



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
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ATLANTA, GEORGIA 30303-8931

October 30, 2007

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

SUBJECT: NORTH ANNA POWER STATION – NRC INTEGRATED INSPECTION  
REPORT 05000338/2007004 AND 05000339/2007004

Dear Mr. Christian:

On September 30, 2007, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your North Anna Power Station, Units 1 and 2. The enclosed integrated inspection report documents the inspection findings which were discussed on October 18, 2007, with Mr. Daniel Stoddard and other members of your staff.

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

Based on the results of this inspection, two findings of very low safety significance (Green) were identified by the NRC and involved 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 findings as non-cited violations (NCV) consistent with Section VI.A of the NRC Enforcement Policy. In addition one licensee-identified violation, which was determined to be of low safety significance (Green) is listed in Section 4OA7 of this report. If you wish to contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the North Anna Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component

of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

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

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

Enclosure: Inspection Report 05000338/2007004 and 05000339/2007004  
w/Attachment: Supplemental Information

cc w/encl. (See next page)

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-338, 50-339

License Nos: NPF-4, NPF-7

Report No: 05000338/2007004, 05000339/2007004

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: North Anna Power Station, Units 1 & 2

Location: 1022 Haley Drive  
Mineral, Virginia 23117

Dates: July 1, 2007 to September 30, 2007

Inspectors: J. Reece, Senior Resident Inspector  
R. Clagg, Resident Inspector  
J. Dodson, Senior Project Engineer  
L. Garner, Senior Project Engineer  
E. Michel, Reactor Inspector, Section 1R08

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000338/2007-004, 05000339/2007-004; 07/01/2007 – 09/30/2007; North Anna Power Station, Units 1 and 2. Routine Integrated Resident and Regional Report. Inservice Inspection.

The report covered a three month period of inspection by resident inspectors and reactor inspections from the region. Two finding were identified which were determined to be Non-cited violations (NCVs). The significance of most findings is identified 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", and Revision 4, dated December 2006.

### A. NRC Identified and Self-Revealing Findings

#### Cornerstone: Mitigating Systems

- Green. A Green non-cited, self revealing violation (NCV) of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified for the failure to have an adequate procedure to ensure that the recirculation spray heat exchanger service water system was inspected and maintained such that degradation in performance on the safety-related system would not occur. During testing on March 20, 2007, service water flow to the Unit 2 'B' recirculation spray (RS) heat exchanger (Hx) was low. The low flow was attributed to service water pipe corrosion products partially blocking the Hx tubes. Corrective actions included cleaning of all four RS Hxs and hydrolazing the respective SW piping to remove corrosion products. This issue was documented in the licensee's corrective action program as condition report 014987.

The finding is more than minor because if left uncorrected, it would result in a more significant safety concern, in that, corrosion products would continue to degrade Hx performance. A Significance Determination Process evaluation determined that the finding is of very low safety significance based on the remaining capability of the 'B' RS Hx and the availability of the three remaining RS Hxs to perform the safety function. A direct cause of this finding was related to the aspect of maintaining long term plant safety through maintenance practices aspect of the cross-cutting area of human performance, by not maintaining design margins (H.2(a)). (Section 1R07)

- Green. The inspectors identified a non-cited violation of 10 CFR 50.55a(g)(4) associated with failure to perform testing of buried, isolable piping for the charging, safety injection, recirculation spray, quench spray, auxiliary feedwater, and service water systems in accordance with the American Society of Mechanical Engineers Code Section XI requirements. The licensee promptly entered the issue into their corrective action program. In response to NRC questions, the licensee performed an evaluation to demonstrate the piping condition was acceptable.

This finding is more than minor because it affected the Equipment Performance attribute of the Mitigating Systems cornerstone objective, and would have allowed undetected through-wall flaws to develop in the header piping. These flaws would then grow in size until leakage from the buried headers degraded system operation, or if sufficient general corrosion occurred, a gross rupture or collapse of the piping occurs. The finding is of very low safety significance because the affected systems remained able to perform their safety functions and it did not affect external event mitigation. The cause of the violation is related to the complete documentation and component labeling aspect of the cross-cutting area of human performance, in that, procedures failed to include required testing (H.2(c)). (Section 1R08.1)

B. Licensee Identified Violations

One violation of very low safety significance was identified by the licensee, and has been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. The violation and the corresponding corrective action tracking number is listed in Section 4OA7 of this report.

## REPORT DETAILS

### **Summary of Plant Status:**

Unit 1 began the period at full rated thermal power (RTP) and operated at full power for the entire report period, until September 9, 2007, when the unit shutdown for a planned refueling outage.

Unit 2 began the period in a forced outage due to a spurious safety injection. On July 9, 2007, Unit 2 reached full RTP and operated at or near full power operation for the remainder of the inspection period.

## **REACTOR SAFETY**

### **Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity**

#### **1R04 Equipment Alignment**

##### **Partial Walkdown**

###### **a. Inspection Scope**

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

- Unit 2 'A' Motor Driven Auxiliary Feedwater Pump, 2-FE-P-3A and 2-FW-P-2 during preplanned maintenance on the Unit 2 "B" Motor Driven Auxiliary Feedwater Pump, 2-FW-P-3B, per procedure 2-PT-71.12, "AFE system Valve Position Verification," Revision 5;
- Unit 2 '2J' Emergency Diesel Generator (EDG) 2-EE-EG-2J during preplanned maintenance on Unit 2 2H EDG 2-EE-EG-2H; and.
- Unit 2 'A' Low Head Safety Injection Pump 2-SI-P-1A during preplanned maintenance on the "B" Low Head Safety Injection Pump 2-SI-P-1B.

###### **b. Findings**

No findings of significance were identified.

**1R05 Fire Protection****Fire Protection - Tours****a. Inspection Scope**

The inspectors conducted tours of the eight areas listed below and important to the 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 1-1A (fire zone 11Aa / CPC-1A);
- Charging Pump Cubicle 1-1B (fire zone 11Ba / CPC-1B)
- Charging Pump Cubicle 1-1C (fire zone 11Ca / CPC-1C);
- Charging Pump Cubicle 2-1A (fire zone 11Da / CPC-2A);
- Charging Pump Cubicle 2-1B (fire zone 11Ea / CPC-2B);
- Charging Pump Cubicle 2-1C (fire zone 11Fa / CPC-2C);
- Main Steam Valve House Unit 2 (fire zone 17-2a / MSVH-2); and,
- Safeguards Area Unit 2 (fire zone Z-16-2 / SA-2).

