



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

April 16, 2004

Virginia Electric and Power Company  
ATTN.: Mr. David A. Christian  
Sr. Vice President and  
Chief Nuclear Officer  
Innsbrook Technical Center - 2SW  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

**SUBJECT: NORTH ANNA POWER STATION - NRC INTEGRATED INSPECTION  
REPORT NO. 05000338/2004002 AND 05000339/2004002**

Dear Mr. Christian:

On March 27, 2004, the US 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 March 18 and March 30, 2004, with Mr. Larry Lane and other members of your staff.

The inspection 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 selective procedures and records, observed activities, and interviewed personnel.

Based on the results of the inspection, no findings of significance were identified by the NRC. However, three licensee-identified violations which were determined to be of very low safety significance (Green) are listed in Section 4OA7 of this report. 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/***

Kerry D. Landis, Chief  
Reactor Projects Branch 5  
Division of Reactor Projects

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

Enclosures: Inspection Reports 05000338/2004002, 05000339/2004002 w/Attachment:  
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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.: 05000338/2004002 and 05000339/2004002

Licensee: Virginia Electric and Power Company (VEPCO)

Facilities: North Anna Power Station, Units 1 & 2

Location: 1022 Haley Drive  
Mineral, Virginia 23117

Dates: December 28, 2003 - March 27, 2004

Inspectors: G. Hutto, Acting Senior Resident Inspector (1/11/04 - 03/20/04)  
M. Widmann, Senior Resident Inspector (3/7/04 - 3/27/04)  
J. Canady, Resident Inspector  
L. Miller, Senior Operations Engineer (Section 1R11.1)  
S. Rose, Operations Engineer (Section 1R11.1)

Approved by: K. Landis, Chief, Reactor Projects Branch 5  
Division of Reactor Projects

Enclosure

## SUMMARY OF FINDINGS

IR 05000338/2004-002, IR 05000339/2004-002; 12/28/2003 - 03/27/2004; North Anna Power Station Units, 1 & 2; Routine Integrated Report.

The report covered a three month period of inspection by resident inspectors and announced inspections by two regional operations engineers. No findings of significance were identified. 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

No findings of significance were identified.

B. Licensee-Identified Violations

Three violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations are listed in Section 40A7.

Enclosure

## Report Details

### **Summary of Plant Status**

Unit 1 began the inspection period at 100% power. On February 20, 2004, a unit shut down commenced and Mode 3 was entered on February 21 to allow replacement of the C main transformer. Unit startup commenced on February 26 and 100 percent power was achieved on February 28. The unit continued operation at this power for the remainder of the reporting period except for small power reductions to perform periodic testing.

Unit 2 began the inspection period at 100% power and remained at this power level throughout 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

Due to the extreme cold weather temperatures and the snow and icing conditions on January 26, 2004, the inspectors performed an actual adverse weather protection inspection. The inspectors reviewed procedures, held discussions with licensee personnel and conducted a walkdown of both Unit's refueling water storage tank (RWST) level transmitter areas, the four emergency diesel generator (EDG) rooms and the service air compressors. The walkdown was to assess the licensee's implementation of extreme cold weather measures for the protection of risk significant systems susceptible to freezing. The inspectors observed that space heaters in the EDG rooms were energized for the protection of the governor controls, herculite curtains were closed, the RWST level transmitters were enclosed with a temporary tarp, and the interior cabinets of the service air compressors had temporary heating lamps installed.

Documentation reviewed included the following:

- 0-AP-41, "Severe Weather Conditions;"
- 0-GOP-4.2, "Extreme Cold Weather Operations;"
- 0-GOP-4.2A, "Extreme Cold Weather Operations Daily Checks;" and
- Updated Final Safety Analysis Report Section 2.3.1.3.5, "Hail and Ice Storms."

##### b. Findings

No findings of significance were identified.

