UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

January 29, 2007

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

SUBJECT: NORTH ANNA POWER STATION - NRC INTEGRATED INSPECTION REPORT NOS. 05000338/2006005, 05000339/2006005 AND 07200016/2006003

Dear Mr. Christian:

On December 31, 2006, the United States 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 January 17, 2007, with Mr. Dan Stoddard and other members of your staff.

The inspections examined activities conducted under your licenses as they relate 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.

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

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

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/

Eugene F. Guthrie, Chief
Reactor Projects Branch 5
Division of Reactor Projects

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

Enclosure: Inspection Reports 05000338/2006005, 05000339/2006005 and 07200016/2006003 w/Attachment: Supplemental Information

cc w/encl: (See page 3)

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,

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Letter to David A. Christian from Eugene F. Guthrie dated January 29, 2007

SUBJECT: NORTH ANNA POWER STATION - NRC INTEGRATED INSPECTION REPORT NOS. 05000338/2006005, 05000339/2006005 AND 07200016/2006003

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U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-338, 50-339

License Nos.: NPF-4, NPF-7

Report Nos.: 05000338/2006005, 05000339/2006005

Licensee: Virginia Electric and Power Company (VEPCO)

Facilities: North Anna Power Station, Units 1 & 2

Location: 1022 Haley Drive
Mineral, Virginia 23117

Dates: October 1, 2006 - December 31, 2006

Inspectors: J. Reece, Senior Resident Inspector
G. Wilson, Resident Inspector

Approved by: Eugene Guthrie, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000338/2006-005, IR 05000339/2006-005; 10/01/2006 - 12/31/2006; North Anna Power Station Units 1 & 2. Fire Protection, Maintenance Effectiveness, and Surveillance Testing.

The report covered a three-month period of inspection by the resident inspectors. One NRC-identified and two self-revealing Green findings were identified. These 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). 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 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

Green. A Green, self-revealing, non-cited violation of Technical Specification 5.4.1.a was identified for inadequate maintenance work which resulted in the failure of a control room chiller on October 12, 2006. The licensee initiated action to evaluate the problem, perform an extent of condition review, and determine the appropriate corrective actions.

This finding is more than minor due to the impact on the Mitigating Systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences and its attribute of procedure quality. The finding is of very low safety significance because it did not result in a loss of operability due to a design or qualification deficiency, did not represent an actual loss of safety function, and was not potentially risk significant due to possible external events. The cause of this finding involved the cross-cutting area of human performance. (Section 1R12)

Green. The inspectors identified a Green, non-cited violation of the Fire Protection Program because the licensee's assessment of a fire brigade drill was inadequate. Fire brigade performance was not accurately critiqued to identify deficiencies requiring corrective action. The licensee entered this problem into their corrective action program for appropriate action.

This finding is more than minor because it had a high negative impact or degradation on the ability of the fire brigade to effectively carry out its manual fire fighting control and suppression function. This finding was of very low safety significance because the observed crew was only one of four crews of the site fire brigade team, and that the overall condition of the fire detection and suppression systems had been satisfactory. The cause of the finding is related to the cross-cutting area of problem identification and resolution. (Section 1R05.1)

Cornerstone: Barrier Integrity

Green. A Green, self-revealing non-cited violation of 10 CFR 50, Appendix B, Criterion XVI was identified as a result of inadequate corrective action to upgrade the operating mechanism for a Unit 2 Quench Spray pump breaker. The licensee initiated corrective actions that involved replacement of the breaker with an upgraded spare breaker and extent of condition review.

The failure to implement corrective action had a credible impact on safety due to the impact on the component's accident response time which exceeded the analyzed value. The finding is more than minor because it affected the mitigating system cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences and the related attribute of equipment performance. The finding was of very low safety significance (Green) in that it did not result in a loss of operability due to a design or qualification deficiency, did not represent an actual loss of safety function, and was not potentially risk significant due to possible external events. The cause of this finding involved the cross-cutting area of problem identification and resolution. (Section 1R22)

B. Licensee-Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Unit 1 began the inspection period at 100 percent rated thermal power (RTP). On November 12, 2006, the unit shut down to implement repairs for leaks on the pressurizer manway and the secondary manway on 'A' steam generator (SG). The unit resumed full RTP operation on November 17, 2006, and continued at this power level for the remainder of the reporting period except for small power reductions to perform periodic testing.

Unit 2 began the inspection period at 100 percent RTP. An automatic initiated reactor trip occurred on November 16, 2006, following failure of a 7300 System card associated with "B" SG, Channel III, steam flow. Unit 2 returned to full RTP operation on November 18, 2006, and continued at this power level for the remainder of the reporting period except for small power reductions to perform periodic testing.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed the licensee's seasonal adverse weather preparations for cold weather operations specified in 0-GOP-4.2, "Extreme Cold Weather Operations," and 0-GOP-4.2A, "Extreme Cold Weather Daily Checks", and the licensee's correction action data base for cold weather related issues. The inspectors walked down the three risk-significant areas listed below to verify compliance with the procedural requirements and to verify that the specified actions provided the necessary protection for the structures, systems, or components.

- Unit 1 & 2 Emergency Diesel Generator Rooms ,
- Unit 1 & 2 Auxiliary Feedwater Rooms, and
- Unit 1 & 2 Casing Cooling Rooms.

