



UNITED STATES  
NUCLEAR REGULATORY COMMISSION

REGION II  
SAM NUNN ATLANTA FEDERAL CENTER  
61 FORSYTH STREET, SW, SUITE 23T85  
ATLANTA, GEORGIA 30303-8931

July 31, 2007

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

SUBJECT: NORTH ANNA POWER STATION - NRC INTEGRATED INSPECTION  
REPORT NOS. 05000338/2007003 AND 05000339/2007003

Dear Mr. Christian:

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

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

Based upon the results of this inspection, two findings of very low safety significance (Green) were identified by the NRC and involved the violation of NRC requirements. However, because of the 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, two 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

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

Sincerely,

***/RA/***

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

Docket Nos.: 50-338, 50-339

License Nos.: NPF-4, NPF-7

Enclosure: Inspection Reports 05000338/2007003 and 05000339/2007003  
w/Attachment: Supplementary Information

cc w/encl: (See next page)

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Report to David A. Christian from Eugene Guthrie dated July 31, 2007.

SUBJECT: NORTH ANNA POWER STATION - NRC INTEGRATED INSPECTION  
REPORT NOS. 05000338/2007003 AND 05000339/2007003

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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.: 05000338/2007003, 05000339/2007003

Licensee: Virginia Electric and Power Company (VEPCO)

Facilities: North Anna Power Station, Units 1 & 2

Location: 1022 Haley Drive  
Mineral, Virginia 23117

Dates: April 1, 2007 - June 30, 2007

Inspectors: J. Reece, Senior Resident Inspector  
G. Wilson, Resident Inspector  
L. Lake, Senior Reactor Inspector, Section 1R08  
G. Khouri, Reactor Inspector, Section 1R08  
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4OA5  
H. Gepford, Senior Health Physicist, Section 2OS3  
A. Nielsen, Health Physicist, Sections 2PS1, and 4OA1  
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R. Taylor, Reactor Inspector, Section 4OA5

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

Enclosure

## SUMMARY OF FINDINGS

IR 05000338/2007-003, IR 05000339/2007-003; 04/01/2007 - 06/30/2007; North Anna Power Station Units 1 & 2; other activities.

The report covered a three-month period of inspection by the resident inspectors, health physicists, and reactor inspectors from the region. Two findings were identified by the NRC, which were determined to be Non-cited Violations (NCV). 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 4, dated December 2006.

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

Green. A Green, non-cited violation of 10 CFR 50, Appendix B, Criterion V was identified by the NRC for failure to properly accomplish a procedure to ensure doors on safety-related pressurizer (PZR) heater cabinets were adequately secured to maintain seismic requirements. On March 15, 2007, during a plant status tour the inspectors identified that all five of the PZR heater cabinet doors were improperly secured. The problem was documented in the licensee's corrective action program as condition report 013992.

The finding was more than minor because if left uncorrected it would cause a more significant safety concern. The finding was of very low safety significance, Green, because it was potentially risk significant due to a seismic initiating event, and the loss of the equipment would not sufficiently degrade the TS required system that supported the intended safety function as described in Phase 1 of the significance determination process. This finding has aspects relating to the cross-cutting area of human performance (H.4.(b)), based on procedural compliance and failure of personnel to follow procedures. (Section 4OA5)

Cornerstone: Mitigating Systems

Green. A Green, non-cited violation of Technical Specification 5.4.1.a was identified by the NRC for failure to establish adequate post maintenance test procedures for a design change modification installing new backflow preventers (BFP) and for model work orders replacing BFPs as preventative maintenance. On March 15, 2007, the inspectors performed a plant walkdown to review installation of BFPs used for internal flood prevention for flow paths involving floor drains and identified an inoperable BFP in the Unit 1 emergency switchgear area air conditioning fan room. The problem is identified in the licensee's corrective action program as Condition Report CR008734.

The inspectors determined that the finding had a credible impact on safety based on the potential for flooding to impact the instrument rack room which contains both trains of Solid State Protection System cabinets used for engineered safeguards. The finding, if left uncorrected, would result in a more significant safety concern and is consequently more than minor. A Phase III evaluation was performed for the SDP due to the loss or

degradation of equipment specifically designed to mitigate a flooding event and the impact on two trains of a safety system. This evaluation concluded that the performance deficiency was of very low safety significance (Green) based on the existence of high level alarms for the associated sumps and the response time allowed for an operator to isolate the leak (approximately 40 minutes). This finding had aspects relating to the cross-cutting area of human performance based on the failure to establish adequate modification and maintenance procedures for post maintenance test to perform work on a quality-related component. (Section 4OA5.1)

B. Licensee-Identified Violation

Violations of very low safety significance were identified by the licensee, and 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 and corrective action tracking numbers are listed in Section 4OA7 of this report.



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## 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.

Unit 2 was in a refueling outage at the beginning of the inspection period. On April 22, 2007, Unit 2 returned to operation at a reduced RTP due to main turbine vibration issues, and shutdown on April 28, 2007 for main turbine balancing. On April 29, 2007, Unit 2 reached full RTP and operated at or near full RTP for the remainder of the inspection period, except for an unanticipated power reduction on May 31, 2007, and a reactor trip on June 29, 2007.

### 1. REACTOR SAFETY

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

#### 1R01 Adverse Weather Protection

##### Seasonal Adverse Weather Preparation Reviews

The inspectors reviewed the licensee's adverse weather preparations for hot weather operations specified in 0-GOP-5.5, "EDG Hot Weather Operations," Revision 9, 0-GOP-4.1, "Hot Weather Operations," Revision 18, and the licensee's correction action data base for hot weather related issues. The inspectors walked down the Unit 1 and Unit 2 Emergency Diesel Generator (EDG) and auxiliary feedwater (AFW) room components to verify compliance with the procedural requirements and to verify that the specified actions provided the necessary protection for the structures, systems, or components.

#### b. Findings

No findings of significance were identified.

#### 1R04 Equipment Alignment

#### .1 Partial System Walkdowns

#### a. Inspection Scope

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

- Unit 1 “B” Charging Pump, 1-CH-P-1B, while maintenance was completed on the Unit 1 “A” Charging Pump, 1-CH-P-1A;
- Unit 2 “B” Outside Recirculation Spray Pump (ORSP) during maintenance on the Unit 2 “A” ORSP;
- Unit 2 EDG 2H during a maintenance outage on 2J EDG; and,
- Unit 1 1H EDG during a maintenance outage on 1J EDG.

b. Findings

No findings of significance were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed walkdown and inspection of the Unit 2 Outside Recirculation Spray and Casing Cooling System to assess proper alignment and to identify discrepancies that could impact its availability and functional capacity. The inspectors assessed the physical condition and position of each recirculation spray and casing cooling valve, whether manual, power operated or automatic to ensure correct positioning of the valves. The inspection also included a review of the alignment and the condition of support systems including fire protection, room ventilation and emergency lighting. Equipment deficiency tags were reviewed and the condition of the system was discussed with engineering personnel. The operating procedures, drawings and other documents utilized and reviewed as part of the inspection are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors conducted tours of the eleven areas listed below and important to reactor safety to verify the licensee’s implementation of fire protection requirements as described in Virginia Power Administrative Procedure (VPAP)-2401, “Fire Protection Program.” The inspectors evaluated, as appropriate, conditions related to: (1) licensee control of transient combustibles and ignition sources; (2) the material condition, operational status, and operational lineup of fire protection systems, equipment, and features; and (3) the fire barriers used to prevent fire damage or fire propagation.

- Turbine Driven Auxiliary Feedwater Pump Room Unit 1 (fire zone 14A-1a / TDAFW-1);
- Motor-Driven Auxiliary Feedwater Pump Room Unit 1 (fire zone 14B-1a / MDAFW-2);
- Alternate AC Building (fire zone Z-52 / AAC);
- Main Control Room (fire zone 2a / CR);

- Cable Vault and Tunnel Unit 1 and 2 (includes Control Rod Drive Room, Z-27-1, and Z-27-2) (fire zones 3-1a / CV & T-1, and 3-2a / CV & T-2);
- Turbine-Driven Auxiliary Feedwater Pump Room Unit 2 (fire zone 14A-2a / TDAFW-2);
- Technical Support Center (fire zone 46b / TSC);
- Technical Support Center Battery Room (fire zone 46B / TSCBR);
- Motor-Driven Auxiliary Feedwater Pump Room Unit 2 (fire zone 14B-2a / MDAFW-2);
- Battery Room 1 - II Unit 1, Battery Room 2 - II Unit 2, Battery Room 1 - III Unit 1, and Battery Room 2 - III Unit 2 (fire zones 7B-1 / BR1-II, 7B-2 / BR2-II, 7C-1 / BR1-III, and 7C-2 / BR2-III); and,
- Turbine Building (includes Chiller Rooms and Z-21B, Z-21C, Z-22, Z-34, Z-35, Z-36, and Z-46B).

b. Findings

No findings of significance were identified.

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 the following activities performed during the Unit 2 refueling outage 2007/RFO18: a) nondestructive examinations (NDE) required by the 1995 Edition Through the 1996 Addenda of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, b) examinations of the Reactor Pressure vessel (RPV) head and head penetrations in accordance with NRC Order EA-03-009, c) commitments included in Confirmatory Action Letter (CAL) dated March 29, 2007 covering corrective actions taken to address safety concerns associated with intergranular stress corrosion cracking (IGSCC) of dissimilar metal nozzle welds on pressurizer (PZR) heads, d) disposition of NDE recordable indications, and e) welding activities as part of repair and replacement activities.

Specifically, the inspectors reviewed NDE procedures, NDE reports, NDE electronic data (as applicable), equipment calibration and certification records, personnel qualification records, and observed the following NDE activities.

- Ultrasonic (UT) examination of Weld PZR-4, Pressurizer bottom head to shell weld;
- UT/ET examinations performed on RPV head penetrations #5, 15, 31, and 51; and,
- Baseline UT examinations of the weld overlays on the PZR nozzles, lines # 14"RC-410-2510R-Q1, 6"RC-437-1502-Q1, 6"RC-438-1502-Q1, 6"RC-439-1502-Q1, 4"RC-415-1502-Q1 and 4"RC-437-1502Q1.

The inspectors reviewed the UT recordable indication associated with PZR weld #4 to verify that the evaluation and disposition of indications were in accordance with the applicable edition of ASME Section XI, IWB-3000.

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 IGSCC of dissimilar metal nozzle welds on pressurizer heads. This included Repair/Replacement Plan #2007-023, Revision 1 and Work Order 759462-01, weld overlays completed on PZR safety valve nozzles, relief valve nozzle, PZR spray nozzle and the surge nozzle. Specifically, the inspectors reviewed weld process control sheets, welding procedure specifications, welding procedure qualification records, welder qualification records, Certified Material Test Reports for weld material, ASME Code reconciliation documents, and NDE reports; and,
- Repair/Replacement Plan #2007-038, Design Change Package 06-002, Replacement of Hot Leg and Cold Leg Thermal Welds.

b. Findings

No findings of significance were identified.