Enclosure

## 1R04 Equipment Alignment

### a. Inspection Scope

Partial System Walkdown. The inspectors performed the following three partial system walkdowns during this inspection period. The walkdowns were to evaluate the operability of the selected train or system when the redundant train or system was inoperable or out of service. The inspectors checked for correct valve and power alignments by comparing the positions of valves, switches, and electrical power breakers to that of procedures and drawings.

- Unit 1 and Unit 2 A train of Service Water supply and return headers at the Component Cooling Water heat exchangers while the B train was out of service for inspections and repairs (0-OP-49.1A, "Valve Checkoff–Service Water;" Tagging Record (N)0-04-SW-0003," Technical Specifications (TS) 3.7.19, "Component Cooling Water System," and Plant Drawing 111715-FM-078C, sheet 1);
- Unit 2 B train of the Outside Recirculating Spray System while the A train was out of service for motor cleaning and inspection (2-OP-7.5A, "Valve Checkoff–Outside Recirculation Spray System," Tagging Record (N)2-04-RS-0003, TS 3.6.7, "Recirculation Spray System," and Plant Drawing 12050-FM-091A, sheet 4); and,
- Unit 2 A and B train of the Motor Driven Auxiliary Feedwater System while the Turbine Driven pump was out of service for scheduled maintenance on the discharge motor operated valve (2-OP-31.2A, "Valve Checkoff - Auxiliary Feedwater," TS 3.5.2, "ECCS - Operating," and Plant Drawings 12050-FM-074A, sheets 1 and 2).

Complete System Walkdown. The inspectors performed a complete equipment alignment review of the Unit 2 low head safety injection system. The inspectors assessed the system for material condition, electrical power availability, essential support equipment availability, component labeling correctness and the functionality of hangers and supports. In addition, the inspectors reviewed outstanding maintenance work requests, design issues, temporary modifications, and operator workarounds that could impact the system functional capability. System related plant issues were reviewed to verify that the licensee had properly identified and resolved equipment problems that could affect the availability, reliability and operability of the system. The inspectors also reviewed the following documents as part of the inspection:

- TS 3.5.2, "ECCS - Operating;"
- 2-OP-7.1A, "Valve Checkoff - Low Head Safety Injection System;"
- 2-ES-1.3, "Transfer to Cold Leg Recirculation;"
- Updated Final Safety Analysis Report (UFSAR), Section 3.1, "Conformance With AEC General Design Criteria," and Section 6.3, "Emergency Core Cooling System;"

- 2-PT-14.5, "Venting ECCS Piping;"
- 2-PT-57.1A, "Emergency Core Cooling Subsystem - Low Head Safety Injection Pump (2-SI-P-1A);"
- 2-PT-57.1B, "Emergency Core Cooling Subsystem - Low Head Safety Injection Pump (2-SI-P-1B);"
- Plant Drawings, 12050-FM-096A, "Flow Diagram - Safety Injection System;" and,
- Plant Issues N-2003-1549, 1566, and 3231, and N-2002-3035.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

.1 Fire Drill

a. Inspection Scope

During a fire protection drill on February 19, 2004, in the Unit 1 Cable 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 protective clothing; the effectiveness of communications, and the exercise of command and control by the scene leader. The inspectors reviewed the scenario for the simulated fire caused by an electrical short that ignited paint and paint thinner stored in the vicinity. The inspectors also accessed the acceptance criteria for the drill objectives and performed a word search of the corrective action program (CAP) for recent fire protection issues placed in the CAP.

b. Findings

No findings of significance were identified.

