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

July 23, 2004

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

SUBJECT: NORTH ANNA POWER STATION - NRC INTEGRATED INSPECTION REPORT 05000338/2004003, 05000339/2004003

Dear Mr. Christian:

On June 26, 2004, the US Nuclear Regulatory Commission (NRC) completed an inspection at your North Anna Power Station, Units 1 and 2. The enclosed integrated inspection report documents the inspection findings, which were discussed on May 26 and on June 28 with Mr. Jack Davis 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.

This report documents six findings and two licensee-identified violations. One of the findings of very low safety significance (Green) concerned an inadequate containment closeout inspection conducted by the licensee to ensure all loose debris was removed prior to Unit 2 startup following a refueling outage. The other five findings documented in this report included one self-revealing and four NRC-identified findings of very low safety significance (Green), which were determined to involve violations of NRC requirements. However, because of the very low safety significance and because they are entered into your corrective action program, the NRC is treating these five findings as non-cited violations (NCVs) consistent with Section VI.A of the NRC Enforcement Policy. Additionally, the two licensee-identified violations were determined also to be of very low safety significance (Green) and 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, it's enclosure, and your response (if any), will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of

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

Sincerely,
/RA/

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

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

Enclosures: Inspection Reports 05000338/2004003, 05000339/2004003 w/Attachment: Supplemental Information

cc w/encl.:

Chris. L Funderburk, Manager
Nuclear Licensing and
Operations Support
Virginia Electric and Power Company
Electronic Mail Distribution

J. M. Davis
Site Vice President
North Anna Power Station
Virginia Electric and Power Company
Electronic Mail Distribution

Richard H. Blount, II
Site Vice President
Surry Power Station
Virginia Electric and Power Company
Electronic Mail Distribution

Executive Vice President
Old Dominion Electric Cooperative
Electronic Mail Distribution

County Administrator
Louisa County
P. O. Box 160
Louisa, VA 23093

Lillian M. Cuoco, Esq.
Senior Nuclear Counsel
Dominion Nuclear Connecticut, Inc.
Electronic Mail Distribution

Attorney General
Supreme Court Building
900 East Main Street
Richmond, VA 23219

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-338, 50-339

License Nos.: NPF-4, NPF-7

Report Nos.: 05000338/2004003 and 05000339/2004003

Licensee: Virginia Electric and Power Company (VEPCO)

Facilities: North Anna Power Station, Units 1 & 2

Location: 1022 Haley Drive
Mineral, Virginia 23117

Dates: March 28 - June 26, 2004

Inspectors: M. Widmann, Senior Resident Inspector
G. Warnick, Acting Senior Resident Inspector
J. Canady, Resident Inspector
D. Jones, Health Physicist (Sections 2OS1, 4OA1)
W. Loo, Radiation Protection Team Leader (Section 2PS2)
R. Hamilton, Health Physicist (Section 2OS2)
R. Chou, Reactor Inspector (Section 1R08)
M. Maymi, Reactor Inspector (Section 1R07)
M. Scott, Senior Reactor Inspector (Section 1R17)
S. Vias, Senior Reactor Inspector (Section 1R17)
D. Mas-Penaranda, Reactor Inspector (Section 1R17)
Gerald R. Wiseman, Senior Reactor Inspector (Section 4OA5)
Reinaldo Rodriguez, Nuclear Safety Intern(Section 4OA5)

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

Enclosure

SUMMARY OF FINDINGS

IR 05000338/2004-003, IR 05000339/2004-003; 03/28/2004 - 06/26/2004; North Anna Power Station Units 1 & 2; Integrated Resident and Regional Report; Maintenance Implementation, Maintenance Risk Assessment, Non-Routine Evolution, Operability Evaluation, and Surveillance Testing.

The report covered a three month period of inspection by resident inspectors and regional DRS engineers. Four Green non-cited violations (NCVs), one Green finding, and two licensee identified violations were identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 3, dated July 2000.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Initiating Events

- Green. The licensee failed to properly install cell switches for bypass reactor trip breakers in accordance with plant drawings causing a reactor trip during the performance of reactor protection logic testing.

  A self-revealing non-cited violation of Technical Specification 5.4.1.a was identified. The finding is greater than minor since it was associated with the design control attribute of the initiating events cornerstone, and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The incorrect cell switch configuration would not have prevented a reactor trip if required by the Reactor Protection System. The finding was determined to have very low safety significance because it only affects the initiating events cornerstone and does not contribute to the likelihood that mitigation equipment or functions will not be available. The issue involved human performance cross-cutting aspects associated with a lack of attention to detail by licensee personnel. (Section 1R14)

Cornerstone: Mitigating Systems

- Green. The licensee failed to assess and manage the increase in risk for planned component maintenance activities involving opening of the chiller room rolling jet impingement/missile protection steel door inside the turbine building to support change-out of the control room supply air bottles for trains III and IV.

  An inspector-identified non-cited violation of 10 CFR 50.65(a)(4) was identified. The finding is more than minor because the failure to properly manage the increase in risk affected the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to

initiating events. The finding was determined to be of very low safety significance because there was no loss of mitigating system function in that the common control room air supply from trains I and II were available to mitigate a loss of main control room ventilation. (Section 1R13.2)

- Green. The licensee failed to adequately implement the preventative maintenance program to properly inspect the Emergency Diesel Generator concrete tornado missile barriers.

  An inspector-identified non-cited violation of Technical Specification 5.4.1.a was identified. The finding is more than minor because if the condition was left uncorrected it would become a more significant safety concern. Continued degradation of the concrete would lead to spalling and concrete debris in the exhaust piping. Accumulation of debris would restrict exhaust flow and derate the engine Kilowatt output. The finding was determined to be of very low safety significance because the tornado concrete structure remained in tact and capable to perform the design basis function to protect the exhaust piping. (Section 1R15.2)

- Green. One finding was identified involving an inadequate Unit 2 containment closeout inspection to ensure all loose debris was removed and that recirculation sumps were operable prior to Mode 4 entry.

  No violation of regulatory requirements was identified. The finding is greater than minor due the potential to have a degraded or inoperable containment sump recirculation system. The finding was determined to be of very low safety significance because an actual loss of safety function was not identified. (Section 1R22.2)

- Green. The licensee failed to properly torque studs associated with the Unit 2 Turbine Driven Auxiliary Feedwater pump discharge restricting orifice.

  An inspector identified non-cited violation of Technical Specification 5.4.1.a was identified. The finding is greater than minor because if left uncorrected, it could result in a more significant safety concern. Under torqued studs could lead to the development of a gasket leak at the non-isolable restricting orifice and challenge the ability of the pump to meet its design basis flow requirements. The finding was determined to be of very low safety significance because pump operability was not challenged and two motor driven trains of Auxiliary Feedwater were available to supply water to the steam generators. (Section 1R12.2)

- Green. The licensee failed to provide adequate separation, isolation, or barriers for the shared ventilation system between the main control room (MCR) and the Units 1 and 2 emergency switchgear rooms (ESGRs).

- A non-cited violation for failure to comply with 10 CFR 50, Appendix R, Sections III.G and III.L was identified by the inspectors. In some fire scenarios involving a

severe fire in the MCR, smoke and toxic gases could be transported to the ESRGs where the alternate shutdown panels (ASPs) are located. The licensee entered this finding into their corrective action program as Plant Issue N-2003-1585. This finding is greater than minor because it affected the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. Because the alternative shutdown capability is not physically independent of the affected fire area, it could present a habitability concern for the operators attempting to achieve shutdown at the respective unit's ASP. This finding is of very low safety significance because both the likelihood of starting a MCR fire and likelihood of generating sufficient smoke to spread to the ESGRs are very low. Additionally, timely fire brigade response activities would provide a pathway to ventilate the smoke away from the MCR. (Section 4OA5)

B. Licensee-Identified Violations

Cornerstone: Mitigating Systems

- Two violations of very low safety significance, which were identified by the licensee, have been reviewed by the inspectors. Corrective actions taken or planned by the licensee have been entered into the licensee's corrective action program. These violations and corrective action tracking numbers are listed in Section 4OA7 of this report.

CONTENTS

Report Details

Summary of Plant Status

Unit 1 began the inspection period at 100% power and remained at this power for the reporting period except for small power reductions to perform periodic testing.

Unit 2 began the inspection period at 100% power but shutdown for refueling on May 1, and returned to full operating status on May 30. The unit remained at full power until June 10, when the reactor automatically tripped due to an equipment issue. Unit 2 returned to 100% power on June 11, and remained at this power for the remainder of the reporting period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

a. Inspection Scope

The inspectors reviewed the licensee's adverse weather procedures written for seasonal extremes for recovering from cold weather conditions and the preparations for hot weather operations (one sample). Additionally, the licensee's corrective action data base for hot weather related issues was reviewed. The inspectors toured the emergency diesel generator rooms, the service air area, and the station blackout diesel house to verify that restoration actions from cold weather had been taken for the protection of these risk significant systems during hot weather operations.

Documentation reviewed included the following:

- 0-GOP-4.1, "Hot Weather Operations;"
- 0-GOP-4.2, "Extreme Cold Weather Operations;" and
- Plant Issue (PI) N-2004-1231, Main control room differential pressure problems result from opening turbine building doors and louvers for hot weather mitigation.

b. Findings

No findings of significance were identified.

1R02 Evaluations of Changes, Tests or Experiments

a. Inspection Scope

The inspectors reviewed selected samples of evaluations to confirm that the licensee had appropriately considered the conditions under which changes to the facility, Updated Final Safety Analysis Report (UFSAR), or procedures may be made, and tests conducted, without prior NRC approval. The inspectors reviewed full evaluations for seven changes and additional information, such as calculations, supporting analyses, the UFSAR, and drawings to confirm that the licensee had appropriately concluded that

the changes could be accomplished without obtaining a license amendment. The seven evaluations reviewed are included in the List of Documents Reviewed.

The inspectors also reviewed samples of changes for which the licensee had determined that evaluations were not required, to confirm that the licensee's conclusions to "screen out" these changes were correct and consistent with 10 CFR 50.59. The twelve "screened out" changes reviewed are included in the List of Documents Reviewed.