.2 Pressurized Water Reactor (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 procedures, NDE reports, equipment calibration records, and personnel qualification records for the following VT-2 activities (examination for leakage) and Bare Metal Visual examinations performed to meet the examination requirements of the NRC Order EA-03-009, and observed the following examinations:

- VT-2 examinations (examination for leakage), Bare Metal Visual examinations of RPV head and head penetrations #24, 27, 30, 32, 38, 47, 48, 51, and 59; and,
- UT/ET examinations performed on RPV head penetrations #5, 15, 31, and 51

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 Generic Letter 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 condition reports documenting the results of containment walkdown inspections. The inspectors also conducted an independent walk-down of the reactor building 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:

- ET-N-07-0029 - Disposition of As-Found condition for 2-RH-P-1A Pump, Boric Acid residue found at the Pump Bowl Stuffing Box Flange;
- Corrective Action CA006864, Boric Acid discovered during 2-PT-48 walkdown; and,
- Corrective Action CA007209, Boric Acid buildup found on "B" Cold leg.

#### 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 2 tubes in Steam Generator (SG) A and C conducted during the refueling outage to verify that inspection activities were being conducted in accordance with TS and applicable industry standards. The inspectors' review of documentation included vendor's inspection plan, pre-outage degradation assessment, pre-outage condition monitoring and operational assessment, inspection procedures, ECT bobbin and array probe certificates of compliance, and personnel qualifications. 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 activities along with verification of equipment settings for ongoing data acquisition. The inspectors also reviewed ECT data for SG C tubes R24C45, R38C46, R42C22, R45C50, R45C51, and

R13C76 to verify the adequacy of the licensee's primary, secondary, and resolution analyses.

The inspectors reviewed video tapes and documentation of secondary side inspections including steam drum and moisture separator components, internal feed-ring inspections of all J nozzles, U bend regions from steam drum, seventh tube support plate (TSP) region, and UT inspection of feed ring components.

b. Findings

No findings of significance were identified.

.5 Identification and Resolution of Problems

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 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 report attachment.

1R11 Licensed Operator Requalification Program

a. Inspection Scope

The inspectors observed an licensed operator re-qualification simulator scenario on May 22, 2007. The scenario, Simulator Examination Guide SXG-54, involved a fuel failure, a pressurized pressure master controller failure, an increasing reactor coolant system leak rate, and a large break loss of cooling accident (LOCA), coupled with a failure of the automatic containment depressurization actuation (CDA) and the recirculation spray pump start signals.

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

b. Findings

No findings of significance were identified.

## 1R12 Maintenance Effectiveness

### a. Inspection Scope

For the two 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."

- Emergency switchgear room ventilation was placed in 10 CFR 50.65 (a)(1) status due to repeat failures of the 2-HV-E-4A ventilation chiller
- Preventative maintenance associated with backflow preventers used for internal flood protection

### b. Findings

No findings of significance were identified, with the exception of preventative maintenance associated with backflow preventers which was documented in section 4OA5 of this report.

## 1R13 Maintenance Risk Assessments and Emergent Work Evaluation

### a. Inspection Scope

The inspectors evaluated, as appropriate, for the six activities listed below: (1) the effectiveness of the risk assessments performed before maintenance activities were conducted; (2) the management of risk; (3) that, upon identification of an 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.

- Work associated with the 1-EP-BKR-15F3 while planned maintenance on 1-BLD-DR-M54-1, 1-CW-P-1B, 1-SW-MOV-120A/120B, 2-CH-408, 2-HV-E-4A, 2-EE-EG-2J, 2-CC-P-1B, 2-SW-P-1B, 1-EP-RST-1C, 2-HV-E-4B and 2-HV-AC-6 which condition resulted in an orange maintenance window which was subsequently re-evaluated;
- Work associated with 2-III battery inverter while planned maintenance on 2-EE-EG-2J, 2-SW-P-1B, 2-CC-P-1B, 2-CH-P-1B, 2-CH-P-1C, 2-SI-P-1B, and 2-RH-P-1B;
- Emergent work associated with the step changer on 1-EP-RST-1B while planned maintenance on 1-BLD-DR-M54-1, 1-CW-P-1B, 1-SW-MOV-120A, 1-SW-MOV-120B, 2-HV-E-4A and 1-PT-35.1.4;



- Emergent work associated with Anticipated Transient Without Scram (ATWS) Mitigation Actuation Circuitry (AMSAC) system on Unit 1 in parallel with the following major components out of service: 1-BLD-DR-M54-1, 1-CW-P-1B, 2-HV-E-4A, switchyard and rack work;
- Emergent work associated with card replacement for the steam generator Pressure Operated Relief Valve (PORV) 1-MS-PCV-101C control circuitry in parallel with the following major components out of service: 1-HV-4A, 1-HV-AC-6, AMSAC, and 1-BLD-DR-M54-1; and,
- Work associated with Unit 2 Transient with the following components out of service: 1-FP-P-2, 2-BLD-DR-MS4-14, 1-EP-BKR-15C7, 1-SW-MOV-115A, and 1-SW-P-4.

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

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

- Condition Report CR009147, review of operability determination (OD) 000091 as found testing of 2-SW-MOV-205B showed indication of a degraded bearing;
- Condition Report CR009639, review of OD000087 evaluation of impact on Unit 1 and 2 Recirculation Spray (RS) heat exchangers from problem associated with corrosion product debris on Unit 2 "B" RS Heat exchangers;
- Condition Report CR006964, review of close-out of OD000069, 8"-CC-103-151-Q3 piping potential overstress issue during a design basis earthquake;
- Condition Report CR011987, oil leak of three drops per seven minutes discovered at sight glass on the motor for 2-SI-P-1A, low head safety injection pump;
- Condition Report CR013450, 2-SI-71 was found open during the performance of 2-PT-57.1C, which calls for the valve to be closed. 2-OP-7.2A call for the valve to be closed;
- Condition Reports CR012345, failure of the Unit 2 ESWGR halon discharge timer to initiate, and CR013009, 02-FP-CP-100 Halon Control panel received trouble alarm, and RAS000027; and,

- Condition Report CR012737, amps greater than 10% above nameplate during post maintenance test on 1-SW-MOV-118.

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications

a. Inspection Scope

The inspectors reviewed the completed permanent plant modification Design Change Package (DCP) 05-147, Emergency Switchgear Sump Modifications/NAPS/Units 1 & 2. The inspectors conducted a walkdown of the installation, discussed the desired improvement with system engineers, and reviewed the 10 CFR 50.59 Safety Review/Regulatory Screening, technical drawings, test plans and the modification package to assess TS implications.

b. Findings

No findings of significance were identified, with the exception of post maintenance testing for DCP 05-147 which was documented in section 4OA5 of this report.

1R19 Post Maintenance Testing

a. Inspection Scope

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

- Testing Procedure 0-77.14A, "ECCS PREACS Train A Filter In-Place Test (1-HV-FL-3A)," Revision 14, per Work Order (WO) 772103-112;
- Testing Procedure 1-PT-14.1, "Charging Pump 1-CH-P-1A Test," Revision 45, per WO 754050-01;
- Testing Procedures GOP-3.3, "Valve Position Verification for IS Valves," Revision 6, and 2-PT-213.10, "Valve Inservice Inspection (Sample System Trip Valves)," Revision 12, per WO 776931-01 for work on 2-SS-TV-204A (PRT gas space sample isolation valve) which indicated mid position when open;

- Testing Procedures 1-PT-82.2B, "1J Diesel Generator Test (Simulated Loss of Off-Site Power)," Revision 39, and 0-MCM-0701-37, "Radiator Inspection and Testing for EDG Engine," Revision 3, per WO 733953-1 for 1J EDG east side outer radiation replacement;
- Testing Procedures 2-PT-82J, "2J Emergency Diesel Generator Slow Start Test," Revision 43, and 0-MCM-0701-37, "Radiator Inspection and Testing for EDG Engine," Revision 3 per WO 733886-02 for 2J EDG east side outer radiator replacement; and,
- Procedure 2-PT-107.7, "Emergency Switchgear Room Halon System Functional Test," Revision 5-P1 per WO 778356-01.

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

.1 Refueling Outage

a. Inspection Scope

The inspectors reviewed the Outage Safety Plan (OSP) and contingency plans for the Unit 2 refueling outage, conducted March 18, 2007 through April 17, 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 of defense-in-depth. The inspectors used Inspection Procedure 71111.20, "Refueling and Outage Activities," to observe portions of the 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. Documents reviewed during the inspection are listed in the Attachment.

- Licensee configuration management, including daily outage reports, to evaluate defense-in-depth commensurate with the outage safety plan and compliance with the applicable TS.
- Installation and configuration of reactor coolant instruments to provide accurate indication and an accounting for instrument error.
- Controls over the status and configuration of electrical systems and switchyard to ensure that TS and outage safety plan requirements were met.
- Licensee implementation of clearance activities to ensure equipment was appropriately configured to safely support the work or testing.
- Decay heat removal processes to verify proper operation and that steam generators, when relied upon, were a viable means of backup cooling.
- 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 that activities which could affect reactivity were reviewed for proper control within the outage risk plan.

- Refueling activities for compliance with TS, to verify proper tracking of fuel assemblies from the spent fuel pool to the core, and to verify foreign material exclusion was maintained.
- Activities from unexpected conditions or emergent work to verify no impact on operator ability to maintain the required reactor vessel level during decreased inventory conditions (Reduced inventory and mid-loop conditions as described in Generic Letter 88-17 were not entered.)
- Containment closure activities, including a detailed containment walkdown prior to startup, to verify no evidence of leakage and that debris had not been left which could affect the performance of the containment sump.
- Heat-up and startup activities to verify that TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant conditions. RCS integrity was verified by reviewing RCS leakage calculations and containment integrity was verified by reviewing the status of containment penetrations and containment isolation valves.

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 safety injection (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 remained off line through the end of the reporting period.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the seven 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.

The surveillance tests reviewed were:

In-Service Test:

- 1-PT-71.2Q, "1-FE-P-3A, A Motor-Driven AFW Pump and Valve Test," Revision 31
- 1-PT-75.2A, "Service Water Pump (1-SW-P-1A) Quarterly Test," Revision 48

Other Surveillance Tests:

- 2-PT-64.8, "Flow Test of the Inside Recirculation Spray Pump," Revision 25
- 2-PT-52.2, "Reactor Coolant System Leak Rate Calculation," Revision 30
- 2-PT-82J, "Unit 2 2J Emergency Diesel Generator Slow Start Test," Revision 43
- 2-PT-57.1B, "Emergency Core Cooling Subsystem - Low Head Safety Injection Pump (2-SI-P-1A)," Revision 52

Containment Integrity Support System (Containment Isolation Valves)

- 2-PT-61.3.5, "Containment Purge Valves Type C Test," Revision 16

b. Findings

No findings of significance were identified.

**2. RADIATION SAFETY**

**Cornerstone: Occupational Radiation Safety**

2OS1 Access Control To Radiologically Significant Areas

a. Inspection Scope

Access Control: Licensee activities for monitoring workers and controlling access to radiologically significant areas were inspected. The inspectors evaluated procedural guidance and directly observed implementation of administrative and physical controls; appraised radiation worker and technician knowledge of, and proficiency in implementing, Radiation Protection (RP) program activities; and assessed worker exposures to radiation and radioactive material.