.2 Fire Area Tours

a. Inspection Scope

The inspectors assessed the implementation of the fire protection program using Virginia Power Administrative Procedure (VPAP)-2401, "Fire Protection Program." The inspectors checked the control of transient combustibles and the material condition of the fire detection and fire suppression systems in the following seven areas:

- Unit 1 and 2 Emergency Switchgear Instrument Rack and Control Room Air Conditioning Chiller Rooms;
- Unit 1 Charging Pump Rooms;
- Unit 1 and 2 Emergency Diesel Generator Rooms;
- Station Blackout Diesel Building;
- Unit 2 Cable Vault and Rod Control Room;



- Unit 1 Quench Spray Pump House; and,
- Unit 2 Quench Spray Pump House.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures

a. Inspection Scope

The inspectors assessed the internal flooding vulnerability of the auxiliary building basement and the charging pump cubicles due to a breach of the Service Water (SW) System boundary by an opening greater than 18 inches. The SW breach was to perform preplanned maintenance on the component cooling water heat exchanger SW return header #3 isolation valve (1-SW-240). Additionally, the inspectors held discussions with licensee personnel and verified that the procedural requirements were met for the breach of the SW system boundary. The inspectors assessed a design change that had been implemented for the installation of back flow preventors in the charging pump cubicle floor drains to prevent flooding of the cubicles due to overflowing of the associated auxiliary building sumps.

Documentation reviewed included the following:

- 0-AP-39.2, "Auxiliary Building Flooding;"
- 0-MOP-49.15, "CCHX Service Water Outlet Valve Maintenance;"
- 0-MOP-49.11, "Service Water Flooding in the Auxiliary Building;" and
- Plant Drawing 11715-FB-9B, Flood Drainage, Auxiliary Building.

b. Findings

No findings of significance were identified.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors witnessed portions of the inspection/cleaning activities and reviewed documentation associated with the planned maintenance outage of the 2 A component cooling (CC) water heat exchanger. The inspectors determined from a documentation review and discussions with system engineering that the nine "as found" tubes blocked by foreign material did not adversely affect the operability of the heat exchanger. The inspectors also reviewed the licensee's CAP data base to assess whether previous significant CC heat exchanger performance problems had been entered into the CAP.

Documentation reviewed included the following:

- 0-MCM-0801-01, "Cleaning, Removal, and Plugging of Component Cooling Heat Exchanger Tubes;"
- WO 482655-01, Inspection, Cleaning, plugging Component Cooling Water Heat Exchanger;
- Plant Issue N-2004-0021, Excessive DP across 1 A CC heat exchanger on SW side due to trapped air; and,
- Plant Issue N-2004-0426, Foreign material (pieces of trash bag) found in CC heat exchanger upon disassembly.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

.1 Biennial Review

a. Inspection Scope

During the week of January 12, 2004, the inspectors reviewed documentation, interviewed licensee personnel, and observed the administration of simulator operating tests associated with the licensee's operator requalification program. Each of the activities performed by the inspectors was done to assess the effectiveness of the licensee in implementing requalification requirements identified in 10 CFR 55, "Operators' Licenses." The evaluations were performed to determine if the licensee effectively implemented operator requalification guidelines established in NUREG-1021, "Operator Licensing Examination Standards for Power Reactors," and Inspection Procedure 71111.11, "Licensed Operator Requalification Program." The inspectors reviewed and evaluated the licensee's simulation facility for adequacy for use in operator licensing examinations. The inspectors observed two operator crews and two staff crews during the performance of the operating tests. Documentation reviewed included written examinations, Job Performance Measures (JPMs), simulator scenarios, licensee procedures, on-shift records, licensed operator qualification records, selected watchstanding and medical records, the feedback process, and remediation plans. The inspectors also reviewed a sample of simulator performance test records (transient tests, malfunction tests, steady state test, and procedure tests), simulator modification request records, and the process for ensuring continued assurance of simulator fidelity to ensure compliance with 10CFR 55.46 "Simulation Facilities." Licensee documents reviewed during the inspection are listed in the Attachment.

Following the completion of the annual operating examination testing cycle which ended on February 11, 2004, the inspectors reviewed the overall pass/fail results of the individual JPM operating tests, and the simulator operating tests administered by the

licensee during the operator licensing requalification cycle. These results were compared to the thresholds established in Manual Chapter 609 Appendix I, "Operator Requalification Human Performance Significance Determination Process."

b. Findings

No findings of significance were identified.

