



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

October 30, 2009

Mr. David A. Heacock
President and Chief Nuclear Officer
Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060

SUBJECT: NORTH ANNA POWER STATION – NRC INTEGRATED INSPECTION
REPORTS 05000338/2009004, 05000339/2009004, 05000338/2009501, AND
05000339/2009501

Dear Mr. Heacock:

On September 30, 2009, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your North Anna Power Station Units 1 and 2. The enclosed integrated inspection report documents the inspection findings which were discussed on October 20, 2009, with Mr. Daniel Stoddard and other members of your staff.

The inspection examined activities conducted under your licenses as they related to safety and compliance with the Commission's rules and regulations and with the conditions of your licenses. The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel.

This report documents one self-revealing finding and three NRC-identified findings of very low safety significance (Green) of which two findings were determined to be violations of NRC requirements. However, because of the very low safety significance of these issues and because they were entered into your corrective action program, the NRC is treating these as non-cited violations (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. If you wish to contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the North Anna Power Station.

Additionally, if you disagree with the characterization of any finding in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the Regional Administrator, Region II, and the NRC Resident Inspector at the North Anna Power Station. The information you provide will be considered in accordance with Inspection Manual Chapter 0305.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Docket Nos. 50-338, 50-339
License Nos. NPF-4, NPF-7

Enclosure: Inspection Reports 05000338/2009004, 05000339/2009004, 05000338/2009501,
and 05000339/2009501
w/ Attachment: Supplemental Information

cc w/ encl. (See page 3)

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Letter to David A. Heacock from Gerald J. McCoy dated October 30, 2009

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REPORTS 05000338/2009004, 05000339/2009004, 05000338/2009501, AND
05000339/2009501

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-338, 50-339

License Nos.: NPF-4, NPF-7

Report No: 05000338/2009004, 05000339/2009004, 05000338/2009501 and
05000339/2009501

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: North Anna Power Station, Units 1 and 2

Location: 1022 Haley Drive
Mineral, Virginia 23117

Dates: July 1, 2009 through September 30, 2009

Inspectors: J. Reece, Senior Resident Inspector
R. Clagg, Resident Inspector
L. Miller, Senior Emergency Preparedness Inspector (Sections 1EP2,
1EP3, 1EP4, 1EP5, 4OA1.2, 4OA3.2, 4OA6.2)

Approved by: Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000338/2009-004, 05000339/2009-004, 05000338/2009501, 05000339/2009501; 07/01/2009 – 09/30/2009; North Anna Power Station, Units 1 and 2; Emergency Preparedness Baseline, Operability Evaluations, Surveillance Testing, and Identification and Resolution of Problems.

The report covered a 3-month period of inspection by resident inspectors and emergency preparedness inspectors from the region. Four findings were identified, and two of the findings were determined to be non-cited violations (NCVs). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspect was determined using IMC 0305, "Operating Reactor Assessment Program." Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4, dated December 2006.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. 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. (Section 4OA2.3)

Cornerstone: Mitigating Systems

- Green. 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 defense-in-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 relating to both examples. (Section 40A2.2)

- Green. 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. (Section 1R22)

Green. 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 relating to the finding. (Section 1R15.1)

B. Licensee Identified Violations

None

REPORT DETAILS

Summary of Plant Status

Unit 1 and Unit 2 began the period at full Rated Thermal Power (RTP) and operated at or near full RTP for the entire report period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R04 Equipment Alignment

a. Inspection Scope

The inspectors conducted four equipment partial alignment walkdowns to evaluate the operability of selected redundant trains or backup systems, listed below, with the other train or system inoperable or out of service. The inspectors reviewed the functional systems descriptions, Updated Final Safety Analysis Report (UFSAR), system operating procedures, and Technical Specifications (TS) to determine correct system lineups for the current plant conditions. The inspectors performed walkdowns of the systems to verify that critical components were properly aligned and to identify any discrepancies which could affect operability of the redundant train or backup system.

- Unit 2 'B' train Low Head Safety Injection (LHSI) System during maintenance on 'A' train LHSI pump and related components
- Unit 1 'B' train LHSI System during maintenance on 'A' train LHSI pump and related components
- Unit 1 '1J' Emergency Diesel Generator (EDG) during maintenance for the '1H' EDG
- Unit 2 'A' train Quench Spray (QS) during maintenance on 'B' train QS and related components

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Protection – Tours

a. Inspection Scope

The inspectors conducted tours of the six areas listed below that are important to reactor safety to verify the licensee's implementation of fire protection requirements as described in Virginia Power Administrative Procedure (VPAP)-2401, "Fire Protection Program," Revision 29, which was superseded by a fleet procedure, CM-AA-FPA-100, Revision 0, "Fire Protection/Appendix R (Fire Safe Shutdown) Program," on August 14, 2009. The inspectors evaluated, as appropriate, conditions related to: (1) licensee control of transient combustibles and ignition sources; (2) the material condition, operational status, and operational lineup of fire protection systems,

equipment, and features; and (3) the fire barriers used to prevent fire damage or fire propagation.

- Emergency Switchgear Room Unit 1 (fire zone 6-1a / ESR-1)
- Emergency Switchgear Room Unit 2 (fire zone 6-2a / ESR-2)
- EDG 1J Unit 1 (fire zone 9B-1a / EDG-1J) and EDG 2J Unit 2 (fire zone 9B-2a / EDG-2J)
- QS Pump House and Safeguards Area Unit 2 (fire zone 15-2a / QSPH-2) and Safeguards Area Unit 2 (fire zone Z-16-2 / SA-2)
- QS Pump House and Safeguards Area Unit 1 (includes Z-16-1)(fire zone 15-1a / QSPH-1), Safeguards Area Unit 1 (fire zone Z-16-1 / SA-1)
- Service Water Pump House (fire zone 12a / SWPH), Auxiliary Service Water Pump House (fire zone 13a / ASWPH), Motor-Driven Fire Pump Building (fire zone 26 / FPB), and Service Water Valve House (fire zone 48a / SWVH)

b. Findings

Control of Transient Combustibles

Introduction: An unresolved item (URI) was identified by the inspectors relating to compliance with the licensee's procedures, VPAP-2401, "Fire Protection Program," Revision 29, which was superseded by CM-AA-FPA-100, Revision 0, "Fire Protection/Appendix R (Fire Safe Shutdown) Program," on August 14, 2009, with their fire protection program license requirement relative to Appendix A to Branch Technical Position APCSB 9.5-1.

