due to continuous, excessive CC flow through the excess letdown Hx which caused a tube crack that allowed excessive intersystem leakage from the reactor coolant system (RCS) at approximately 60 gallons per minute for the 4 minutes in which the excess letdown heat exchanger was in service. The finding was more than minor because if left uncorrected it would have the potential to result in a more significant event involving multiple tube cracks with consequent leakage exceeding the capacity of a charging pump. In accordance with NRC inspection manual chapter (IMC) 0609, "Significant Determination Process," the inspectors performed a phase 1 analysis and determined the finding required a phase 2 analysis by a regional senior reactor analyst (SRA) due to the finding resulting in RCS leakage that exceeded TS limits. The finding resulted in an intersystem leak from the RCS system into the CC system when the excess letdown Hx was placed into service; however, an intersystem LOCA was not addressed in the pre-solved risk table, therefore a phase 3 analysis was performed by the SRA in accordance with the guidance of NRC IMC 0609, Appendix A. The SDP phase 3 risk evaluation resulted in a risk increase for the finding of less than 1E-6 for core damage frequency and less than 1E-7 for large early release frequency. The dominant sequence was an RCS leak into the CC system due to tube leakage in the excess letdown Hx when excess letdown was initiated, coupled with a failure of the charging function and a failure to isolate the leakage. Therefore, the finding was characterized as of very low safety significance (Green). The risk was low due to the magnitude of the leakage, which was less than the makeup capability of 1 charging pump, the availability of charging pumps to mitigate the leakage, and the high probability of accomplishing letdown isolation given the multiple operator cues and time availability. The finding had no cross-cutting aspects due to its legacy

nature (not indicative of current licensee performance).

Inspection Report# : 2009005 *(pdf)*

Mitigating Systems

Significance: G Mar 31, 2010
Identified By: Self-Revealing
Item Type: NCV NonCited Violation
Inadequate Procedure Implementation Results in Inoperability of a Fire Suppression System
A self-revealing performance deficiency (PD) was identified for the failure to adequately implement fire protection procedure requirements of 0-PT-104.2 to ensure zone 3 was adequately reset. This PD had a credible impact on safety due to an inoperable fire suppression system for safety-related components. 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 respective attributes of external events regarding fire due to the adverse impact on the capability of the fire suppression system and human performance due to the failure to properly implement a test procedure. In accordance with NRC Inspection Manual Chapter (IMC) 0609, “Significant Determination
Process,” (SDP) the inspectors performed a Phase 1 analysis and determined the finding was of very low safety significance (Green) because core damage frequencies related to the fuel oil pump room #1 were less than 1E-6 and the duration of the system inoperability was less than three days. This finding involved the cross-cutting area of human performance, the component of work practices and the aspect of personnel do
not proceed in the face of unexpected circumstances, H.4(a), because licensee personnel encountered problems with a CO2 system reset and failed to stop for proper guidance from supervision.
Inspection Report# : 2010002 *(pdf)*

Significance: G Mar 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Install LSHI/ORS Pump Discharge Piping in accordance with Prescribed Drawings
A PD was identified by the NRC for the failure to adequately to accomplish the installation of LHSI and ORS pump discharge piping in accordance with prescribed drawings which resulted in hard contact between the aforementioned system piping. This PD had a credible impact on safety due to the loss of design margin resulting in a reasonable doubt regarding long term reliability. The PD was more than minor because if left uncorrected it would have the potential to result in a more significant event involving Unit 1 ‘A’ train LHSI pump discharge nozzle failure from excessive stress. 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# : 2010002 *(pdf)*

Significance: G Mar 31, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Establish an Adequate Post-Modification Test Program for Piping Supports
The inspectors determined that the failure to establish an adequate postmodification test program for piping supports affected by piping modifications as required by 10 CFR 50, Appendix B, Criterion III, was a PD. This PD had a credible impact on safety due to a programmatic deficiency that resulted in safety-related piping supports adversely affected by modifications. The PD was more than minor because if left uncorrected it would have the potential to result in a more significant event involving inoperable, unidentified safety-related piping supports with consequent adverse impact on the respective system during a seismic event. 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. This finding involved the cross-cutting area of human performance, the component of the resources, and the aspect of complete, accurate and up-to-date procedures, H.2(c), because the licensee failed to establish up-to-date program procedures to ensure adequate postmodification testing of piping supports.
Inspection Report# : 2010002 *(pdf)*

Significance: G Jan 25, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Perform Periodic TOL Testing on Unit 1
Green: The team identified a finding of very low safety significance (Green) and associated NCV of 10 CFR Part 50, Appendix B, Criterion XI, "Test Control," for the licensee's failure to assure that thermal overload protection devices (TOLs) on safety-related motor-operated valve (MOV) circuits of Unit 1 were periodically tested to ensure that trip set point drift does not affect the reliability or availability of mitigating systems when called upon to operate. The licensee entered this issue into the corrective action program as CR361181.

The inspectors concluded that the finding was more than minor in that the finding involves the mitigating systems cornerstone attribute of procedure quality and affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the inspectors determined that the failure to assure that TOLs would not unnecessarily prevent safety related valves from performing their function. This could affect the availability and
ability of MOVs to respond to initiating events. As no failures due to TOL performance were identified by the inspectors which would affect plant response, the inspectors determined this finding and violation of regulatory requirements to be of very low safety significance. The finding was reviewed for cross-cutting aspects and none were identified as this was determined to not be indicative of current licensee performance.
Inspection Report# : 2009007 *(pdf)*

Significance: G Jan 25, 2010
Identified By: NRC
Item Type: FIN Finding
Failure to Ensure RSST 'A' LTC Controller Settings Were Correctly Implemented
Green: The inspectors identified a finding having very low safety significance (Green) involving the failure of the licensee to ensure that the control settings for the non-safety related reserve station service transformer (RSST) 'A' replacement load tap changer (LTC) controller installed through design change package (DCP) 05-108 were correctly implemented such that the LTC could respond as expected and credited across the range of design conditions. The licensee declared the RSST inoperable and implemented a change to the controller settings in compliance with design, and is tracking further actions under CR 358215.