.2 Quarterly Review

a. Inspection Scope

The inspectors observed licensed operator simulator training on January 22, 2004. The scenario involved a steam generator level instrument failure followed by a loss of a reactor coolant pump below 30 percent power resulting in a manual reactor trip. The scenario concluded with a loss of all AC electrical power. 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 any 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

For the equipment issues listed below, the inspectors evaluated the licensee's effectiveness of the corresponding 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 VPAP 0815, "Maintenance Rule Program," and Engineering Transmittal CEP-97-0018, "North Anna Maintenance Rule Scoping and Performance Criteria Matrix." Additionally, the inspectors attended a sample of the licensee's scheduled Maintenance Rule Working Group meetings.

- Plant Issues N-2004-0410 and 0422, and Work Order 506013-01 associated with packing leak on the Unit 2 C feedwater regulating valve, improper torque values, and common mode failure concerns; and,

- Plant Issues N-2004-0104, 0107, 0121, 134, and 0144 associated with maintenance on the Unit 1 Instrument Air Compressor cooling water heat exchangers (microbial induced corrosion on the cooler heads and shutdown timer failures).

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors reviewed data output from the licensee's safety monitor associated with the risk profile of Units 1 and 2, attended pre-job briefs, and held discussions with licensee personnel. The following risk assessment areas were inspected:

- A 41-day risk window existed on Unit 1 due to the A service water header out of service for scheduled maintenance, scheduled switch yard work, and maintenance extended for the 1-IA-C-1 instrument air compressor due to cooler head replacement;
- A 29-hour risk window existed on Unit 1 and 2 due to the removal of the flood wall separating the emergency switchgear room from the basement of the turbine building for breaker replacement work. Switch yard work was planned in conjunction with the flood wall removal;
- A 31-day risk window existed on Unit 2 due to having the B outside recirculation spray, the A low head safety injection, and the A component cooling water heat exchanger out of service for pre-planned maintenance. Switch yard work was planned to be performed during the time that the components were out of service;
- A 94-day risk window existed on Unit 1 and a 170-day risk window existed on Unit 2 due to the performance of pre-planned maintenance on the Unit 1 A high head safety injection pump and a solid state protection test on Unit 2 while the Unit 2 C main feedwater pump was out of service for repairs. These maintenance, testing and repair activities were performed in conjunction with switchyard work;
- A 45-day risk window existed on Unit 2 due to the performance pre-planned maintenance on the steam driven auxiliary feedwater pump and the control room air conditioning system in conjunction with switchyard work; and,
- A 32-day risk window existed on Unit 1 and a 182-day risk window existed on Unit 2 due to the performance of emergent work associated with the repairs of the 1H Emergency Diesel Generator in conjunction with planned maintenance on

a Unit 2 Service Water valve and control room air condition chiller. Switch yard work was performed during these maintenance activities.

b. Findings

No findings of significance were identified.

1R14 Operator Performance During Non-Routine Evolutions and Events

a. Inspection Scope

For the non-routine events described below, the inspectors reviewed operator logs, plant computer data, and held discussions with plant operators to determine what occurred, how the operators responded, and if the response was in accordance with plant procedures:

- The inspectors monitored control room operator response during fish (thread-fin shad) impingement events on December 29, 2003, and January 4, 2004. The inspectors reviewed procedure 0-GOP-5.2, "Operation of the Intake Equipment During a Fish Impingement Event." It was noted that the operators were using this procedure during the impingement event. Condenser vacuum decreased by 0.2 psi during the first event and by 0.1 psi during the second. Rated power was maintained during both events; and,
- The inspectors monitored control room operator actions during reactor startup of Unit 1 on February 27, 2004, following a short duration outage to replace the C main transformer. The inspectors reviewed procedures 1-OP-1.5, "Unit Startup from Mode 3 to Mode 2," and 1-OP-1.5A, "Mode Change Checklist Mode 3 to Mode 2." The inspectors witnessed operator actions and reviewed operator logs and plant computer data to determine if the operators performed the startup in accordance with plant procedures, actions were appropriate to plant conditions and applicable TS requirements were met.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors conducted reviews and held discussions with the appropriate licensee engineers, managers and operations personnel for the four operability determinations addressed in the plant issues listed below. The inspectors assessed the accuracy of the evaluations, the use and control of compensatory measures, and compliance with TSs. The inspectors' review included a verification that the operability determinations were made as specified by Procedure VPAP-1408, "System Operability." The technical

adequacy of the determinations was reviewed and compared to the TSs, the Technical Requirements Manual and the UFSAR.