**b. Findings**

No findings of significance were identified.

**1R07 Heat Sink Performance****a. Inspection Scope**

The inspectors selected the risk significant Unit 2 recirculation spray heat exchangers (Hx) and reviewed inspection records, test results, maintenance work orders, and other documentation to ensure that deficiencies which could mask or degrade performance were identified and corrected. The test procedures and records were also reviewed to verify that they were consistent with Generic Letter 89-13 licensee commitments, and Electric Power Research Institute (EPRI) Heat Exchanger Performance Monitoring Guidelines. In addition, the inspectors reviewed inspection documentation of the related service water piping to assess general material condition and to identify any degraded conditions. Documents reviewed are listed in the attachment.

**b. Findings**

Introduction: A Green non-cited, self revealing violation (NCV) of 10 CFR 50 Appendix B, Criterion V, "Instructions, Procedures and Drawings," was identified for the failure to have an adequate procedure to ensure that the recirculation spray heat exchanger service water system was inspected and maintained such that degradation in performance on the safety-related system would not occur. The service water inspection

and maintenance procedure (VPAP-0811, Attachment 1, "Service Water Inspection and Maintenance Program") was inadequate since it did not provide a means to perform inspection and maintenance on the effected piping.

Description: On March 20, 2007, during performance of functional testing for the containment depressurization actuation circuitry as prescribed in 2-PT-66.3, "Containment Depressurization Actuation Operational Test," the licensee found that SW flow to the Unit 2 'B' RS Hx or cooler was 3500 gallons per minute (gpm). The UFSAR, section 6.2, "Containment Systems," states that the containment depressurization analysis assumes a SW water flow rate of 4500 gpm per recirculation spray cooler. Subsequent inspections by the licensee revealed that the cause of the flow blockage was SW pipe corrosion products. The remaining three RS heat exchangers were also impacted, however SW flow remained at greater than the normally expected system flow rate of 6000 gpm. The licensee performed corrective actions that included cleaning of all four RS Hxs, hydrolazing the respective SW piping to remove corrosion products, implementing a modification to install a drain valve on a section of SW piping to each RS Hx and performing a root cause evaluation (RCE). The inspectors reviewed the RCE which stated that the root cause was "inadequate system/equipment design, operating parameters exceed the system/component's ability to function effectively." The evaluation also identified a short term corrective action to "develop and implement a periodic inspection program to verify loose corrosion scale is not forming and that design basis requirements are still being met with regard to RSHX tube blockage." An operability determination was performed by the licensee and determined that the Unit 2 'B' RS Hx remained operable at the lower flow rate, but degraded.

As a result of this issue the inspectors reviewed other licensee SW inspection, maintenance, and testing documentation as noted below:

- Administrative procedure, VPAP-0811, "Service Water Inspection and Maintenance Program," was established as a response to the licensee's commitments to Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment." Action III of GL 89-13 states, "Ensure by establishing a routine inspection and maintenance program for open-cycle service water system piping and components that corrosion, erosion, protective coating failure, silting, and biofouling cannot degrade the performance of the safety-related systems supplied by service water," and was identified as one of the purposes of this procedure.
- Performance test procedure, 0-PT-75.15, "Generic Letter 89-13 Service Water System Testing Requirements Coordination," was created to ensure implementation of all of the commitments made by the licensee in response to GL 89-13.
- Procedure, 0-PT-75.14, "Service Water Wall Thickness Monitoring," was created to monitor SW pipe corrosion rates at selected locations.
- Procedure, 2-PT-75.6, "Service Water System Flow Balance," was intended to verify that SW flow to the Unit 2 RS Hxs met design requirements.

- Technical Report No. ME-0025, Rev. 2, "NRC Generic Letter 89-13 Activities," had a quality assurance category of nuclear safety related and documented the licensee activities for meeting GL 89-13 action items. This report was subsequently superceded by licensee documents for SW program management.
- North Anna Site Engineering Services implementing procedure, NASES-3.20, Rev. 2, "Generic Letter 89-13 Programs," defined the licensee's commitments to GL 89-13 and identified the implementing procedures for inspection and testing.

Based on a review of the above documents the inspectors found the following pertinent licensee procedures and documentation:

- VPAP-0811, step 6.1.3 stated, "Inspections of the service water system shall be performed to identify degraded conditions which may lead to failure of the service water system to perform its intended function. Appropriate action shall be taken to correct degraded conditions." Attachment 1 of this procedure identified the piping/components included in the SW inspection and maintenance program; however, the related procedure for inspecting the RS Hx piping was identified as "NA" or not applicable. The inspectors questioned the licensee why the related procedure for inspection of the RS HX piping was not applicable. The licensee stated that NASES-3.20, Attachment 1 identified two procedures, PT-66.3 for full flow testing of the RS Hx lines and piping to ensure they were not fouled or clogged. The licensee had concluded that the portion of piping that became degraded would remain dry and therefore would not be susceptible to corrosion degradation. As a result the licensee determined that no procedure was needed to inspect or maintain that piping and therefore flow testing was adequate.
- The test frequency for 0-PT-75.14 was 24 months; this procedure was not specified in VPAP-0811, Attachment 1, as a method for SW inspection and maintenance and was ineffective in the identification of an adverse condition of the SW piping prior to a negative impact on the Hx.
- The flow testing procedures, 2-PT-66.3 and 2-PT-75.6, did not detect a RS Hx flow blockage problem until a flow reduction below the UFSAR specified flow value occurred.

The inspectors concluded that the licensee's SW system inspection and maintenance program procedure, VPAP-0811, was not adequate to ensure the RS Hx SW piping was inspected and maintained such that degradation in performance on the safety-related system would not occur. The inspectors concluded that the licensee made a flawed assumption when determining the program inspection implementation procedures by assuming that the effected portion of service water piping would remain dry and therefore require no inspection and maintenance. This is reflected in current licensee performance since there was opportunity to identify and correct the procedure inadequacies following the low flow conditions that were revealed as a result of testing.