Radiological postings and material labeling were observed during tours of the auxiliary building, external buildings and the Independent Spent Fuel Storage Installation (ISFSI). Inspectors conducted independent surveys in the auxiliary building and the ISFSI to verify posted radiation levels and to compare with current licensee survey records. During plant tours, control of High Radiation Area (HRA), HRA with dose rates greater than 15 rem/hr and Very HRA keys and the physical status of HRA doors were

examined. In addition, the inspectors observed radiological controls for non-fuel items stored in the spent fuel pools. The inspectors also reviewed selected RP procedures and radiation work permits (RWPs), and discussed current access control program implementation with RP supervisors.

During the inspection, radiological controls for work activities in HRAs were observed and discussed. The inspectors observed workers' adherence to RWP guidance and Health Physics Technician (HPT) proficiency in providing job coverage. Controls for limiting exposure to airborne radioactive material were reviewed and operation of ventilation units and positioning of air samplers were also observed. The inspectors evaluated electronic dosimeter alarm set points for consistency with radiological conditions in auxiliary building, decontamination building and the ISFSI. In addition, the inspectors interviewed workers to assess knowledge of RWP requirements.

The inspectors evaluated worker exposures through review of data associated with discrete radioactive particle and dispersed skin contamination events. Controls used for monitoring extremity doses and the placement of dosimetry when work involved significant dose gradients were reviewed. The inspectors discussed the processes that would be used if an individual were to have an uptake of radioactive materials.

RP program activities were evaluated against 10 CFR Part 20; Regulatory Guide (RG) 8.38, Control of Access to High and Very High Radiation Areas in Nuclear Power Plants; and approved licensee procedures. Licensee guidance documents, records, and data reviewed are listed in the Attachment to this report.

Problem Identification and Resolution: Five condition reports associated with radiological controls, personnel monitoring, and three internal exposure assessments were reviewed and discussed with RP supervisors. The inspectors assessed the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with licensee procedure VPAP-1601, Corrective Action. Specific documents reviewed are listed in the Attachment.

The inspectors completed 21 of the specified line-item samples detailed in IP 71121.01.

b. Findings

No findings of significance were identified.

2OS3 Radiation Monitoring Instrumentation and Protective Equipment

a. Inspection Scope

Radiation Monitoring Instrumentation: During tours of U1 and U2 auxiliary building and spent fuel pool areas, the inspectors observed and evaluated material condition and operational status of installed radiation detection equipment including the following: area radiation monitoring (ARM) systems, continuous air monitor instrumentation (AMS-4), portal monitor equipment (PM-7), and post-accident sampling system (high radiation sampling system) components. Area radiation monitoring system equipment observed included 2-MS-RM-290, 291, and 292 (main steam line), 1-RMS-RM-154

(auxiliary building area), 1-RMS-RM-156 (sample room), 1-RMS-RM-152 (new fuel storage area), and 1-RMS-RM-153 (fuel pit bridge). Sensitivity ranges of selected instruments were compared to UFSAR details and other applicable requirements. The inspectors also observed health physics technician selection and use of portable gamma sensitive survey meters.

In addition to equipment walk-downs, the inspectors observed functional checks and alarm set-point testing of various fixed and portable detection instruments. These observations included: calibration of a PM-7 and AMP-100; daily response checks of portable instruments and friskers including a teletector, RO-2, RO-20, BC-4 beta counter, and SAC-4 alpha counter; and daily response checks of PM-7s and personnel contamination monitoring equipment. Daily source check results for the FastScan whole body counter (WBC) were also reviewed. The most recent 10 CFR Part 61 analysis for dry active waste was reviewed to determine if calibration and check sources were representative of the plant source term.

The inspectors reviewed the last two calibration records for the U2 containment high range radiation monitors (2-RMS-RM-265/266) as well as the U1 and U2 containment particulate and area gas radiation monitors (1-RMS-RM-159, 1-RMS-RM-160, 2-RMS-RM-259, and 2-RMS-RM-260). The records were evaluated to determine frequency and adequacy of the calibrations. In addition, calibration stickers on portable survey instruments identified as "ready-to-use" and friskers staged throughout the radiologically controlled area were noted. Calibration records for select instruments staged for use were reviewed. In addition, the most recent calibration of the FastScan WBC and its analysis libraries were reviewed.

Operability and reliability of selected radiation detection instruments were reviewed against details documented in the following: 10 CFR Part 20; NUREG-0737, Clarification of TMI Action Plan Requirements; Technical Specifications 3.4, 3.6, and 3.9; UFSAR Chapter 11; and applicable licensee procedures. Documents reviewed during the inspection are listed in Section 2OS3 of the Attachment to this report.

Self-Contained Breathing Apparatus (SCBA) and Protective Equipment: Select SCBA units staged for emergency use in the control room and other locations were evaluated for material condition, air pressure, and number of units available. Extra air bottles staged for emergency use were inspected for acceptable air pressure and hydrostatic testing markings. The inspectors also reviewed certification records associated with quality of vendor-provided bottled air including compressed grade D air and enriched 35% oxygen/65% nitrogen (35/65) breathing air. Maintenance records for, and training of individuals performing maintenance on, vital components for 35/65 "containment use only" SCBA were reviewed. The inspectors noted that vital component maintenance for SCBA units using grade D air was performed by a vendor. Administrative controls for segregating SCBA units designated "containment use only" were evaluated.

Control room operators were interviewed to evaluate their knowledge of available SCBA equipment locations, including corrective lens inserts if needed, and their training on bottle change-out for extended periods of SCBA use. Respirator qualification records were reviewed for select operations, health physics, chemistry, and maintenance department personnel assigned emergency response duties.

Licensee activities associated with maintenance and use of respiratory protection equipment were reviewed against 10 CFR Part 20; Regulatory Guide (RG) 8.15, Acceptable Programs for Respiratory Protection; and applicable licensee procedures. Documents reviewed during the inspection are listed in Section 2OS3 of the Attachment.

Problem Identification and Resolution: Selected licensee plant issues, condition reports, and self-assessments associated with instrumentation and protective equipment were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure VPAP-1601, Corrective Action, Revision 23. Documents reviewed are listed in Section 2OS3 of the Attachment to this report.

The inspectors completed nine of the specified line-item samples detailed in IP 71121.03.

b. Findings

No findings of significance were identified

**Cornerstone: Public Radiation Safety**

2PS1 Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems

a. Inspection Scope

Effluent Monitoring and Radwaste Equipment: During inspector walk-downs, accessible sections of the U1/U2 liquid and gaseous radioactive waste (radwaste) and effluent systems were assessed for material condition and conformance with system design diagrams. The inspection included Clarifier Tanks, Boron Recovery Tanks, liquid waste system piping, Liquid Waste Clarifier Radiation Monitor (RM-111), Vent Stack Monitors A/B (RM-179/180), the Process Vent Monitor (RM-178), and associated airborne effluent sample lines. The inspectors interviewed licensee staff regarding radwaste equipment configuration and effluent monitor operation.

The inspectors reviewed performance records and calibration results for selected radiation monitors, flowmeters, and air filtration systems. For effluent monitors RM-111, RM-178, RM-179, and RM-180, the inspectors reviewed the two most recent calibration records. The last two surveillances on the Auxiliary Building High Efficiency Particulate Air (HEPA)/charcoal air treatment system were also reviewed. The inspectors evaluated out-of-service effluent monitors and compensatory action data for the period April 2006 - May 2007. In addition, for Vent Stack Monitors RM-179 and RM-180, sample line flow rates were observed on local skid readouts and discussed with chemistry staff to evaluate the adequacy of isokinetic sampling.

Installed configuration, material condition, operability, and reliability of selected effluent sampling and monitoring equipment were reviewed against details documented in the following: 10 CFR Part 20; RG 1.21, "Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials In Liquid and Gaseous Effluents



from Light-Water Cooled Nuclear Power Plants; “ American Nuclear Standards Institute (ANSI)-N13.1-1969, Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities; TS Section 5; the Offsite Dose Calculation Manual (ODCM), Revision 11; and UFSAR, Chapter 11. Procedures and records reviewed during the inspection are listed in Section 2PS1 of the Attachment.

Effluent Release Processing and Quality Control (QC) Activities: The inspectors directly observed the collection of airborne effluent samples from the Vent Stack and Process Vent Monitors and liquid samples from the Clarifier Tank proportional sampler. Chemistry technician proficiency in collecting, processing, and counting the samples, as well as preparing the applicable release permits was evaluated. The inspectors also reviewed selected procedures for effluent sampling, processing, and release.

QC activities regarding gamma spectroscopy and beta-emitter detection were discussed with count room technicians and Chemistry supervision. The inspectors reviewed daily QC data logs for selected High Purity Germanium (HPGe) detectors and reviewed licensee procedural guidance for count room QC. The inspectors also reviewed the two most recent calibration records for HPGe detector No. 1 and the liquid scintillation counter. In addition, results of the 2006 radiochemistry cross-check program were reviewed.

Liquid and gaseous release permits were reviewed against ODCM specifications for pre-release sampling and effluent monitor setpoints. The inspectors also reviewed the 2005 and 2006 annual effluent reports to evaluate reported doses to the public and to review ODCM changes.

Observed task evolutions, count room activities, and offsite dose results were evaluated against details and guidance documented in the following: 10 CFR Part 20 and Appendix I to 10 CFR Part 50; ODCM; RG 1.21; RG 1.33, Quality Assurance Program Requirements (Operation); and TS Section 5. Procedures and records reviewed during the inspection are listed in Section 2PS1 of the Attachment to this report.

Groundwater Monitoring: The inspectors discussed current and future programs for onsite groundwater monitoring with Chemistry supervisors, including number and placement of monitoring wells and identification of plant systems with the most potential for contaminated leakage. The inspectors also reviewed procedural guidance for identifying and assessing onsite spills and leaks of contaminated fluids. In addition, the inspectors reviewed records of historical contaminated spills retained for decommissioning purposes as required by 10 CFR Part 50.75(g).

The licensee currently has no wells suitable for monitoring groundwater contamination, however hydrological studies have been performed to determine the optimum location for groundwater sample points and new wells are currently being constructed. Samples have been taken in various sumps and outdoor drains with detectable levels of tritium identified in storm drain outfalls, subsurface drains, underground manholes and valve pits, and containment mat sumps. The tritium concentrations were approximately the same as or slightly lower than those in nearby Lake Anna. Monitoring for tritium contamination in groundwater is complicated by the fact that Lake Anna has a relatively high tritium background due to routine effluent discharges. Tritium concentrations in the

lake range from 2500 pCi/L to 5000 pCi/L depending on water levels and plant discharge rates. No levels exceeding the EPA drinking water limit of 20,000 pCi/L (corresponding to 4 mrem/year to a member of the public) have been identified in the offsite environs.