- N-2004-0295, 2J EDG battery cells found with electrolyte at the minimum mark;
- N-2004-0232, 1J EDG jacket cooling water leaks;
- N-2004-0212, Potential damage to safety related unistrut from seismic interaction;
- N-2004-0527, Cracks identified on top of 1J EDG engine driven blower suction housing;
- N-2004-0645, 1H Emergency Diesel Generator jacket cooling water control side inboard radiator leak; and,
- N-2004-0721, 2H Emergency Diesel Generator #9 cylinder fuel injector supply line leak.

b. Findings

No findings of significance were identified.

1R19 Post-Maintenance Testing

a. Inspection Scope

The inspectors reviewed the following post-maintenance test (PMT) procedures, WOs, plant issues, and activities associated with the repair or replacement of components to determine that the procedures and test activities were adequate to verify operability and functional capability of the equipment:

- Procedure 2-PT-228, "Atlas Copco Zr3-65 Instrument Air Compressor 2-1A-C-1 Performance Verification," and WO 494862-01, Change oil and clean filters;
- Procedure 1-PT-64.4B, "Casing Cooling Pump (1-RS-P-3B) Test," WO 500925-01, Repair leaking tubing union; and WO 503156-01, Repair fitting leak at pump casing;
- Procedure 1-PT-14.1, "Charging Pump 1-CH-P-1A," WO 495215-01, Perform lube oil inspection of charging pump coupling; WO 491525-01, Inspect pump discharge header check valve; Plant Issue N-2004-0540, Charging pump auxiliary oil pump fails to turn off with normal pressure; and Plant Issue N-2004-0551, Charging pump speed increaser makes high pitched noise;

- Procedure 1-OP-6.8, "Slow Start and Operation of 1H Emergency Diesel Generator," Plant Issue N-2004-0645, Coolant leak on the control side radiator of the 1H Emergency Diesel Generator;
- Procedure 2-PT-64.1.2, "Outside Recirculation Spray Pump 2-RS-P-B," following breaker preventive maintenance and motor clean and inspect; and,
- Procedure 0-PT-82.13, "Quarterly Test of 0-AAC-DG-OM, Alternate AC Diesel (SBO Diesel), on F Transfer Bus," following 18 month diesel preventive maintenance activities.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the surveillance tests listed below, the inspectors examined the test procedure and either witnessed the testing and/or 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 TSs were met:

- 1-PT-63.1B, "Quench Spray System-B Subsystem;"
- 1-PT-36.5.3A, "Solid State Protection System Output Slave Relay Test (Train A);"
- 1-PT-71.1Q, "1-FW-P-2, Turbine Driven Auxiliary Feedwater Pump and Valve Test;"
- 1-PT-82J, "1J Emergency Diesel Generator Slow Start Test;"
- 1-PT-14.2, "Charging Pump 1-CH-P-1B;" and
- 1-PT-63.1A, "Quench Spray System - 'A' Subsystem."