Description: On July 27, 2009, the licensee initiated condition report (CR) 342754 for a NRC-identified failure to obtain a transient fire loading permit for transient combustibles pre-staged in the Unit 2 safeguards building. The inspectors' review of the licensee's fire protection program required by North Anna Power Plant Facility Renewed Operating Licensee NPF-4 & 7, Condition D, and described in USFAR section 9.5.1, "Fire Protection System," identified issues relating to Appendix A to Branch Technical Position APCSB 9.5-1 and the licensee's compliance as implemented by their fire protection program procedures noted above. Specifically, the inspectors identified changes in the methodology of transient combustible controls from VPAP-2401, Revision 0, up to Revision 29 which was in effect on July 27, 2009.

The issues are unresolved pending completion of NRC review of additional licensee documents to determine if there are performance deficiencies relating to fire protection program changes and implementation which are greater than minor and are identified as URI 05000338, 339/2009004-01, Control of Transient Combustibles.

.2 Fire Protection – Drill Observation

a. Inspection Scope

During an unannounced fire brigade drill on September 22, 2009, at the Unit 1 cable tray spreading room, the inspectors assessed the timeliness of the fire brigade in arriving at the scene, the fire fighting equipment brought to the scene, the donning of fire protection clothing, the effectiveness of communications, performance of the fire brigade and the exercise of command and control by the scene leader. The inspectors also assessed

the licensee's critique and related acceptance criteria for the drill objectives and reviewed the licensee's corrective action program (CAP) for recent fire protection issues.

b. Findings

Fire Brigade Performance

Introduction: A URI was identified by the inspectors relating to several issues noted during their inspection of an unannounced fire brigade drill relative to the licensee's fire brigade performance and the requirements as set forth in licensee procedure, CM-AA-FPA-100, Revision 0, "Fire Protection/Appendix R (Fire Safe Shutdown) Program."

Description: On September 22, 2009, the inspectors observed an unannounced fire brigade drill conducted at the Unit 1 cable tray spreading room, and the post drill critique immediately following completion of the drill. The inspectors identified issues relating to controller performance and impact on the overall drill performance, characterization of critique objectives and how the objectives were met relative to the requirements of the licensee's fire protection program. Drill issues were captured by the licensee in the corrective action system as CR349154.

The issues are unresolved pending completion of NRC review of the licensee's evaluation to determine if there is a performance deficiency which is greater than minor and is identified as URI 05000338, 339/2009004-02, Fire Brigade Performance.

1R11 Licensed Operator Regualification Program

a. Inspection Scope

The inspectors reviewed a crew examination involving a failure of a main feedwater pump, a reactor coolant pump seal failure, and a faulted steam generator. The scenario required classifications and notifications that were counted for NRC performance indicator input. The inspectors observed crew performance in terms of communications; ability to take timely and proper actions; prioritizing, interpreting, and verifying alarms; correct use and implementation of procedures, including the alarm response procedures; timely control board operation and manipulation, including high-risk operator actions; and oversight and direction provided by the shift supervisor, including the ability to identify and implement appropriate TS actions. The inspectors observed the post training critique to determine that weaknesses or improvement areas revealed by the training were captured by the instructor and reviewed with the operators.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the two equipment issues listed below, the inspectors evaluated the effectiveness of the corresponding licensee's preventive and corrective maintenance. The inspectors performed walkdowns of the accessible portions of the systems, performed in-office

reviews of procedures and evaluations, and held discussions with system engineers. The inspectors compared the licensee's actions with the requirements of the Maintenance Rule (10 CFR 50.65) using licensee procedure, ER-AA-MRL-10, "Maintenance Rule Program," Revision 2.

- CR332636, "The 'B' RSST tripped and locked out on a 'B' phase fault," and related maintenance rule evaluation MRE010601
- CR336616, "The 1J diesel has exceeded allowable MRule unavailability hours," and related maintenance rule (a)(1) evaluation, A1E000113.

b. Findings

The enforcement aspects of the event documented by CR332636 are discussed in section 4OA2.3.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, the four activities listed below for the following: (1) effectiveness of the risk assessments performed before maintenance activities were conducted; (2) management of risk; (3) upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and (4) maintenance risk assessments and emergent work problems were adequately identified and resolved. The inspectors verified that the licensee was complying with the requirements of 10 CFR 50.65 (a)(4) and the data output from the licensee's safety monitor associated with the risk profile of Units 1 and 2.

- Emergent work due to failure of discharge motor operated valve, 2-CH-MOV-2286A for 'A' train charging pump, 2-CH-P-1A
- Restoration of 'C' Reserve Station Service Transformer (RSST) following cable replacement
- Emergent work due to the failure of vibration monitor on the Station Blackout Diesel
- CR346399, changes to Safety Monitor have been made using an uncontrolled process

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

Quarterly Inspection Results

a. Inspection Scope

The inspectors reviewed seven operability evaluations affecting risk-significant mitigating systems, listed below, to assess, as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were considered as compensating measures; (4) whether the compensatory measures, if involved, were in place, would work as intended, and

were appropriately controlled; and (5) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation and the risk significance in accordance with the Significant Determination Process (SDP). The inspectors' review included a verification that determinations of operability were made as specified by procedure, OP-AA-102, "Operability Determination," Revision 5.

- CR339918, cleaning equipment left inside flood wall in Unit 2 Main Control Room Chiller Room
- CR337102, perform operability determination for MIC leak on SW pipe associated with supply to Unit 2 control room chillers
- CR340405, broken pipe support U-bolt on 1-EG-P-608J discharge line
- CR342172, loose structural bolting on SW spray array 1B2 requires repair
- CR346756, 1-CH-P-1B thermocouples non-conforming due to not being in direct contact with bearing
- CR343744, U1 ORS/LHSI Discharge Piping Interference Identified by the NRC Resident Inspector
- CR343736, NRC resident observed 1-SI-HSS-107 with questionable amount of offset

b. Findings

.1 Closed: URI 05000338/2009003-01, Degradation of an Internal Flood Protection Feature

Introduction: A Green finding was identified by the NRC for the licensee's failure to maintain the functionality of an internal flood protection feature which was installed by design change (DC) D92-015, to reduce core damage frequency based on evaluations performed for Generic Letter 88-20, "Individual Plant Examination for Severe Vulnerabilities – 10CFR50.54(f)."

Description: The inspectors had previously opened URI 05000338/2009003-01, Degradation of a Flood Protection Feature, in NRC Integrated Inspection Report 05000338/2009003 and 05000339/2009003, based on the identification of materials stored between a flood wall located in the Unit 2 chiller room and the adjacent door exiting to the turbine building on the dates of June 4 and 30, 2009. The inspectors subsequently reviewed related licensee documentation that included the associated corrective action documents, risk evaluations for the specific scenario, and previous modifications that installed internal flood protection features.