Problem Identification and Resolution: Selected plant issue reports associated with effluent release activities were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve selected issues in accordance with procedure VPAP-1601, Corrective Action, Revision 23. The inspectors also evaluated the scope of the licensee's internal audit program and reviewed recent audit results. Documents reviewed are listed in Section 2PS1 of the Attachment to this report.

The inspectors completed 11 of 11 required line-item samples described in IP 71122.01.

b. Findings

No findings of significance were identified.

2PS3 Radiological Environmental Monitoring Program (REMP)

a. Inspection Scope

REMP Implementation: The inspectors reviewed the licensee's most recent Annual Radiological Environmental Operating Reports for 2005 and 2006 which described implementation of the REMP and provided an assessment of the program results. Information regarding surveillance results, analysis of data, land use census, the interlaboratory comparison program, and permitted program deviations were evaluated. The inspector also reviewed and discussed implementation of the REMP with respect to sampling locations, monitoring and measurement frequencies.

The inspectors observed collection of air particulate filters at selected air sampling stations and assessed sample collection methodology and techniques. Calibration procedures and records for the air sampling stations were reviewed. The inspectors also observed thermoluminescent dosimeters (TLDs) placement at selected locations as described in the ODCM. In addition, the inspectors observed vegetation sample collection for selected locations.

Calibration procedures and records for the two most recent calibrations of the meteorological monitoring instruments for air temperature, wind speed and direction were also reviewed. The inspectors evaluated the operability of instruments and determined the availability of current meteorological conditions in the Control Room for the primary tower.

Through the above reviews and observations, the licensee's practices and implementation of their radiological environmental monitoring program, meteorological monitoring program and radioactive material control program were evaluated by the inspectors for consistency with the ODCM, the UFSAR, TS and 10 CFR Part 20 requirements.

Meteorological Monitoring Program: The inspectors reviewed the operability of the meteorological monitoring equipment and operator access to meteorological data. Current meteorological monitoring equipment performance and calibration were reviewed with cognizant licensee representatives. Cognizant licensee representatives responsible for equipment maintenance and surveillance were interviewed by the inspectors concerning equipment performance, reliability, and routine inspections.

Meteorological monitoring program implementation and results were reviewed against TS, ODCM guidance, and procedures listed in Section 2PS3 of the Attachment to this report.

Unrestricted Release of Materials from the Radiologically Controlled Area (RCA): The inspectors reviewed, evaluated, and discussed with cognizant licensee representatives, radiation protection program activities associated with the unconditional release of licensed materials from the main RCA and satellite RCA locations. In addition, the inspectors observed personnel and equipment released from the main RCA access point and satellite RCA locations. Licensee guidance and implementation of RCA exit monitoring activities were evaluated against 10 CFR Part 20 requirements and applicable procedures documented in Section 2PS3 of the Attachment to this report.

Problem Identification (PI) and Resolution: The inspectors reviewed audits, and selected PIs associated with REMP operations and the program for unrestricted release of materials from the RCA. The inspectors assessed the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with licensee procedures VPAP-1601, Corrective Action, Revision 23. Specific PI documents reviewed and evaluated in detail for these program areas are identified in Section 2PS3 of the Attachment to this report.

The inspectors completed 10 of the specified line-item samples detailed in Inspection Procedure 71122.03.

b. Findings

No findings of significance were identified.

**4. OTHER ACTIVITIES**

4AO1 Performance Indicator (PI) Verification

a. Inspection Scope

Cornerstone: Barrier Integrity

The inspectors reviewed the licensee's procedure for developing the data for the Barrier Integrity PI which are: (1) RCS Specific Activity; and (2) Reactor Coolant System Leakage. The inspectors examined data reported to the NRC for the period January, 2006, to March 2007. Procedural guidance for reporting PI information and records used by the licensee to identify potential PI occurrences were also reviewed for both

units. The inspectors reviewed the licensee event reports, monthly operating reports, operating logs, inspection reports, corrective action programs documents, and maintenance rules records as part of the verification process.

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.

Cornerstone: Occupational Radiation Safety

The inspectors reviewed the Occupational Exposure Control Effectiveness Performance Indicator results for the period of April 2006 through March 2007. For the assessment period, the inspectors reviewed HP shift log entries, electronic dosimeter alarm logs, and licensee procedural guidance for collecting and documenting Performance Indicator data. Plant issues were reviewed for uptakes and abnormal TLD results. Report Section 2OS1 contains additional details regarding the inspection of controls for high dose areas and review of related plant issues. Documents reviewed are listed in Sections 2OS1 and 4OA1 of the Attachment to this report.

Cornerstone: Public Radiation Safety

The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from April 2006 through March 2007. For the assessment period, the inspectors reviewed cumulative and projected doses to the public, out-of-service effluent radiation monitor data logs, and selected plant issue reports related to Radiological Effluent Technical Specifications (RETS)/ODCM issues. Documents reviewed are listed in Section 4OA1 of the Attachment to this report.

The inspectors completed the two radiation protection related line-item samples detailed in Inspection Procedure 71151.

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

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

As required by Inspection Procedure 71152, "Identification and Resolution of Problems," and in order to help identify repetitive equipment failures or specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the licensee's corrective action program. This review was accomplished by reviewing daily Plant Issues summary reports and periodically attending daily Plant Issue Review Team meetings.

## .2 Semi-Annual Review to Identify Trends

### a. Inspection Scope

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

### b. Assessment and Observations

No findings of significance were identified. In general, the licensee has identified trends and has addressed the trends with their CAP. However, the inspectors continue to note ongoing issues with failed circuit boards or cards of various systems. Previous trend information regarding failed cards was documented in inspection report Nos. 05000338/2006005 and 05000339/2006005. Since that report on January 3, 2007, an automatic reactor trip occurred on Unit 1 as the result of a failed 7300 process card; for additional information reference Green finding, FIN 05000338, 339/2007002-02, Inadequate Implementation of a Non-quality Procedure Results in Reactor Trips, documented in inspection report Nos. 05000338/2007002 and 05000339/2007002. Additionally, on June 29, 2007, a solid state protection system card failure resulted in a spurious safety injection and reactor trip; reference section 4OA3 of this report for additional information. The inspectors also noted other card failures documented by the following condition reports for the past six months:

- CR007096, Unit 2 'A' main feed regulating valve exhibiting erratic control in manual
- CR008839, Comparator C6-426 found not functioning correctly
- CR009226, Comparator card 2-SI-PC-2925A will not change states
- CR009767, Intermittent failure on SSPS train A universal card A404
- CR010254, Signal converter card found failed bringing in power supply failure annunciators
- CR011019, S/G channel III card C3-222 for 'A' S/G failed
- CR012290, Unit 2 B RC Flow Channel 1 alarmed due to signal comparator card C1-241 failure.

The inspectors continue to monitor the licensee's corrective action progress regarding these card failures and licensee inspection and maintenance program enhancements.

.3 Annual Sample: Review of B Reserve Station Service Transformer Cable Tie Wraps

a. Inspection Scope

The inspectors reviewed the licensee's assessments and corrective actions for Condition Report CR013581, "Untimely completion of corrective action for cable tie-wrap replacement." 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 VPAP-1601, "Corrective Action Program," VPAP-1501, "Deviations" and 10 CFR 50, Appendix B.

b. Findings and Observations

No findings of significance were identified. On March 7, 2007, the "B" RSST tripped and locked out due to a fault on one of the "B" phase cables associated with the low side on the 'B' RSST and resulted in a partial loss of offsite power to an emergency bus. Although the fault challenged a plant safety system, a successful, automatic start of the Unit 2 "H" emergency diesel generator (EDG) did occur due to the resultant, degraded voltage/under voltage signal from the fault.

While the cables between the RSSTs and the emergency buses were installed underground, the cables between the RSSTs and station service buses were located above ground and involve vertical/horizontal routes over the turbine and service building roofs. Consequently, these cables and respective support components, which include cable tie-wraps, were vulnerable to ultraviolet exposure, wind conditions, and thermal contraction/expansion. Therefore, rigorous cable retention methods were necessary to help ensure the integrity of the cable insulation. A fault on a cable to the non-emergency buses could result in the loss of a RSST and therefore impact one of the emergency buses.

In response to this event, the licensee performed a root cause evaluation which determined that broken cable tie-wraps were a contributing cause for the 'B' RSST cable failure. Consequently, the licensee initiated condition report, CR013581, "Untimely completion of corrective action for cable tie-wrap replacement." The inspectors reviewed the licensee's evaluation and independently verified the following corrective action documents:

Plant Issue N-1998-2346, investigation of broken tie-wraps on the service building roofs revealed that the RSST cables that run over the turbine building roof have many broken or missing tie-wraps where cables are tie-wrapped to the cable tray. A corrective action was assigned to replace broken tie-wraps and establish a new preventative maintenance task evaluation request for replacing these tie-wraps on a 10 year interval. Three WO tasks were initiated to perform the initial tie-wrap replacements. Of those, only WO 396025-01 was completed on March 10, 1999. The other two, WO 396025-02 was not closed until February 8, 2007, and WO 396025-03 was not closed until April 2, 2007.

Plant Issue N-2000-1449, The inspectors reviewed Plant Issue N-2000-1449, Unit 2 turbine trip-reactor trip occurred due to a fault on Unit 2 'C' station service transformer caused by a 4160 volt cable that shorted to the cable tray. The associated root cause evaluation determined that a contributing cause was maintenance/testing because there was no process in place to verify the condition of the tie-wraps that restrain the cables associated with the station service transformers (SST). A corrective action was assigned to develop a preventative maintenance activity to periodically inspect and replace damaged tie-wraps in the cable trays associated with the SSTs. The inspectors determined that they extent of condition from Plant Issue N-1998-2346 was not adequate.

Plant Issue N-2003-3522, multiple tie-wraps on the vertical electrical cables from the 'C' RSST to the station service bus appear to have failed resulting in movement of the cables within cable trays during or after Hurricane Isabel. This cause evaluation noted that degraded cable tie-wraps were also identified in 1997 and replaced under WO 370734 which was completed in April, 1998. Additionally, short term corrective actions were assigned to replace all cable tie-wraps on outdoor cables for all three RSSTs and additionally, the cables associated with the station service transformers, with a material with improved resistance to ultraviolet exposure. Long term corrective actions were recommended to evaluate the existing PM for correct periodicity and update of the licensee specification for the appropriate material use for tie-wraps in outdoor applications. The inspectors noted that although the WOs (500104-01 - 09) associated with the short term corrective actions were completed, portions of RSST cabling still have the tie-wraps of the original material installed which presents an ongoing vulnerability for the station.

Given the above information the inspectors concluded that tie-wrap degradation was a vulnerability that contributed to the failure of the "B" RSST cable in addition to the previous cable failures.