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed Temporary Modification 1738 associated with the temporary installation of an on-line fault gas monitor for the continuous monitoring of hydrogen concentration in the C phase of the Unit 1 main transformer. The review was completed

to verify that the spare power supply used from a ESGR relay panel did not adversely impact any safety significant circuitry.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors reviewed the licensee's Emergency Plan Implementing Procedures (EPIP) that provided guidelines for the classification, notification, and protective action recommendations (PAR) for the licensee's emergency preparedness drill on March 25, 2004. The inspectors observed portions of the drill in the simulator control room, the technical support center, operations support center and the local emergency operating facility. The drill scenario was reviewed and the post drill critique was attended by the inspectors. As a result of the issues identified during the licensee's critique, the licensee scheduled another drill to address those items. The inspectors verified that these issues were included in the proposed drill.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors performed a periodic review of the Unit 1 and 2 data reported to the NRC for the following PIs:

- High Pressure Injection System Safety System Unavailability (SSU)
- Heat Removal System (Auxiliary Feedwater System) SSU.

The inspectors reviewed data for the first quarter 2003 to the fourth quarter 2003 from the licensee's corrective action program, maintenance rule records, operating logs and maintenance work orders. Discussions with the applicable system engineers, the PI data compiler and the maintenance rule coordinator were held by the inspectors regarding the data reviewed. The data was compared with that displayed on the NRC's public web site. The PI method of assessment was compared with the guidelines



contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline."

During plant tours the inspectors also periodically assessed the Occupational Exposure Control Effectiveness and the RETS/ODCM Radiological Effluent Occurrence PIs by determining if high radiation areas (>1R/hr) were properly secured and looking for unmonitored radiation release pathways.

b. Findings

No findings of significance were identified.

4OA2 Problem Identification and Resolution

.1 Condition Report Reviews and Attendance at Daily Screen Meetings

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 hard copies of each condition report, attending daily screening meetings, and accessing the licensee's computerized database.

.2 Focused Reviews

a. Inspection Scope

The inspectors performed focused reviews of the licensee's CAP to access trends that might indicate the existence of more significant safety issues. The following two issues, with their associated plant issues, were reviewed:

Unit 1 C Main Transformer

- N-2004-0194 Combustible gas accumulation in the C main transformer which ultimately led to a unit shutdown to Mode 3 to allow transformer replacement; and,
- N-2003-2322 Unit 1 reactor trip on main transformer lockout relay trip due to a fault in the C main transformer.

Flow Bypass in Charging Pump Gear Box Cooler

- N-2003-4337 Bypassing one-half of the flow in the Unit 1 B charging pump gear box cooler due to incorrect orientation of the rear channel head during maintenance activities

The inspectors reviewed the plant issues to ensure:

- Complete and accurate identification of the problem in a timely manner commensurate with its significance;
- Evaluation and disposition of performance issues associated with maintenance effectiveness, including maintenance practices, work controls and risk assessment;
- Consideration of extent of condition, common cause and previous occurrences;
- Identification of root and contributing causes of the problem;
- Identification of corrective actions which are appropriately focused to correct the problem; and
- Completion of corrective actions in a timely manner commensurate with the safety significance of the issue.

b. Findings and Observations

One licensee-identified violation was documented and dispositioned in Section 4OA7 of this report regarding an inadequate preventive maintenance procedure associated with the B charging (high head safety injection) pump gear box cooler. No other items of significance were identified.

.3 Semi-Annual Review of the Licensee's Correction Action Program

a. Inspection Scope

The inspectors performed a semi-annual review of the licensee's CAP to assess trends that might indicate the existence of more significant safety issues. This semi-annual review included a review of the licensee's system health reports, self assessment reports, and the Problem Identification data base.

b. Findings and Observations

There were no findings of significance identified. However, the inspectors noted negative trends in the areas of EDG reliability, a continued small trend concerning EDG exhaust fires, as well as, tagging concerns and a recent identified vulnerability in the area of foreign material control regarding the service water reservoir. In addition, recently completed licensee self-assessments identified that not all corrective actions developed as a result of root cause reports and plant issue resolutions have been effective in resolving issues. The licensee was aware of these problems and have taken additional actions to address them in their CAP. For example, the licensee has formulated an action plan to address EDG reliability issues.