Additionally, the inspectors performed a site specific weather related inspection due to anticipated adverse weather conditions. During November 2006, the licensee entered abnormal procedure, AP-41, "Severe Weather Conditions," for an adverse weather forecast. Specifically, on November 16, 2006, the inspectors reviewed the licensee response to an anticipated tornado watch at the plant site which was expected to bring heavy winds and rains to the area.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

.1 Partial System Walkdowns

a. Inspection Scope

The inspectors conducted three equipment alignment partial 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 system 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 1 recirculation spray pump, 1-RS-P-2B, during relay testing on 1-RS-P-2A;
- Unit 2 safety injection pump, 2-SI-P-1B, during planned maintenance on 2-SI-P-1A; and,
- Unit 1 1J emergency diesel generator (EDG) during planned maintenance on 1H EDG.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed walkdown and inspection of the Unit 1, 1J EDG and related components to assess proper alignment and to identify discrepancies that could impact its availability and functional capacity. The inspection also included a review of the alignment and the condition of support systems including fire protection, room ventilation and emergency lighting. Equipment deficiency tags were reviewed and the condition of the system was discussed with engineering personnel. The operating procedures, drawings and other documents utilized and reviewed as part of the inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Drill

a. Inspection Scope

During a fire protection drill on November 28, 2006, at the fuel oil pump house, 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 protective clothing, the effectiveness of communications, and the exercise of command and control by the scene leader. The inspectors also assessed the acceptance criteria for the drill objectives and reviewed the licensee's corrective action program for recent fire protection issues. Documents reviewed are listed in the Attachment to this report.

b. Findings

Introduction: A Green non-cited violation (NCV) was identified by the NRC regarding the failure to identify performance deficiencies during a fire post-drill critique contrary to the Fire Protection Program requirements.

Description: On November 28, 2006, the inspectors observed a fire drill and the post-drill critique to evaluate the fire brigade performance and the ability of the evaluation team to identify performance deficiencies. The inspectors determined that, while the evaluation team identified some deficiencies, several significant deficiencies were not identified. These inspector observed deficiencies included:

- A Fire Brigade Member (FBM) entered a fire area with their SCBA face mask hose disconnected contrary to training requirements. The other team members and evaluators failed to identify this during the drill. The inspectors noted that during the critique, the FBMs were given the opportunity to self-critique their performance and this deficiency was not mentioned. Rather than note the deficiency as unsatisfactory performance, the item was noted as "needs improvement" by the evaluators after it was identified by the inspector.
- During the time the 2nd team entered the fire area, the 1st team was removing their safety gear and was therefore not readily available for backup contrary to training requirements. Additionally, the Fire Brigade Leader never briefed the teams with respect to backup team responsibility and/or expectations.

The inspectors reviewed Fire Protection Maintenance Procedure, 0-FPMP-10.0, "Conduct of Fire Drills," and determined that the acceptance criteria does not directly relate to the critique evaluation forms (a procedure attachment) listing the performance criteria, i.e., the procedure does not state what unsatisfactory performance criteria would result in the acceptance criteria not being met. North Anna Power Plant Facility Renewed Operating License NPF-4 & 7, Condition D, Fire Protection, stated in part that VEPCO shall implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR for the facility. UFSAR section 9.5.1,

Fire Protection System, stated in section 9.5.1.1, "The station's fire protection program satisfies the regulatory criteria set forth in General Design Criterion 3, in 10 CFR 50 Appendix R (Sections III.G, III.J, and III.O), and in Appendix A to Branch Technical Position (BTP) APCSB 9.5-1." One of the ways the station's program for fire protection complies with these criteria is Virginia Power administrative procedure, VPAP-2401, "Fire Protection Program." In this procedure section 6.7.12 b., "Drill Evaluation," stated that each planned drill shall be monitored and critiqued; and section 6.7.11, "Fire Brigade Training Program," of this procedure stated that the fire brigade training program shall ensure that the capability to fight potential fires is established and maintained.

Analysis: The inspectors determined that the failure to identify deficiencies in the post-drill critique was a performance deficiency because the requirements of the fire protection program were not met. The inspectors performed an analysis of the unsatisfactory fire drill performance using Inspection Manual Chapter (IMC) 0609, Significance Determination Process, Appendix F, and determined that the finding was more than minor due to a high negative impact or degradation on the ability of the fire brigade to effectively carry out its manual fire fighting control and suppression function. This was based on the fire brigade members not performing satisfactorily as a team and general weaknesses associated with the fire fighting equipment deployment that were not identified during the drill critique. The inspectors determined that the finding was of very low safety significance (Green) because the observed crew was only one of four crews of the site fire brigade team, the other crews had no known problems and that the overall condition of the fire detection and suppression systems had been satisfactory. This finding involves the cross-cutting area of problem identification and resolution, the related component of self and independent assessments, and the aspect of appropriate self-assessment.

Enforcement: North Anna Power Plant Facility Renewed Operating License N.F.-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 described in the UFSAR for the facility. Contrary to this, on November 28, 2006, the licensee failed to implement the fire protection program when fire brigade performance deficiencies were not identified during the post-drill critique. Because the finding is of very low safety significance and because it has been entered into the licensee's corrective action program as Condition Report CR005708, this violation is being treated as a Green NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000338, 339/2006005-01, Failure to Identify Unsatisfactory Performance of a Fire Brigade Crew.

.2 Fire Area Tours

a. Inspection Scope

The inspectors conducted tours of the nine areas listed below and 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." 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.

- Charging Pump Cubicle 1-1B (fire zone 11Ba / CPC-1B)
- Turbine Building (includes Chiller Rooms and Z-21B, Z-21C, Z-22, Z-34, Z-35, Z-36, Z-46B) (fire zone 8a / TB)
- Emergency Diesel Generator 2J Unit 2 (fire zone 9B-2a / EDG-2J)
- Fuel Oil Pump Room - Motor Control Center Room (fire zone 10C / MCC)
- Auxiliary Building (includes Z-18 and Z-20) (fire zone 11a / AB)
- Charging Pump Cubicle 1-1A (fire zone 11a / CPC-1A)
- Technical Support Center Battery Room (fire zone 46B / TSCBR)
- Emergency Diesel Generators 2H, Unit 2, and 1J, Unit 1 (fire zones 9A-2a / EDG-2H and 9B-1a / EDG-1J)
- Charging Pump Cubicle 2-1A, 2-1B, and 2-1C (fire zones 11Da / CPC-2A, 11Da / CPC-2B, 11Fa / CPC-2C)