#### 40A3 Event Followup

##### .1 (Closed) Licensee Event Report (LER) 05000339/2007-001-00: Damper Leak-by During PREACS Testing Results in Unanticipated Power Reduction

On February 27, 2007, during performance of 0-PT-77.14A, "Emergency Core Cooling System (ECCS) Pump Room Exhaust Air Cleanup System (PREACS) Train A Filter In-Place Test (1-HV-FL-3A)," the licensee determined that the exhaust bypass dampers, 2-HV-AOD-228-1 and 2-HV-AOD-228-2, had leakby greater than the acceptance criteria which rendered both trains of PREACS inoperable. This placed the unit in TS 3.0.3 which subsequently resulted in a power reduction to 32%. At 2230 hours following the installation of a temporary modification which returned both trains to an operable status, the licensee exited TS 3.0.3. The licensee determined the cause to be ineffective short term corrective action from a previous similar problem documented by Plant Issue N-2006-0504. Corrective actions included improved programmatic training for apparent and root cause evaluations. This finding is more than minor because of the impact on the Barrier Integrity Cornerstone and was considered to have very low safety significance (Green) because of the degradation of a radiological barrier function provided for the control room. This licensee-identified finding involved a violation of 10

CFR 50, Appendix B, criterion XVI, Corrective Action. The enforcement aspects are documented in Section 4OA7 of this report. This LER is closed.

.2 (Closed) Licensee Event Report (LER) 05000339/2007-002-00: Automatic Start of 2H EDG on Loss of "B" Reserve Station Service Transformer Due to Cable Fault

On March 7, 2007, the "B" RSST tripped and locked out due to a fault on one of the "B" phase cables associated with the low side on the "B" RSST. This resulted in an automatic start of the Unit 2 "H" EDG from a degraded voltage/under voltage signal due to the loss of the "B" RSST. Additional discussion regarding the corrective action aspects of this event are documented in Section 4OA2 of this report. The LER was reviewed by the inspectors and no findings of significance were identified and no violations of NRC requirements occurred. The licensee documented the failed equipment in Condition Report CR008355. This LER is closed.

.3 (Closed) Licensee Event Report (LER) 05000339/2007-002-01: Automatic Start of 2H EDG on Loss of "B" Reserve Station Service Transformer Due to Cable Fault Update

On March 7, 2007, the "B" RSST tripped and locked out due to a fault on one of the "B" phase cables associated with the low side on the "B" RSST. This resulted in an automatic start of the Unit 2 "H" EDG from a degraded voltage/under voltage signal due to the loss of the "B" RSST. Further investigation of the faulted cable showed that the cause of the event was damage during the original construction installation that resulted in a hole in the cable jacket allowing moisture intrusion, which resulted in corrosion and then breakage of the zinc shield tape. The LER was reviewed by the inspectors and no findings of significance were identified and no violations of NRC requirements occurred. The licensee placed additional corrective actions into their Corrective Action Program for tracking and implementation as part of Condition Report CR008355. This LER is closed.

.4 Unit 2 Spurious Safety Injection Actuation and Reactor Trip, June 29,2007

On March 7, 2007, the inspectors responded to an event on Unit 2 involving a spurious 'B' train SI actuation which initiated a trip of both feedwater pumps which tripped the main turbine. The reactor then tripped due to the main turbine trip. The single train SI resulted in ECCS flow to the reactor coolant system (RCS). The 'A' train of SI was manually initiated per station emergency operating procedures. Subsequently, the 'A' train SI was secured and reset; however, the 'B' train SI could not be reset. Continued injection from the 'B' train SI resulted in RCS inventory increasing resulting in multiple actuations of the pressurizer power operated relief valves (PORV) to limit RCS system pressure. RCS inventory from the PORVs discharged to the pressurizer relief tank (PRT) which subsequently overfilled. PRT overpressure was prevented by actuation of the associated rupture disc, and water from the PRT was released to the containment sump. Through local, manual actions the licensee was subsequently successful in securing injection from the 'B' train SI, and RCS pressure and level control was then maintained by normal charging and letdown.

The circumstances surrounding this event are under review by a Special Inspection team who will document the results of their inspection in report No. 05000339/2007009.



#### 4OA5 Other Activities

##### .1 (Closed) Flood Protection Measures URI Closeout 05000338, 339/2007002-01, Backflow Preventer Design and Preventative Maintenance Evaluation

###### a. Inspection Scope

The inspectors completed a review and characterization of URI 05000338, 339/2007002-01. The inspectors reviewed design change modification and preventative maintenance documentation and interviewed engineering personnel in regards to internal flood protection using backflow preventer components.

###### b. Findings

Introduction: A Green, non-cited violation of TS 5.4.1a was identified by the NRC for failure to establish an adequate post maintenance test (PMT) for a design change modification installing new backflow preventers (BFP) and for work orders replacing BFPs as preventative maintenance. This resulted in degraded and inoperable BFPs in the Unit 1 and 2 emergency switchgear area air conditioning fan rooms.

Description: On March 15, 2007, the inspectors performed a plant walkdown to review installation of BFPs used for internal flood prevention for flow paths involving floor drains. The inspectors found a high head charging pump cubicle floor drain in which several drainage tubes were routed for miscellaneous equipment. The inspectors noted that a possible interference existed between the tubing and operation of the installed BFP. The licensee performed an inspection and determined that the component would still function adequately and initiated Condition Report CR008737 to review processes which would provide adequate control of drainage tube placement to prevent any interference with BFP operation. The inspectors also reviewed installation of the BFPs located in the Unit 1 and 2 emergency switchgear area air conditioning fan rooms (ACFR) and identified a degraded BFP, 1-DB-BFP-5. The licensee declared this component inoperable and initiated CR008734. While the licensee took immediate action to replace the ACFRs BFPs (total of two drains on each Unit), the licensee subsequently found another Unit 1 ACFR BFP problem in which 1-DB-BFP-6 was found resting on top of the floor drain pipe opening (Condition Report CR008997). The licensee subsequently performed an apparent cause evaluation and determined that operation of the Unit 1 instrument room sump pumps which discharge into floor drain piping associated with the ACFR BFPs could have an impact on operation of these components due to the increased back-pressure.

The inspectors reviewed the design change modification, DCP 05-147, which installed the ACFR BFPs on both Units (reference Inspection Report 05000338, 339/2006002 for more information regarding the internal flooding impact on Solid State Protection System (SSPS) components located in the area of concern) and the work orders for periodic preventative maintenance to replace BFPs used for internal flood protection. The inspectors determined that no PMT existed for the work orders and the PMT for the modification did not specify any testing to ensure that an installed Unit 1 ACFR BFP would be unaffected by the increased back-pressure from sump pump operation. The inspector concluded that the failure to establish an adequate PMT for BFPs in general

precluded assurance of adequate functionality for back-pressure due to flooding or a combination of flooding and sump pump discharge pressure for those affected BFPs. The inspectors determined from the licensee's quality assurance program (QAP) that the BFPs used for internal flooding protection are classified non-safety-related with special quality/regulatory requirements (NSQ), which is the application of selected quality assurance measures to structures, systems, components, or programs that are important to safe operation of the nuclear facilities. The inspectors noted that the QAP states, "The post-maintenance testing program ensures that a functional test can be performed as additional assurance demonstrating the quality of work where inspections for breach of a pressure boundary are performed by an individual within the same functional group (e.g., Maintenance)." The inspectors determined that the BFPs act as a pressure boundary during an internal flooding scenario. The inspectors also noted that VPAP-2003, Post Maintenance Testing Program," step 2.2.1, states, "Test matrices have been developed to specify post maintenance testing requirements for selected safety related and NSQ equipment. The intent of the program is to eventually expand the scope to include all safety related, NSQ, and selected NS mechanical and electrical equipment."

Analysis: The failure to establish an adequate PMT as required by TS 5.4.1.a, is the performance deficiency. The finding had a credible impact on safety based on the potential for flooding to impact both trains of SSPS cabinets used for engineered safeguards, and if left uncorrected this finding would result in a more significant safety concern and is more than minor. The inspectors evaluated the significance of the finding and determined that it was similar and bounded by the phase III evaluation performed for NCV 05000338, 339/2006002-02, Inadequate Design Control Results in Safeguards Instrument Rack Room Flood Problem, and concluded that absence of any BFPs in the Unit 1 ACFR was of very low safety significance (Green) based on the existence of high level alarms for the associated sumps and the response time allowed for an operator to isolate the leak (approximately 40 minutes). The cause of this finding involved the cross-cutting area of human performance, the related component of resources, and the associated aspect of complete and accurate procedures based on the failure to establish adequate design change modification and maintenance procedures for PMT to perform work on a quality-related component.

Enforcement: TS 5.4.1.a, requires in part that written procedures shall be established per Regulatory Guide 1.33, Appendix A, item 9 requires that procedures be maintained for performing maintenance and modifications. Contrary to this on March 15, 2007, design change modification and maintenance procedures for PMT were not established and resulted in the failure of BFPs located in the Unit 1 ACFR. This finding is of very low safety significance and has been entered into the licensee's corrective action program as CR 008734, this violation is being treated as an NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000338/2007003-01, Inadequate Post Maintenance Testing Procedure to Prevent Failure of a BackFlow Preventer for Internal Flood Protection.

.2 Failure to secure the Unit 2 safety related pressurizer heater cabinet doors as required by procedure VPAP-0312.

a. Inspection Scope

The inspectors performed plant tours in accordance with IMC 2515, Appendix D to provide an independent perspective of ongoing plant activities that may affect plant performance in the cornerstones.

b. Findings

Introduction: A Green, non-cited violation of 10 CFR 50, Appendix B, Criterion V was identified by the NRC for failure to properly accomplish a procedure for ensuring doors on safety-related PZR heater cabinets are adequately secured to maintain seismic requirements.

Description: On March 15, 2007, during a plant status plant tour the inspectors identified all five of the Unit 2 PZR heater cabinet (2-EP-CB-10A, B, C, D, E) doors improperly secured. Each of the doors have three spring loaded clips which includes a bolt for tightening the clip against the door. All five doors were found with the top and bottom clips in the unsecured or open position with some actually tightened in this position. All five doors had the center clips positioned in the secured position with the door closed; however, all five clips were sufficiently loose to allow easy repositioning in order to open the door. The inspectors determined that the PZR heater cabinets have a safety-related classification which includes seismic qualifications. Additionally, the inspectors determined that PZR heater groups 1 and 4 associated with cabinets 2-EP-CB-10A & D, respectively powered from the emergency busses and are required operable by TS. The licensee had previously evaluated the PZR heater cabinets using the "Generic Implementation Procedure for Seismic Verification of Mechanical and Electrical Equipment for Nuclear Plants," Revision 2, prepared by the Seismic Qualification Utility Group in response to Generic Letter 87-02. This evaluation noted that as part of the bounding spectrum or seismic capacity of the cabinets of concern, one of the requirements was that the cabinet doors have to be secured. The inspectors also determined through interviews with engineering personnel that the door for 2-EP-CB-10C could impact an adjacent contactor cabinet and damage the indicator lamps and in a worst case scenario, result in a short circuit. The associated circuit fuse would then blow to protect the circuit; however, this would also render 2-EP-CB-10D, one of the TS required cabinets, inoperable. The inspectors reviewed the TS Bases for PZR heaters and noted that in MODES 1, 2, and 3, there was need to maintain the availability of pressurizer heaters, capable of being powered from an emergency bus. In the event of a loss of offsite power, the initial conditions of these MODES give the greatest demand for maintaining the RCS in a hot pressurized condition with loop subcooling for an extended period. The inspectors also noted that the switchyard components do not have seismic requirements; thus, a seismic event would likely result in a loss of the switchyard, and loss of the TS offsite power supply causing a loss of offsite power to the plant.