In response to an evaluation completed for Generic Letter 88-20, the licensee implemented DC D92-015 which installed internal flood protection features on Units 1 and 2, of which one feature was the combination of a 3 feet and 3 inch high flood wall located in the instrument rack room area at the entrance to the chiller room and a .75 inch gap beneath the door leading from the chiller room to the turbine building. The modification was overall safety-related due to the anchoring of certain features into safety-related walls and floors; however, the feature of concern was non-safety-related, but seismically designed. This internal flood protection feature serves to protect the instrument rack room and emergency switchgear areas from postulated service water (SW) floods of 1500 gallons per minute (gpm) within the chiller room in which there is also a 3 feet high flood wall that provides protection from a turbine building flood. The combination of flood protection features allows a SW flood within the chiller room to overflow the shorter flood wall within the chiller room and exit the room via the .75 inch

gap under the doors leading to the turbine building. However, debris or materials stored between the chiller room flood wall and adjacent door can impede the flow under the door and allow an increase in flood height that would overflow the flood wall in the instrument rack room and challenge the solid state protection system instrumentation and emergency switchgear.

The inspectors concluded that the internal flood protection feature installed by DC D92-015 was a self-imposed standard to reduce overall core damage frequency from a postulated SW flood occurring in the chiller room. The inspectors also concluded that the storage of materials of a type that blocked the door gap sufficiently to allow SW flood waters to enter the instrument rack room and emergency switchgear areas was a failure to ensure this standard was met.

Analysis: The inspectors concluded that the degradation of the internal flood protection feature concerning the door gap was contrary to the requirements of DC D92-015 and was therefore a performance deficiency. The inspectors determined the finding is more than minor because if left uncorrected the finding had the potential to lead to a more significant safety concern because degradation of the internal flood protection feature protecting the instrument relay rack room (IRR) and the emergency switchgear room (ESGR) 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 (approximately 3 days), 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 relating to the finding.

Enforcement: Enforcement action does not apply because the performance deficiency did not involve a violation of regulatory requirements. The degradation of the internal flood protection features was contrary to the requirements of DC D92-015 which was a licensee standard. Contrary to this standard, on June 4 and 30, 2009, the licensee allowed storage of materials of a type that blocked the door gap sufficiently to allow postulated SW flood waters to enter the instrument rack room and emergency switchgear areas. Because this finding does not involve a violation of regulatory requirements, has very low safety significance, and has been entered into the licensee's CAP as CR337066 and CR339918, it is identified as FIN 05000339/2009004-03, Degradation of an Internal Flood Protection Feature.

.2 LHSI/ORS Pump Discharge Piping Interference

Introduction: A URI was identified by the inspectors relating to an issue involving interference between discharge piping for the Unit 1 'A' train LHSI pump and the Unit 1 'A' train outside recirculation spray (ORS) pump.

Description: On August 4, 2009, the inspectors identified an interference issue involving hard contact between discharge piping for the Unit 1 'A' train LHSI pump and the Unit 1 'A' train ORS pump. The licensee initiated CR343744 and performed an operability determination documented by OD000314 which concluded the as-found configuration was operable but not fully qualified and should be corrected during the next outage of sufficient duration. The licensee's stress analysis package was forward to NRC regional and headquarters design personnel for additional review which has resulted in additional questions for the licensee.

This issue is unresolved pending completion of NRC review of the licensee's evaluation to determine if there is a performance deficiency which is greater than minor and is identified as URI 05000338/2009004-04, LSHI/ORS Pump Discharge Piping Interference.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed four post maintenance test procedures and/or test activities, as appropriate, for selected risk-significant mitigating systems listed below, to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform in accordance with licensee procedure VPAP-2003, "Post Maintenance Testing Program," Revision 13.

- Work Order (WO) 59101935075, Replace 4" stainless steel pipe to repair MIC leak
- WO 59076232901, Replace thrust bearing on 1-FC-P-1A
- WO 59101946375, Repair 2-CH-MOV-22864 failure to stroke
- WO 59101984200, Perform closing coil test IAW 0-ECM-0302-03 for breaker 15H2

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the six surveillance tests listed below, the inspectors examined the test procedures, witnessed testing, and reviewed test records and data packages, to determine whether

the scope of testing adequately demonstrated that the affected equipment was functional and operable, and that the surveillance requirements of TS were met. The inspectors also determined whether the testing effectively demonstrated that the systems or components were operationally ready and capable of performing their intended safety functions.

In-Service Tests:

- 2-PT-751.2A, "Service Water Pump (2-SW-P-1A) Quarterly Test," Revision 49
- 21-PT-71.2Q, "2-FW-P-3A, A Motor-Driven AFW Pump and Valve Test," Revision 33
- 1-PT-14.2, "Charging Pump 1-CH-P-1B," Revision 48 (CR 342935 PT inadequate RE: ASME code requirements 2 min and stable)
- 1-PT-213.8A, "Valve Inservice Inspection ('A' Train of Safety Injection System)", Revision 11

Other Surveillance Tests:

- 2-PT-82J, "Unit 2 2J Emergency Diesel Generator Slow Start Test," Revision 48
- 2-PT-82H, "2H Emergency Diesel Generator Slow Start Test," Revision 48

b. Findings

Preconditioning of the Low Head Safety Injection Motor Operated Valves

Introduction: An NRC-identified non-cited violation (NCV) 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 as required by Technical Specifications.

Description: On August 3, 2009, the licensee removed the 'A' train low head safety injection pump from service for PMs and surveillance testing on the pump and related MOVs. The inspectors observed the licensee implementation of PM procedure 0-MPM-0300-01, "Stem and Bearing Lubrication on Limitorque MOVs in General," which completed lubrication of valve components and manually stroked the following valves: 1-SI-MOV-1862A, 1-SI-MOV-1864A, 1-SI-MOV-1885A, and 1-SI-MOV-1885C. Following completion of the PM activities and during the same shift, the licensee performed periodic surveillance test, 1-PT-213.8A, "Valve Inservice Inspection ('A' Train of Safety Injection System)," which performed stroke time testing of the above valves. The inspectors reviewed historical licensee documents listed in the Attachment related to preconditioning.

The inspectors determined that by cycling these valves as part of the PM, there was the potential to mask an actual as-found condition of the valves and thereby prevent the verification of valve operability during the PT. The inspectors concluded that the PMs performed constituted unacceptable preconditioning of the above LHSI MOVs. NRC Inspection Manual Part 9900 Technical Guidance, "Maintenance – Preconditioning of Structures, Systems, and Components Before Determining Operability," states that the NRC expects surveillance and testing processes of structures, systems and components (SSCs) to be evaluated in an as-found condition. It also defines preconditioning of SSCs

as the alteration, variation, manipulation or adjustment of the physical condition of an SSC before TS surveillance or ASME Code testing. It also states, in part, that influencing test outcome by performing valve stroking, preventative maintenance, pump venting or draining, or manipulating SSCs does not meet the intent of the as-found testing expectations. 10 CFR Part 50 Appendix B, Criterion XI, "Test Control," states, in part, that a test program shall be established to assure that all testing required to demonstrate that structures, systems and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptable limits contained in applicable design documents.