4OA3 Event Followup

- .1 (Closed) Licensee Event Report (LER) 05000338/2003002-00, Entered Mode 4 with an Inoperable Containment Air Lock Due to Human Error  
 This LER documented the April 15, 2003, discovery that on April 13, 2003, the licensee entered Mode 4 with the inner containment air lock inoperable which is a condition prohibited by TS. The inspectors reviewed the LER and the associated corrective actions and assessed the risk significance of the deficiency by performing a SDP phase 1 screening. It was determined that the deficiency had very low safety significance (Green) as the containment degradation did not result in a direct path to the atmosphere as the outer air lock remained operable. This item was placed in the licensee's CAP as Plant Issue N-2003-1690 and an associated licensee root cause evaluation was performed (N-2003-1690-E1). The enforcement aspects of this licensee-identified violation are discussed in Section 4OA7.
- .2 (Closed) LER 05000338,339/2002002-00, Incorrect Low Temperature Overpressure Protection Setpoints Due to Inadequate Procedures

This LER documented the August 16, 2002, identification that the Low Temperature Overpressure Protection (LTOP) setpoints for the pressurizer power operated relief valves (PORV) exceeded the TS limits. The inspectors reviewed the LER and the associated corrective actions and assessed the risk significance of the deficiency by performing a SDP phase 1 screening. It was determined that the deficiency had very low safety significance (Green) because the as-left setpoints for pressure and temperature were within the Safety Analysis Limits and the valves would have performed their design function. This item was placed in the licensee's CAP as Plant Issue N-2002-1982. The issue is further discussed and dispositioned in Section 4OA7 of this report.

4OA5 Other Activities

- .1 (Discussed) Temporary Instruction (TI) 2515/154 Spent Fuel Material Control and Accounting at Nuclear Power Plants  
 Temporary Instruction 2515/154, Spent Fuel Material Control and Accounting at Nuclear Power Plants, Phase I and Phase II, were completed during this inspection period.
- .2 INPO/WANO Report Review  
 On March 16, 2004, the Senior Resident Inspector reviewed the Institute of Nuclear Power Operations / World Association of Nuclear Operators (INPO / WANO) Peer Review Interim Report of the North Anna Power Station, dated October 29, 2003. The Chief, Reactor Projects Branch 5, reviewed the same report on March 18, 2004.

#### 40A6 Meetings, Including Exit

##### .1 Exit Meeting Summary

On March 18 and March 30, 2004, the resident inspectors presented the inspection results to Mr. Larry Lane and other members of his staff who acknowledged the findings. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

##### .2 Annual Assessment Meeting Summary

On April 6, 2004, the NRC Chief of Reactor Projects Branch 5 met with Virginia Electric and Power Company to discuss the NRC's Reactor Oversight Process (ROP) and the North Anna Power Station (NAPS) annual assessment of safety performance for the period of January 1, 2003 - December 31, 2003. The major topics addressed were the NRC's assessment program and the results of the NAPS assessment. Attendees included corporate and NAPS site management, site staff, an Old Dominion Electric Cooperative representative, and members of the local news media and the public.

This meeting was open to the public. The presentation material used for the discussion is available from the NRC's document system (ADAMS) as accession number ML041070225. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

#### 40A7 Licensee-Identified Violations

The following violations of very low safety significance (Green) were identified by the licensee and are violations of NRC requirements, which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for being dispositioned as an NCVs.

1. TS 3.6.2 requires that two containment air locks shall be operable for Modes 1, 2, 3, and 4. Contrary to the above, on April 13, 2003, the licensee entered Mode 4 for Unit 1 and Mode 3 later that day with only one containment air lock operable as a result of leakage above the TS acceptance criteria for the inner air lock. The deficiency was discovered April 15, 2003 after the unit was placed in Mode 5 for an unrelated repair. The licensee repaired the inner air lock seal and performed a satisfactory leak rate test prior to reentering Mode 4. The licensee entered the deficiency into their CAP as Plant Issue N-2003-1690. Reference Section 40A3.1 for a discussion of the associated LER.
2. TS 3.4.9.3 requires for the LTOP System that two pressurizer PORVs shall be operable with lift settings of  $\leq 500$  psig (Unit 1) and  $\leq 415$  psig (Unit 2) whenever RCS cold leg temperatures are  $\leq 235$  °F (Unit 1) and  $\leq 270$  °F (Unit 2). TS 3.4.9.3 requires that the valves be operable in Modes 4 based on specific RCS temperatures and in Mode 5 and 6 when the head is on the reactor vessel and the RCS is not vented. Contrary to the above, on August 16, 2002, with Units 1 and 2 in Mode 1 operating at 100% power the licensee identified six occasions during the previous three years where calibration as-left setpoints for the