The inspectors also reviewed a recent audit and self assessment of the 10 CFR 50.59 process and selected corrective action items (plant issues, PI), and work orders to confirm that problems were identified at an appropriate threshold, were entered into the corrective action process, and appropriate corrective actions had been initiated.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignment

a. Inspection Scope

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

- Unit 1 B train Service Water System (0-OP-49.1A, "Valve Checkoff - Service Water");
- Unit 1 A train Low Head Safety Injection System (1-OP-7.1A, "Valve Checkoff - Low Head Safety Injection System"), and
- Unit 1 trains 1 and 3 of the Control Room Bottled Air System (11H5-FM-078A, "DWO: Service Water System").

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

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

- Unit 2 Containment, fire zone 1-2a/RC-1;
- Main Control Room, fire zone 2a/CR;
- Unit 1 and 2 Cable Tray Spreading Rooms, fire zones 4-1b/CSR-1 and 4-2b/CSR2;
- Unit 1 and 2 Normal Switchgear Rooms, fire zones 5-1/NSR-1 and 5-2/NSR-2;
- Unit 1 and 2 Emergency Switchgear Rooms, fire zones 6-1a/ESR-1 and 6-2a/ESR-2;
- Unit 1 and 2 Safeguards Area, fire zones Z-16-1/SA-1 and Z-16-2/SA-2;
- Unit 2 RCP 1A Oil Collection System;
- Unit 1 and 2 Battery Rooms, fire zones 7B-1/BR1-I and 7B-2/BR2-I; and,
- Turbine Building including Chiller Rooms, fire zone 8a/TB.

b. Findings

No findings of significance were identified.

1R06 Flood Protection Measures (Internal Flooding)

a. Inspection Scope

The inspectors reviewed the removal of the hazard barrier and assessed the internal flooding vulnerability of the Unit 1 and 2 Emergency Switch gear rooms at power.

b. Findings

No findings of significance were identified.

1R07 Biennial Heat Sink Performance

a. Inspection Scope

The inspectors reviewed inspection records, test results, maintenance work orders, and other documentation to ensure that heat exchanger (HX) deficiencies that could mask or degrade performance were identified and corrected. The test procedures and records were also reviewed to verify that these were consistent with Generic Letter 89-13 licensee commitments, and EPRI Heat Exchanger Performance Monitoring Guidelines.

The six risk significant HXs reviewed included two Component Cooling (CC) HXs, a charging pump's gear box cooler and lube oil cooler, and two Recirculation Spray (RS) HXs.

The inspectors reviewed CC HXs inspection and cleaning procedures, completed work orders, design specification sheets, and tube plugging margins. The inspectors also reviewed charging pump gear box and lube oil coolers inspection and cleaning procedures, completed work orders, and Service Water (SW) supply check valve flow test records. Additionally, the inspectors reviewed RS HXs fouling factor design specifications, heat load calculations, and related SW side in leakage and draining procedures. These documents were reviewed to verify that test results were consistent with design acceptance criteria, inspection methods and performance of the HXs under the current maintenance frequency were adequate, and to verify minimum flow requirements and HX design bases were being maintained.

The inspectors also reviewed general health of the SW system via review of design basis documents, system health reports, self assessments, clam survey reports, SW system data trending such as supply temperature and reservoir level, and had discussions with the SW system engineer. Additionally, auxiliary SW bay intake inspection work orders, SW piping minimum wall thickness requirements and calculations, and testing procedures for SW backup supply valves were reviewed. These documents were reviewed to verify design bases were being maintained and to verify adequate SW system performance under current preventive maintenance, chemical treatments, and inspection frequencies.

Plant issues were reviewed for potential common cause problems and problems which could affect system performance to confirm that the licensee was entering problems into the corrective action program and initiating appropriate corrective actions. These plant issues included actions regarding the charging pump gear box cooler heads' incorrect orientation issues and condition reports regarding foreign material found during CC HX inspections. In addition, the inspectors conducted a walk down of the two CC HXs, the charging pump's gear box and lube oil coolers and major components for the SW system to assess general material condition and to identify any degraded conditions of selected components.

b. Findings

No findings of significance were identified.

1R08 Inservice Inspection Activities

a. Inspection Scope

The inspectors observed inspection activities and reviewed the documentation and selected supporting records for inservice inspection (ISI) work activities conducted during North Anna Unit 2 refueling outage 16. The inspection activities, documentation, and supporting records were reviewed for compliance with the Technical Specifications

(TS); the ASME Boiler and Pressure Vessel Code, Section XI, 1995 Edition, with 1996 Addenda; and other appropriate industry and NRC guidance and standards.

The inspectors reviewed the following nondestructive examinations (NDE):

- Ultrasonic Test (UT):
  - Weld No. 4 for a 88" Joint Length of Pressurizer Tank Shell and Bottom Head of Line 2-RC-E-2
  - Weld No. 8 for a 88" Joint Length of Pressurizer Tank Bottom Head and Supporting Skirt of Line 2-RC-E-2
  - Weld No. 1 for a 4" Vertical Seam Joint Length of Pressurizer Tank Shell above the joint of Tank Shell and Bottom Head of Line 2-RC-E-2

- Penetrant Test (PT):
  - Lug Weld No. 48H of Support 2-RC-CSH-24 on Line 4"-RC-415-1502-Q1

- Radiography Test (RT):
  - Four Thermal Sleeve Tack Welds connected to 6"-RC-419-1502-Q1 B Loop on Cold Leg, 6"-RC-417-1502-Q1 A Loop on Cold Leg, 12"-RC-422-1502-Q1 A - Loop on Cold Leg, and 14"-RC-410-2501R-Q1 C Loop on Hot Leg

Qualification and certification records for NDE procedures, examiners, and equipment and consumables (i.e., UT oscilloscopes, transducers, calibration blocks, and couplant) for the inspected ISI examinations were reviewed.

The inspectors reviewed evaluations for continued service associated with recordable indications on Weld Nos. WS-2 and 50H, from the last Unit 2 outage. The inspectors reviewed weld examinations on Work Orders (WO) 00478381-01 for the weld repair of the Class 2 Relief Valve 1A Safety Injection Accumulator and 00469746-04 for the replacement of 1B Safety Injection Tank 3/4" and 1" nozzles. The inspectors reviewed WOs 00478381 and 00469746 for ASME Section XI Class 2 Code repairs or replacements to ensure they met ASME code requirements. The inspectors reviewed the licensee's Boric Acid corrosion control program inspection results. The inspectors walked down the containment to assess selected licensee findings and to independently check for any additional leakage.

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification

a. Inspection Scope

The inspectors observed licensed operator simulator training on March 31, 2004. The scenario, Simulator Exercise Guide SEG-7A, involved a shutdown loss of coolant accident (LOCA), a loss of the Residual Heat Removal System at midloop, and a solid

water reactor coolant pump (RCP) start. 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

.1 Quarterly Sample Review

a. Inspection Scope

For the equipment issues listed below, the inspectors evaluated the licensee's effectiveness of the corresponding preventive and corrective maintenance. The inspectors performed walkdowns of the accessible portions of the systems, performed in-office reviews of procedures and evaluations, and held discussions with system engineers. The inspectors compared the licensee's actions with the requirements of the Maintenance Rule (10 CFR 50.65) using VPAP 0815, "Maintenance Rule Program," and Engineering Transmittal CEP-97-0018, "North Anna Maintenance Rule Scoping and Performance Criteria Matrix." Additionally, the inspectors attended some of the licensee's scheduled Maintenance Rule Working Group meetings.

- Plant Issue N-2004-0946 associated with torque values, provided by engineering, which exceeded maximum design on Boron Injection Tank flow bypass valve 2-SI-83; and,

- Plant Issues N-2004-1213, 0750, and 1034 associated with the failure of the backup control power supply for Cabinet 2-E1-CB-56, primary power supply for Cabinet 2-E1-CB-58, primary power supply for Cabinet 2-E1-CB-55, which left a single vulnerability to critical components, including steam generator feed flow control, loop hotleg safety injection flow, and RCP seal injection flow.

b. Findings

No findings of significance were identified.

.2 Auxiliary Feedwater Orifice Stud Under Torqued

a. Inspection Scope

The inspectors reviewed procedure 0-MCM-1006-01, “Repair of Safety-Related Piping and Component Bolted Flange Joints,” associated with a missing nut on the Unit 2 Turbine Driven Auxiliary Feedwater (TDAFW) pump restricting orifice 2-FW-RO-202A.

b. Findings

Introduction. A Green non-cited violation (NCV) of TS 5.4.1.a was identified for a failure to properly torque studs associated with the Unit 2 TDAFW pump discharge restricting orifice.

Description. The inspectors identified that the diameter of the studs used to secure the restricting orifice in the discharge piping of the Unit 2 TDAFW pump was incorrectly measured. Purchase Order Number NT-573597 (Item number 06262560) described the nut for the stud as a one-inch heavy hex nut. Craft personnel installing the flange erroneously measured the stud diameter for torque reference value purposes as 7/8-inch instead of one-inch. Due to this error in measurement, the torque value applied to the one-inch nuts was 320 ft-lb. instead of the required minimum of 490 ft-lb. that is specified in Attachment 1 of procedure 0-MCM-1006-01.

A review of procedure 0-MCM-1006-01 by the inspectors revealed that Section 5.0 (Special Tools and Equipment) did not list any type of dimensional measuring device (example: caliper, ruler, etc.) for determining the diameter of the stud. Moreover, Section 6.2.7 of the procedure did not provide sufficient details for ensuring that the thread depth was included in the overall diameter measurement.

Analysis. The finding is more than minor because if left uncorrected, it could result in a more significant safety concern. Under torqued studs could lead to the development of a gasket leak at the non-isolable restricting orifice and challenge the ability of the pump to meet its design basis flow requirements. This finding was evaluated using the Significance Determination Process Phase I screening worksheet and was determined to be of very low safety significance (Green) because pump operability was not challenged and two motor driven trains of Auxiliary Feedwater were available to supply water to the steam generators.