Analysis: The inspectors determined that the preconditioning of the LHSI MOVs was contrary to the requirements of 10 CFR 50, Appendix B, Criterion XI, and was therefore a performance deficiency. 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 be masked. The inspectors performed a Phase I SDP analysis and determined the finding was of very low safety significance (Green) because the finding did not result in a loss of safety function. The 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 a procedure enhancement to define and control preconditioning but failed to ensure their employees were adequately trained.

Enforcement: 10 CFR Part 50 Appendix B, Criterion XI, "Test Control" states, in part, that a test program shall be established to assure that all testing required to demonstrate that structures, systems and components will perform satisfactorily in service is identified and performed in accordance with written test procedures which incorporate the requirements and acceptable limits contained in applicable design documents. Contrary to this, on August 3, 2009, the licensee performed PM procedure 0-MPM-0300-01 prior to the surveillance test for LHSI valves, 1-SI-MOV-1862A, 1-SI-MOV-1864A, 1-SI-MOV-1885A, and 1-SI-MOV-1885C. Consequently, the maintenance and testing sequence failed to prevent preconditioning of these specified LHSI MOVs. Because this finding is of very low safety significance and because it is in the licensee's corrective program as CR344052, this violation is treated as an NCV consistent with Section VI.A.1 of the NRC Enforcement Policy: NCV 05000338/2009004-05, Preconditioning of the Low Head Safety Injection Motor Operated Valves.

Cornerstone: Emergency Preparedness

1EP2 Alert and Notification System Testing

a. Inspection Scope

The inspector evaluated the adequacy of licensee's methods for testing the alert and notification system in accordance with NRC Inspection Procedure 71114, Attachment 02, "Alert and Notification System Evaluation." The applicable planning standard 10 CFR Part 50.47(b)(5) and its related 10 CFR Part 50, Appendix E, Section IV.D requirements were used as reference criteria. The criteria contained in NUREG-0654, "Criteria for Preparation and Evaluation of Radiological Emergency Response Plans and Preparedness in Support of Nuclear Power Plants," Revision 1, was also used as a reference.

The inspector reviewed various documents which are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the alert and notification system on a biennial basis.

b. Findings

No findings of significance were identified.

1EP3 Emergency Response Organization (ERO) Augmentation

a. Inspection Scope

The inspector reviewed the licensee's Emergency Response Organization (ERO) augmentation staffing requirements and process for notifying the ERO to ensure the readiness of key staff for responding to an event and timely facility activation. The qualification records of key position ERO personnel were reviewed to ensure all ERO qualifications were current. A sample of problems identified from augmentation drills or system tests performed since the last inspection were reviewed to assess the effectiveness of corrective actions.

The inspection was conducted in accordance with NRC Inspection Procedure (IP) 71114, Attachment 03, "Emergency Response Organization Staffing and Augmentation System." The applicable planning standard, 10 CFR 50.47(b)(2) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspector reviewed various documents which are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the ERO staffing and augmentation system on a biennial basis.

b. Findings

No findings of significance were identified.

1EP4 Emergency Action Level (EAL) and Emergency Plan Changes

a. Inspection Scope

Since the last NRC inspection of this program area, revisions 34 and 35 of the North Anna Power Station Emergency Plan were implemented based on the licensee's determination, in accordance with 10 CFR 50.54(q), that the changes resulted in no decrease in the effectiveness of the Plan, and that the revised Plan continued to meet the requirements of 10 CFR 50.47(b) and Appendix E to 10 CFR Part 50. The inspector conducted a sampling review of the Plan changes and implementing procedure changes made between August 1, 2008, and July 1, 2009, to evaluate for potential decreases in effectiveness of the Plan. However, this review was not documented in a Safety Evaluation Report and does not constitute formal NRC approval of the changes. Therefore, these changes remain subject to future NRC inspection in their entirety. The inspection was conducted in accordance with NRC IP 71114, Attachment 04, "Emergency Action Level and Emergency Plan Changes." The applicable planning standard, 10 CFR 50.47(b)(4) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspector reviewed various documents which are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the emergency action level and emergency plan changes on an annual basis.

b. Findings

No findings of significance were identified.

1EP5 Correction of Emergency Preparedness Weaknesses and Deficiencies

a. Inspection Scope

The inspector reviewed the corrective actions identified through the Emergency Preparedness program to determine the significance of the issues and to determine if repeat problems were occurring. The facility's self-assessments and audits were reviewed to assess the licensee's ability to be self-critical, thus avoiding complacency and degradation of their emergency preparedness program. In addition, the inspector reviewed licensee's self-assessments and audits to assess the completeness and effectiveness of all emergency preparedness related corrective actions.

The inspection was conducted in accordance with NRC IP 71114, Attachment 05, "Correction of Emergency Preparedness Weaknesses." The applicable planning standard, 10 CFR 50.47(b)(14) and its related 10 CFR 50, Appendix E requirements were used as reference criteria.

The inspector reviewed various documents which are listed in the Attachment to this report. This inspection activity satisfied one inspection sample for the correction of emergency preparedness weaknesses on a biennial basis.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems PIs

a. Inspection Scope

The inspectors performed a periodic review of the following five Unit 1 and 2 Mitigating Systems PIs to assess the accuracy and completeness of the submitted data and whether the performance indicators were calculated in accordance with the guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 5. The inspection was conducted in accordance with NRC IP 71151, "Performance Indicator Verification." Specifically, the inspectors reviewed the Unit 1 and Unit 2 data reported to the NRC for the period July 1, 2008, through June 30, 2009. Documents reviewed included applicable NRC inspection reports, licensee event reports, operator logs, condition reports, and station performance indicators.

- Emergency AC Power System
- High Pressure Injection System
- Auxiliary Feedwater system
- Residual Heat Removal System
- Support Cooling Water System

b. Findings

No findings of significance were identified.

.2 Emergency Preparedness PIs

a. Inspection Scope

The inspector sampled licensee submittals relative to the PIs listed below for the period April 1, 2008 through March 31, 2009. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline", Revision 5, was used to confirm the reporting basis for each data element.

Emergency Preparedness Cornerstone

- Emergency Response Organization (ERO) Drill/Exercise Performance
- ERO Drill Participation
- Alert and Notification System Reliability

For the specified review period, the inspector examined data reported to the NRC, procedural guidance for reporting PI information, and records used by the licensee to identify potential PI occurrences. The inspector verified the accuracy of the PI for ERO drill and exercise performance through review of a sample of drill and event records. The inspector reviewed selected training records to verify the accuracy of the PI for ERO drill participation for personnel assigned to key positions in the ERO. The inspector verified the accuracy of the PI for alert and notification system reliability through review of a sample of the licensee's records of periodic system tests. The inspector also interviewed the licensee personnel who were responsible for collecting and evaluating the PI data. Licensee procedures, records, and other documents reviewed within this inspection area are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

40A2 Identification and Resolution of Problems

.1 Review of Items Entered into the Corrective Action Program (CAP):

As required by IP 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's CAP. This review was accomplished by reviewing daily CR report summaries and periodically attending daily CR Review Team meetings.