pressurizer PORVs were outside TS limits. The licensee subsequently corrected the setpoints for the pressurizer PORVs on September 4 and 5, 2002. The licensee entered this deficiency in their CAP as N-2002-1982. Reference Section 4OA3.2 for a discussion of the associated LER.

3. Technical Specification 5.4.1.a requires that written procedures be established and implemented for the activities covered in Regulatory Guide 1.33. Contrary to this requirement, Procedure 0-MPM-0103-01, "Preventive Maintenance of Charging/High-Head Safety Injection Pumps," was not established to provide adequate guidance for correctly orienting the rear channel head of the Unit 1 B charging pump gear box cooler (1-CH-E-1B1). This deficiency is documented in the licensee's CAP as Plant Issue N-2003-4337. This event is of very low safety significance because operability of the cooler was maintained. Reference Section 4OA2 for additional information related to the issue.

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel

K. Barnette, Supervisor, Site Industrial Safety/Fire Protection  
J. Crossman, Supervisor, Nuclear Engineering  
J. Davis, Site Vice President  
E. Dreyer, Supervisor Health Physics Technical Services  
M. Dunston, Manager, Nuclear Site Services  
B. Evans, Manager, Radiological Protection & Chemistry  
D. Jernigan, Director, Nuclear Operations & Maintenance  
P. Kemp, Manager, Nuclear Operations  
L. Lane, Director, Nuclear Safety and Licensing  
T. Maddy, Manager, Nuclear Protection Services  
B. McBride, Supervisor, Emergency Preparedness  
F. Mladen, Manager, Nuclear Maintenance  
W. Renz, Director, Nuclear Security and Emergency Preparedness  
H. Royal, Manager, Nuclear Training  
M. Sartain, Manager, Nuclear Engineering  
B. Speckine, Supervisor Nuclear Fuel Handling

### **LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED**

#### Opened

None

#### Closed

05000338/2003002-00 LER Entered Mode 4 with an Inoperable Containment Air Lock Due to Human Error (Section 4OA3.1)

05000338,339/2002002-00 LER Incorrect Low Temperature Overpressure Protection Setpoints Due to Inadequate Procedures (Section 4OA3.2)

#### Discussed

2515/154 TI Spent Fuel Material Control and Accounting at Nuclear Power Plants (Section 4OA5.1)

**LIST OF DOCUMENTS REVIEWED**

**Section 1R11: Licensed Operator Requalification Program**

Section 1R11.1 - Biennial Review

TRCP-0006, Nuclear Training Program Implementation, Rev. 11  
FIG-09, Administer the LORP Examination Banks (Test Items and Task Performance Evaluations), Rev. 14  
TRCP-3002: Simulator Modification Record (SMR) Process, Rev. 9  
TRCP-3003: Simulator Technical Procedures, Rev. 4  
TRCP-3004: Simulator Software Management, Rev. 5  
TRCP-3006: Simulator Configuration Management, Rev. 5  
TRCP-3005: Simulator Hardware Management, Rev. 8  
TRCP-3007: Simulator Performance Testing, Rev. 0  
North Anna 2002/2003 LORP Table of Specs and Sample Plans  
North Anna Simulator Certification Submittal, August 1988  
Licensed Operator Requalification Program, Rev. 12  
Various Written Examinations, Return to Licensed Duties Certifications, and Remediation Training Records