Enforcement. Technical Specification 5.4.1.a requires that written procedures be established and implemented for the activities covered in Regulatory Guide 1.33, Revision 2, Appendix A, Item 9, Procedures for Performing Maintenance. Procedure 0-MCM-1006-01,“ Repair of Safety-Related Piping and Component Bolted Flange Joints,” was issued to cover maintenance on the TDAFW pump. Contrary to this, procedure 0-MCM-1006-01 was not properly implemented to torque studs on restricting orifice 2-FW-RO-202A. A lack of proper procedural guidance resulted in the incorrect torque reference value being selected for the stud nuts. Because the failure to provide proper guidance for measuring the stud diameter to adequately torque studs on the TDAFW

pump piping is of very low safety significance and has been entered into the licensee's corrective action program as Plant Issue N-2004-1018, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy, and is identified as NCV 05000339/2004003-01, Failure to Properly Torque Studs for TDAFW Pump Discharge Restricting Orifice.

1R13 Maintenance Risk Assessments and Emergent Work Evaluation

.1 Quarterly Sample Review

a. Inspection Scope

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

- Removal of flood hazard barrier at power potentially rendering two trains of safety-related switchgear inoperable. Maintenance Rule (a)(4) risk orange;
- 2H EDG maintenance with 1J and 2J battery ½-PT-85, switchyard inspection of 1-EP-ST-1B3 transformer and swapping of reserve station service transponder in progress;
- Identification that control room chillers were inoperable due to previous modification, rendering Unit 1 in 12-day green window and Unit 2 in an 11-day green window, with Unit 2 CCP work in progress;
- Assessment of risk for Unit 1H EDG out of service in conjunction with the performance of switchyard work resulting in a 28 day Green window on Unit 1 and 96 days on Unit 2;
- Loss of 2-II DC bus while refueling operations were in progress caused a loss of control power while Service Water Header was isolated and Unit 2 flood wall removed; and,
- Unit 2 shutdown safety assessment of the shut down safety functions (Reactivity, Core Cooling, Power Availability, Containment, Inventory, and Support Systems).

b. Findings

No findings of significance were identified.

.2 Plant Risk Evaluation for Preplanned Maintenance

a. Inspection Scope

The inspectors reviewed the licensee plant risk evaluation involving change-out of the Unit 2 control room supply air bottles while two trains of the control room chillers were inoperable and while Unit 2 charging pumps were removed from service due to planned maintenance.

b. Findings

Introduction. The inspectors identified a Green NCV of 10 CFR 50.65(a)(4) for the licensee's failure to assess and manage the increase in risk during planned maintenance which involved the opening of a jet impingement/missile protection door.

Description. On April 19, 2004, the licensee was performing maintenance activities on the Unit 2 charging pumps, component cooling and service water pumps, and conducting activities in the high voltage switchyard. The licensee had entered these activities into the online safety monitor program. The associated risk level for this activity placed the plant in a low risk level (Green condition). Later in the day, with the stated equipment still out of service, the shift supervisor authorized opening of the chiller room rolling steel door inside the turbine building to support change-out of the control room supply air bottles trains III and IV. The inspectors identified that the plant risk was increased due to opening the rolling jet impingement/missile protection door which made the two trains of control room chillers vulnerable to a turbine generated missile and a flood event. Through discussions with scheduling personnel and the shift technical advisor, the inspectors determined that no risk assessment was performed for the air bottle maintenance activity. An assessment of the increase in risk was necessary to determine if the licensee needed to place additional restrictions or compensatory measures on the opposite train of redundant equipment. In addition, the 10 CFR 50.65 (a)(4) assessment was needed to determine whether the planned maintenance scheduled needed to be altered to reduce plant risk during the time that the missile door would be open making two trains of control room chillers vulnerable.

Analysis. The finding is more than minor because the failure to properly manage the increase in risk affected the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. The finding was determined to be of very low safety significance because there was no loss of mitigating system function in that the common control room air supply from trains I and II were available to mitigate a loss of main control room ventilation. Due to the components removed from service (i.e., charging pump, component cooling and service water pumps) for maintenance, the licensee was required to evaluate activities that have the potential to impact the reliability and availability of support systems that respond to initiating events and prevent undesirable consequences. The opening of the rolling jet impingement/missile protection door during planned maintenance made the two trains of control room chillers vulnerable to a turbine generated missile and a flood event and, therefore, needed to be assessed for its impact on plant risk.

Using the Significance Determination Process, the inspectors determined that the finding degraded the Mitigating Systems cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events. The finding was determined to be of very low safety significance (Green) because the common control room air supply from Unit 1 trains I and II were available to mitigate a loss of main control room ventilation.

Enforcement. 10 CFR 50.65(a)(4) requires, in part, that "Before performing maintenance activities (including but not limited to surveillance, post-maintenance testing, and corrective and preventive maintenance), the licensee shall assess and manage the increase in risk that may result from the proposed maintenance activities." On April 19, 2004, the licensee failed to properly assess and manage the increase in risk associated with the maintenance activities involving opening of the chiller room rolling jet impingement/missile protection steel door inside the turbine building to support change-out of the control room supply air bottles trains III and IV. Because the finding is of very low safety significance and has been entered in the licensee's corrective action program as Plant Issues N-2004-1239 and N-2004-1224, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy, and is identified as NCV 05000339/2004003-02, Failure to Assess and Manage the Increase in Risk of Opening a Jet Impingement/Missile Protection Steel Door During Planned Component Maintenance.

1R14 Personnel Performance During Non-Routine Evolutions and Events

a. Inspection Scope

The inspectors evaluated operators' preparations and response for the non-routine events listed to ensure they were appropriate and in accordance with the required procedures. The inspectors also evaluated performance and equipment problems to ensure that they were entered into the corrective action program.

- The inspectors monitored the response of Unit 1 control room operators on April 22, 2004, for entry into abnormal procedure 0-AP-5.2, "MGP Radiation Monitoring System" upon receipt of an annunciator indicating a failure of the B Vent stack monitor. The inspectors additionally verified that the operators submitted Plant Issue N-2004-1345 as required by Technical Requirements Manual 3.3.7.F once it was determined that the radiation monitor would be out of service for 7 days or greater; and

- On June 10, 2004, the inspectors responded to the control room to evaluate the plant conditions and operator performance following a Unit 2 automatic reactor trip. The inspectors performed a control board walkdown to verify all safety equipment responded as required. The inspectors discussed the plant response to the event with the control room operators and plant management. This event was documented in Plant Issue N-2004-2301.

b. Findings

Introduction. A Green self-revealing NCV of TS 5.4.1.a was identified for failure to properly install bypass reactor trip breaker cell switches in accordance with plant drawings, which caused a reactor trip.

Description. On June 10, 2004, a reactor trip occurred during the performance of 2-PT-36.1A, "Train A Reactor Protection and ESF Logic Actuation Logic Test." An incorrect contact configuration in the cell switch for Bypass Reactor Trip Breaker A, 2-EP-BKR-BYA, was the direct cause of the event. During the course of performing the surveillance test, the incorrectly configured cell switch created a spurious reactor trip signal which caused a turbine trip. The turbine trip resulted in an actual reactor trip signal being sent to the Reactor Protection System. The licensee responded to the reactor trip and took appropriate actions to stabilize the plant in Mode 3.

During the post-trip investigation, the licensee identified that cell switches for Bypass Reactor Trip Breakers A and B were not configured in accordance with the reactor trip switchgear connection drawings. Additional investigation identified that the cell switches for Reactor Trip Breakers A and B and Bypass Reactor Trip Breakers A and B were replaced during the recent Unit 2 refueling outage completed May 30, 2004. The licensee failed to identify that certain cell switch replacements for the bypass reactor trip breakers needed to be modified from the original configuration prior to installation. Further, the licensee missed opportunities to identify the configuration discrepancy during maintenance planning, installation, and post-maintenance testing. This equipment condition went undetected until the testing performed on June 10 completed the necessary circuit for the spurious reactor trip signal. The licensee performed an extent of condition evaluation and determined that the cell switches for the Unit 2 Reactor Trip Breakers, Unit 1 Reactor Trip Breakers, and Unit 1 Bypass Reactor Trip Breakers were all in the correct configuration.

Analysis. The finding is greater than minor since it was associated with the design control attribute of the initiating events cornerstone, and affected the cornerstone objective to limit the likelihood of those events that upset plant stability and challenge critical safety functions during power operations. The inspectors concluded that the incorrect cell switch configuration would not have prevented a reactor trip if required by the Reactor Protection System. Using the Significance Determination Process Phase 1 Worksheet, the finding is determined to have very low safety significance because it only affects the initiating events cornerstone and does not contribute to the likelihood that mitigation equipment or functions will not be available. The inspectors noted human performance weaknesses associated with a lack of attention to detail by licensee personnel during the planning, performance, and post-maintenance test development of the cell switch replacement.

Enforcement. Technical Specification 5.4.1.a states that written procedures shall be established, implemented, and maintained covering the activities specified in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, Item 9a, requires that maintenance affecting the performance of safety-related

equipment be properly preplanned and performed in accordance with written procedures, documented instructions, or drawings appropriate to the circumstances. Contrary to the above, the licensee failed to properly install cell switches for bypass reactor trip breakers in accordance with plant drawings. Because the finding is of very low safety significance and has been entered into the licensee's corrective action program as Plant Issue N-2004-2301, this violation is being treated as a non cited violation consistent with Section VI.A of the Enforcement Policy. This finding is identified as NCV 05000339/2004003-03, Reactor Trip due to Improper Cell Switch Installation.

1R15 Operability Evaluations

.1 Quarterly Sample Review

a. Inspection Scope

The inspectors conducted reviews and held discussions with the appropriate licensee engineers, managers and operations personnel for the seven operability determinations addressed in the plant issues listed below. The inspectors assessed the accuracy of the evaluations, the use and control of compensatory measures, and compliance with TS. The inspectors' review included a verification that the operability determinations were made as specified by Procedure VPAP-1408, "System Operability." The technical adequacy of the determinations was reviewed and compared to TSs, the Technical Requirements Manual and the Updated Final Safety Analysis Report (UFSAR).

- N-2004-1018, TDAFW pump discharge flow orifice nut backed off of flange, and other studs and nuts found loosened;
- N-2004-1099, 1H emergency diesel generator (EDG) low glycol concentration following maintenance repairs on the coolant radiator. As found concentration protected EDG to < 10° F only;
- N-2004-2390, body to bonnet gasket leak identified on valve 02-MS-PCV-201C;
- N-2004-2145, 2H EDG exhaust manifold oil leak results in oil sheen on roof and a small fire during testing after the Unit 2 refueling outage;
- N-2004-1365, Low head safety injection pump casing weld inspection and meeting ASME Section XI VT-2 inspection; and,
- N-2004-1588, EDG exhaust seismic restraints found with missing shims that impacted capability of all four engines to withstand a serious condition.

b. Findings

No findings of significance were identified.