.2 Annual Sample: Review of CR325879, Oil at 1-RC-P-1A Stator Cooler

a. Inspection Scope

The inspectors performed a review regarding the licensee's assessments and corrective actions for CR 325879, "Oil at 1-RC-P-1A Stator Cooler," to ensure that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors also evaluated the CR against the requirements of the licensee's CAP as specified in procedure, PI-AA-200, "Corrective Action Program," Revision 8, and 10 CFR 50, Appendix B.

b. Findings and Observations

Failure to Adequately Design and Install Oil Collection Devices for Reactor Coolant Pump Motor Stator Air Coolers

Introduction: The inspectors identified a Green NCV 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 systems associated with the motor stator air coolers.

Description: On March 8, 2009, the licensee entered a problem concerning oil accumulation at the 1A RCP motor stator air cooler into their CAP as CR 325879. The inspectors independently identified the oil accumulation including oil drips on the 1C RCP motor stator air cooler, which the licensee had initially failed to identify, and determined that the RCP motor oil collection system has no provisions for collecting oil leakage from the motor stator air coolers. 10 CFR 50, Appendix R, section III.O, states in part that oil collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the RCP lube oil systems and that leakage points to be protected shall include lift pump and piping, overflow lines, lube oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and lube oil reservoirs. Therefore, the inspectors identified a concern regarding the oil accumulation at the RCP motor stator air coolers which constituted an oil leakage point. The licensee initiated corrective action (CA) 130704 to evaluate the oil leakage concern for all three RCP motors. The inspectors reviewed the completed CA130704 and associated Attachment 1, "01-RC-P-1A/1B/1C-Motor Evaluation," which referenced a Nuclear Electric Institute (NEI) document, "RCP Lube Oil Collection System Industry Position Paper," dated May, 2007. The inspectors noted that the CA Attachment concluded that the motor stator air cooler did not constitute a valid oil leakage point and that the amounts of accumulated oil or oil from potential oil seal leakage were insignificant. The inspectors provided the licensee's CAP documentation to the NRC Region II Division of Reactor Safety (DRS) fire protection inspectors for review. Additional review was performed by fire protection engineers within HRC headquarters. These reviews determined that:

- The NEI industry paper on RCP lube oil collection has not been endorsed by the NRC,
- The listing of leakage points in Appendix R, Section III.O, is not an all inclusive list, and
- The RCP motor stator air coolers are a valid leakage point.

The inspectors concluded that the licensee's corrective actions were not adequate to resolve the concern regarding compliance with Appendix R, Section III.O, and that the problem involved Units 1 and 2. The licensee's fire protection program is required by North Anna Power Plant Facility Renewed Operating License NPF-4 & 7, Condition D, Fire Protection, which states in part that VEPCO shall implement and maintain in effect all provisions of the approved Fire Protection Program as stated in the UFSAR of which section 9.5.1.1 includes 10 CFR 50, Appendix R, Section III.O.

Analysis: The inspectors determined that the failure to design and install an adequate oil collection system which included provisions for the RCP motor stator air coolers was a performance deficiency. This finding had a credible impact on safety because the inadequate installation and design of the oil collection systems 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 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 protection against external factors such as a fire. The inspectors reviewed IMC 0609, Appendix F, with DRS inspectors and determined the finding was of very low safety significance (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 defense-in-depth features such as automatic fire detection, manual suppression capability, and safe shutdown capability from the main control room. This finding involved a legacy issue associated with a modification for original installation; therefore, there are no assigned cross-cutting aspects.

Enforcement: North Anna Power Plant Facility Renewed Operating License NPF-4 & 7, Condition D, Fire Protection, states in part that VEPCO shall implement and maintain in effect all provisions of the approved Fire Protection Program as stated in the UFSAR of which section 9.5.1.1 includes 10 CFR 50, Appendix R, Section III.O, which requires in part that the RCP shall be equipped with an oil collection system which shall be so installed that failure will not lead to fire during normal or design basis accident conditions and such collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems. Contrary to the above, on March 8, 2009, the licensee failed to adequately design and install an adequate oil collection system that was capable of collecting oil from unpressurized leakage sites which included the RCP motor stator air coolers. Because the finding is of very low safety significance and has been entered into the licensee's CAP as CR325879, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000338, 339/2009004-06, Failure to Adequately Design and Install Oil Collection Devices for Reactor Coolant Pump Motor Stator Air Coolers.

3. Annual Sample: Review of CR332636, 'B' RSST Tripped and Locked Out on 'B' Phase Fault

a. Inspection Scope

The inspectors performed a review regarding the licensee's assessments and corrective actions for CR332636, "The 'B' RSST tripped and locked out on a 'B' phase fault," to

ensure that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors also evaluated the CR against the requirements of the licensee's CAP as specified in procedure, PI-AA-200, "Corrective Action Program," Revision 8, and 10 CFR 50, Appendix B.

b. Findings and Observations

Failure to Determine Cause and Related Corrective Action Results in Loss of a Required Offsite Power Supply

Introduction: A self-revealing finding was identified for the licensee's failure to comply with the standards established in their 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).

Description: On March 7, 2007, a fault occurred on a non-safety, phase B cable from the 'B' reserve station service transformer (RSST) to the Unit 1, 1B station service bus (SSB). This resulted in a lockout of the 'B' RSST, loss of power to the 2H emergency bus, and auto start of the 2H EDG. Unit 2 remained at full rated thermal power during the event. The 'B' RSST provides alternate power to the Unit 1 and 2 'B' SSBs via non-safety cables that are routed over the top of the turbine building. The licensee initiated a significance level 2 CR 008355, completed root cause evaluation (RCE) 000031, and assigned nine CAPRs for the event.

On April 28, 2009, a fault occurred on a non-safety, phase B cable from the 'B' RSST to the Unit 2 2B SSB. The impact on the station was similar to the 2007 cable fault as well as the location of the fault, and the licensee initiated RCE000978 for this event.