Analysis: The inspectors determined that the licensee's inadequate procedure for service water (SW) system inspection and maintenance, which resulted in reduced SW flow to the Unit 2 RS HX, constituted a performance deficiency. This finding is more than minor because if left uncorrected, it would result in a more significant safety concern, in that, corrosion products would continue to degrade Hx performance. The inspectors determined that the finding had a credible impact on safety due to the effect on the two design bases accident functions of the system to 1) preclude an uncontrolled release of radioactivity to the environment in the event of an accidental release of high-energy fluids inside containment and 2) the transfer of heat from the hot containment sump liquid to the water of the ultimate heat sink supplied by the SW system. This finding was evaluated using the SDP, which evaluated the two design functions of the system involving the cornerstones on mitigating systems and barrier integrity. The SDP evaluation concluded that the finding was of very low safety significance (Green) based on the remaining capability of the 'B' RS Hx and that the three remaining RS Hxs remained available to perform the safety function.

The inspectors determined that the cause of this finding was related to the cross-cutting area of human performance, the related component of resources, and the associated aspect of maintaining long term plant safety through maintenance practices by not maintaining design margins (IMC 305, item H.2.(a)). The licensee failed to monitor changes in SW piping to ensure degradation would not reduce the design margins of the respective, safety-related RS Hxs.

Enforcement: 10 CFR 50 Appendix B, Criterion V, states, in part, that activities affecting quality shall be prescribed by documented instructions, procedures, or drawings of a type appropriate to the circumstances and shall be accomplished in accordance with these instructions, procedures, or drawings. Contrary to the above, the licensee's SW system inspection and maintenance program procedure VPAP-0811 failed to prescribe an adequate inspection procedure resulting in reduced SW flow through the Unit 2 RS HX on March 20, 2007. Because this failure to comply with 10 CFR 50, Appendix B, Criterion V, is of very low safety significance and has been entered into the licensee's corrective action program, as CR014987, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000339/2007004-01, Inadequate Procedure for SW System Inspection and Maintenance which Resulted in Reduced SW Flow to the Unit 2 RS Hx.

1R08 Inservice Inspection (ISI) Activities (71111.08P, Unit 1)

.1 Piping Systems ISI

a. Inspection Scope

The inspectors reviewed the implementation of the licensee's ISI program for monitoring degradation of the reactor coolant system (RCS) boundary and risk significant piping system boundaries. The inspectors reviewed a sample from activities performed during the Unit 1-Fall 2007 / Refueling Outage (RFO) 19 including: a) nondestructive examinations (NDE) required by the 1989 Edition (no Addenda) of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, b)

examinations of reactor pressure vessel (RPV) head and head penetrations in accordance with NRC Order EA-03-009, c) Boric Acid Program activities done in response to GL 88-05, and d) welding activities associated with preemptive weld overlays of dissimilar metal (DM) welds on the pressurizer (PZR). The inspectors also reviewed ISI records to verify completeness of the second interval test program for which the ASME Code of record was the 1983 Edition.

Specifically, the inspectors reviewed NDE procedures, reports, equipment calibration and certification records, and personnel qualification records, for the following NDE activities.

- Ultrasonic (UT) examination of SW-30 (PZR "B" Safety DM weld);
- Liquid Penetrant (PT) examination of SW-51 (PZR surge nozzle DM weld) in the "as-found condition," per ASME Code Case N-740; and,
- PT examination of examination of SW-51 (PZR surge nozzle DM weld) after application of the stainless steel barrier layer.

No samples of recordable indications accepted by the licensee for continued service were available since the previous refueling outage.

The inspectors reviewed the following Repair/Replacement Activities for compliance with ASME Code:

- Weld overlays performed in accordance with commitments in the CAL issued March 29, 2007, covering corrective actions taken to address safety concerns associated with primary water stress corrosion cracking (PWSCC) of dissimilar metal nozzle welds at PZR surge lines. This included weld overlays completed on PZR safety valve nozzles, and the surge nozzle; and,
- Repair/Replacement Plan 2006-057, replacement of 2" bypass valve 1-CH-289.

Specifically, the inspectors reviewed weld process control sheets, welder operating instructions, welding procedure specifications, welding procedure qualification records, welder qualification records, Certified Material Test Reports for weld material, and NDE reports.

The inspectors performed a review of ISI related problems, including welding, and BACC program that were identified by the licensee and entered into the corrective action program as Condition Report (CR) documents. The inspectors reviewed the condition reports to confirm that the licensee had appropriately described the scope of the problem and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed this review to ensure compliance with 10CFR Part 50, Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the Attachment to this report.

b. Findings

Introduction: The inspectors identified a Green NCV of 10 CFR 50.55a(g)(4) for failure to perform periodic leakage testing on Unit 1 of buried, isolable piping sections of various systems in accordance with Section XI of the ASME Code for the second 10-year ISI interval.

Description: On September 27, 2007, the inspectors identified that the licensee had not performed the required periodic pressure drop test or change in flow rate test for buried, isolable piping portions of the charging (CH), safety injection (SI), RS, quench spray (QS), Auxiliary Feedwater (AFW), and SW systems during the second ISI interval in accordance with the 1983 Edition of Section XI, Article IWA-5244. The licensee was committed to this Code Edition for the second interval. The Code required testing for buried piping that is isolable by means of valves. During this inspection, Unit 1 was in the third ISI interval and the one-year period allowed to submit regulatory relief for the second interval had expired.

The inspectors questioned the current condition and operability of the pipe. The licensee provided the following information to support that the systems were in an acceptable condition: (1) no gross leakage based upon periodically logged tank levels specific to each system and Service Water Reservoir level for the SW system; (2) personnel involved in the VT-2 testing for exposed portions of system piping had not noticed indirect indications of leakage; and, (3) tritium monitoring of ground water had not revealed any indications of leakage from systems containing reactor coolant. The licensee concluded and the inspectors agreed that there were no immediate operability concern for any of the systems in question. However, the inspectors noted that the primary means of confirming pressure retaining integrity of buried piping was through the periodic leakage testing required by Section XI of the ASME Code.

Analysis: The inspectors determined that the failure to perform the required periodic testing of buried piping was a performance deficiency. This finding was more than minor because it affects the Equipment Performance attribute of the Mitigating Systems cornerstone objective of ensuring availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Should a significant leak or rupture occur due to undetected degradation, this piping could not reliably deliver cooling water to the safety related heat exchangers which, in turn, cool many mitigating system components that are needed to respond to an initiating event. This finding was evaluated using Phase 1 of IMC 0609 SDP. This finding is of very low safety significance (Green) because it was not a design issue resulting in a loss of operability, did not represent an actual loss of a system's safety function, did not result in exceeding a Technical Specification allowed outage time, and did not affect external event mitigation.