.2 Emergency Diesel Generator Missile Shields

a. Inspection Scope

The inspectors reviewed the operability determination of the EDG exhaust missile shields due to concerns with concrete degradation.

b. Findings

Introduction. The inspectors identified a Green NCV of TS 5.4.1.a for inadequate implementation of licensee's preventative maintenance (PM) program to properly inspect the EDG concrete tornado missile barriers.

Description. On April 19, 2004, during a system walkdown of the EDGs, the inspectors identified that all four EDG's exhaust missile shields had cracking in the faces of the concrete. The cracks culminated from heat induced stress due to expansion of the steel rebar internal to the structure. Cracking was limited to over hang areas of the structure with the heat resistant steel shield and the interior exposed concrete intact. The overhang area is not protected from direct contact with the exhaust temperatures.

The licensee had created PM model work order 441526 to inspect the barriers on a three year periodicity. In March 2004 the licensee performed the specified inspection and did not identify indications of cracking or spalling.

The design basis function of the barriers are to provide tornado missile protection for the exhaust pipe at the exit of the diesel building. Based on an operability determination by the licensee, they determined that the structure would still remain capable of performing its intended design function even though cracks were measured to the depth of the steel rebar (six inches).

Analysis. The finding is more than minor because if the condition was left uncorrected it would become a more significant safety concern. Continued degradation of the concrete would lead to spalling and concrete debris in the exhaust piping. Accumulation of debris would restrict exhaust flow and derate the engine Kilowatt output.

Using the Significance Determination Process, the inspectors determined that the finding degraded the mitigating systems cornerstone, in that, it affected the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding was determined to be of very low safety significance (Green) because the tornado concrete structure remained intact and able to perform the design basis function to protect the exhaust piping.

Enforcement. Technical Specification 5.4.1.a states that written procedures shall be established, implemented, and maintained covering the activities specified in Regulatory Guide 1.33, Revision 2, Appendix A, February 1978. Regulatory Guide 1.33, Appendix A, Item 9b, requires procedures for performing equipment inspections during preventive maintenance. The licensee established and implemented PM work order 441526 to

inspect the EDG exhaust missile barriers. Contrary to this requirement, the licensee failed to properly perform an inspection of the EDG exhaust missile barriers in March 2004, when the PM was last performed. Because the finding is of very low safety significance (Green) and has been entered in the licensee's corrective action program as Plant Issue N-2004-1261, this violation is being treated as an NCV, consistent with Section VI.A.1 of the NRC Enforcement Policy, and is identified as NCV 05000338, 339/2004003-04, Failure to Properly Inspect the EDG Tornado Exhaust Missile Barriers.

1R16 Operator WorkArounds

a. Inspection Scope

The inspectors reviewed the cumulative effects of the licensee's operator workarounds (OWAs) and procedure 0-GOP-5.3, "Review of Operator Work Around." The inspectors reviewed the data package associated with this procedure which included an evaluation of the cumulative effects of the OWAs on the operator's ability to safely operate the plant and effectively respond to abnormal and emergency plant conditions. Additionally, the inspectors discussed the OWAs with operations personnel to determine whether outstanding OWAs were reviewed in the aggregate on a periodic basis as required by VPAP-1401, "Conduct of Operations."

b. Findings

No findings of significance were identified.

1R17 Permanent Plant Modifications (Binennial)

a. Inspection Scope

The inspectors evaluated engineering design changes (DCP) for six modifications to evaluate for adverse affects on system availability, reliability, and functional capability. The modifications and the associated attributes reviewed are as follows:

Modifications:

DCP-02-133, Replacement Terry Turbine Pump 1-FW-P-2 Restricting Orifice

- Materials/Replacement Components - functional properties
- Operations - procedures
- Pressure Boundary
- Flowpaths
- Structural
- Process Medium - pressures and flow rate

DCP-00-003, SW Pump Discharge Piping Repair/Replacement

- Materials/Replacement Components - material compatibility

- Flowpaths
- Structural

DCP-01-131, Replacement QS, RS, and SW RTD's Associated with Containment Integrity Re-Analysis, Unit 1

- Materials/Replacement Components - functional properties
- Seismic & Environmental Qualification
- Plant Document Updating - design and licensing documents
- Post Modification Testing - design assumptions or test acceptance criteria

DCP-00-143, Pressurizer Pressure Transmitter Replacement, Unit 2

- Post Modification Testing - design assumptions or test acceptance criteria
- Materials/Replacement Components - functional properties and material compatibility
- Seismic & Environmental Qualification
- Plant Document Updating - design and licensing documents

DCP-01-161, Replacement of Vital Bus Inverters 2-I & 2-II, Unit 2

- Post-Modification Testing for operability
- Plant Document Updating - design and licensing documents
- Seismic Qualification
- Operations - procedures

DCP- 01-147, Replacement of the Start AAC Sequence Timers/NAPS, Unit 2

- Post-Modification Testing - operability and periodic testing
- Plant Document Updating - plant test and maintenance procedures

For selected modification packages, the inspectors observed the as-built configurations. Documents reviewed included procedures, engineering calculations, modification design and implementation packages, work orders, site drawings, corrective action documents, applicable sections of the living UFSAR, supporting analyses, Technical Specifications, and design basis information.

The inspectors also reviewed selected self-assessments and corrective action documents associated with modifications to confirm that problems were identified at an appropriate threshold, were entered into the corrective action process, and appropriate corrective actions had been initiated. One modification self assessment was reviewed.

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

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

- Procedure 2-PT-15.1, "Boric Acid Transfer Pump (1-CH-P-2C) Test," per WO 503017-01 to change oil in pump;
- Procedure PMT-C-OP-3, "Operability Retest of O-BSA-C-1A AAC Air Compressor," WO 510939-01, coupling replacement, and Plant Issue N-2004-1179;
- Procedure 2-ICP-MS-P-201B, "Steam Generator B Power Operated Relief Valve (P-MS-201B) Calibration," and WO 497487-01, instrumentation PM for B steam generator PORV;
- Procedure 0-PT-82.1, "Quarterly Test of 0-AAC-DG-OM, Alternate AC Diesel Generator (SBO Diesel) on D Transfer Bus," per PMT in WO 509294-01 ;
- Procedure 0-PT-76.3.1, "Main Control Room Pressure Boundary Door Seal Inspection," per WO 494074-05 to replace essential switchgear room door 2-BLD-STR-S54-11; and,
- Procedure 1-PT-82J, "1J Emergency Diesel Generator Slow Start Test," per WO 501735-01 and WO 498389-01, and Plant Issues N-2004-1350 (1J EDG scheduled for 16 hrs but took 25), N-2004-1324 (Maintenance delay due to equipment calibration problems), and N-2004-1320 (Erratic spikes in load gain).

b. Findings

No findings of significance were identified.

1R20 Refueling and Outage Activities

a. Inspection Scope

The inspectors performed the inspection activities described below for the Unit 2 refueling outage (RF-16) that began on May 2, 2004, and ended May 30, 2004. The inspectors used inspection procedure 71111.20, "Refueling and Outage Activities," to complete the inspections.

Prior to and during the outage, the inspectors reviewed the licensee's outage risk control plan for the Unit 2 RF-16 outage schedule to verify that the licensee had appropriately

considered risk, industry experience and previous site specific problems, and to confirm that the licensee had mitigation/response strategies for losses of key safety functions.

In the area of licensee control of outage activities, the inspectors reviewed equipment removed from service to verify that defense-in-depth was maintained commensurate with the outage risk control plan for key safety functions and applicable technical specifications, and that configuration changes due to emergent work and unexpected conditions were controlled in accordance with the outage risk control plan.

The inspectors reviewed selected components which were removed from service to verify that tags were properly installed and that associated equipment was appropriately configured to support the function of the clearance.

During the outage, the inspectors:

- Reviewed RCS pressure, level, and temperature instruments to verify that those instruments were installed and configured to provide accurate indication; and that instrumentation error was accounted for;

- Reviewed the status and configuration of electrical systems to verify that those systems met TS requirements and the licensee's outage risk control plan. The inspectors also evaluated if switchyard activities were properly controlled and if they were consistent with the licensee's outage risk control plan assumptions;

- Observed spent fuel pool operations to verify that outage work was not impacting the ability of the operations staff to operate the spent fuel pool cooling system during and after full core offload. The inspectors also compared these operations to UFSAR commitments and TS requirements;

- Observed licensee control of containment penetrations to verify that the licensee controlled those penetrations in accordance with the refueling operations TSs and could achieve containment closure for required conditions; and,

- The inspectors examined the spaces and cubicles inside the reactor building prior to reactor startup to verify that debris had not been left which could affect performance of the containment sumps.

The inspectors also reviewed the following activities related to Unit 2 RF-16 for conformance to applicable procedural and TS requirements:

- monitoring of shutdown activities;
- decay heat system operations;
- inventory control and measures to provide alternative means for inventory addition, including periods of reduced inventory conditions;
- reactivity controls including locked valve dilution controls;
- fuel handling operations (inspection, insertion, and tracking of fuel assemblies through core reload); and,

- reactor heatup, startup and power ascension activities.

The inspectors reviewed various problems that arose during the outage to verify that the licensee was identifying problems related to refueling outage activities at an appropriate threshold and entering them in the corrective action program. The plant issues that were specifically reviewed by the inspectors are listed below. The plant issues identified below were initiated during the refueling outage and were considered significant.