The inspectors reviewed RCE000031 from the 2007 event which stated the root cause as: "A failure to detect damage during original construction installation resulted in a hole in the cable jacket allowing moisture intrusion, which resulted in corrosion and then breakage of the zinc shield tape." The inspectors also reviewed the cable failure analysis report (Attachment 4 to RCE000031) provided by the cable vendor, and an independent assessment, initiated by CAPR000137, of the failure analysis report. The inspectors noted both reports included pictures of cable sections adjacent to the fault area which clearly showed indications of corrosion but also showed separation of the zinc shield tape and consequent cracking of the tape. Additionally, the cable vendors report concluded: "The slippage of the cable in the grip resulted in the tearing of the cable jacket and movement of the zinc shielding tape enough to open the tape laps in this area. The compromised jacket allowed moisture ingress, which over a long period of time corroded the underlying zinc tape. The corrosion and cracking of the zinc tape eventually caused the tape to lose continuity, and the electrical ground was lost in this section of the shield. The floating (ungrounded) shield on one side of the failure resulted in high electrical stress between it and the grounded side. Tracking and burning of the underlying insulation was initiated and over time (probably years) eroded the insulation from the outside inward towards the conductor. Failure eventually occurred."

The inspectors then reviewed RCE000978 and noted that the licensee characterized the root cause as: "The vertical support design does not properly secure and distribute the

weight of the cable in the vertical direction. The cable is allowed to slip in its supports creating an unevenly distributed load that places excessive mechanical stress under the upper Kellems [cable support components used for vertical cable runs]. This mechanical stress is transferred onto the helically wound zinc shield tape, which over time causes the zinc shield tape to unwind, stretch, crack, and eventually break, leading to a loss of cable insulation shielding function opposite the grounded Kellems grips. Loss of insulation shielding function creates areas of electrical stress sufficient for partial discharge, surface tracking, and burning, leading to erosion of the dielectric, and finally arcing.”

The inspectors noted that at the time of the 2007 event the licensee implemented their CAP via procedures, VPAP-1601, Revision 22, “Corrective Action,” and VPAP-1501, Revision 17, “Deviations.” The inspectors reviewed the licensee’s CAP relative to the treatment of non-safety components and noted the following:

- VPAP-1601, step 2.1 states: “This procedure addresses conditions determined to be adverse to quality as defined in VPAP-1510, “Deviations.”
- VPAP-1501, step 4.8, “Condition Adverse To Quality,” states: “An all-inclusive term used in reference to any of the following: failures, malfunctions, deficiencies, deviations, defective hardware, and non-conformances to Non-Safety Related items (NS), Non-Safety Related Quality, or Nuclear Safety Related equipment, programs, or process.
- VPAP-1601, step 4.29, “Significant Condition Adverse to Quality,” states: “A Condition Adverse to Quality that has, or if left uncorrected could have, an undesirable effect on plant safety, regulatory position, or environmental impact. Because of the high regulatory or safety consequences associated with this type of condition the cause of the condition must be determined and corrective action taken to preclude repetition.”

Based on interviews with the licensee and the CAP procedures noted above, if a condition report is initiated for a significant condition adverse to quality (SCAQ), then a cause evaluation is assigned (typically a RCE), the RCE identifies CAPRs, and a management review and approval of the RCE and related CAPRs is performed.

The inspectors concluded that the licensee failed to determine the correct cause in RCE000031 for the 2007 event and, consequently, failed to initiate CAPRs for a SCAQ to comply with the standards established by procedures VPAP-1601, which resulted in the 2009 event. The inspectors noted that the CAPRs initiated by RCE000978 involved the replacement of all non-safety cables between the plant’s RSSTs and SSBs.

Analysis: The inspectors determined that the failure to determine the correct cause with resultant CAPRs for a SCAQ was contrary to the requirements of the licensee’s CAP procedures and was, therefore, a performance deficiency. The inspectors also 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.

Enforcement: Enforcement action does not apply because the finding did not involve a violation of regulatory requirements. VPAP-1601 defines a SCAQ as “A Condition Adverse to Quality that has, or if left uncorrected could have, an undesirable effect on plant safety, regulatory position, or environmental impact. Because of the high regulatory or safety consequences associated with this type of condition the cause of the condition must be determined and corrective action taken to preclude repetition.” Contrary to the above, on March 7, 2007, the licensee failed to determine the correct cause and related CAPRs for a SCAQ which resulted in a repeat occurrence of the loss of an offsite power supply to the 2H emergency bus on April 28, 2009. Because this finding does not involve a violation of regulatory requirements, has very low safety significance, and has been entered into the licensee’s CAP as CR332636, it is identified as FIN 05000339/2009004-07, Failure to Determine Cause and Related Corrective Action Results in Loss of a Required Offsite Power Supply.

4OA3 Event Followup

.1 (Closed) Licensee Event Report (LER) 05000339/2009-001-00 Automatic Start of 2H EDG Due to Loss of ‘B’ RSST

On April 28, 2009, a fault occurred on a non-safety, phase B cable from the ‘B’ RSST to the Unit 2 2B SSB. This resulted in a lockout of the ‘B’ RSST, loss of power to the 2H emergency bus, and an automatic start of the 2H EDG. The issue and enforcement aspects of this event are discussed in section 4OA2.3 of this report. This LER is closed.

.2 Event Notification #45013 - Retraction

a. Inspection Scope

On April 22, 2009, at approximately 0500 hours, Operations personnel identified a strong odor in the North Anna Unit 1 Cable Vault area. Investigation identified that the odor was coming from circuit breaker 01-EE-BKR-1J1-2S-J1 associated with the ‘D’ Control Rod Drive Mechanism fan (1-HV-F-37D). At 0506, an operator identified breaker 1J1-2S-J1 as having a hot enclosure door and a slight discoloration above the enclosure door. The Shift Manager was at the breaker and directed the breaker to be manually opened. A small flame was observed when the enclosure door was opened. The fire was extinguished within 1 minute of observing the flame. The Shift Manager notified the control room of the fire, that it was extinguished, and established a fire watch. On return to the control room the Shift Manager and the Shift Technical Advisor reviewed the Emergency Procedures for Event Classification entry conditions. The Shift Manager determined that no event classification entry conditions were reached.

On April 23, 2009, the licensee made an event notification (Event Notification #45013) of a discovery of an after-the-fact emergency condition of an Alert classification due to fire damage to safety-related breaker.

On July 9, 2009, the licensee retracted the notification made to the NRC on April 23, 2009. Subsequent reviews by the licensee determined that the "Initiating Conditions" for the Emergency Action Level (EAL) associated with the declaration was not met and the event was not required to be classified. The licensee wrote a corrective action condition report, CR340893, to document the retraction and to have Emergency Planning evaluate additional emergency classification awareness training for key ERO members.