The inspectors concluded that the finding was more than minor in that it is associated with the reactor safety mitigating systems cornerstone attribute of equipment performance and affects the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, failure of the LTC to operate, as credited, due to incorrect LTC controller set points or inadequate control voltages, would have caused the 4kV safety related buses to prematurely disconnect from offsite power during a design basis event. The finding is of very low safety significance as it did not result in an actual loss of safety function. Further, this finding did not constitute a violation of NRC requirements as the RSST 'A' is a non-safety related component. The team also evaluated the finding for cross-cutting aspects and determined it to involve a failure to ensure adequately trained resources were available to design, check, and review complex digital controllers and their settings, and so involved the human performance (H) resources component cross cutting aspect (H.2.(c)).
Inspection Report# : 2009007 *(pdf)*

Significance: G Jan 25, 2010
Identified By: NRC
Item Type: NCV NonCited Violation
Failure to Ensure the Adequacy of Control Voltage to the 4160 and 480 VAC Equipment

Green: The team identified a finding of very low safety significance and associated NCV of 10 CFR Part 50, Appendix B, Criterion III, “Design Control,” for the failure to ensure the adequacy of control voltage to the 4160 and 480 VAC equipment in support of mitigating system loads; specifically, a lack of voltage drop analysis for 125 VDC control power to breaker open/close coil, spring charging motors, and other miscellaneous DC loads. The licensee entered this issue into the corrective action program as CR361181.

The inspectors concluded that the finding is more than minor in that it involves the mitigating systems cornerstone attribute of design control and affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences.
The inspectors determined the failure to assure and verify that adequate control voltage was available to close and open the 4160 VAC and 480 VAC breakers could have affected the capability of safety-related equipment to respond to initiating events. The finding is of very low safety significance as it did not result in an actual loss of safety function. The team also evaluated the finding for cross-cutting aspects and none were identified as this was determined to not be indicative of current licensee performance.
Inspection Report# : 2009007 *(pdf)*

Significance: G Nov 12, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Inadequate Procedure for Powering Credited Components for Fire in Cable Vault & Tunnel.
The inspectors identified a Green non-cited violation (NCV) of Technical Specification 5.4.1, Procedures, in that the Unit 1 post-fire safe shutdown (SSD) procedure 1-FCA-3, “Cable Vault and Tunnel Fire”, Revision 20, was not consistent with the safe shutdown analysis (SSA) for FA 3-1. Specifically, 1-FCA-3 directed operators to plug a ventilation fan into a receptacle that is powered from an electrical bus that had been previously de-energized in a prior step of the procedure. In another example, 1-FCA-3 did not give operators guidance for swapping the power supply of the auxiliary monitoring panel in the Fuel Handling Building. The licensee entered this issue into their corrective action program, and issued a new revision of 1-FCA-3.

This finding is more than minor because it is associated with the procedure quality attribute of the Mitigating Systems cornerstone, 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 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 in Phase 1 because it was determined to be a procedural deficiency that is compensated by operator experience and/or familiarity.

The inspectors reviewed guidance contained in IMC 0305 to determine if any cross-cutting aspects existed. This finding has a cross-cutting aspect in the resources component of the human performance area [H.2(c)] because the procedure was not complete and up to date in accordance with the SSA.
Inspection Report# : 2009008 *(pdf)*

Significance: G Oct 15, 2009
Identified By: NRC
Item Type: NCV NonCited Violation
Preconditioning of the Low Head Safety Injection Motor Operated Valves
A NRC-identified non-cited violation of 10 CFR Part 50, Appendix B, Criterion XI, “Test Control,” was identified for preconditioning of low head safety injection (LHSI) motor operated valves (MOVs). A preventative maintenance (PM) work order specified that licensee personnel lubricate valve components and manually stroke the MOVs prior to performing documented stroke time testing required by Technical Specifications. The licensee entered this problem in their corrective action program as condition report 344052.

This finding is more than minor because if left uncorrected the finding has the potential to lead to a more significant safety concern in that other safety-related valve performance deficiencies could have been masked. The inspectors evaluated the finding using the significance determination process and determined the finding was of very low safety significance (Green) because the finding did not result in a loss of safety function. This finding involved the cross-cutting area of human performance, the component of resources and the aspect of training of personnel (H.2.b),

because the licensee had previously performed procedure enhancements but failed to ensure their employees were adequately trained.
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: Self-Revealing
Item Type: NCV NonCited Violation
Failure to Repair or Rework Nonconforming Parts in Accordance with Documented Procedures
A self-revealing, Green, non-cited violation of 10 CFR 50, Appendix B, Criterion XV, Nonconforming Materials, Parts, or Components was identified for failure to repair or rework nonconforming parts in accordance with documented procedures which resulted in the failure of a Unit 1 pressurizer power operated relief valve (PORV). The licensee entered this problem into their corrective action program as condition report 328709 to review extent of condition and determine addition corrective actions.

The inspectors reviewed IMC 0612, Appendix B, and determined the finding was more than minor because if left uncorrected the performance deficiency would have the potential to lead to a more significant safety concern. The inspectors reviewed IMC 0609, Appendix G because the plant was shut down at the time, and determined that the finding did not require a quantitative assessment and thus screened as Green. 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 that precluded work orders from containing instructions that alter plant/SSC design unless authorized by approved design documents or plant procedures.

Inspection Report# : 2009003 *(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

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