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors assessed the internal flooding vulnerability of the Unit 1 and 2 Quench Spray Pump House basement and Safeguards Building areas with respect to adjacent safety-related areas to verify that the flood protection barriers and equipment were being maintained consistent with the UFSAR. This inspection spanned second, third and fourth quarters of 2006 due to ongoing licensee and regional NRC evaluations. The licensee's corrective action documents were reviewed to verify that corrective actions with respect to flood-related items identified in Plant Issues and Condition Reports were adequately addressed. The inspectors also reviewed the maintenance history and current open work orders for the sump level switches. The inspectors conducted a field survey of the selected areas to evaluate the adequacy of flood barriers, floor drains, sump level switches, and sump pumps to protect the equipment, as well as their overall material condition. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

The inspectors observed an annual licensed operator requalification simulator examination on October 3, 2006. The scenario, Simulator Examination Guide, SXG-65, involved a loss of power range monitor N44, a small SG tube leak requiring entry into abnormal procedure AP-24, subsequent increase in SG tube leakage requiring a reactor trip and cooldown, and a failure of a pressurizer level channel coincident with the reactor trip.

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 instructors and reviewed with the operators.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

The inspectors evaluated the two equipment issues listed below relative to the licensee's effectiveness of the related preventive and corrective maintenance programs and procedures. 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 VPAP 0815, "Maintenance Rule Program," and Engineering Transmittal CEP-97-0018, "North Anna Maintenance Rule Scoping and Performance Criteria Matrix."

- Maintenance issues concerning Unit 1 and 2 control room chillers and associated service water pump motors, 1 / 2- HV-P-22A, B, C; and,
- Maintenance issue concerning the B control room chiller, 1-HV-E-4B, as documented in Condition Report CR002426 and Plant Issue N-2006-0622.

b. Findings

Introduction: A Green, self-revealing, NCV of TS 5.4.1.a was identified for inadequate maintenance which resulted in the failure of a control room chiller.

Description: On October 12, 2006, the licensee attempted to place control room chiller, 1-HV-E-4B, in service; however, the chiller failed to start and was declared inoperable per TS 3.7.11. The inspectors reviewed licensee troubleshooting, which determined that the respective, safety-related supply breaker, 1-EE-BKR-1J1-A1, had tripped due to overheating caused by a loose 'A' phase load side field lead. The inspectors also reviewed the work history associated with this breaker and noted that a similar problem involving 'A' phase load side field lead damage was previously identified during breaker preventative maintenance on February 14, 2006. The inspectors further reviewed the affected maintenance procedure, 0-EPM-0304-01, Revision 46, "Testing/Replacing 480-Volt Breaker Assemblies," and determined that although the procedure had a step to reconnect the field leads to the breaker, the associated maintenance work resulted in an inadequate field lead connection for the 'A' phase on the same breaker two different times. Maintenance management indicated that, as part of their effort to include more details in procedures and to rely less on skill-of-the-craft, one of their corrective actions was to revise the applicable maintenance procedure.

Analysis: The inspectors determined that the inadequate maintenance that resulted in a breaker failure was a performance deficiency since the maintenance resulted in the inoperability of a TS required component. In accordance with Inspection Manual Chapter (IMC) 0612, the inspectors determined that the issue was more than minor due to the impact on 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 procedure quality. The inspectors evaluated this finding using IMC 0609, Appendix A and determined that it was of very low safety significance (Green), in that, it did not result in a loss of operability due to a design or qualification deficiency, did not represent an actual loss of safety function, and was not potentially risk significant due to possible external events. The cause of this finding involved the cross-cutting area of human performance, the related component of resources, and the associated aspect of complete documentation.

Enforcement: TS 5.4.1.a requires in part that written procedures shall be maintained and implemented covering the activities in the applicable procedures recommended by RG 1.33, Revision 2, Appendix A, February 1978, of which part 9.a. requires procedures for performing maintenance. Contrary to the above, on October 12, 2006, the licensee failed to adequately maintain and implement the maintenance procedure when inadequate maintenance resulted in failure of breaker, 1-EE-BKR-1J1-A1, which resulted in the inoperability of control room chiller, 1-HV-E-4B. This finding is of very low safety significance and is in the licensee's corrective action program as Condition Report CR002426 and CR005913; therefore, this violation is characterized as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000338/2006005-02, Inadequate Maintenance Results In Failure of Control Room Chiller.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

a. Inspection Scope

The inspectors evaluated, as appropriate, for six activities listed below: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an unforseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and (4) that 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 on the breaker for Unit 2 "A" QS pump motor during planned work associated with 2-BLD-DR-M54-14 (chiller room door), 2-SW-MOV-272A (value), switchyard, instrument racks, and "C" RSST on overhead lines
- Emergent work on 2-SI-MOV-2864B during planned testing as directed by Procedures 2-PT-44.7, 2-PT-57.1B, and 1-PT-82J
- Emergent work on the breaker for 0-AAC-DG-OM on October 31, 2006
- CR005497, Tagout of 1-FP-P-1 was not included in Safety Monitor model for current week. Maintenance Rule evaluation performed using Safety Monitor with 1-FP-P-1 unavailable; Maintenance Rule window duration and color unchanged
- Emergent work on 2-RC-PCV-2455A during planned work associated with 1-CW-P-1C, 1-SW-P-1A, and 2-PT-35.1.4 on November 8, 2006
- Unplanned work initiated by the plant transient from Unit 2 trip

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed six 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; (5) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation and the risk significance in accordance with the SDP. The inspectors' review included a verification that the operability determinations were made as specified by Procedure VPAP-1408, "System Operability."