A contributing cause of the violation was related to the cross-cutting area of human performance, the component of resources and the aspect of complete documentation and component labeling (IMC 305, item H.2(c)), in that, procedures to conduct system pressure tests were not adequate to ensure testing was performed in accordance with the requirements of the ASME Boiler and Pressure Vessel Code, Section XI. This

performance was considered as indicative of current performance because the test procedures for the third interval did not adequately address this testing.

Enforcement: 10 CFR 50.55a(g)(4) requires, in part, that throughout the service life of a boiling or pressurized water reactor facility, components classified as ASME Code Class 1, 2, and 3 must meet the requirements set forth in Section XI of the ASME Code. The 1983 Edition of Section XI, IWA-5244 "Buried Components," states, "(a) In nonredundant systems where the buried components are isolable by means of valves, the visual examination VT-2 shall consist of a leakage test that determines the rate of pressure loss. Alternatively, the test may determine the change in flow between the ends of the buried components." Contrary to the above, the licensee failed to perform the required rate of pressure loss testing on buried portions of the CH, SI, RS, QS, AFW and SW systems during the second 10-year ISI interval for which the 1983 Edition of the ASME Code was applicable. Therefore, because this finding is of very low safety significance and because this issue was entered into the licensee's corrective action program (CR021041), it is being treated as an NCV consistent with Section VI.A.1 of the Enforcement Policy: NCV 050000338/2007004-02, Failure to Perform Required ASME Code Section XI Leakage Testing.

.2 PWR Vessel Upper Head

a. Inspection Scope

The inspectors reviewed the implementation of the licensee's ISI program for monitoring degradation of the RPV head and head penetrations in accordance with NRC Order EA-03-009. In addition, the inspectors verified that activities performed were in accordance with the requirements of the order and that indications and/or defects detected were dispositioned in accordance with the ASME Code or an NRC alternative.

The inspectors reviewed NDE reports associated with VT-2 activities (examination for leakage) and Bare Metal Visual examinations performed to meet the examination requirements of NRC Order EA-03-009. The inspectors reviewed photographic documentation and corrective actions taken for minor leakage identified at Core Exit Thermocouple Nozzle Assembly at penetration 49.

b. Findings

No findings of significance were identified.

.3 Boric Acid Corrosion Control (BACC) Program

a. Inspection Scope

The inspectors reviewed the licensee's BACC program activities to ensure implementation with commitments made in response to NRC GL 88-05, "Boric Acid Corrosion of Carbon Steel Reactor Pressure Boundary," and applicable industry guidance documents. Specifically, the inspectors performed an on-site record review of procedures and plant issue reports documenting the results of containment walkdown

inspections. The inspectors also reviewed the walk-down of the reactor building by the resident inspectors to evaluate compliance with licensee's BACC program requirements and verify that degraded or non-conforming conditions, such as boric acid leaks, were properly identified and corrected in accordance with the licensee's corrective action program.

The inspectors reviewed a sample of engineering evaluations completed for evidence of boric acid found on systems containing borated water to verify that the minimum design code required section thickness had been maintained for the affected components. Specifically, the inspectors reviewed the following evaluations:

- Plant Issue N-2004-2728, Boric acid found on piping between valves on safety injection system; and,
- Plant Issue N-2005-5034, Boric acid on "A" low head safety injection suction line.

b. Findings

No findings of significance were identified.

.4 Steam Generators

a. Inspection Scope

The inspectors reviewed licensee documentation and performed direct observation of licensee and vendor activities related to the eddy current examination (ECT) of Unit 1 tubes in SG A conducted during the refueling outage to verify that inspection activities were being conducted in accordance with Technical Specifications and applicable industry standards. The inspectors' review of documentation included the vendor's inspection plan, degradation assessment, pre-outage assessment, inspection procedures, site-specific Examination Technique Specification Sheets (ETSS), ECT bobbin and array probe certificates of compliance, calibration certificate for the MIZ-80(iD) eddy current tester, calibration standard drawings, personnel qualifications, and personnel and Computer Data System site-specific performance demonstrations. Inspectors also confirmed that all areas of potential degradation (based on site-specific experience and industry experience) are being inspected.

The inspectors performed direct observation of data acquisition and analysis activities along with verification of equipment settings for ongoing data acquisition. The inspectors reviewed historical ECT data from new dent signals (DNT) at tubes 10,7; 46,37; and 46,38. The inspectors observed secondary side visual inspections in the vicinity of the 7<sup>th</sup> tube support plate and reviewed documentation of secondary side inspections including vendor procedures and personnel qualifications.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

a. Inspection Scope

The inspectors performed a review of ISI-related problems, including welding, and BACC problems that were identified by the licensee and entered into the corrective action program as condition report (CR) documents. The inspections reviewed the CRs to confirm that the licensee had appropriately described the scope of the problem and had initiated corrective actions. The review also included the licensee's consideration and assessment of operating experience events applicable to the plant. The inspectors performed the review to ensure compliance with 10 CFR 50 Appendix B, Criterion XVI, "Corrective Action," requirements. The corrective action documents reviewed by the inspectors are listed in the report attachment.

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 August 30, 2007. The scenario, Simulator Examination Guide SXG-4C, involved a temporary loss of process cabinet 8 at 25 percent RTP power, a loss of a main feedwater pump resulting in a turbine trip without a reactor trip, and a failure of a reactor coolant pressure transmitter resulting in an open pressurizer power operated relief valve and a failed open pressurizer spray valve.

The inspectors observed crew performance in terms of communications; ability to take timely and proper actions; prioritizing, interpreting, and verifying alarms; correct use and implementation of procedures, including the alarm response procedures; timely control board operation and manipulation, including high-risk operator actions; and oversight and direction provided by the shift supervisor, including the ability to identify and implement appropriate TS actions. The inspectors observed the post training critique to determine that weaknesses or improvement areas revealed by the training were captured by the instructor and reviewed with the operators.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the equipment issue listed below, the inspectors evaluated the licensee's effectiveness of the corresponding preventive and corrective maintenance. The

inspectors performed walkthroughs 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 Rules (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."

- Classification of Units 1 and 2 Main Steam Dump Valves to Maintenance Rule (a)(1) status for repeat failures.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, for the five 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 unforeseen 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.