The inspector discussed the breaker fire with operations, maintenance, training, emergency planning, and licensing personnel to gain an understanding of the event and assess follow-up actions. The inspector reviewed Shift Managers actions taken in accordance with licensee procedures and the follow-on actions taken by the licensee to include the retraction of the alert classification notification to the NRC. The inspector determined that the Shift Manager's determination of "no classification was necessary" was the accurate and timely. The inspector reviewed EAL training presented in operator requalification training and determined the training was satisfactory. The operations personnel demonstrated by their actions and in discussion the understanding that the initiating condition, the plant operating mode, the EAL thresholds, and the EAL basis are considered when making a classification determination. The EAL basis training provided to the operations personnel provided an understanding of the EALs for those situations when conditions would not allow time to reference the basis document. Operations personnel know if time permits that reference to the basis can be made by operations and other decision makers. Documentation reviewed within this inspection area is listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.3 Broken Fuel Rod in AREVA Fuel Assembly 5K9

a. Inspection Scope

The inspectors reviewed the licensee's actions taken on September 15, 2009, in response to broken fuel rod in fuel assembly 5K9 which occurred during vendor operations to extract the rod for failed fuel analysis. The inspectors interviewed operations, engineering, and licensee management personnel to obtain an understanding of the event and assess follow-up actions. The inspectors reviewed operator actions taken in accordance with licensee procedures and reviewed unit and system indications to verify that actions and system responses were as expected. The inspectors also reviewed the initial licensee notifications to verify that the requirements specified in NUREG-1022, Event Reporting Guidelines were met.

b. Findings

No findings of significance were identified.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with the licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

b. Findings

No findings of significance were identified.

.2 Review of the Operation of an Independent Spent Fuel Storage Installation (ISFSI) (Inspection Procedure 60855.1)

a. Inspection Scope

The inspectors monitored the transport of a NUHOMS design cask from the fuel building to the ISFSI. The inspectors reviewed licensee cask loading and handling procedures, and reviewed previous cask loading and ISFSI related plant issues and corrective action status.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On October 20, 2009, the resident inspectors presented the inspection results to Mr. Daniel Stoddard and other members of the staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Emergency Preparedness Baseline Exit Meeting

On July 10, 2009, the lead inspector presented the inspection results to Mr. Daniel Stoddard and other members of his staff. The inspector confirmed that proprietary information was not provided during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

Enclosure

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

W. Anthes, Manager, Nuclear Maintenance
D. Blakeney, Nuclear Oversight Manager
J. Breeden, Supervisor, Radioactive Analysis and Material Control
J. Collins, Emergency Preparedness Manager
R. Evans, Manager, Radiological Protection and Chemistry
E. Hendrixson, Director, Nuclear Safety and Licensing
T. Huber, Director, Nuclear Engineering
S. Hughes, Manager, Nuclear Operations
P. Kemp, Supervisor, Station Licensing
L. Lane, Plant Manager
G. Lear, Manager, Organizational Effectiveness
T. Maddy, Manager, Nuclear Protection Services
G. Marshall, Manager, Nuclear Outage and Planning
C. McClain, Manager, Nuclear Training
F. Mladen, Manager, Nuclear Site Services
B. Morrison, Supervisor Nuclear Engineering
M. Olin, Emergency Preparedness Site Supervisor
J. Scott, Supervisor, Nuclear Training (Operations)
P. Serra, Emergency Preparedness Fleet Manager
D. Stoddard, Site Vice President

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

05000338, 339/2009004-01 URI Control of Transient Combustibles (Section 1R05.1)
05000338, 339/2009004-02 URI Fire Brigade Performance (Section 1R05.2)
05000338/2009004-04 URI LHSI/ORS Pump Discharge Piping Interference (Section 1R15.2)

Closed

05000338/2009003-01 URI Degradation of a Flood Protection Feature (Section 1R15.1)
05000339/2009-001-00 LER Automatic Start of 2H EDG Due to Loss of 'B' Reserve Station Service Transformer (Section 4OA3.1)

Opened and Closed

05000339/2009004-03 FIN Degradation of a Flood Protection Feature (Section 1R15.1)

05000338/2009004-05	NCV	Preconditioning of the Low Head Safety Injection Motor Operated Valves (Section 1R22)
05000338, 339/2009004-06	NCV	Failure to Adequately Design and Install Oil Collection Devices for Reactor Coolant Pump Motor Stator Air Coolers (Section 4OA2.2)
05000339/2009004-07	FIN	Failure to Determine Cause and Related Corrective Action Results in Loss of a Required Offsite Power Supply (Section 4OA2.3)

Discussed

None

LIST OF DOCUMENTS REVIEWED

Section 1R22: Surveillance Testing

- WO 59101678405, 1-SI-MOV-1862A, 'A' LHSI Pump Suction from Refueling Water Storage Tank
- WO 59101678425, 1-SI-MOV-1864A, 'A' LHSI Pump Discharge to Cold Legs
- WO 59101678509, 1-SI-MOV-1885A, 'A' LHSI Pump Recirculation Valve
- WO 59101678519, 1-SI-MOV-1885C, 'A' LHSI Pump Recirculation Valve
- Plant Issue N-1997-1412 was issued for preconditioning concerns regarding air start solenoid valves for the EDGs.
- Plant Issue N-1998-3977 was issued to review IN 97-16 as operating experience.
- Nuclear Oversight Audit Report 01-04, "Technical Specifications & License Requirements," dated January 23, 2001
- Procedure, VPAP-1101, Revision 5, "Test Control"
- Plant Issue N-2006-0864, initiated for an NRC identified issue regarding no evaluation for preconditioning of turbine driven auxiliary pump bearings

Section 1EP2: Alert and Notification System Testing

Procedures and Manual

- 0-PT-172.2, Early Warning System Sirens Activation Monitoring, Revision 4
- 0-PT-172.3, Early Warning System Polling Function Test, Revision 1
- Emergency Warning System (EWS) North Anna/Surry, Revision H
- WPS2800 Series High Power Voice & Siren System, 2001

Records and Data

- 0-PT-172.3, Early Warning System Polling Function Tests, 08/01/2007 to 06/21/2009
- 0-PT-172.2, Early Warning System Sirens Activation Monitoring, 08/15/2007 to 05/20/2009
- North Anna EWS Test Form Telecommunications Operability Testing Quarterly Siren Maintenance June 2007 to June 2009
- North Anna EWS Test Form Telecommunications Operability Testing Annual Siren Maintenance, 4th Quarter 2008

Section 1EP3: Emergency Response Organization (ERO) Augmentation

Procedures

- VPAP-2601, Maintaining Emergency Preparedness, Revision 16
- EPIP-3.05, Augmentation of Emergency Response Organization (With no Attachments), Revision 4
- 0-PT-114, Emergency Kit Inspection, Revision 24