- CR001990,"Small fuel leak on 2-EE-EG-2H. During conduct of 2-PT-82H fuel leak developed at the 50 minute point into the loaded run. 1DPS flowed from the 1C control side injector bushing. 12DPM flowed from the 12C control side injector bushing."
- CR002035,"2J EDG Coolant Leak on East Radiator. A 2 DPM Coolant leak was discovered on the East Radiator."
- CR002333,"License Renewal Visual Interior Inspection of Air Start Receiver 1-EG-TK-1HA. Visual boroscope inspection results did not meet the acceptance criteria needed to waive License."
- CR002783,"Design requirements revised without evaluation of existing plant equipment. During data processing and analysis for 1-PT-77.13A, it was identified that the PT did not reflect the values required by the latest design calculation (ME-0275 Addendum 00C, issued 7/31/2006)."
- CR002975, "Right hand fuse, FU1 in 2-EE-EG-04C, partially engaged in bottom fuse clip. FU1 for 2-EE-EG-2J Generator Voltage Regulator Control Circuit is partially engaged in bottom fuse clip."
- CR004403,"High COF observed during PMT testing on 1-SI-MOV-1885A. During MOV testing the Coefficient of Friction (COF) was observed to be approximately 0.22 which is above the assumed COF of 0.20 for NAPS MOV's."

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the completed permanent plant modification DCP 04-117, “Replacement of RWST Refrigeration Units,” which installed new refueling water storage tank (RWST) chillers. The inspectors conducted a field survey of the installation, discussed the desired improvement with system engineers, and reviewed the 10 CFR 50.59 Safety Review/Regulatory Screening, technical drawings, test plans and the modification package to assess TS implications.

b. Findings

No findings of significance were identified.

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 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 its safety function. The inspectors verified that these activities were performed in accordance with licensee procedure VPAP-2003, "Post Maintenance Testing Program."

- Procedure 1-PT-14.1, "Charging Pump 1-CH-P-1A," per Work Order (WO) 751919-01 to repair oil leak on 1-CH-P-1A.
- Procedure 0-MCM-0400-36, "Packing Adjustment of Air-Operated Valves While Not Tagged or Depressurized," Revision 1, and testing procedure 2-PT-213.24, "Valve Stoke Time Test (Partial)," per WO 760702-01 to adjust the packing on Unit 2 "B" main feed regulator valve.
- Procedures 0-MCM-0300-03, "Mov Packing Adjustment w/ Thrust Verification Testing," Revision 5, and 1-PT-213.8A, "Valve Inservice Inspection ("A" Train of Safety Injection System)," Revision 9, per WO 746387-01 to repack valve on backseat expect water (1-S1-MOV-1885A).
- Procedures 0-MCM-1209.01, Revision 3, "Removal and Installation of the Pressurizer Manway Cover," and 1-PT-46.21, "ISI System Leak Test," per WO 758514-01 to remove the manway for repairs (1-RC-E-2-Vessel).

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities

a. Inspection Scope

Unit 1 was shutdown for a forced outage on November 12, 2006, to implement repairs for leaks on the pressurizer manway and the secondary manway on 'A' SG. The inspectors used inspection procedure 71111.20, "Refueling and Outage Activities," to observe portions of the cooldown, maintenance activities, heatup and startup activities to verify that the licensee maintained defense-in-depth (DID) commensurate with the outage risk plan and applicable TS. The inspectors monitored licensee controls over the outage activities listed below. Documents reviewed are listed in the Attachment to this report.

- Licensee configuration management, including daily outage reports, to evaluate defense-in-depth commensurate with the outage safety plan and compliance with the applicable TS when taking equipment out of service.
- Installation and configuration of reactor coolant instruments to provide accurate indication and an accounting for instrument error.

- Controls over the status and configuration of electrical systems and switchyard to ensure that TS and outage safety plan requirements were met.
- Licensee implementation of clearance activities to ensure equipment was appropriately configured to safely support the work or testing.
- Decay heat removal processes to verify proper operation and that steam generators, when relied upon, were a viable means of backup cooling.
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.
- Reactivity controls to verify compliance with TS and that activities which could affect reactivity were reviewed for proper control within the outage risk plan.
- Heatup and startup activities to verify that TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant conditions. RCS integrity was verified by reviewing Reactor Coolant System (RCS) leakage calculations.

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 procedure, 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 the 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. The inspectors reviewed three in-service testing activities for a risk significant pump or valve as part of the surveillance activities:

In-Service Tests:

- 2-PT-71.2Q, “Unit 2 Motor Driven Auxiliary Feedwater (2-FW-P-3A) Pump Test”
- 2-PT-63.1A, “Unit 2 Quench Spray System - ‘A’ Subsystem”
- 1-PT-14.1, “Charging Pump 1-CH-P-1A”
- 1-PT-57.1A, “Unit 1 ”A” Low Head Safety Injection Pump Test”

Other Surveillance Tests:

- 1-PT-82.1, “1J EDG Slow Start Test”
- 1-PT-60.1A, “Containment Integrity Checklist - Inside Containment”

b. Findings

Introduction: A Green, self-revealing NCV of 10 CFR 50, Appendix B, Criterion XVI was identified as a result of inadequate corrective action to upgrade the operating mechanism for a Unit 2 quench spray (QS) pump breaker.

Description: On October 6, 2006, during performance of surveillance test, 2-PT-63.1A, "Quench Spray System- "A" Subsystem," the safety-related supply breaker, 2-EE-BKR-24H1-4, for the Unit 2 'A' QS pump, 2-QS-P-1A, initially failed to close during an attempt to start the pump, but subsequently closed approximately 10 seconds later. The inspectors reviewed the licensee's root cause evaluation (RCE) which determined that the delayed closing of 2-EE-BKR-24H1-4 was attributed to binding within the operating mechanism which consists of non-interlocking primary and secondary latches. The inspectors also noted that the RCE documented a Part 21 Notification, 2002-12-0, that reported several cases involving a failure of breakers to charge and/or close had occurred and that provided recommendations including upgrade of the operating mechanisms to interlocking primary and secondary latches. The inspectors also noted that the licensee originally determined that the Part 21 notification did not apply to them and therefore did not apply the recommendations. The inspectors reviewed the work history for 2-EE-BKR-24H1-4 and identified that on April 13, 2005, the licensee initiated Plant Issue N-2005-1408 which documented breaker 2-EE-BKR-24H1-4 as one of 21 circuit breakers with an operating history of one or more failures. The inspectors noted that one of the recommended corrective actions was "to initiate corrective actions and prioritization of work associated with the failure events." However, the inspectors determined that the licensee did not take timely action to perform this in that resolution item N-2005-1408-R8, "Electrical maintenance to work with Component Engineering and other departments, as needed, to develop and plan corrective actions for the list of breakers attached to N-2005-1408-R2 with a failure history," was not initiated until November 22, 2006. This was after the October 6, 2006, QS breaker event and over a year from when Plant Issue N-2005-1408 was initiated.