- Maintenance Rule risk evaluation for unplanned work on August 31, 2007 to replace actuator due to test failure, while executing Procedure 0-PT-77.14B, "ECCS PREAACs Train B Filter In-Place Test (1-HV-FL-3B)," Revision 16;
- Emergent yellow risk condition on Unit 2 due to entry in 0-AP-41, "Severe Weather Conditions," on September 6, 2007, with the following equipment unavailable: AMSAC, 1-IA-C-1, and 1-SI-TK-2, Case 070818I;
- Emergent work on 1H EDG on September 11, 2007, with the following equipment unavailable: 1-BLD-DR-M54-1, 2-S4-C-1, and 1-SI-TK-2, Case U107G;
- Work associated with Unit 1 refueling outage risk plan schedule change regarding refueling line activities and reactor head movement; and,
- Work associated with Unit 1 refueling outage risk plan schedule change regarding emergent work to repair exhaust and coolant leaks on '1J' EDG.

b. Findings

No findings of significance were identified.

**1R15 Operability Evaluations****a. Inspection Scope**

The inspectors reviewed four operability evaluations affecting risk-significant mitigating system, listed below, to assess, as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were considered as compensating measures; (4) whether the compensatory measures, if involved, were in place, would work as intended, and were appropriately controlled; and (5) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation and the risk significance in accordance with the SDP. The inspectors' review included a verification that determinations of operability were made as specified by procedure VPAP-1408, "System Operability."

- Condition Report CR013325, high delta-P on "B" component cooling water heat exchanger showing a lack of safety related circuit breaker coordination for service water valve house MCC;
- Condition Report CR016271, Review of OD000111: Determine operability of 1-HV-E-4B due to SW supply piping with a 'pit' below code minimum wall thickness;
- Condition Report CR0018924, Review of OD000118: Determine operability of 1-HV-AOD-103-4 with a mechanical block installed; and,
- Condition Report CR014701, Review of OD000109: Determine operability of 2-CC-TV-203B with minor air leak on valve actuator.

**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) test were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform in accordance with licensee procedure VPAP-2003, "Post Maintenance Testing Program."

- Procedure 2-PT-36.1B, "Train "B" Reactor Protection and ESF Logic Actuation Logic Test," Revision 54, per Work Order (WO) 780901-01 for Unit 2 "B" Train SSPS cards;
- Procedure 2-PT-36.1A, "Train "A" Reactor Protection and ESF Logic Actuation Logic Test," Revision 54, per WO 780901-02 for Unit 2 "A" Train SSPS cards;
- Post maintenance test activities for work on 2-FW-E-9B, and 2-FW-P-3B, for lube oil cooler inspection and cleaning, per WO 721598-01; and,
- Post maintenance testing activities for EDG PMT following tube replacement on fuel oil supply governor 1-EG-GOV-601J and 2-EG-GOV-701H, per WOs 781020-01 and 781018-01.

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities

.1 Refueling Outage

a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for the Unit 1 refueling outage, which began September 9, 2007, to confirm that the licensee had appropriately considered risk, industry experience, and previous site-specific problems in developing and implementing a plan that assured maintenance or defense-in-depth. The inspectors used Inspection Procedure 71111.20, "Refueling and Outage Activities," to observe portions of the shutdown, cooldown, refueling, maintenance activities, and startup activities to verify that the licensee maintained defense-in-depth commensurate with the outage risk plan and applicable TS. The inspectors monitored licensee controls over the outage activities listed below.

- 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 OSP 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.
- Controls to ensure that outage work was not impacting the ability to operate the spent fuel pool cooling system during and after core offload.
- 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 activities which could affect reactivity were reviewed for proper control within the outage risk plan.

b. Findings

No findings of significance were identified.

.2 Unit 2 Spurious Safety Injection Actuation and Reactor Trip

a. Inspection Scope

Unit 2 began an unscheduled outage on June 29, 2007, due to a spurious SI actuation. During the forced outage period, the inspectors evaluated the licensee's outage activities to verify that appropriate risk consideration was given in developing schedules and that the licensee adhered to administrative risk reduction methodologies. The inspectors also monitored the licensee's risk management of off-normal plant conditions, as well as ensuring mitigation strategies were developed for any loss of key safety functions. The unit was synchronized to the grid on July 8, 2007 at 2051 hours, and 100 percent RTP power was obtained on July 9, 2007 at 1335 hours.

b. Findings

No findings of significance were identified. The NRC conducted a special inspection of this event which is documented in NRC Special Inspection Report No. 05000339/2007009.

1R22 Surveillance Testing

a. Inspection Scope

For the five 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 one in-service testing activity for a risk significant pump or valve as part of the surveillance activities.

In-Service Test

- 2-PT-71.3Q, "2-FW-P-3B Motor-Driven AFW Pump and Valve Test," Revision 31
- 2-PT-71.1Q, "2-FW-P-2 Turbine Driven Auxiliary Feedwater Pump and Valve Test," Revision 42

Other Surveillance Test:

- 1-PT-82J, "1J Emergency Diesel Generator Slow Start Test," Revision 40
- 2-PT-82.2A, "2H Diesel Generator test (Simulated Loss of Off-Site Power)," Revision 59

Containment Integrity Support System (Containment Isolation Valves)

- 1-PT-70.1, "Main Steam safety Valve Setpoint Verification using Trevitest," Revision 1

b. Findings

No findings of significance were identified.

1R23 Temporary Plant Modifications

a. Inspection Scope

The inspectors reviewed a temporary plant modification, Temporary Modification 2007-1782, "Install Cap on 1A Line to 10HV-AOD-187-1 Supply Damper for 1-HV-F-17 Unit 1 Mechanical Equipment Room and Block Same Damper Open;" to verify that the modification 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 modification 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.

b. Findings

No findings of significance were identified.

**Cornerstone: Emergency Preparedness**

1EP6 Drill Evaluation

a. Inspection Scope

On August 21, 2007, the inspectors reviewed and observed the performance of an emergency planning drill that involved a simulated 'C' main steam trip valve closure followed by a reactor trip, safety injection, turbine driven auxiliary feedwater pump failure, 'C' steam generator tube rupture, and a failed open 'C' main steam safety relief valve with a concurrent fuel failure resulting in a general emergency declaration. 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.

b. Findings

No findings of significance were identified.

#### 4. OTHER ACTIVITIES

##### 4OA1 Performance Indicator (PI) Verification

###### a. Inspection Scope

The inspectors reviewed the licensee's procedure for developing the data for the Mitigating Systems Performance Indicators for Unit 1 and Unit 2, which are: (1) Emergency AC Power System; (2) High Pressure Injection System; (3) Auxiliary Feedwater System; (4) Residual Heat Removal System; and (5) Support Cooling Water System. The inspectors examined data reported to the NRC for the period January 2005 through June 2007. Procedural guidance for reporting PI information and records used by the licensee to identify potential PI occurrences were also reviewed. The inspectors verified the accuracy of the PIs through review of licensee event reports to determine if any mitigating systems failures occurred, and to compare the number of occurrences to the number reported in that period by the performance indicator.