The licensee's administrative procedure, VPAP-0312, "Seismic Housekeeping." Section 6.10, "Doors for Electrical Switchgears, Cabinets, and Panels," provided instructions for

appropriate seismic controls. Step 6.10.4 c states, "At job completion, when enclosure doors are replaced or closed, ensure all screws, bolts, clamps, latches, etc. are in place and tightened at least snug tight unless otherwise specified. (Snug tight is defined as that tightness attained using average force with a wrench, screwdriver, or other appropriate tool)."

Analysis: The inspectors determined that the failure to properly accomplish procedure VPAP-0312 was a performance deficiency. The inspectors determined that this finding was more than minor because if left uncorrected it would cause a more significant safety concern by rendering a TS required component inoperable during seismic events. The inspectors determined that the finding was of very low safety significance, Green, because it was potentially risk significant due to a seismic initiating event, and the loss of the equipment would not sufficiently degrade the TS required system that supported the intended safety function as described in Phase 1 of the significance determination process. This finding has aspects relating to the cross-cutting area of human performance (H.4.b), based on procedural compliance and failure of personnel to follow procedures.

Enforcement: 10 CFR 50, Appendix B, Criterion V, "Instructions, Procedures and Drawings," requires in part that activities affecting quality shall be accomplished in accordance with procedures. Contrary to this on June 15, 2007, the NRC identified that the licensee had failed to secure the Unit 2 safety related pressurizer heater cabinet doors as required by procedure VPAP-0312. This finding is of very low safety significance and is in the licensee's corrective action program as CR 013992; therefore, this violation is characterized as a NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000339/2007003-02, failure to secure the Unit 2 safety related pressurizer heater cabinet doors as required by procedure VPAP-0312.

.3 (Open) Temporary Instruction (TI) 2515/166 "Pressurized Water Reactor Containment Sump Blockage (NRC Generic Letter 2004-02)" - Unit 2

a. Inspection Scope

The inspectors verified the Unit 2 implementation of the licensee's commitments documented in their September 1, 2005, response to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at Pressurized Water Reactors." The commitments included permanent modifications, and program and procedure changes. Permanent modifications included installation of the sump screen assembly, RWST low level change, and insulation removal/change. Program and procedure changes were related to plant labeling, the modification process, coatings control and the technical specification surveillance for periodic screen inspection. This review included the sump screen assembly installation procedure, screen assembly modification 10 CFR 50.59 evaluation, structural (debris) loading

calculation, and the vortex analysis. The hydraulic performance analysis was reviewed to identify the allowable screen head loss and verify strainers will fulfill the hydraulic performance requirements. The inspectors also reviewed the foreign materials exclusion controls and the completed Quality Assurance / Quality Control records for the screen assembly installation on Unit 2.

The inspectors conducted a visual walkdown of the Unit 2 screen assembly to verify the installed screen assembly configuration was consistent with drawings and the tested configuration and to verify the design acceptance criteria for screen gap.

b. Findings

No findings of significance were identified.

Unit 2 permanent modifications completed at the time of this inspection, which included the sump screen assembly and the insulation removal, were implemented in accordance with North Anna's Generic Letter 2004-02 response.

The TI will remain open pending completion of the following Generic Letter 2004-02 commitments:

1. Completion of downstream effects analysis and any subsequent corrective actions.
2. Completion of additional chemical effects analysis.
3. Completion of changes to programmatic control for debris sources. These controls are to address piping and equipment insulation, housekeeping, coating, foreign materials and in containment modifications for effects on recirculation function.
4. Completion of Unit 1 Generic Letter 2004-02 commitments.

.4 Independent Spent Fuel Storage Installation (ISFSI) Radiological Controls

a. Inspection Scope

The inspectors conducted independent gamma and neutron surveys of the ISFSI facility and compared the results to previous surveys. The inspectors also observed and evaluated implementation of radiological controls, including RWPs and postings, and discussed the controls with a HPT and RP supervisory staff. Radiological controls for loading the ISFSI casks were also reviewed and discussed.

Radiological control activities for ISFSI areas were evaluated against 10 CFR Part 20, 10 CFR Part 72, and applicable licensee procedures. Documents reviewed are listed in Section 4OA5 of the Attachment

The inspectors completed one of the specified line-item samples detailed in IP 60855.1.

b. Findings

No findings of significance were identified.

#### 4OA6 Meetings, including Exit

##### .1 Exit Meeting Summary

On July 18, 2007, the senior resident inspector and the reactor projects branch chief 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 Temporary Instruction 2515/166 Inspection Interim Exit Meeting

An interim exit was conducted on April 12, 2007, to discuss the findings of this inspection. Although proprietary information was reviewed during the inspection, no proprietary information is included in this report.

##### .3 Inservice Inspection Exit Meeting

An exit meeting was conducted on April 6, 2007, with Mr. Dan Stoddard and other members of his staff. Some proprietary information was reviewed and is not included in this report.

##### .4 Radiation Protection Inspection Exit Meeting

An exit meeting was conducted on June 15, 2007, with Mr. Dan Stoddard and other members of his staff. Although proprietary information was reviewed during the inspection, no proprietary information is included in this report.

#### 4OA7 Licensee-Identified Violation

The following findings of very low significance were identified by the licensee and are a violation of NRC requirements which meet the criteria of Section VI of the NRC Enforcement Policy, NUREG-1600, for characterization as an NCV.

- 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, requires in part that for significant conditions adverse to quality, measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. Contrary to this, on February 27, 2007, the licensee identified that both trains of PREACS were inoperable due to inadequate corrective actions from a similar event in 2006. The finding is identified in the licensee's corrective action program as Condition Report CR008099. The finding is of very low safety significance because it only represented a degradation of a radiological barrier function provided for the control room.
- North Anna Power Plant Facility Renewed Operating License N.F.-4 & 7, Condition D, Fire Protection, states in part that VEPCO shall implement and maintain in effect all provisions of the approved fire protection program as described in the UFSAR for the facility. Contrary to this on May 11, 2007, the licensee determined that the fuel oil supply lines and electrical conduit

associated with the diesel drive fire pump, 1-FP-P-2, were not seismically supported and declared the component inoperable. The finding is identified in the licensee's corrective action program as Condition Report CR011802. The finding is of very low safety significance because of the very low frequency of seismic events within the area.

## SUPPLEMENTAL INFORMATION

### KEY POINTS OF CONTACT

#### Licensee personnel

V. Armentrout, SG Programs, ISI Corporate  
J. Breeden, Supervisor, Radioactive Analysis and Material Control  
B. Britt, Boric Acid Program  
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  
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  
B. Morrison, Supervisor Nuclear Engineering  
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  
R. Williams, Component Engineer



**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**Discussed  
2515/166

TI	Pressurized Water Reactor Containment Sump Blockage Unit 2 (NRC Generic Letter 2004-02) (Section 4OA5.2)
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Opened and Closed  
05000338/2007003-01

NCV	Inadequate Procedures Results in Failure of a Backflow Preventer for Internal Flood Protection (Section 4OA5.1)
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05000339/2007003-02

NCV	Failure to Secure the Unit 2 Safety Related Pressurizer Heater Cabinet Doors as Required by Procedure VPAP-0312. (Section 4OA5.2)
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Closed

05000338, 339/2007002-01

URI	Backflow Preventer Design and Preventative Maintenance Evaluation (Section 4OA5.1)
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05000339/2007-001-00

LER	Damper Leak-by During PREACS Testing Results in Unanticipated Power Reduction (Section 4OA3.1)
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05000339/2007-002-00

LER	Automatic Start of 2H EDG on Loss of "B" Reserve Station Service Transformer Due to Cable Fault (Section 4OA3.2)
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05000339/2007-002-01

LER	Automatic Start of 2H EDG on Loss of "B" Reserve Station Service Transformer Due to Cable Fault Update (Section 4OA3.2)
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## LIST OF DOCUMENTS REVIEWED

### **Section 1R04: Equipment Alignment**

#### Documents

- Procedure 2-PT-64.7, "Outside Recirc Spray and Casing Cooling System Valve Lineup and Verification," Revision 5
- Technical Specification 3.6.7, Recirculation Spray System
- Technical Specification SR 3.6.7.4, RS System Surveillance Requirements

#### Drawings

- 12050-FM-918A, "Cont Quench and Recir Spray Sub Sys," Sheet 1 of 4 and Sheet 4 of 4
- 12050-FM-91B, "Containment Quench and Recirculating Spray Sub System," Sheet 1

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

#### Procedures

- 54-ISI-30-04, Revised March 8 2006, Areva/Framatome Written Practice for Qualification and Certification of Personnel
- 54-ISI-600-02, Revised July 17 2006, Areva/Framatome Manual Ultrasonic Examination of Verly for Thickness and Profile Measurement
- 54-MT-02-04, Revised September 07 2006, Wet or Dry Magnetic Particle Examination Procedure
- 54-PT-200-07, Revised January 08, 2007, Areva/Framatome Color Contrast Solvent Removable Liquid Penetrant Examination of Components
- 54-ISI-838-08, Revised February 09 2007, Areva/Framatome Manual Ultrasonic Examination of Weld Overlays Similar and Dissimilar Welds
- 54-ISI-24-29, Revised July 23, 2004, Areva Written Practice for Personnel Qualification in Eddy Current Examination
- ER-AA-NDE-VT-604, Dominion Visual Examination for Leakage of PWR Reactor Head penetrations
- NAP-SGPMS-001, North Anna Site Specific Eddy Current Analysis Guidelines, Revision 10, 3/10/07
- 54-ISI-603-003, Revised January 2007, Automated Ultrasonic Examination of RPV Closure Head Penetrations Containing Thermal Sleeves
- 54-ISI-604-002, Revised January 30, 2007, Automated Ultrasonic Examination of Open Tube RPV Closure Head Penetrations
- 54-ISI-605-03, Revised January 29 2007, Automated Ultrasonic Examination of RPV Closure Head Small Bore Penetrations

#### Areva Drawings

- 8017405D, Revision 002, North Anna Pressurizer Overlay Implementation
- 8017177D, Revision 001, North Anna Pressurizer Safety Nozzle Overlay Design
- 8017182D, Revision 001, North Anna Pressurizer Relief Nozzle Overlay Design
- 8017175D, Revision 001, North Anna Pressurizer Spray Nozzle Overlay Design

#### Corrective Action and Evaluation Documents

- ET-N-07-0029, Engineering Transmittal for Disposition of As-Found Condition for 2-RH -P-1A Pump with Boric Acid Residue Found at the Pump Bowl to Stuffing Box Fflange
- CA007209, Boric Acid Buildup found on "B" cold leg
- CA006864, Discovery of Boric Acid during 2-PT-48 Walkdown
- CR009437, 3/27/2007, White Material Found on top of Unit 2-RX Head
- ACE000365, Red Tape affixed to nozzle N2-34 found during 2-PT-48.5 walkdown
- Plant Issue N-2005-4388, 10/13/2005, following head replacement in 2002 there were paint chips left on which turned into white residue
- Plant Issue N-2004-3957, 9/21/2004, paint chips observed under insulation during Unit 2 Reactor vessel inspection

Other Records

- Steam generator Condition Monitoring and Operational Assessment North Anna Unit 2 - March 2007 Refueling
- S/G Monitoring Program Pre-Outage Assessment North Anna Unit 2 - Spring 2007
- 51-9043689-000, 3/15/2007, North Anna Unit 2 2R18 - EPRI Appendix H Eddy Current Technical Review
- Dominion North Anna Power Station Eddy Current Analyst Orientation & Training program Manual, September 14, 2004
- 51-9044346-000, 2/27/2007, Areva RPV Head Penetration Inspection Plan and Coverage Assessment for North Anna Unit 2
- Repair Replacement Plan 2007-023/ Work Order #759462-01, Weld Overlays on pressurizer Nozzle DM welds in accordance with DCP 06-004 and Relief Request CMP-023R1
- Repair Replacement Plan # 2007-038, Cut out existing Alloy 600 thermowells and install new thermowells fabricated from ASME SA-479 type 304 SS material per DCP 06-002.