Analysis: The inspectors determined that the failure to take timely and adequate corrective action to preclude subsequent degraded performance of 2-EE-BKR-24H1-4 was a performance deficiency. The inspectors also determined that the finding had a credible impact on safety due to the additional time of approximately 10 seconds in conjunction with a time delay of 54.8 seconds resulted in the respective train response time exceeding the analyzed engineered safety feature response time of 57.8 seconds. The inspectors reviewed IMC 0612 and determined the finding is more than minor because it affected the mitigating system cornerstone objective of ensuring the availability, reliability and capability of systems that respond to initiating events to prevent undesirable consequences and the related attribute of equipment performance. The inspectors evaluated this finding using IMC 0609, Appendix A, and determined that it was of very low safety significance (Green) in that it did not result in a loss of operability due to a design or qualification deficiency, did not represent an actual loss of safety function, and was not potentially risk significant due to possible external events. The cause of this finding involved the cross-cutting area of problem identification and

resolution, the component of corrective action program, and the associated aspect of appropriate and timely corrective action.

Enforcement: 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires in part that conditions adverse to quality are promptly identified and corrected. Contrary to the above, the licensee failed to identify and implement corrective action as described by corrective action document, Plant Issue N-2005-1408, which subsequently resulted in a malfunction of a QS pump breaker on October 6, 2006. Since this finding is of very low safety significance and is in the licensee's corrective action program as Condition Report CR002130; this violation is characterized as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000339/2006005-03, Inadequate Corrective Action to Upgrade Breaker Operating Mechanism.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed two temporary plant modifications to verify that the modifications did not affect system operability or availability as described by the TS and UFSAR. In addition, the inspectors verified that the installation of the temporary modifications was in accordance with the work package, that adequate controls were in place, that procedures and drawings were updated, and that post-installation tests verified the operability of the affected systems.

The temporary plant modifications reviewed were:

- Temporary modification to inject stop leak compound into Unit 1 "A" SG Manway, per WO 757009-02, using procedure 1-MCM-1904.01, "On Line Leak Repair Using Contractor Leak-Sealing Methods," Revision 4.
- Temporary modification involving reducing seal injection flow to Unit 2 "A" Reactor Coolant Pump (RCP) seals from 6 gpm to 5 gpm.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

On November 15, 2006, the inspectors reviewed and observed the performance of a table-top drill that involved licensee emergency response during a security force on force drill using procedure 71114.07, Force on Force Exercise Evaluation. The inspectors assessed emergency procedure usage, emergency plan classification, notifications, and the licensee's identification and entrance of any problems into their

corrective action program. This inspection evaluated the adequacy of the licensee's conduct of the drill and critique performance. Drill issues were captured by the licensee in their corrective action program and were reviewed by the inspectors. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator Verification

a. Inspection Scope

Cornerstones: Initiating Events, Mitigating Systems and Barrier Integrity

During the period of development for Temporary Instruction (TI) 2515/169 "Mitigating Systems Performance Index (MSPI) Verification, inspection of some Performance Indicators (PIs) were suspended. The inspectors performed a review during performance of TI 2515/169 to ensure all required PIs had been appropriately reviewed prior to the year of suspension. The inspectors sampled licensee submittals for the PIs listed below for Unit 1 and Unit 2. The inspectors reviewed data from the licensee's corrective action program, maintenance rule records, operating logs and maintenance work orders for the periods listed below. The data was compared with that displayed on the NRC's public web site. The performance indicator method of assessment was compared with the guidelines contained in Nuclear Energy Institute NEI 99-02, "Regulatory Assessment Indicator Guideline," Revision 3, and the Performance Indicator Frequently Asked Questions (FAQ) list.

- Unplanned Scrams (3rd and 4th quarters, 2004)
- Scrams with Loss of Normal Heat Removal (3rd and 4th quarters, 2004)
- Reactor Coolant System Activity (3rd and 4th quarters, 2004)
- Unplanned power reductions (2nd, 3rd and 4th quarters, 2004)
- Safety System Functional Failures (2nd, 3rd and 4th quarters, 2004)
- Reactor Coolant System Leakage (2nd, 3rd and 4th quarters, 2004)

b. Findings

No findings of significance were identified. The performance indicators all remained in the licensee response band (Green).

4OA2 Identification and Resolution of Problems

.1 Daily Review

As required by Inspection Procedure 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 corrective action program. This review was accomplished by reviewing daily Plant Issues summary reports and periodically attending daily Plant Issue Review Team meetings.

.2 Semi-Annual Review to Identify Trends

a. Inspection Scope

The inspectors performed a review of the licensee's corrective action program and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues but also considered the results of daily inspector corrective action program item screening discussed in Section 4OA2.1. The review also included issues documented outside the normal correction action program in system health reports, corrective maintenance works orders, component status reports, site monthly meeting reports and maintenance rule assessments. The inspectors' review nominally considered the six-month period of July through December 2006, although some examples expanded beyond those date when the scope of the trend warranted. The inspectors' compared and contrasted their results with the results contained in the licensee's latest integrated quarterly assessment report. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy. Documents reviewed are listed in the Attachment to this report.

b. Assessment and Observations

No findings of significance were identified. In general, the licensee has identified trends and has appropriately addressed the trends with their CAP. On November 16, 2006, the licensee experienced a Unit 2 automatic reactor trip from 100 percent power as a result of "B" steam generator, channel III, steam flow indicator, 2-MS-FI-2484, failing low which caused a steam flow/feed flow mismatch and subsequent low-low steam generator level. The inspectors reviewed the licensee's cause determination which concluded that a 7300 System card, (2-MS-FM-2484A), within the flow indicator circuitry had failed due to age-related degradation (29 years of service). The inspectors performed a trend review for any other recent card failures relating to SG control parameters. When none were found within the previous 6 months, the inspectors expanded the scope to include the historical corrective action database and identified the following occurrences:

- Plant Issue N-1998-1739, 1-FWLC1498D level error due to failure of card C8-327 due to normal aging.