The inspection was conducted in accordance with NRC Inspection Procedure 71151, "Performance Indicator Verification." The applicable planning standards, 10 CFR 50.9 and NEI 99-02, "Regulatory Assessment Performance Indicator Guidelines," Revision 3, were used as reference criteria. The inspectors reviewed various documents which are listed in the Attachment to this report.

###### b. Findings

No findings of significance were identified.

##### 4OA2 Problem Identification and Resolution

###### .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 and Condition Report summaries, and periodically attending daily Plant Issue Review Team meetings.

###### .2 Annual Sample Review

###### a. Inspection Scope

The inspectors reviewed the licensee's assessments and corrective actions for Condition Report (CR) 019499 Rev. 0, "1-SW-MOV-103D Failed Type C Test (1-PT-61.3) Unmeasurable." The condition report was reviewed to ensure that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors also evaluated the

condition report against the requirements of the licensee's corrective action program as specified in PI-AA-200, "Corrective Action", and 10 CFR 50, Appendix B.

b. Findings and Observations

The inspectors identified issues related to the corrective actions associated with 1-SW-MOV-103D, SW supply to 'D' RS Hx isolation valve, exceeding as left containment type C test leakage rate criteria on a previous occasion. Specifically, the inspectors noted that on April 1, 2006 the as left containment type C test result for 1-SW-MOV-103D was a 40 standard cubic feet per hour (scfh) leakage rate, as documented in Plant Issue N-2006-1943. Although this plant issue was subsequently closed to work completed on WO-00740175-01, the inspectors determined that annotations within the WO indicated that no maintenance was performed. The inspectors reviewed 1-PT-61.3, "Containment Type C Test", Rev. 26 One Time Only-1 which documented the as found and as left leakage rate for 1-SW-MOV-103D as zero. The inspectors noted that no remarks were made regarding the previous leakage rate issue documented in Plant Issue N-2006-1943.

On September 9, 2007 the inspectors noted that 1-PT-61.3 documented the as found containment type C test leakage rate for 1-SW-MOV-103D as greater than 257 scfh, which is in excess of the acceptance criteria. The licensee documented this problem in CR 019499, Rev. 0, "1-SW-MOV-103D Failed Type C Test (1-PT-61.3) Unmeasurable". The inspectors identified the issues relating to corrective action as an unresolved item (URI) pending additional information from the licensee. This URI is designated 05000338/2007004-03, Containment Type C Test and Corrective Maintenance Evaluation.

4OA3 Event Follow-up

(Closed) Licensee Event Report (LER) 05000339/2007-003-00: Automatic Reactor Trip Due to Invalid Safety Injection Relay Actuations

On June 29, 2007, at 1752 hours, an invalid Train "B" SI actuation resulted in an automatic turbine trip, reactor trip and Phase 'A' containment isolation. The NRC conducted a special inspection of this event which is documented in NRC Special Inspection Report No. 05000339/2007009. The licensee documented the corrective actions associated with this event in Condition Report CR015096. This LER is closed.

4OA6 Exit

.1 Exit Meeting Summary

On October 18, 2007, the senior resident inspector presented the inspection results for the routine integrated quarterly report to Mr. Dan Stoddard and other members of the 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.

.2 Inservice Inspection Meeting

An exit meeting was conducted on September 28, 2007 with Tom Huber, Director Station Engineering, and other Dominion staff. Some proprietary information was reviewed and is not included in this report.

4OA7 Licensee Identified Violations

The following violation of very low safety significance (Green) was identified by the licensee and is a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600 for characterization as a NCV:

The North Anna Power Station, Unit 2 Renewed Facility Operating License section 2.D, Fire Protection, states in part that the fire protection program as described in the UFSAR shall be implemented and maintained. Contrary to this, on August 18, 2007, the licensee rendered the 2J EDG carbon dioxide fire protection system inoperable by blocking open the room ventilation intake louvers during maintenance activities within the 2J EDG room and failed to take the required compensatory actions. This problem was identified in the licensee's corrective action program as CR017835. The finding is of very low safety significance because of the low degradation rating of the observed deficiency.

ATTACHMENT: SUPPLEMENTAL INFORMATION

## **SUPPLEMENTAL INFORMATION**

### **KEY POINTS OF CONTACT**

#### Licensee personnel:

V. Armentrout, SG Programs, ISI Corporate  
W. Corbin, Director, Nuclear Engineering  
J. Eastwood, Steam Generator Activities Corporate  
R. Evans, Manager, Radiological Protection and Chemistry  
R. Foster, Supply Chain Manager  
M. Hall, Site Welding Engineer  
S. Hamil, Repair Replacement Engineer  
T. Huber, Director, Site Engineering  
S. Hughes, Manager, Nuclear Operations  
P. Kemp, Supervisor, Station Licensing  
J. Kirkpatrick, Manager, Nuclear Maintenance  
L. Lane, Plant Manager  
G. Lear, Manager, Organizational Effectiveness  
T. Maddy, Manager, Nuclear Protection Services  
M. Main, Component Engineer  
G. Marshall, Manager, Nuclear Outage and Planning  
T. Mayer, ISI Material NDE  
C. McClain, Manager, Nuclear Training  
F. Mladen, Manager, Nuclear Site Services  
S. Morris, ISI/NDE Engineering Supervisor  
B. Morrison, Supervisor Nuclear Engineering  
P. Naughton, SW system Engineer  
N. Nicholson, Health Physicist Technical Services  
J. Rayman, Nuclear Emergency Preparedness  
M. Sartain, Director, Nuclear Safety and Licensing  
J. Scott, Supervisor, Nuclear Training (operations)  
R. Simmons, Supervisor Radiological Analysis  
R. Stack, ISI Program  
D. Stoddard, Site Vice President  
M. Whalen, Station Licensing  
R. Williams, Component Engineer  
J. Zabrowski, Engineering Supervisor

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

##### Opened

05000338/2007004-03      URI      Containment Type 'C' Test and Corrective Maintenance Evaluation (Section 4OA2)

Attachment

Opened and Closed

05000339/2007004-01 NCV Inadequate Procedure for SW System Inspection and Maintenance which Resulted in Reduced SW Flow to the Unit 2 RS Hx (Section 1R07)