**Section 20S1: Access Control To Radiologically Significant Areas**

Procedures, Manuals, and Guides

- C-HP-1020.010, Radiological Protection Failed Fuel Action Plan, Revision 3
- C-HP-1020.011, Radiological Protection Action Plan During Diving Activities, Revision 3
- C-HP-1031.023, RWP Dosimetry: Exposure Control Support, Revision 2
- C-HP-1031.025, Dosimetry Requirements for Site Restricted Areas, Revision 1
- C-HP-1032.010, Radiological Survey Records, Revision 5
- C-HP-1032.020, Radiological Survey Criteria and Scheduling, Revision 5
- C-HP-1032.030, Radiation Surveys, Revision 4
- C-HP-1032.040, Contamination Surveys, Revision 5
- C-HP-1032.050, Airborne Radioactivity Surveys, Revision 6
- C-HP-1032.060, Radiological Posting and Access Control, Revision 1
- C-HP-1032.061, High Radiation Area Key Control, Revision 4
- C-HP-1032.080, Controlled Area and Unrestricted Area Radiological Surveys, Revision 7

- C-HP-1061.110, Radiological Control Areas, Revision 7
- C-HP-1061.120, Hot Particle Control, Revision 3
- C-HP-1081.010, Radiation Work Permits: Preparing and Approving, Revision 9
- C-HP-1081.020, Radiation Work Permits: RWP Briefing and Controlling Work, Revision 6
- C-HP-1081.030, Radiation Work Permits: Extending, Revising and Terminating, Revision 4
- C-HP-1081.040, Radiation Work Permits: Providing HP Coverage During Work, Revision 3
- HP-1020.013, RP Action Plan in Response to Unusual Radiological Occurrences, Revision 1
- HP-1032.070, Radiological Surveys for Releasing Oil, Sewage, & Other Bulk Materials, Revision 6
- HP-1061.340, Reactor Cavity and Fuel Transfer Canal Decontamination, Revision 2
- VPAP-1601, Corrective Action, Revision 23

#### Radiation Work Permits (RWPs)

- RWP 07-0001, Walkdowns/ Inspections/ Observations
- RWP 07-1006, Perform Maintenance on Spare RCP Motor.
- RWP 07-1018, Retrieve Foreign Material from Spent Fuel Pool
- RWP 07-1011, Perform Fuel/Insert Shuffles (Non-Cask Related)
- RWP 07-1204, Transfer Filter to OSSC
- RWP 07-1210, Resin Transfers
- RWP 07-1502, Containment Entries

#### Corrective Action Program (CAP) Documents/Audits

- CR008901, Contamination identified on workers shoe at protected area exit
- CR009561, TLD arrived at vendor with contaminated case
- CR009571, Individual left DAD with outer layer of coveralls while undressing
- CR009631, Individual lost DAD while installing insulation
- CR010003, Contamination identified on workers shoe at protected area exit
- CR011413, Radioactive particles discovered at the high range calibration facility (inside posted radioactive material area)

### **Section 2OS3: Radiation Monitoring Instrumentation and Protective Equipment**

#### Procedures

- HP-1041.044, Standup Whole Body Counter: Operation and Performance Checks, Revision 8
- HP-1041.064, Standup Whole Body Counter: Calibration, Revision 4
- HP-1033.022, J.L. Shepherd Model 89 Shielded Calibration System, Operation and Surveillance, Revision 1
- HP-1033.015, Personnel Contamination Monitoring Instrumentation Control, Revision 12
- C-HP-1033.012, Portable Radiation Protection Instrumentation Control, Revision 1

- C-HP-1033.021, Reference Sources for Radiation Protection Instrumentation, Revision 0
- C-HP-1033.532, MGP AMP-100/200, Calibration and Operation, Revision 1
- C-HP-1042.011, Respirator User Qualification, Revision 0
- C-HP-1042.151, Respirator Issue, Revision 1
- C-HP-1042.450, Self-Contained Breathing Apparatus Maintenance, Revision 11
- C-HP-1042.520, Respiratory Protection Program Equipment Criteria and Verification, Revision 4
- HPAP-1041, Bioassay Program, Revision 7
- CH-94.300, High Radiation Sampling System Control, Revision 4
- CH-43.410, High Radiation Sampling System: Shutdown Alignment, Revision 0

Records and Data

- Certificate of Conformance, Airgas East Inc., breathing air quality for cylinders by serial number, 4/15/04
- Technical Basis Paper for Using the PM-7 for Meeting the WBC Requirement, 1/6/00
- MRULE-RTF-06-001, Run To Failure Evaluation for RM Westinghouse RM Connectors, 7/18/06
- Calibration Record - Standup Whole Body Counter, 5/9/07
- Calibration Certificate - Eberline AMS-4, serial number 1551, 2/20/07
- Calibration Certificate - Eberline PM-7, serial number 434 (12/7/06, 6/12/07)
- Calibration Certificate - Eberline BC-4, serial number 668, 5/14/07
- Calibration Certificate - Eberline ASP-2, serial number 1128, 4/19/07
- Calibration Certificate - Eberline RO-2, serial number 1160, 4/6/07
- Calibration Certificate - Eberline RO-20, serial number 5425, 1/23/07
- Calibration Certificate - Eberline Teletector, serial number 69702, 4/1/07
- Source Curves, J.L. Shepherd Irradiator 89-400, 4/26/06
- Source Curve, Gammatron AmBe Device, 4/26/06
- ICP-RMS-1-RM-159, Containment Particulate Radiation Monitor Calibration (6/24/04, 1/27/06)
- ICP-RMS-1-RM-160, Containment Area Gas Radiation Monitor Calibration (6/28/04, 1/17/06)
- ICP-RMS-2-RM-259, Containment Particulate Radiation Monitor Calibration (12/7/05)
- ICP-RMS-2-RM-260, Containment Area Gas Radiation Monitor Calibration (3/28/04, 12/14/05)
- ICP-RM-2-RMS-265, Containment High Range Radiation Monitoring System Surveillance (7/19/05, 10/22/05; 1/23/07, 4/1/07)
- ICP-RM-2-RMS-266, Containment High Range Radiation Monitoring System Surveillance (7/18/05, 10/22/05; 1/22/07, 4/1/07)
- Accuscan WBC Inhalation Library
- Memorandum: Respirator Use in Containment, 6/28/93
- Letter: North Anna CTS 02-98-2199-001, Exemption from 10 CFR 20.1703(a)(1), 10 CFR 20.1703(c) and 10 CFR Part 20, Appendix A, Protection Factors For Respirators, Footnote d.2.(d), and Authorization To Use Certain

- Respirators For Worker Protection Inside Containment (TAC NOS. M98384 and M98385), N. Kalyanam NRC Project Manager to J.P. O'Hanlon, July 31, 1998.
- PM-7 Trending Data, January 2005 - June 2007

#### Self-Assessments

- Radiological Respiratory Protection Program Evaluation (5/2002-5/2005), 7/12/05
- Radiological Instrumentation Program Surveillance and Evaluation (1/2003-6/2006), 7/25/06
- Bioassay Program Surveillance and Evaluation (4/2002-6/2004), 8/12/04
- RP CTS 051107-901, 2006 Assessment of the Performance of Automatic Contamination Monitoring Systems
- NAPS-SA-05-05, Whole Body Count Practices, 4/21/05
- NAPS-SA-05-07, Use and Operation of Instrumentation Used for the Radioactive Free Release of Personnel and Material, 7/20/05

#### Plant Issues

- N-2006-0807, Personnel Contamination Monitors failed in the month of January 2006, 2/24/06
- N-2006-1139, Personnel Contamination Monitors failed in the month of February 2006, 3/14/06
- N-2006-2463, J.L. Shepherd model 89 calibrator #8282 switch arm bent upward preventing source rod from be fully raised, 5/1/06
- N-2005-3502-R6, Trend operational performance of automatic contamination monitoring systems, 9/8/05
- N-2006-3781, 1-RM-RMS-153 is not functioning, 7/15/06
- N-2006-4208, Found cause of 1-RM-RMW-153 not source checking was a failed detector, 8/7/06
- N-2006-4350, 2-RM-RMS-263 (containment high rad monitor) spiked a second tie during shift, 8/14/06
- N-2005-4928, During checkout of SCBA equipment, deficiencies were found, 10/29/05
- N-2005-4935, During issuance of SCBA equipment for workers performing 2-PT-46.21, deficiencies were found, 10/29/05

#### Condition Reports

- CR002134, Emergency Plan RP instrument calibrated 3% high on lower scale, 10/6/06
- CR007131, Source interlock for JL Shepard #8282 is broken, 2/4/07

### **Section 2PS1: Radioactive Gaseous and Liquid Effluent Treatment and Monitoring Systems**

#### Manuals and Procedures

- Offsite Dose Calculation Manual, Revisions 10 and 11
- HP-3010.031, Radioactive Gaseous Waste Sampling and Analysis, Revision 25
- HP-3010.021, Radioactive Liquid Waste Sampling and Analysis, Revision 19

- HP-3010.040, Radiation Monitoring System Setpoint Determination, Revision 19
- 0-AP-5.2, 1-VG-RI-179-1, 2, or 3, MGP Vent Stack A Rad Monitor, Revision 16
- HP-1033.105, EG&G Ortec Gammavision MCA: Performance Checks, Revision 4
- VPAP-1601, Corrective Action, Revision 23
- VPAP-2802, Notifications and Reports, Revision 25