Records and Data

- Augmentation Capability Assessment Emergency Response Organization, 08/14/2007
- Augmentation Capability Assessment Emergency Response Organization, 10/18/2007
- Augmentation Capability Assessment Emergency Response Organization, 02/26/2008
- Augmentation Capability Assessment Emergency Response Organization, 06/23/2008
- Augmentation Capability Assessment Emergency Response Organization, 08/26/2008
- Augmentation Capability Assessment Emergency Response Organization, 12/09/2008
- Augmentation Capability Assessment Emergency Response Organization, 02/10/2009
- Augmentation Capability Assessment Emergency Response Organization, 05/07/2009
- Review of quarterly Emergency Kit inspections 06/2007 - 06/2009
- Review of ERO position qualifications for selected individuals

- Functional Exercise, 06/24/2008
- Proficiency Exercise, 10/21/2008
- Emergency Exercise, 11/27/2007

Section 1EP4: Emergency Action Level (EAL) and Emergency Plan Changes

Change Packages for Plans and Procedures

- North Anna Power Station Emergency Plan, Revisions 34 and 35
- NAPS Emergency Action Level Matrices (Hot and Cold), Revisions 0 and 1
- EPIP-1.01, Emergency Manager Controlling Procedure, Revision 44
- EPIP-1.02, Response to Notification of Unusual Event, Revision 14
- EPIP-1.03, Response to Alert, Revision 17
- EPIP-1.04, Response to Site Area Emergency, Revision 17
- EPIP-1.05, Response to General Emergency, Revision 19
- EPIP-1.06, Protective Action Recommendations, Revision 8
- EPIP-2.01, Notification of State and Local Governments, Revisions 32 and 33
- EPIP-2.02, Notification of NRC, Revision 19

Section 1EP5: Correction of Emergency Preparedness Weaknesses and Deficiencies

Audits and Self-Assessments

- Nuclear Oversight Audit 08-02: Emergency Preparedness
- SAR000220, Emergency Response Organization data Self-Assessment, 08/28/2007
- SAR000243, Emergency Response Facilities & Equipment Follow-up Assessment, 01/10/2008
- SAR000671, NRC Inspection Readiness Review, 05/27/2009

Condition Reports

- CR017451, Disconnect/reconnects during Unit 1 ERDS 0-PT-172.5
- CR018362, Protective Action Recommendation (PAR) procedure completed after-the-fact
- CR022762, Augmentation capability Assessment completed with administrative issues
- CR024486, Location of OSC and TSC accountability card readers
- CR024511, Documented classification time not consistent with declaration time
- CR025625, Understanding of accountability process appears to be lacking
- CR028689, Self-assessment SAR000243 results for North Anna
- CR090261, Unsat EP Performance Indicators
- CR097239, ERO OSC Director position staffing level falls below minimum requirement
- CR106278, Additional classification of site area emergency during exercise
- CR117297, NEI 99-01 EAL changes required
- CR317451, AFWPT Exhaust Rad Monitor NOUE set point has potential to cause nuisance alarms
- CR336791, Transfer of EAL problems and resolutions to entire group of decision makers
- CR340893, Retraction of Alert Notification on April 23, 2009
- CR340970, 2009 EP inspection Observations

Section 4OA1.2: Performance Indicator (PI) Verification

Procedures

- DNAP-2605, Emergency Preparedness Performance Indicators, Revision 8

Records and Data

- Documentation of DEP opportunities: April 1, 2008 thru March 31, 2009
- Drill and exercise participation records of ERO personnel: April 1, 2008 thru March 31, 2009

- Siren testing data: April 1, 2008 thru March 31, 2009

Section 40A3.2: Event Followup

Documents and Procedures

- Safety Evaluation for EAL change to NEI 99-01, Revision 4
- Event Notification #45013, April 23, 2009 and July 7, 2009
- North Anna Power Station Emergency Action Level Technical Bases Document, Revision 1
- Additional Potential Disconnects or Ambiguities in the EAL Matrix, Morse Olin, 5/6/2009
- Operator Training Lesson Plan, Emergency Action Levels
- North Anna Power Station Emergency Plan, Revision 35
- NAPS Emergency Action Level Matrices (Hot and Cold), Revision 1
- EPIP-1.01, Emergency Manager Controlling Procedure, Revision 44
- EPIP-1.03, Response to Alert, Revision 17

Condition Reports

- CR331819, Breaker 1J1-2S J1 (1-HV-F-37D CRDM fan) smoldering, breaker is quarantined
- CR332074, 1 hour report made to NRC for not classifying alert on 1-HV-F-37D fire
- CR332993, Information concerning 1J1-2S J1 breaker from Root Cause Evaluation team

Corrective Action (CA)

- CA134297, Emergency Planning to evaluate call for 1-EE-BKR-1J1-2S J1 found smoldering
- CA134471, Operations to document the fire team response and recommend action
- CA135644, Ensure policy for sounding the fire alarm and calling out the fire team understood
- CA135907, Engineering to revise OD000291 with information received from Innsbrook
- CA136561, Submit FAQ to NRC on Open Item 214
- CA136617, Initiate a revision to NAPS EAL HA2.1
- CA136618, Initiate a proposal for prior NRC review to revise NAPS EAL HA2.1
- CA136619, Document review of the non-complementary IC and EAL content
- CA136620, Monitor NEI working group's efforts to modify NEI 99-01
- STCA000214, Interim Action - perform thermography on breaker cubicles
- ACE017553, Emergency Planning to evaluate ambiguities in the EAL classification

Operability Determination (OD)

- OD000291, Evaluate degradation of breaker enclosure material

Root Cause Evaluation (RCE)

- RCE000976, 1-EE-BKR-1J1-2S J1 found smoldering
- Interim Report, Root Cause 976, May 14, 2009

LIST OF ACRONYMS

ADAMS	Agencywide Document Access and Management System
CA	Corrective Action
CAP	Corrective Action Program
CAPR	Corrective Action to Preclude Repetition
CFR	Code of Federal Regulations
CR	Condition Report
DC	Design Change
EAL	Emergency Action Level
EDG	Emergency Diesel Generator
IMC	Inspection Manual Chapter
IP	Inspection Procedure
JPM	Job Performance Measures
LHSI	Low Head Safety Injection
MOV	Motor Operated Valve
NCV	Non-cited Violation
NRC	Nuclear Regulatory Commission
OD	Operability Determination
PARS	Publicly Available Records
PI	Performance Indicator
QS	Quench Spray
RCE	Root Cause Evaluation
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RSST	Reserved Station Service Transformer
RTP	Rated Thermal Power
SCAQ	Significant Condition Adverse to Quality
SDP	Significance Determination Process
SR	Surveillance Requirements
SSB	Station Service Bus
SSC	Systems, Structures, and Components
SW	Service Water
TDAFWP	Turbine Driven Auxiliary Feedwater Pump
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VEPCO	Virginia Electric and Power Company
VPAP	Virginia Power Administrative Procedure
WO	Work Order