- Plant Issue N-2000-1505, Unit 1 team generator “B” feed flow /steam flow mismatch due to failure of loop power supply card, 1-MS-FQ-1485-IPWSUP, due to aging.
- Plant Issue N-2002-1123, Unit 1 steam generator “C” level error due to failure of driver card, NCD3, for “C” main feed regulator valve due to aging.
- Plant Issue N-2003-1449, Unit 2 reactor trip due to failure of driver card, 2-FW-FCY-2498, due to age degradation.
- Plant Issue N-2005-2769, Loop power supply card, C4-147 (2-MS-PQ-2496), for Unit 2 “C” steam generator experiencing intermittent failure. This card had been in service since 1977 (28 years of service) and apparently failed due to normal age.

The inspectors’ review of the unit trip root cause evaluation revealed that the licensee had categorized the affected card related to SG parameter control as non-critical, i.e., not leading to or causing a reactor trip, based on a mitigating strategy whereby operators could maintain control of the failed system by placing the affected component in manual control or by transfer to an operable channel. The inspectors noted that the only cards designated as critical were the final driver cards. The inspectors also reviewed the licensee’s 7300 System condition monitoring process, which was implemented due to the number of card failures industry-wide in the 1990's, and noted that the process did not identify other mitigating strategies for non-critical cards beyond a run-to-failure approach. The inspectors concluded that a failure trend exists associated with 7300 system designated cards. Based on the licensee’s implementation of maintenance on these cards as run-to-failure, the inspectors determined that this trend may not have been addressed by the licensee for re-evaluation or whether the approach mentioned was appropriate. No regulatory issues were identified with the individual card failures. The inspectors discussed this overall concern with the licensee. The licensee initiated an investigation into this trend for necessary corrective action.

.3 Annual Sample Review

a. Inspection Scope

The inspectors performed a review regarding the licensee’s assessments and corrective actions for operator workarounds (OWAs) . The inspectors reviewed the cumulative effects of the licensee’s OWAs and procedure 0-GOP-5.3, “Review of Operator Work Around.” The inspectors reviewed the data package associated with this procedure which included an evaluation of the cumulative effects of the OWAs on the operator’s ability to safely operate the plant and effectively respond to abnormal and emergency plant conditions. The inspectors reviewed and monitored licensee planned and completed corrective actions to address underlying equipment issues causing the OWAs. The inspectors also evaluated OWAs against the requirements of the licensee’s corrective action program as specified in VPAP-1601, “Corrective Action Program,” VPAP-1501, “Deviations,” and 10 CFR 50, Appendix B. OWAs were additionally reviewed in the aggregate on a periodic basis as required by VPAP-1401, “Conduct of Operations.”

b. Findings and Observations

The inspectors reviewed OWA-369, "1-CC-TV-116C, RCP Thermal Barrier Isolation" and OWA-370, "2-CC-TV-216A/B/C, RCP Thermal Barrier Isolations," which discussed revisions of abnormal procedure, 1/2-AP-16, "Increasing Primary Plant Leakage," as one of the corrective actions for Plant Issue N-2006-3515, "Valves 1-CC-TV-116C and 2-CC-TV-216A/B/C will leak-by if required to isolate an RCP thermal barrier tube leak. During development of design basis calculations for these valves the licensee discovered that the vendor for the air operated valves did not size the actuator using the design differential pressure across the valve of 2485 psid. Instead, the actuator was designed using component cooling (CC) operating pressure of 120 psig, which would not ensure isolation in the event of a RCP thermal barrier tube leak or rupture. The licensee determined that the downstream CC containment isolation valves, 1/2-CC-TV-101/201A and B, would close against a differential pressure of 2485 psid. As interim actions, the licensee revised 1/2-AP-16 for the control room operators to close the containment isolation valves during conditions involving a RCP thermal barrier leak. For this same flow path, the inspectors also reviewed the apparent cause evaluation for the associated plant issue which used a previous evaluation from engineering transmittal, ET #ME94-027, "Thermal Barrier Relief Valve Safety Evaluation North Anna Power Station, Unit 1/2," which justified leaving the thermal barrier CC relief valve setpoints at 1500 psig versus a higher setpoint as questioned by a 1990 plant problem report, PPR No. 90-022. The inspectors identified various questions regarding the licensee's evaluation with respect to related piping and component specifications, support/restraint and piping design, and previous evaluations relating to risk. The issues associated with the incorrectly sized actuators and relief valve set points is identified as an unresolved item (URI) pending additional information from the licensee. This URI is designated 05000338, 339/2006005-04, RCP Thermal Barrier CC Isolation Valve Evaluation.

4OA3 Event Followup 71153

a. Inspection Scope

The inspectors responded to a Unit 2 automatic reactor trip on November 16, 2006. The inspectors discussed the trip with operations, engineering, and licensee management personnel to gain an understanding of the event and assess followup 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 discussed the trip with the licensee's root cause analysis team and assessed the team's actions to gather, review, and assess information leading up to and following the trip. The inspectors later reviewed the unit trip report and initial RCE to assess the detail of review, adequacy of the RCE and proposed corrective actions prior to unit restart. The licensee's investigation identified that the cause of the trip was failure of a 7300 System card associated with "B" SG, Channel III, steam flow. 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 (Closed) Temporary Instruction (TI) 2515/169 "Mitigating Systems Performance Index (MSPI) Verification"

a. Inspection Scope

During this inspection period, the inspectors completed a review of the licensee's implementation of the Mitigating Systems Performance Index (MSPI) guidance for reporting unavailability and unreliability of monitored safety systems in accordance with Temporary Instruction 2515/169.