- N-2004-1381, steam dump operation was erratic during shutdown activities at approximately 14 percent power;
- N-2004-1404, pressurizer administrative limit exceeded during cooldown;
- N-2004-1432, RHR weld leak identified on piping;
- N-2004-1453, RCS loop stop valve 42B leaking by preventing loop drain activities;
- N-2004-1471, EDG 2H glycol instrument issues and impact on diesel operability;
- N-2004-1501, 2-EP-BKR-25A2 discolored bus bar and broken stab;
- N-2004-1518, nuclear instrument N-42 failed low;
- N-2004-1535, coatings inside containment damaged due to mechanical impact;
- N-2004-1582, 2H EDG exhaust stack seismic concern due to missing shims;
- N-2004-1684, tagging issue with dc control circuit 2-SW-P-1B;
- N-2004-1820, Mono-ball supports require shim work for operability; and,
- N-2004-1890, recirculation sump screens needing additional repairs.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

.1 Quarterly Sample Review

a. Inspection Scope

For the surveillance tests listed below, the inspectors examined the test procedure and witnessed the 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 technical specifications were met:

- Procedure 2-PT-82.4A, ”2H Diesel Generator Test (Start by ESF Actuation)” - Fast Start;
- Procedure 1-PT-71.1Q, “1-FW-P-2, Turbine Driven Auxiliary Feedwater Pump 2nd Valve Test;”
- Procedure 2-PT-71.15, “Loss of Offsite Power - Train A Operational Test for Auxiliary Feedwater Pumps;”
- Procedure 0-PT-213.37, “Hydrogen Recombinator 2-HC-HC-1 Flow Test;” and,

- Procedure 2-PT-138, "Valve Inservice Inspection LHSI System Functional Verification."

b. Findings

No findings of significance were identified.

.2 Unit 2 Containment Closeout

a. Inspection Scope

The inspectors performed a walkdown and observed containment cleanliness activities conducted by the licensee to ensure compliance with Technical Requirements Manual (TRM) Surveillance Requirement 3.5.2, "Emergency Core Cooling Systems (ECCS)."

b. Findings

Introduction. The inspectors identified a Green finding for inadequate closeout of Unit 2 containment prior to Mode 4 entry which did not involve a violation of regulatory requirements.

Description. On May 27, 2004, during a system walkdown of the Unit 2 containment the inspectors identified that not all loose debris (rags, trash, clothing, tools) were removed prior to vacuum being drawn for Mode 4 entry. The licensee conducted surveillance test 2-PT-1B, "Containment Checklist," prior to the inspectors' entry. The licensee completed their inspection sign-off and had not identified the existence of additional loose debris that was required to be removed prior to the heatup activities. TRM surveillance requirement 3.5.2.1 has the licensee conduct a visual inspection of containment to verify that no loose debris is present which could be transported to the recirculation spray sump and cause restriction of the pump suctions during loss of coolant accident conditions. The inspectors had identified various hand tools including a cable fish tape reel, rags, wipes, metal insulation, unsecured cable tray shielding, rubber shoe cover, wire, duct tape, a roll of electrical tape, tie-wraps, washers, earplugs, paper and other minor miscellaneous materials.

The licensee generated Plant Issue N-2004-2108 to address the operability of the sumps given the quantity of material removed from containment following the inspectors' walkdown. Engineering personnel performed an operability assessment and transport analysis to determine if the debris would have impacted sump operation. Engineering concluded that the containment sumps remained capable of performing their intended design function.

Analysis. The finding is more than minor because it could be reasonably viewed as a precursor to a significant event. If loose debris is not removed prior to closeout, transport of those materials to the containment sump would cause restricted flow or blockage that could impede the ability of the recirculation sump pumps from maintaining adequate net positive suction head.

Using the Significance Determination Process, the inspectors determined that the finding degraded the mitigating systems cornerstone, in that, it increased the likelihood of a loss of recirculation sump pumps capability. The finding was determined to be of very low safety significance (Green) because an actual loss of safety function was not identified. Loose materials were removed and follow-up inspections were conducted to ensure containment cleanliness and that the sumps were clear of potential blockage.

Enforcement. No violation of regulatory requirements was identified. However, the inspectors determined that the closeout inspections of containment were incomplete and failed to ensure that the sumps were free from being blocked by loose debris. This is a Green finding of very low safety significance, FIN 05000339/2004003-01, Incomplete Closeout Inspections of Unit 2 Containment.

1R23 Temporary Plant Modifications

a. Inspection Scope

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

- Temporary Modification (TM) 2004-1738, involving stainless steel tubing, fittings, and instrument valves which were installed to replace copper and brass components on electrical penetration 2-PE-EP-22C. This TM was necessary for the performance on Procedure 2-PT-61.2.1, “Containment Type B Testing - Electrical Penetrations”; and,

- Temporary Modification (TM) 2004-1742, for the Unit 1 A Chiller being returned to service during warm months without freeze protection due to unavailability of replacement parts. A procedural change will tag the component out during extreme cold weather until a design change package for a new replacement is implemented.

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

a. Inspection Scope

The inspectors observed portions of the announced emergency preparedness drill conducted on June 15, 2004, to evaluate emergency response organization performance by focusing on the risk-significant activities of classification, notification, and protective action recommendations. The inspectors also assessed personnel recognition of abnormal plant conditions, the transfer of emergency responsibilities between facilities, communications, and the overall implementation of the emergency plan. Overall, the inspectors evaluated the adequacy of the licensee's conduct of the drill and critique performance. The drill was conducted using the simulator and all onsite response facilities (emergency operation facility, technical support center, and the operations support center) were activated. The scenario involved a tornado in the protected area followed by a steam generator tube rupture with failed fuel, which required the declaration of a general emergency.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY

Cornerstones: Occupational Radiation Safety (OS) and Public Radiation Safety (PS)

2OS1 Access Control To Radiologically Significant Areas

a. Inspection Scope

Access Controls.

Licensee program activities for monitoring workers and controlling access to radiologically significant areas and tasks were inspected. The inspectors evaluated procedural guidance, directly observed implementation of administrative and established physical controls, assessed worker exposures to radiation and radioactive material, and appraised radiation worker and technician proficiency in implementing radiation protection program activities.

The licensee's procedures for posting, surveying, and controlling access to airborne radioactivity areas, radiation areas, high radiation areas (HRAs), locked high radiation areas (LHRAs), and very high radiation areas (VHRAs) were reviewed by the inspectors for consistency with applicable Technical Specifications (TS) and 10 CFR 20 requirements. During plant tours, the inspectors evaluated radiological postings and barricades against the current radiological surveys on several elevations of the Auxiliary

and Unit 2 (U2) Containment Buildings to determine the appropriateness of the established radiological controls. In addition, the inspectors conducted independent radiological surveys and compared observed dose rates to those recorded on current survey maps for various locations on the 216 and 241 foot elevations of the U2 Containment Building to determine the accuracy of licensee surveys.

The inspectors observed designated LHRA doors and evaluated their established controls against TS requirements. The inspectors also evaluated implementation of key controls and postings for VHRAs and LHRA areas. Radiological control procedures and practices for non-fuel materials stored in the spent fuel pool were evaluated by the inspectors and discussed with Radiological Protection (RP) supervisors. Enhanced controls and procedures implemented for work in high dose rate areas and VHRAs were reviewed and discussed with RP management and supervisors. Internal dose assessments were evaluated and assigned dose calculations were independently assessed for accuracy and consistency with licensee procedures.

The inspectors reviewed selected Radiation Work Permit (RWP) guidance used to access radiologically significant areas associated with the U2 refueling outage work to evaluate incorporation of appropriate access controls and electronic dosimeters setpoints for the expected radiological conditions. Through worker interviews, radiologically controlled area (RCA) tours, and selected job site observations, the inspectors evaluated radiation worker and radiation protection staff training/skill level, adherence to access control procedures and RWP requirements, and understanding of RWP requirements and dosimetry setpoints.

Radiation protection program activities were evaluated against 10 CFR 19.12; 10 CFR 20, Subparts B, C, F, G, H, and J; Updated Final Safety Analysis Report (UFSAR) details in Section 12, Radiation Protection; TS Section 5.4.1, Procedures, and Section 5.7, HRA; and approved licensee procedures. Licensee guidance documents, records, and data reviewed within this inspection area are listed in Section 2OS1 of the report Attachment.

Problem Identification and Resolution.

Five Plant Issues (PIs) and two audits related to access controls 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 Virginia Power Administrative Procedure (VPAP) 1601, "Corrective Action, Revision Rev. 18". Specific documents reviewed are listed in the report Attachment.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

a. Inspection Scope

ALARA Planning and Controls.

Inspectors identified five jobs that were expected to have the highest cumulative radiation exposure and reviewed the associated ALARA packages. This review included incorporation of industry experience, the use of temporary shielding, airborne radioactivity and contamination controls. The packages were reviewed for procedural compliance. Five RWPs were reviewed for consistency with the planning documentation and logical task breakdown. Follow up reviews of the RWPs was done to determine if any revisions to dose estimates were needed. Scope reductions which reduced the cumulative dose estimates and goals were reviewed by inspectors for integration into planning and outage dose goals. Exposures significantly less than originally estimated led inspectors to re-review the ALARA estimates to determine if estimates had been inflated. Inspectors selected several work groups to determine equitablity in the dose distribution within various disciplines, the groups included RP, Scaffold Builders, Mechanical Maintenance and Insulators. Where individual cumulative exposures were statistically significantly higher than the general population of that craft, the inspectors followed up to determine the causes. Plant collective exposure trends and source terms were discussed with ALARA and Chemistry supervision.

Inspectors interviewed workers from several disciplines to evaluate adequacy of supervision in field and the sufficiency of Health Physics (HP) coverage. Several HP Technicians, both vendor and utility, were interviewed to determine if there would be any reluctance to stop work if unsafe conditions would be created or if the job could not be adequately covered.

Primary Chemistry personnel were interviewed for details on how the chemistry aspects of the shutdown and the ensuing crud burst, oxygenation and subsequent cleanup were handled. Plant Chemistry procedures and internal guidance for conduct of the shutdown and subsequent cleanup were reviewed for consistency with industry guidance. Inspectors evaluated coolant analysis results to ascertain the effectiveness of the cleanup.

Inspectors observed several Containment and Auxiliary Building activities using the licensee's remote monitoring facility in addition to direct observation during tours. Tours included observation of regulatory and informational postings, engineering controls, worker aids such as identified low dose work areas, HP interaction with workers and deployment of airborne activity and direct radiation monitoring instrumentation. Inspectors were able to assess the sites integration of remote visual and radiological monitoring with on scene coverage. Inspectors toured containment evaluating HP controls and practices and performed independent surveys of containment including general walkways, "A" steam generator cubicle, containment sump work area, and containment ventilation work area.