#### Records and Data

##### Annual Radioactive Effluent Release Report, 2005 and 2006

- Onsite Tritium Sampling Results, 1/06 - 12/06
- Liquid Waste Clarifier Radiation Monitor (RM-LW-111) Calibration, 9/4/04 and 9/7/06
- Vent Stack B Normal and High Range Effluent Radiation Monitor (VG-RM-180) Calibration, 6/3/04 and 9/2/05
- Vent Stack A Normal and High Range Effluent Radiation Monitor (VG-RM-179) Calibration, 2/23/05 and 9/21/06
- Process Vent Normal and High Range Effluent Radiation Monitor (RM-GW-178) Calibration, 1/30/05 and 6/16/06
- Auxiliary Building Train A Filter In-Place Test, 4/12/07
- Auxiliary Building Train B Filter In-Place Test, 2/22/06
- Germanium Detector #1 Calibration, 11/8/05 and 12/11/06
- Liquid Scintillation Detector Calibration, 3/8/06, 2/9/07, and 3/30/07
- Gaseous Radioactive Waste Release Permit Nos. 07-MGR-44 (4/6/07), 07-RXC-02 (3/24/07), 07-WGDT-04 (4/22/07), 07-VV-16 (4/6/07), 07-VV-18 (4/18/07), 07-MGR-64 (5/29/07), and 07-MGR-67 (6/6/07)
- Liquid Radioactive Waste Release Permit Nos. 07-HCBD-02 (1/30/07), 07-CE-01 (12/28/06), and 07-CE-04 (3/30/07)
- Results of Interlaboratory Cross-Check Program, 1<sup>st</sup> and 3<sup>rd</sup> Quarters 2006
- Germanium Detector and Liquid Scintillation Detector Daily Source Check and Trend Logs, 5/1/07 - 5/31/07
- Out-of-service data and selected compensatory sample records for U1 and U2 radiation monitors, 4/06 - 5/07
- 10 CFR Part 50.75(g) Records of Historical Contaminated Spills

#### CAP Documents

- Radioactive Effluent Control Program Evaluation, 7/13/05
- CR 003999, Elevated tritium levels found in U2 valve pit, 11/8/06
- OER N-2006-3208-E1, Tritium levels found in subsurface drains consistent with levels in Lake Anna, 6/13/06
- PIR N-2006-1916-R2, Detectable tritium leak from U1 Turbine Building, 3/31/06
- PIR N-2006-2872-R1, Alarm received on vent effluent monitors, 5/25/06

#### **Section 2PS3: Radiological Environmental Monitoring Program (REMP) and Radioactive Material Control Program**

##### Procedures and Guidance Documents

- Procedure No. 0-ICP-MM-S-101B, Weather Tower 10 Meter Wind Speed Calibration, Revision 8

- Procedure No. 0-ICP-MM-S-101B, Weather Tower 48 Meter Wind Speed Calibration, Revision 8
- Procedure No. 0-ICP-MM-SR-ZR-2, Backup Meteorological Tower Wind Speed and Wind Direction Calibration, Revision 9
- Procedure No. 0-ICP-MM-ST-100, Backup Weather Tower Sigma Theta Calibration, Revision 9
- Procedure No. 0-ICP-MM-T-100A, Weather Tower 10 Meter Temperature Calibration, Revision 9
- Procedure No. 0-ICP-MM-T-100B, Weather Tower 10/48 Meter Delta Temperature Calibration, Revision 10
- Procedure No. 0-ICP-MM-Temp-1, Primary Meteorological Tower Ambient Temperature and Differential Temperature Calibration, Revision 12
- Procedure No. 0-ICP-MM-Z-101A, Weather Tower 48 Meter Wind Direction Calibration, Revision 8
- Procedure No. 0-ICP-MM-Z-101B, Weather Tower 10 Meter Wind Direction Calibration, Revision 8
- Procedure No. 0-ICP-MM-Z-101C, Backup Weather Tower Wind Direction Calibration, Revision 6
- Procedure No. 0-ICP-MM-ZR-1A, Primary Meteorological Tower 10 Meter Wind Speed and Wind Direction Calibration, Revision 7
- Procedure No. 0-ICP-MM-ZR-1B, Primary Meteorological Tower 48 Meter Wind Speed and Wind Direction Calibration, Revision 8
- Procedure No. 0-PT-487.10, Radiological Environmental Monitoring Program, Land Use Census, Revision 10
- Procedure No. C-HP-1033.440, NE Technology Sam-9/SAM-11 Calibration and Operation, Revision 4
- Procedure No. C-HP-1033.620, Portable Air Samplers, Calibration and Operation, Revision 5
- VPAP-1601, Corrective Action, Revision 23

Instrument Calibration and Environmental Data Records

- Analytics, Inc., Radiochemistry Cross Check Programs, Dominion, Framatome and NAPS, Dated 02/13/06
- Backup Meteorological Tower Wind Speed and Wind Direction Calibrations, Dated 02/21/06, 08/29/06, and 03/07/07
- Backup Weather Tower Sigma Theta Calibrations, Dated 02/20/06, 08/28/06, and 03/06/07
- Backup Weather Tower Wind Direction Calibrations, Dated 02/20/06, 08/28/06, and 03/06/07
- Calibration Certificates, Eberline PCM-2, Serial Nos. 322, Dated 10/28/05 and 10/05/06; 389 Dated 07/21/06 and 06/28/06; and 494 Dated 09/01/05 and 09/07/06
- Calibration Certificates, Eberline PM-7, Serial Nos. 432, Dated 10/02/06 and 04/19/07; and 433 Dated 10/02/06 and 04/19/07
- Calibration Certificates, Portable Air Samplers, HiQ, Kit Nos. 1, 2, 4, 6, 7, 9, 10, and 13, Dated 03/14/07; and Kit Nos. 5, 8, 11, 12, 14, and 15, Dated 03/14/07



- Dominion, North Anna Power Station (NAPS), 2005 and 2006 Annual Radiological Environmental Operating Reports
- NAPS Calibration Certificates, NE Technology Sam-9/Sam-11, Sam-11, Serial Nos. 177A, Dated 07/13/06 and 01/09/07; and 247 Dated 07/18/06 and 01/10/07
- New Waste Stream Data, Primary Resin 4/2007, Dated 01/24/07
- Primary Meteorological Tower Ambient Temperature and Differential Temperature Calibrations, Dated 02/24/06 and 03/08/07
- Primary Meteorological Tower 10 Meter Wind Speed and Wind Direction Calibrations, Dated 02/24/06, 09/21/06, and 03/05/07
- Primary Meteorological Tower 48 Meter Wind Speed and Wind Direction Calibrations, Dated 02/24/06, 09/21/06, and 03/05/07
- Results of Radiochemistry Cross Check Program, Dominion, Framatome ANP and NAPS, 3<sup>rd</sup> Quarter 2005
- Waste Stream Reports, Common DAW 2005, Dated 12/12/06; and U1 DAW 2006, Dated 05/09/06
- Weather Tower 10 Meter Temperature Calibrations, Dated 02/22/06, 08/31/06, and 03/05/07
- Weather Tower 10 Meter Wind Direction Calibrations, Dated 02/22/06, 08/31/06, and 03/06/07
- Weather Tower 10 Meter Wind Speed Calibrations, Dated 08/31/06 and 03/06/07
- Weather Tower 10/48 Meter Delta Temperature Calibrations, Dated 02/22/06, 08/31/06, and 03/06/07
- Weather Tower 48 Meter Wind Direction Calibrations, Dated 02/22/06, 08/31/06, and 03/06/07
- Weather Tower 48 Meter Wind Speed Calibrations, Dated 08/31/06 and 03/06/07

#### CAP Documents

- Audit 05-06: RP/PCP/CHEM Programs, Dated 09/22/05
- Audit 05-10: Offsite Dose Calculation Manual (ODCM) Radiological Environmental Monitoring Program (REMP) & Environmental Protection Program (EPP), Dated 01/18/06
- N-2005-3675, While inspecting rigging that was returned to Building 14, several pieces of rigging did not pass inspection. Prior to disposal tool room attendant checked it in the SAM 11. SAM 11 check indicated that the slings were contaminated, Dated 09/19/05
- N-2005-4823, An orange size 10 glove and an orange size 11 glove and a pair of size M-L yellow totes rubber shoe covers were found in the clean change area of the Decon Facility Building, Dated 10/26/05
- N-2005-4891, The REMP sampling program includes airborne monitoring at the 2 highest D/Q locations, but does not appear to include airborne monitoring at the third highest D/Q location, Dated 10/28/05
- N-2005-5241, Security officer found contaminated wire cutters, behind vending machine in the administrative building, Dated 11/17/05

- N-2006-0282-R1, Recommendation that telemetry be installed on each air sample monitoring station to alert appropriate personnel of equipment inoperability in order to ensure prompt correction, Dated 01/23/06
- N-2006-0282-R3, Consider modifying the REMP air sampling equipment to port the suction or the exhaust to the outside of the sampling enclosure, Dated 01/23/06
- N-2006-0973, While performing a review of observations done on the FIN team, it was discovered that a supplemental worker supporting the FIN team was leaving the PA without carrying buckets and tool bags through PM-7 monitors, Dated 03/08/06
- Radioactive Material Control Program Evaluation, Dated 06/21/06
- REM Program Surveillance and Evaluation, Dated 01/18/06

#### **Section 40A1: Performance Indicator Verification**

##### **Records and Data**

- Out-of-service data and selected compensatory sample records for U1 and U2 radiation monitors, 4/06 - 5/07
- Gaseous Effluent Cumulative Dose Summary, 1/1/07 - 5/31/07
- Liquid Effluent Cumulative Dose Summary, 1/1/07 - 5/31/07

##### **CAP Documents**

- Plant Issue N-2005-5596-R1, Sample flow alarms received on 1-VG-RM-180 Vent Stack B effluent monitor, 12/17/05
- Plant Issue N-2005-4286-R1, Conversion factors for calculating percent of Technical Specification limits are conservative, but incorrect, 10/11/05

#### **Section 40A5: Other Activities**

- Design Change Package 05-014, NRC GSI-191 Containment Sump Strainer Design, January 2007
- North Anna September 2005 Response to Generic Letter 2004-02
- Installation Problem Reports Related to Design Change Package 05-014
- Procedure 0-HSP-ISFSI-001, Independent Spent Fuel Storage Installation (ISFSI), Health Physics TLD Survey Surveillance, Revision 3
- Procedure HP-1020.012, Radiological Protection Action Plan During Dry Storage Cask Activities, Revision 14

**LIST OF ACRONYMS & ABBREVIATIONS**

ANSI	American National Standards Institute
CAP	Corrective Action Program
CRD	Control Rod Drive
FAQ	Frequently Asked Questions
HPT	Health Physics Technician
HRA	High Radiation Area
ISFSI	Independent Spent Fuel Storage Installation
ODCM	Offsite Dose Calculation Manual
OOS	Out-of-Service
PASS	Post-Accident Sampling System
PCM	Personnel Contamination Monitor
PI	Plant Issue
PM	Portal Monitor
QC	Quality Control
Radwaste	Radioactive Waste
RCA	Radiologically Controlled Area
REMP	Radiological Environmental Monitoring Program
RG	Regulatory Guide
RP	Radiation Protection
RWP	Radiation Work Permit
SAM	Small Article Monitor
SCBA	Self-contained Breathing Apparatus
TS	Technical Specification
TLD	Thermoluminescent dosimeter
UFSAR	Updated Final Safety Analysis Report
WBC	Whole-body Counter