The inspectors examined surveillances that the licensee determined would not render the train unavailable for greater than 15 minutes or during which the system could be promptly restored through operator action and therefore, are not included in unavailability calculations. As part of this review, the recovery actions were verified to be uncomplicated and contained in written procedures.
On a sample basis, the inspectors reviewed operating logs, work history information, maintenance rule information, corrective action program documents, and surveillance procedures to determine the actual time periods the MSPI systems were not available due to planned and unplanned activities. The results were then compared to the baseline planned unavailability and actual planned and unplanned unavailability determined by the Licensee to ensure the data's accuracy and completeness. Likewise, these documents were reviewed to ensure MSPI component unreliability data determined by the licensee identified and properly characterized all failures of monitored components. The unavailability and unreliability data were then compared with performance indicator data submitted to the NRC to ensure it accurately reflected the performance history of these systems.

b. Observations and Findings

No findings of significance were identified. With only minor exceptions, the licensee accurately documented the baseline planned unavailability hours, the actual unavailability hours and the actual unreliability information for the MSPI systems. No significant errors in the reported data were identified, which resulted in a change to the indicated index color. No significant discrepancies were identified in the MSPI basis document which resulted in: (1) a change to the system boundary, (2) an addition of a monitored component, or (3) a change in the reported index color.

.2 Review of the Operation of an Independent Spent Fuel Storage Installation (60855)

a. Inspection Scope

The inspectors observed: loading spent fuel assemblies into the spent fuel dry storage casks TN-32-49 and TN-32-52; verification of assemblies being loaded into the cask; setting the lid on the top of canister; verification of positive engagement of lifting devices being positioned; lifting of the loaded cask above the water surface; draining a small portion of water from the cask for the lid bolting; removing water from bolt holes; hand tightening lid bolts; draining the water from the cask; moving the loaded cask to the cask setting area by following the heavy load lifting path; drying the cask; and backfill with helium. Observations were compared to the licensee's procedures to ensure compliance. The inspectors also observed radiation protection controls and monitoring.

The inspectors reviewed required records and data contained in the working copy of the procedure. The inspectors reviewed TN-32-49 and TN-32-52 Independent Spent Fuel Storage Installation (ISFSI) Fuel Assembly and Insert Component Certification and Cask Loading Maps to verify that the loaded assemblies met the Technical Specification TN-32 Cask Operating Limits. This document contained the description and limits of the spent fuel assemblies to be placed in the canister, such as initial fuel enrichment, fuel burnup, decay heat, time discharged, fuel assembly design, time since discharged for burnable poison rods, and uranium content. The inspectors reviewed training certificates and qualification records for crane operators and cask loading operators. The inspectors also reviewed spent fuel cask crane periodic inspection, functional test, and maintenance records. Finally, the inspectors reviewed licensee's records for any ISFSI modifications, tests or experiments evaluated under 10 CFR 72.48.

b. Findings

No findings of significance were identified.

4OA6 Meetings, including Exit

On January 17, 2007, the senior resident inspector presented the inspection results to Mr. Daniel Stoddard and other members of the licensee's staff. The licensee 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.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

W. Anthes, Assistant Manager, Maintenance
J. Breeden, Supervisor, Radioactive Analysis and Material Control
W. Corbin, Director, Nuclear Engineering
J. Costello, Supervisor, Nuclear Emergency Preparedness (Virginia)
J. Crossman, Assistant Manager, Nuclear Operations
J. Davis, Site Vice President
R. Evans, Manager, Radiological Protection
R. Foster, Supply Chain Manager
S. Hughes, Manager, Nuclear Operations
P. Kemp, Supervisor, Nuclear Safety & Licensing
J. Kirkpatrick, Manager, Maintenance
L. Lane, Director, Operations and Maintenance
J. Leberstien, Licensing Technical Advisor
T. Maddy, Manager, Nuclear Protection Services
M. Main, Component Engineer
C. McClain, Manager, Organizational Effectiveness
F. Mladen, Manager, Nuclear Site Services
B. Morrison, Assistant Engineering Manager
J. Rayman, Emergency Planning Supervisor
H. Royal, Manager, Nuclear Training
G. Salomone, Licensing
M. Sartain, Manager, Nuclear Engineering
J. Scott, Supervisor, Nuclear Training (operations)
D. Stoddard, Nuclear Safety and Licensing
R. Williams, Component Engineer

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed

05000338, 339/2006005-01	NCV	Failure to Identify Unsatisfactory Performance of a Fire Brigade Crew (Section 1R05.1)
05000338/2006005-02	NCV	Inadequate Procedure Results in Failure of Control Room Chiller (Section 1R12)
05000339/2006005-03	NCV	Inadequate Corrective Action to Upgrade Breaker Operating Mechanism (Section 1R22)

Closed

2515/169	TI	Mitigating Systems Performance Index Verification (Section 4OA5)