ALARA, HP, Chemistry and Decon personnel were interviewed to evaluate source term control activities including decontamination to remove surface contamination, temporary shielding installation and removal, control of spread of contamination, hotspot elimination, taking advantage of the shielding afforded by water filled systems, sequencing of scaffold erection and modification and the impacts of forced oxygenation of the primary using hydrogen peroxide during crud burst. Initiatives being evaluated for future source term reduction were discussed with ALARA personnel and RP Supervision.

The plant collective exposure history for the years 2000 through 2002, based on the data reported to the NRC pursuant to 10 CFR 20.2206 (c), was reviewed and discussed with licensee staff, as were established goals for reducing collective exposure. The inspectors examined the dose records of the declared pregnant workers (DPWs) during 2003 to evaluate current gestation dose. The applicable RP procedure was reviewed to assess licensee controls for DPWs.

Radiation protection program activities and their implementation were evaluated against 10 CFR 19.12; 10 CFR Part 20, Subparts B, C, F, G, H, and J; and approved licensee procedures. In addition, licensee performance was evaluated against Regulatory Guide (RG) 8.8, Information Relevant to Ensuring that Occupational Radiation Exposures at Nuclear Power Stations will be As Low As Reasonably Achievable, and RG 8.13, Instruction Concerning Prenatal Radiation Exposure. Procedures and records reviewed within this inspection area are listed in Section 2OS2 of the report Attachment.

Problem Identification and Resolution.

Five licensee PIs associated with ALARA activities were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedures VPAP-1501,"Deviations, Rev. 16", and VPAP-1601, "Condition Reports, Rev. 18". Documents reviewed are listed in Section 2OS2 of the report Attachment.

b. Findings

No findings of significance were identified.

2PS2 Radioactive Material Processing and Transportation

a. Inspection Scope

Waste Processing and Characterization.

During the onsite inspection, the inspectors walked down operational and abandoned radwaste processing systems with cognizant licensee representatives. The operational systems were examined for unmonitored release pathways and the abandoned equipment was examined to determine whether it had been properly drained. The operational components and equipment were compared to system descriptions

contained in the process control plan and UFSAR. Process changes made since the last inspection of this area were reviewed and discussed with cognizant licensee representatives.

During the onsite inspection, the inspectors reviewed the licensee's procedures for sampling and analysis of wastes streams pursuant to 10 CFR 61.55 requirements. Also, analytical results were reviewed by the inspectors to determine whether all waste streams were being periodically sampled, trended and evaluated as required. In addition, analyses were reviewed to determine whether appropriate scaling factors for activated materials, fission products and transuranics were current. Furthermore, the inspectors reviewed the licensee's procedures for transferring, sampling and mixing radioactive resins and documentation for vendor and licensee's laboratory inter-comparison analyses.

Transportation.

During the onsite inspection, the licensee did not have any Type B shipment scheduled. However, the inspectors reviewed selected records of Type B shipments since the last inspection that were for primary resin and solid waste.

The inspectors assessed training for individuals responsible for shipping radioactive material. This was accomplished by observation of work, review of completed shipping records, and evaluation of training courses and lesson plans for initial qualification.

The inspectors reviewed selected records for shipments that included, Low Specific Activity (LSA) exclusive use, Surface Contaminated Object (SCO) exclusive use, LSA nonexclusive use, Limited Quantities (LQ) and instruments and articles.

The inspectors observed the licensee's preparation of a shipment that consisted of eight boxes of ultrasound and video equipment that had been used during the outage. In addition, the inspector observed the preparation of a shipment that consisted of U2 Reactor Head O-Ring pieces. The observed activities included package inspection, surveys, labels and markings, vehicle placarding, vehicle checks, emergency instructions, verification of drivers training certification, shipping papers provided to driver, and licensee verification of shipment readiness.

Personnel training, shipment preparations, and shipping documentation was reviewed for compliance with 10 CFR 61, 10 CFR 71, and 49 CFR 171-189 requirements.

Problem Identification and Resolution.

Five PIs, one audit, and two self-assessments related to radioactive waste management 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", Rev. 18. Specific documents reviewed are listed in the report Attachment.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

Reactor Safety PI Verification

a. Inspection Scope

The inspectors performed a periodic review of the Unit 1 and 2 performance indicator data reported to the NRC for the following mitigating systems:

- Safety System Functional Failures;
- Unplanned Power Changes; and,
- Reactor Coolant System Leakage.

The inspectors reviewed data from the licensee's corrective action program, maintenance rule records, operating logs and maintenance work orders for the period covering the second quarter 2003 through the first quarter 2004. Discussions with licensee personnel were held by the inspectors regarding the data reviewed. The data was compared with that displayed on the NRC's public web site. The performance indicator method of assessment was compared with the guidelines contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guidelines."

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

b. Findings

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

Radiation Safety PI Verification

a. Inspection Scope

The inspectors sampled licensee submittals relative to the PIs listed below for the period June 1, 2003, through March 31, 2004. To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in NEI 99-02, "Regulatory Assessment Performance Indicator Guideline", Rev. 2, were used to confirm the reporting basis for each data element.

Occupational Radiation Safety Cornerstone

Occupational Exposure Control Effectiveness

The inspectors reviewed a listing of radiation protection related corrective action program records (Plant Issues) generated from June 2003 through March 2004 to ensure that radiological occurrences were properly classified in accordance with NEI 99-02 guidance. The inspectors also reviewed individual RCA exit transaction records for exposures exceeding 100 millirem during the period June 1, 2003 through May 5, 2004. Exposures exceeding 100 millirem were evaluated by comparison to electronic dosimeter alarm set points specified in the applicable RWP. In addition, licensee procedural guidance for classifying and reporting PI events was evaluated. Reviewed documents are listed in Section 4OA1 of the report Attachment.

Public Radiation Safety Cornerstone

RETS/ODCM Radiological Effluent Occurrences

The inspectors reviewed a listing of radiological effluent related corrective action program records (PIs) generated from June 2003 through March 2004 and the most recent annual radioactive effluent release report to ensure that radiological effluent release occurrences were properly classified in accordance with NEI 99-02 guidance. In addition, licensee procedural guidance for classifying and reporting PI events was evaluated. Reviewed documents are listed in Section 4OA1 of the report Attachment.

b. Findings

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

4AO2 Identification and Resolution of Problems

.1 Routine Review of Corrective Action Program Documents

a. Inspection Scope

Plant Issue N-2004-1927, “Close out of Unit 2 inside recirculation spray sump following maintenance revealed a considerable amount of debris” was selected for review. The inspectors reviewed the licensee’s actions to address this issue which involved the identification of accumulated debris, a missing fastener and discolored coating as a result of welding activity in the sump. The inspectors conducted a review of the licensee’s problem identification and resolution activities to ensure they included:

- Complete and accurate identification of the problem in a timely manner commensurate with it’s significance;

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

b. Findings and Observations

No findings of significance were identified. The inspectors observed from a review of the root cause evaluation and discussions with quality control (QC) personnel that a mechanic accompanied a QC inspector into the sump to remove the debris (welding slag, a nail, a tie wrap and a piece of tape) as it was identified during the closeout inspection. An engineering evaluation determined that the missing fastener may be deferred until the next outage, but the damaged coating (discolored) on the underside of the sump deck plate was removed and re-coated prior to entry into Mode 4.

.2 Daily Review of the Licensee's Corrective Action Program (CAP)

a. Inspection Scope

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 Issue (PI) summary reports and attending daily PI review team (PIRT) meetings.

b. Findings

No findings of significance were identified.

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

a. Inspection Scope

The inspectors performed a semi-annual review of the licensee's CAP to access trends that might indicate the existence of more significant safety issues as documented in NRC inspection report 05000338/2004002 and 05000339/2004002, dated April 16, 2004. As required by Inspection Procedure 71152, "Identification and Resolution of Problems," the inspectors performed a review of the licensee's corrective action program (CAP) and associated documents to identify trends that could indicate the existence of a more significant safety issue. The inspector's review was focused on repetitive equipment issues, but also considered the results of daily inspector CAP item screening discussed in section 4OA2.1 above, licensee trending efforts, and licensee

human performance results. The inspector's review nominally considered the six month period of January 2004 through June 2004, although some examples expanded beyond those dates when the scope of the trend warranted. The review also included issues documented outside the normal CAP in major equipment problem lists, repetitive and/or rework maintenance lists, departmental problem/challenges lists, system health reports, quality assurance audit/surveillance reports, self assessment reports, and maintenance rule assessments. The inspectors also evaluated the report against the requirements of the licensee's corrective action program.

b. Findings and Observations

There were no findings of significance identified. However, the inspectors documented in NRC inspection report 05000338/2004002 and 05000339/2004002 the negative trends in the areas of EDG reliability. The licensee has formulated an action plan to address EDG reliability issues.

4OA4 Cross Cutting Aspects of Findings

Cross-References to Human Performance Findings Documented Elsewhere

Section 1R14 describes a finding for failure to properly preplan and perform maintenance in accordance with plant drawings. A lack of attention to detail by licensee personnel during the planning, performance, and post-maintenance test development of the cell switch replacement resulted in an incorrect contact configuration that caused a reactor trip.

4OA5 Other Activities

.1 (Closed) NRC Temporary Instruction (TI) 2515/152, Revision 1, "Reactor Pressure Vessel Lower Head Penetration Nozzles (NRC Bulletin 2003-02)" - Unit 2

a. Inspection Scope

The inspectors observed activities relative to inspection of the Unit 2 reactor pressure vessel (RPV) lower head penetrations in response to NRC Bulletin 2003-02. The guidelines and criteria for the inspection were provided in NRC TI 2515/152, "Reactor Pressure Vessel Lower Head Penetration Nozzles (NRC Bulletin 2003-02)."

b. Findings and Observations

No findings of significance were identified. Specific questions contained within the TI are discussed below.

1. For each of the examination methods used during the outage, was the examination:

a. Performed by qualified and knowledgeable personnel? (Briefly describe the personnel training/qualification process used by the licensee for this activity.)

The examination was performed by qualified and knowledgeable individuals that were qualified as Level II non-destructive Visual Testing (VT)-1, 2 and 3 examiners.

b. Performed in accordance with demonstrated procedures?