05000338/2007004-02 NCV Failure to Perform Required ASME Code Section XI Leakage Testing (Section 1R08.1)

Closed

05000339/2007-003-00 LER Automatic Reactor Trip Due to Safety Injection Relay Actuation (Section 4OA3)

**LIST OF DOCUMENTS REVIEWED****Section 1R07: Heat Sink Performance**

- 2-PT-66.3, "Containment Depressurization Actuation Operational Test," completed on 4/13/07
- 0-PT-75.15, "Generic Letter 89-13 Service Water System Testing Requirements Coordination"
- RCE000033, "SW Flow Restricted through RSHX during CDA functional Testing"
- Letter dated January 29, 1990 from VEPCO to NRC re GL 89-13
- Letter dated April 30, 1991 from VEPCO to NRC re GL 89-13, Supplemental Response
- Letter dated October 18, 1991 from VEPCO to NRC re GL 89-13, Consolidated Response
- Technical Report No. ME-0025, Revs 0,1 & 2, NRC Generic Letter 89-13 Activities, 12/28/92
- ET No. NAF-94-102, Rev 0, SDBD-NAPS-RS Rev 1, Response to Open Items
- Drawing 12050-FP-5B, Service Water Lines Reactor Containment - Sheet 2

**Section 1R08: Inservice Inspection Activities**Procedures

- 03-9054843, AREVA Procedure, Secondary Side Visual Inspection Plan and Procedure for Dominion, North Anna Unit 1, N1R19, 7/2/2007
- NASES-6023, Boric Acid Corrosion Control Program (BACCP), Rev. 3
- 1-PT-171.3, ASME System Pressure Tests, Rev 1
- 50-9050669, Vendor Procedure for Pressurizer Relief, Safety & Spray Nozzle Weld Overlay, Unit 1, Rev 0
- WP8/8/F6AW3-07, Welding Procedure Specification, Machine Gas Tungsten Arc Welding, 2/14/2007

Attachment

- WP3/8/F44OLTBSCa3-001, Welding Procedure Specification, Machine Temper Bead Overlay GTAW, 2/28/2007
- 55-PS0122-001, AREVEA Procedure Supplement for 55-WP3/8/F43OLTBSCa3, 8/11/2007
- 55-PS0116-000, AREVA Procedure Supplement for 55-O10052-010, 9/18/2007
- PQ7164-03, AREVA Procedure Qualification Record, 5/22/2003
- PQ7213-00, AREVA Procedure Qualification Record, 11/10/2003
- PQ7280-000, AREVA Procedure Qualification Record, 2/26/2007
- PQ7281-000, AREVA Procedure Qualification Record, 2/23/2007
- PQ7062-004, AREVA Procedure Qualification Record, 1/3/2006
- 0-MCM-1801-01, Welding Safety-Related and Seismic-Related Equipment, Rev 16

#### Corrective Action and Evaluation Documents

- N-2006-1357, Variance in signal between ECT bobbin standards, 3/18/2006
- N-2006-1357-E1, Evaluation for N-2006-137
- CR020328, CR N-2006-1357 has information that is inconsistent, 9/18/2007 \*
- CA006861, Discovery Items found during 2-PT-48 Walkdown - Components Requiring Maintenance, 3/18/2007
- N-2005-5034, White substance noted on top of the "A" LHSI suction line. Chemistry analysis of the sample indicated the substance is boric acid., 11/02/2005
- Root Cause Evaluation N-2005-5034, Through-wall Leak in Low Head SI Weld, Unit 1
- N-2004-2728, Boric Acid found on piping between 1-SI-MOV-1860A and 1-SI-305 on first elbow at tee, 7/21/2004
- N-2004-2728-E1, Category 1 Root Cause Evaluation Response for N-2004-2728
- CR021041, System Pressure Test documentation less than adequate, 9/27/2007

#### Other Records

- Calibration Certificate, Zetec Rental Corporation, Inc., MIZ-80(iD) Eddy Current Tester Serial Number 069
- Areva Certificate of Calibration, Zetec MIZ-80(iD), Serial Number 069
- Certificate of Authenticity, Eddy Current Probes, Serial Number 457129
- SG Monitoring Program Pre-Outage Assessment, North Anna Unit 1 - Fall 2007, 9/4/2007
- ETSS\_RPC002\_MIZ80\_R0, Examination of low row U-Bends and U-Bend special interest, 1R19
- ETSS\_RPC001\_MIZ80\_R0, Tubesheets, dented and non-dented TSPss, expansion transitions, freespan dents, and freespan bobbin indications, 1R19
- ETSS\_RES\_MIZ80\_R0, Sizing and Resolution Process, 1R19
- ETSS\_BOB001\_MIZ80\_R1, Bobbin Standard ASME Code Examination for Parent Tubing, 1R19
- 51-9058480-000, Areva Engineering Information Record, North Anna Unit 1 1R19 - EPRI Appendix H Eddy Current Technique Review, 9/6/2007
- NAP-SGPMS-001, North Anna Site Specific Eddy Current Analysis Guidelines, Rev 11

Attachment

- Letter from Dominion Resources Services to USNRC, VIRGINIA ELECTRIC POWER COMPANY (DOMINION) NORTH ANNA POWER STATION UNITS 1 AND 2 2006 ANNUAL STEAM GENERATOR TUBE INSERVICE INSPECTION SUMMARY, Ser. No. 07-0089, 2/27/2007
- SII006-06-05-12476-1, Certified Test Report, Laboratory Testing Inc., Soundsafe couplant batch 06120, 5/8/2006
- Letter of Conformance, National Welders Supply Company, Argon, Bulk, Type II Liquid, 9/21/2007
- 51-9031151-002, Areva Engineering Information Record, North Anna Units 1 and 2 Pressurizer Nozzle Weld Overlays - Technical Requirements
- QA Data Pkg. No. 23-9059755-001, Welding Filler Metal for North Anna Unit 1 PZR Overlay, 8/30/2007
- Safety Related Vendor, Station: Dominion Energy Keweenaw, Inc., Dominion Generation, Dominion Nuclear Connecticut LLC, Name: AREVA NP Inc., 7/24/2007
- Report RC-38-NDE-280-00, Weld Overlay Repair Profile and Thickness Data Sheet Weld ID SW-30, Safety "B" Nozzle Weld
- VPAP-0307 - Attachment 2, Repair Replacement Plan, Program Number 2006-057, 4/4/2006
- NIS-2A, Repair Replacement Certification Record for Repair Replacement Plan 2006-057
- 00740176 01, Work Order Task, Replace 1-CH-289
- Receipt Inspection for Welding Rod ER316L, 1/8" diameter, Lot 000000041968, Purchase Order 45143613, 11/26-27/2002
- Arcos Industries, LLC Certification of Tests, ER316L, 1/8" diameter, 11/01/2002
- VPAP-0903 - Attachment 4, Weld Data Sheet B, 1-CH-289, Weld 46A, 4/4/2006
- VPAP-0903 - Attachment 4, Weld Data Sheet B, 1-CH-289, Weld 47A, 4/4/2006
- VPAP-0903 - Attachment 4, Weld Data Sheet B, 1-CH-289, Weld SW-17, 4/4/2006
- VPAP-0903 - Attachment 1, Weld Map, 1-CH-289, 2"-CH-231-1502-Q2, 4/4/2006
- Welding Technique Sheet, Technique 803, 11/82, Rev 8
- VPAP-0902 - Attachment 6, Weld Material Field Control, Serial No 129465, 4/6/2006
- VPAP-0307 - Attachment 4, Examination Requirements, Repair Replacement Plan 2006-057
- North Anna Engineering Log, Dated 9/19/2007
- Virginia Electric and Power Company (Dominion) North Anna Power Station, Unit 1 Owner's Activity Reports, 7/5/2006