Opened

05000338, 339/2006005-04	URI	RCP Thermal Barrier CC Isolation Valve Evaluation

LIST OF DOCUMENTS REVIEWED

Section 1R04: Equipment Alignment

- Procedure, 1-OP-6.2A, "Valve Checkoff, 1J Diesel Engine Cooling Water"
- Procedure, 1-OP-6.4A, "Valve Checkoff, 1J Diesel Engine Lube Oil System"
- Procedure, 1-OP-6.6A, "Emergency Generator Pre-Operational Check for 1H" and 1J Diesel"
- Procedure, 1-OP-6.7A, "Valve Checkoff, Diesel Air"
- Procedure, 1-OP-6.8A, "Valve Checkoff, Emergency Generator Fuel Oil System"
- TS 3.8.1, AC Sources - Operating
- FSAR Section 9.5.4, Emergency Diesel Generator Fuel-Oil Storage and Transfer System
- FSAR Section 9.5.5, Diesel-Generator Cooling Water System
- FSAR Section 9.5.6, Diesel-Generator Starting System
- FSAR Section 9.5.7, Diesel-Generator Lubrication System
- Drawing series, 11715-FM-107A, Emergency Diesel Air Services
- Drawing series, 11715-FM-107B, Emergency Diesel Lube Oil System
- Drawing series, 11715-FM-107C, Emergency Diesel Coolant System

Section 1R05: Fire Protection

- Basic Fire Training
- Scene Leader Training

Section 1R06: Flood Protection Measures

- N-2006-1122, During performance of 1-PT-304SW, leakage was identified from flanged connections of three rubber expansion joints in the U1 Quench Spray Pump House basement. Leakage from 1-SW-REJ-24B and 1-SW-REJ-8A was a steady stream. Leakage was spraying from 1-SW-REJ-24H.
- Calculation SM-1342, North Anna Internal Flooding Integration Into The At-Power PRA Models.
- N-2006-2873, The NRC resident has requested testing information that demonstrates the ability of the Dow Corning Firestop 3-6548 Silicone RTV Foam to act as a flood barrier where credited in NAPS PRA flooding analysis. Currently, no testing information has been found that demonstrates seals of all

sizes and configurations used at NAPs are adequate to prevent flood propagation as stated in the PRA flooding analysis.

- CR001654, In PI evaluation N-2006-2873-E1, the response noted that "The IPE concluded that "Since non of the damage conditions oulined above will result in an initiating event (automatic plant trip) and significant accident mitigating systems such as the Auxiliary Feedwater System will not be affected, the risk from flooding within this area is considered insignificant." Based on questions raised by the NRC it was determined that this IPE statement regarding "automatic plant trip" appear in error since flooding in the QSPH could impact the MS pressure transmitters and potentially initiate a spurious SI and plant trip. This IPE statement error is a PRA issue and doesn't impact any design basis assumptions or equipment operability.
- CR001303, The flange bolts and nuts for 1-SW-REJ-6A at 1-SW-MOV-101B in U1 QSPH basement are up against I-beam structural support and NRC has questioning attitude about seismic issues for the pipe and I-beam.
- North Anna Power Station, Probabilistic Risk Assessment Notebook, Part V PRA Risk Analysis, Volume RA.2, Quench Spray Pump House Flooding Evaluation, Rev. 0, November 2006, which concludes: The core damage frequency (CDF) associated with all unanalyzed QSPH flooding sequences has been determined to be 2E-11/yr or less. These sequences include flooding of the main steam protection transmitters and failure of penetration sealant to the Auxiliary Building.
- Engineering Transmittal NAF 00-0069, Rev. 0, Summary of Components Considered in the IPE Internal Flooding Analysis, Surry and North Anna Power Stations, Units 1 & 2
- Probabilistic Risk Assessment for the Individual Plant Examination Final Report, North Anna Power Station Units 1 & 2, December 1992
- Drawing 11715-FM-078A
- Drawing 11715-FM-078B
- TS Table 3.3.2-1, Engineered Safety Feature Actuation System Instrumentation
- Electrical Preventative Maintenance procedure, 0-EPM-2004-01, Rev. 14, Units 1 & 2, Testing Level Switches
- Mechanical Maintenance procedure, 0-MPM-1208-01, Rev. 0, Inspection of Station Flood Barriers and Dikes
- Calculation No. 1250-111-C04, Penetration Seal Configuration Documentation pkg, 12" DC 3-6548 Silicone Foam Blockout/NA & Surry
- Installation Specification No. NAS-1014, Rev. 8, Installation of Silicone Foam in Fire Stops North Anna Power Station Units 1 & 2
- Calculation CE-0963, Rev. 0, IPE Flooding Mods., Sealing of Pipe Tunnels

Section 1R20: Refueling and Other Outage Activities

- 2006 Unit 1 Mid-Cycle Maintenance Outage Risk Assessment
- Plant Computer System trend data for RCS cooldown and heatup
- CR004390, Low fluid level in snubber, 1-RC-HSS-217.4
- CR004389, Boric acid accumulation around packing on valve, 1-SI-MOV-1865C
- CR004371, Wet boric acid found at base of motor for pump, 1-RC-P-1C
- CR004374, Existing Unit 1 SG secondary side manway bolts found not tight

- CR004382, NRC resident inspectors identified 8 items for evaluation during closeout walkdown of the Unit 1 containment
- CR004388, Minor boric acid accumulations on various primary valves listed identified during NRC closeout walkdown of containment

1EP-6, Drill Evaluation

- EPIP-1.01, Revision 42, 07/18/06, “Emergency Manager Controlling Procedure”
- EPIP-1.02, Revision 12, 06/14/04, “Response to NOUE”
- EPIP-1.03, Revision 15, 06/14/04, “Response to Alert”
- EPIP-2.01, Revision 28, 04/19/06, “Notification of State and Local Counties”
- EPIP-2.02, Revision 17, 06/08/05, “Notification of NRC”
- 1-ECA-0.0, Revision 20, 01/03/06, “Loss of All AC Power”
- 0-FCA-0, Revision 10, 03/25/06, “Fire Protection - Operations Response”
- 1-F-0, Revision 5, 09/13/05, “Critical Safety Function Status Trees”
- CR004572, 11/16/06, “Risk-significant EP objectives not fully met during Force-on-Force Exercise”
- CR004809, 11/22/06, “NRC Resident comments about use of 10CFR50.54(x) during NRC Force-on-Force”
- “North Anna Power Station Emergency Plan,” Revision 31, 01/20/06
- “North Anna Power Station Emergency Action Level Technical Bases Document,” Revision 13, 01/20/06