The examination was performed per Engineering Periodic Test (PT) procedure 2-PT-48.4, Revision 0, "Bare Metal Inspection of Vessel BMI Nozzles." The inspectors also reviewed VPAP-1103, "ASME Section XI Visual Examination Program (VT-1,2,3 & General)," which was the governing procedure for the ASME requirements for performing the reactor vessel bottom head inspection. Performance of the visual VT-2 examination was conducted in accordance with established procedures.

c. Able to identify, disposition, and resolve deficiencies?

The examination was completed using a robotic camera with resolution that met the visual acuity as defined by IWE/IWL specifications, ASME Section XI Code and VPAP-1103. In addition, direct visual examinations were also conducted to supplement the robotic camera. Procedure 2-PT-48.4 established criteria to identify, disposition, and resolve deficiencies on a case-by-case basis. There were no deficiencies identified.

d. Capable of identifying pressure boundary leakage as described in the bulletin and/or RPV lower head corrosion?

The examination was capable of identifying pressure boundary leakage as described in the bulletin and/or RPV lower head corrosion.

2. Could small boric acid deposits representing RCS leakage, as described in the Bulletin 2003-02, be identified and characterized, if present by the visual examination method used?

The examination was adequate to satisfy the Bulletin requirements. There was no boric acid deposits identified by either the remote video camera or the direct visual methods of examination.

3. How was the visual inspection conducted (e.g., with video camera or direct visual by the examination personnel)?

The examination was conducted via remote video camera and direct visual means.

4. How complete was the coverage (e.g., 360° around the circumference of all the nozzles)?

   The inspectors observed from a review of the video tapes that many of the penetrations did not have 360 degree video coverage as required by the bulletin and the licensee's procedure. This observation was discussed with the licensee. The licensee performed another review of the video tapes and agreed with the inspectors observation. As a corrective action for the lack of full video coverage, the licensee performed a second examination of the penetrations using the direct visual method. All nozzles were inspected and the complete 360° coverage was completed. This lack of an initial 360° coverage by video was documented in the licensee's corrective action program as PI N-2004-1964.

5. What was the physical condition of the RPV lower head (e.g., debris, insulation, dirt, deposits from other sources, physical layout, viewing obstructions)? Did it appear that there are any boric acid deposits at the interface between the vessel and the penetrations?

   The examination revealed paint chips on the vessel bottom head that came from the anti-corrosive paint coating applied following the manufacturing process. Otherwise, the general physical condition of the RPV lower head area was generally clean with no indications of boric acid deposits at the vessel/BMI interface. Some minor corrosion was noted that appeared to be from water cleaning activities above the RPV lower head. There were no obstructions or obstacles to adversely affect the licensee's ability to complete a comprehensive examination of the lower head.

6. What material deficiencies (i.e., cracks, corrosion, etc.) were identified that required repair?

   The examination determined that there were no identified deficiencies requiring repair nor any evidence of degradation or leakage originating from the reactor lower head surface or instrument interface.

7. What, if any, impediments to effective examinations, for each of the applied non-destructive examination methods, were identified (e.g., insulation, instrumentation, nozzle distortion)?

   The licensee had to remove some insulation panels to gain access to the lower head area for the robotic camera and direct visual examinations.

8. Did the licensee perform appropriate follow-up examinations for indications of boric acid leaks from pressure-retaining components above the RPV lower head?

   There were no additional follow-up examinations required due to the absence of any indications of boric acid leaks from the surface of the lower head.

9. Did the licensee take any chemical samples of the deposits? What type of chemical analysis was performed (e.g., Fourier Transform Infrared (FTIR)), what constituents were looked for (e.g., boron, lithium, specific isotopes), and what were the licensee's criteria for determining any boric acid deposits were not from the RCS leakage (e.g., Li-7, ratio of specific isotopes, etc.)?

   The licensee did not take any chemical samples since no boron deposits were identified.

10. Is the licensee planning to do any cleaning of the head?

    No, there were not boron deposits identified to necessitate cleaning.

11. What are the licensee's conclusions regarding the origin of any deposits present and what is the licensee's rationale for the conclusions?

    The licensee identified no boron deposits on the bottom head.

.2 (Open) NRC TI 2515/153, "Reactor Containment Sump Blockage (NRC Bulletin 2003-01)"

a. Inspection Scope

The inspectors performed a preliminary review of the licensee's activities in response to NRC Bulletin 2003-01, "Potential Impact of Debris Blockage on Emergency Sump Recirculation at Pressurized Water Reactors (PWRs)," in accordance with NRC TI 2515/153, "Reactor Containment Sump Blockage (NRC Bulletin 2003-01)," dated October 3, 2003.

Procedure 1-PT-57.3, "Containment Recirculation Spray Sump Examination" was reviewed for the Unit 1 Spring 2003 Refueling Outage since it was performed after August 31, 2002 but prior to the issuance of TI 2515/153. Visual inspections and procedural reviews of the Unit 2 containment sumps, sump screens and flow paths were performed by the inspectors during the current refueling outage. The inspectors also reviewed the licensee's completed and proposed compensatory measures submitted in accordance with Bulletin 2003-01, Option 2, to verify they have been implemented or are planned and scheduled for implementation consistent with the licensee's response.

b. Observations and Findings

No findings of significance were identified for the preliminary review conducted. Pending NRC (NRR) review of the licensee's response letter Serial Number 03-368, Revision 0, dated August 7, 2003, TI 2515/153 will remain open.

Specific inspection results for each question in the TI are discussed below.

a. For units that entered refueling outages (RFOs) after August 31, 2002, and subsequently returned to power: Was a containment walkdown to quantify potential debris sources conducted by the licensee during the RFO?

Yes, North Anna Power Station Unit 1 containment sump was inspected on March 1, 2003 during the spring RFO.

b. For units that are currently in a RFO: Is a containment walkdown to quantify potential debris sources being conducted during the current RFO?

Yes, North Anna Power Station entered the current refueling outage on May 2 with a scheduled return to power date of May 30, 2004. A containment walkdown was conducted by the licensee to quantify potential debris sources during the RFO.

c. For units that have not entered a RFO between September 1, 2002, and the present: Will a containment walkdown to quantify potential debris sources be conducted during the upcoming RFO?

Not applicable since North Anna Unit 1 containment sump was inspected during the Spring 2003 RFO and Unit 2 during the current RFO.

d. Did the walkdowns conducted check for gaps in the sumps' screened flowpath and for major obstructions in containment upstream of the sumps?

Yes, NAPS walkdowns conducted in March 2003 for Unit 1 and the current RFO for Unit 2, checked for gaps in the sumps' screened flowpath and for major obstructions in containment upstream of the sumps. The walkdowns were performed in accordance with the requirements of Procedures 1-PT-57.3, "Containment Recirculation Spray Sump Visual Examination" and 2-PT-57.3 for Unit 2. Issues with sump screen gaps, sump closeout inspection and containment building foreign material exclusion were captured in the licensee's corrective action program under Plant Issues N-2003-1011, 1297; N-2004-1542, 1682,1838 and 1890. Issues identified were corrected or evaluated as acceptable prior to returning to power.

e. Are any advanced preparations being made at the present time to expedite the performance of sump-related modifications, in case it is found to be necessary after performing the sump evaluation?

North Anna Power Station sump evaluations and analysis have not yet been completed. In response to the NRC Bulletin 2003-01, the licensee chose Option 2 and described interim compensatory measures that have been implemented or will be implemented. These efforts will attempt to reduce the risk which may be associated with the potentially degraded or nonconforming ECCS and sump recirculation functions while complex evaluations to determine compliance

proceed. No specific plant modifications were included in the set of interim compensatory actions to address potential recirculation performance issues.

The licensee was prepared to make sump screen related repairs or minor modifications based on the inspection results identified during the Unit 1 Spring 2003 and the current RFO. Issues with corroded anchor bolts on Unit 1 were identified during the Spring 2003 RFO. The corroded anchor bolt issue was resolved under work order 486647-01. Openings greater than 0.12 inches found during the walkdowns on Unit 2 during the current RFO were repaired under Work Order 512288-01.

No plans were developed by the licensee for major sump related modifications during the Unit 1 Spring 2003 or the current Unit 2 RFO. Depending on the results of the complex sump evaluations and anticipated further generic communications from the NRC and the industry, advanced preparations for modifications are anticipated for future refueling outages. The licensee is investigating plans to increase the sumps' screen area and modifying the design to increase the available design margin.

The inspectors performed visual inspections of the containment sumps, sump screens and flow paths to the sumps during the current Unit 2 refueling outage and verified no major obstructions existed in the containment flowpath upstream of the sumps. The inspectors also performed a Mode 5 containment closeout inspection. Issues identified by the inspectors (i.e., Openings greater than 0.12 inches that were not identified during the licensee's previous walkdowns during the current Unit 2 RFO) were appropriately captured in the licensee's corrective action program under Plant Issues N-2004-1890 and N-2004-2108.

The inspectors reviewed the NRC Bulletin 2003-01, Option 2, interim compensatory measures implemented or planned. These actions appeared to be effectively implemented. The actions were reasonable with the intent to reduce the potential risk of emergency core cooling system and reactor building spray recirculation degradation. Additionally, the licensee compensatory actions included operator training on indications and potential recovery responses should sump clogging occur. A finding was identified relating to the Mode 5 containment closeout inspection (Section 1R22.2).

.3 (Open) NRC TI 2515/156, "Offsite Power System Operational Readiness"

a. Scope

The inspectors collected data from licensee maintenance records, event reports, corrective action documents and procedures and through interviews of station engineering, maintenance, and operations staff, as required by the TI 2515/156. The data was gathered to assess the operational readiness of the offsite power systems in accordance with NRC requirements such as Appendix A to 10 CFR Part 50, General Design Criterion (GDC) 17; Criterion XVI of Appendix B to10 CFR Part 50, Plant

Technical Specifications (TS) for offsite power systems; 10 CFR 50.63; 10 CFR 50.65 (a)(4), and licensee procedures.

b. Findings

No findings of significance were identified. Based on the inspection, no immediate operability issues were identified. In accordance with TI 2515/156 reporting requirements, the inspectors provided the required data to the headquarters staff for further analysis. This TI will remain open pending completion of that analysis.