\*CR generated as result of this inspection

#### **Condition Reports for NRC Identified Issues**

##### **Second Quarter 2007**

- CR009989, During BACCP walkdown with the NRC identified minor buildup of boric acid on components in RC and Aux Basement

Attachment

- CR010397, NRC inspector questioned the requirement for having a transient loading sheet posted at U-1 QSPH area
- CR010864, Miscellaneous materials found in containment during NRC cleanliness walkdown
- CR010865, Insulation deficiencies were identified by NRC during U2 containment walkdown
- CR010875, Boric acid noted on valve 2-CH-HCV-2200B during NRC walkdown of containment
- CR010876, Boric acid noted on valve 02-CH-MOV-2380 during NRC walkdown of containment
- CR010884, White residue noted on supports for 2-DG-TK-1 during NRC containment walkdown
- CR011553, During a walkdown, the resident NRC inspector noted test equipment staged in U2 safeguards without any identifying tags to indicate reason for staging or responsibility
- CR011560, During NRC walkdown, Resident questioned ability of the crib ventilation to provide adequate air exchange
- CR012292, NRC inspector questioned Maintenance Department work practice identifying removed components/parts, discovered work practice is not documented
- CR012564, Anomalies found by NRC inspector during walkdown of U2 RS area, including missing bolts for piping/pipe protective cover in U2 yard
- CR013929, During NRC inspection, the inspector identified vegetation growth around 2 of the 13 environmental monitoring stations
- CR013932, NRC had question regarding achievable LLD for gaseous effluents; specifically the suitability of using primary grade water
- CR014013, NRC inspector during normal walkdown of plant noticed potting material leaking from armored cable connectors - RCP cables
- CR014702, The NRC questioned the expectations for personnel entering the SBO room, specifically whether or not the WCC SRO should be notified prior to entering
- CR014987, NRC inspector questioned NAPS program for implementing GL 89-13 as it applies to SW

#### Third Quarter 2007

- CR015496, during the NRC walkdown of the Unit 2 Containment boric acid was observed on unistrut in the overhead behind the pressurizer
- CR015501, NRC walkdown of Unit 2 containment identified some discrepancies requiring action
- CR015746, NRC questioned if EDG common mode failure evaluation should have included Unit 2 EDGs
- CR016095, NRC inspector discovered several supports for tubing bolts not fully engaged in Unit 2 AFW pumphouse
- CR016141, Regulatory identified that Part 21 is required for previously identified EDG battery degradation issue

- CR016268, NRC audit for North Anna resolution of NRC Generic Safety Issue 191 included review of available calculation for RS and LHSI pumps and a discrepancy was ID'd between hand calculation and output from GOTHIC
- CR016765, At the request of Director of Engineering, this CR is to document a discussion with NRC inspector Larry Garner about PRA review of degraded conditions
- CR017161, Undocumented flashing analysis in AECL Hydraulic report for GSI-191 DCP, the NRC asked for an analysis of whether there would be any flashing inside the RS and LHSI strainers
- CR017917, NRC PI&R inspection identified that CA004296 was inappropriately closed out
- CR018053, During a walkdown, NRC Resident Inspector identified several items of concern
- CR018173, fall protection concerns raised by resident NRC inspector, U1 and U2 Safeguards Valve Pit fall protection may not meet minimum load requirements
- CR018908, The NRC PI&R inspection identified that performance tests for component cooling heat exchangers and control room chillers do not have specific design basis acceptance criteria
- CR018965, NRC questioned if the proper QA hold points are in the ABB-K-Line breaker procedures 0-EPM-0304-01, 0-EPM-0304-03 and 0-EPM-0304-04, need to evaluate
- CR018989, During NRC PI&R inspection it was identified that contrary to requirements, station drawing did not reflect implementation of DCP-01-004
- CR018990, walkdown of diesel sealand was performed with NRC inspector and it was discovered that some S/R parts are still stored at sealand which does not meet controlled environment storage requirements
- CR019368, During an NRC review of the work package associated with 2-FW-E-9B it was discovered that step 7.2 in procedure was not signed by a supervisor prior to returning eqpt to operations for testing
- CR019539, Over pressure condition may exist in U2 cable vault on CO2 discharge, blower door test conducted to address NRC unresolved item
- CR019733, NRC questioned the practice of Sealand containers being set at equipment hatch for material off-load
- CR019769, During NRC Sr Resident observation of Unit 1 containment on-load activities, it was noted that a sea-land storage unit was placed inside the equipment hatch with the bottom corner edges directly on the equipment hatch barrel
- CR019780, In response to a concern raised by NRC Sr Resident that the spherical bearing was bound in the pipe clamp for snubber 1-RH-HSS-104A, Engineering performed VT-3 inspection
- CR020164, NRC resident inspector raised a concern about population estimated based on census data from approximately 17 years ago and whether they are still valid
- CR020301, Inspector questioned why North Anna would stage an outdoor trailer in front of U2 main transformers under the 4160 RSST lines and potential for fire in trailer to cause loss of operating unit
- CR021041, During the NRC ISI inspection, the inspector identified that documentation for completed ASME System Pressure Tests was insufficient to verify full code compliance

Attachment