.4 Independent Spent Fuel Storage Installation (ISFSI).

a. Inspection Scope

Access control and surveillance results for the licensee's ISFSI were evaluated. The evaluation included review of ISFSI radiation control surveillance procedures and assessment of radiological survey data. The inspectors toured the ISFSI and observed access controls, thermoluminescent dosimeter (TLD) locations and material condition, and radiological postings on the perimeter security fence. The inspectors observed a licensee technician perform gamma and neutron radiation surveys of the most recently placed spent-fuel cask and at the perimeter fence. Survey results were compared to the most recent survey records.

Program guidance, access controls, postings, equipment material condition and surveillance data results were reviewed against applicable sections of the ISFSI Safety Analysis Report, ISFSI License No. SNM-2507, ISFSI TS, 10 CFR Parts 20 and 72, and applicable licensee procedures. Licensee guidance documents, records, and data reviewed within this inspection area are listed in Section 2OS1 of the report Attachment.

b. Findings

No findings of significance were identified.

.5 (Closed) URI 05000338, 339/ 2003006-02: Alternate Shutdown Panel Ventilation System Not Independent From Impacts of a Main Control Room Fire

Introduction: A non-cited violation (NCV) of 10 CFR 50, Appendix R, Sections III.G and III.L was identified. Specifically, the shared ventilation system between Fire Area-2, Fire Area-6-1 and Fire Area-6-2 did not have adequate separation, isolation, or barriers. During a severe Main Control Room (MCR) fire (Fire Area-2), smoke and toxic gases could be transported to the Unit 1 and Unit 2 Emergency Switchgear Rooms (ESGRs) (Fire Area-6-1 and 6-2, respectively) where the Alternative Shutdown Panels (ASP) are located. Consequently, operators may not have the environmental conditions or visibility to safely man and accomplish a successful shutdown of either Unit 1 or Unit 2 from the Auxiliary Shutdown Panels (ASP). This finding was of very low significance (Green).

Description: As discussed in inspection report (IR) 05000338, 339/2003006, this unresolved item was opened pending determination of the safety significance of the lack of adequate separation, isolation, or barriers to preclude smoke and toxic gases from being transported to the ESGRs during a fire in the MCR. The North Anna Appendix R Report (Section 4.4) identified the MCR fire area as an alternative shutdown area. During a severe fire in the MCR, the operators would abandon the MCR and utilize the Unit 1 and Unit 2 ASPs to achieve a safe shutdown of the units. The ASPs are located in the respective ESGRs. The ESGRs share a common ventilation system with the MCR.

Fire dampers, located in the ventilation system ducts, were designed to isolate the ESGR area to contain the Halon within the ESGRs, and to prevent smoke and toxic gases from spreading from the ESGRS to the MCR. Although an ESGR fire alarm signal or manual actuation of the Halon system (in response to an ESGR fire) would signal these dampers to close, the inspectors found that there were no smoke or fire actuation devices to signal them to shut during a fire in the MCR. Additionally, these dampers do not have the capability of being manually actuated from the MCR.

During a severe fire in the MCR, large amounts of heavy smoke and toxic gases could be generated. The open dampers could permit smoke and toxic gases to spread from the MCR to the ESGR. This situation could present a habitability concern for the operators attempting to achieve shutdown at the respective unit ASP.

Fire procedure 0-FCA-1, Control Room Fire, Revision 26, does not require the operators to bring self-contained breathing apparatus (SCBA) gear to the ESGR nor are any SCBAs readily available at the ESGRs. The safe shutdown analysis did not include an evaluation of potential maloperation of the ventilation system, its components, or its effect on habitability at the ASP.

The inspectors determined that the alternative shutdown capability was not physically independent of the fire area as required by Sections III.G.3 and III.L of Appendix R. The licensee initiated Plant Issue N-2003-1585 to evaluate the independence and operability of the ESGR ventilation system during an MCR fire.

Analysis: This finding is greater than minor because it is associated with the “protection against external factors” attribute and affected the objective of the Mitigating Systems cornerstone to ensure the availability, reliability, and capability of systems that respond to initiating events. The performance deficiency was assumed to degrade the defense in depth for fire protection. However, the finding was determined to be of very low safety significance because both the likelihood of starting a MCR fire and likelihood of generating sufficient smoke to spread to the ESGRs are very low.

Some additional factors (assumptions used in the SDP, IMC 0609, Appendix F) causing the issue to be of very low safety significance were:

- Heat from the fire plume and natural buoyancy of smoke will cause the smoke gas layer to accumulate near the ceiling of the MCR. Because the ESGR is

located at a lower elevation than the MCR, smoke and toxic gases must nearly fill the MCR envelope in order to drive the smoke gas layer down through ducts to the room below.

- Due to the large volume in the MCR, more than two bench boards need to be involved in the fire. The likelihood of fire spreading to more than two bench boards is very low due to their low fire initiating frequency and due to their construction (self-contained cabinets). Additionally, the MCR is a normally manned station so the MCR operators would attempt to fight the fire in its early stages.

- The fire brigade nominally responds in 10 to 15 minutes (based on fire drills over the last 18 months) of fire notification. At that time, at least one MCR door would be opened to allow fire brigade access to fight the fire. This action would serve to vent smoke out of the MCR to the turbine building and reduce the likelihood of smoke migration down to the ESGRs. In addition, the fire brigade would set up portable ventilation equipment to enhance smoke removal from the area.

Enforcement: 10 CFR 50.48 Fire Protection, §(a)(1) requires each operating nuclear power plant to have a fire protection program that satisfies Criterion 3 of Appendix A to this part. Further, §(b)(2) requires that all nuclear power plants licensed to operate before January 1, 1979, must satisfy the applicable requirements of Appendix R to this part, including the requirements of III.G, III.J, and III.O. Sections III.G and III.L specify "the alternative shutdown capability to be independent of the affected fire area(s)."

Contrary to the above, on May 23, 2003, the NRC identified that the shared ventilation system between the MCR and the ESGRs, did not have adequate separation, isolation, or barriers to preclude smoke and toxic gases from being transported to the ESGRs during a fire in the MCR. Because it is of very low safety significance and has been entered into the licensee's corrective action program (Plant Issue N-2003-1585), this violation is being treated as an NCV, consistent with section VI.A of the NRC Enforcement Policy: NCV 05000338, 339/2004003-06: Alternate Shutdown Panel Ventilation System Not Independent From Impacts of a Main Control Room Fire.

4OA6 Meetings, Including Exit

Exit Meeting Summary

On May 26 and June 28, 2004, the resident inspectors presented the inspection results to Mr. Jack Davis and other members of his staff who acknowledged the findings. During an interim exit on May 21, 2004, Region II inspectors indicated that proprietary information was reviewed during the course of the inspection but would not be included

4OA7 Licensee-Identified Violations

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

- Technical Specification 5.4.1 requires that written procedures be established and implemented for the activities covered in Regulatory Guide 1.33.1(c), Equipment Control (e.g., locking and tagging). Procedure OPAP-0010, "Tag-Outs," Section 6.1.1, requires that isolation/boundary points shall be verified. Contrary to this, on May 18, 2004, tag-out 2-04-EP-11 had the incorrect breaker listed to be removed from service. 2-EP-CB-12B breaker 12 was tagged-out in error, whereas breaker 2 was the intended isolation boundary point. Operations had generated the tag-out, verified and approved the isolation point, and the tag-out was implemented in the field as written. The error caused the protected train of power, 2-II 125 Vdc bus, to be inoperable due to the loss of the associated charger while refueling operations were in progress. This event is documented in the licensee's corrective action program as Plant Issue N-2004-1855. This event is of very low safety significance because no actual loss of power occurred and refueling operations were not significantly impacted.

- 10 CFR 50.55a requires that licensee meet the requirements of the ASME Boiler and Pressure Vessel Code. ASME Section XI IWC 86 Code Edition requires examination of Low Head Safety Injection (LHSI) pump casing welds. The licensee had submitted a relief request and received approval from the NRC to perform required inspections when the pumps were pulled for maintenance. Contrary to this, the licensee pulled the 2-SI-P-1A in 1993 and failed to inspect the required pump casing welds, and in error inspected the exterior welds located on the suction can of the pump. The deficiency is documented in the licensee's corrective action program as Plant Issue N-2004-1365. This event is of very low safety significance because engineering analysis determined that pump casing welds were not subjected to high stresses which minimizes the probability of failure. In addition, the LHSI pump was evaluated in accordance with site procedures and the intent of GL 91-18, and was determined to be operable.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel

K. Barnette, Supervisor, Site Industrial Safety/Fire Protection
J. Breeden, Supervisor, Radiological Protection
J. Crossman, Supervisor, Nuclear Engineering
L. Lane, Director, Nuclear Safety and Licensing
L. Lane, Plant Manager
E. Dreyer, Supervisor Health Physics Technical Services
M. Dunston, Manager, Nuclear Site Services
J. Davis, Site Vice President
R. Evans, Manager, Radiological Protection
B. Evans, Manager, Radiological Protection & Chemistry
R. Foster, Supply Chain Manager
D. Jernigan, Director, Nuclear Operations & Maintenance
R. Jones, ISI Coordinator
P. Kemp, Manager, Nuclear Operations
J. Leberstien, Licensing Technical Advisor
T. Maddy, Manager, Nuclear Protection Services
L. Martin, Supervisor, Nuclear Engineering, Auxiliary Systems
B. McBride, Supervisor, Emergency Preparedness
F. Mladen, Manager, Nuclear Maintenance
B. Morrison, Assistant Engineering Manager
P. Naughton, SW System Engineer
W. Renz, Director, Nuclear Security and Emergency Preparedness
H. Royal, Manager, Nuclear Training
M. Sartain, Manager, Nuclear Engineering
D. Smith, ISI Coordinator
B. Speckine, Supervisor Nuclear Fuel Handling

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened and Closed

05000339/2004003-01	NCV	Failure to Properly Torque Studs for TDAFW Pump Discharge Restricting Orifice (Section 1R12.2)
05000339/2004003-02	NCV	Failure to Assess and Manage the Increase in Risk of Opening a Jet Impingement/Missile Protection Steel Door During Planned Component Maintenance. (Section 1R13.2)
05000339/2004003-03	NCV	Reactor Trip due to Improper Cell Switch Installation (Section 1R14)

05000338, 339/2004003-04	NCV	Failure to Properly Inspect the EDG Tornado Exhaust Missile Barriers (Section 1R15.2)
05000339/2004003-01	FIN	Incomplete Closeout Inspections of Unit 2 Containment (Section 1R22.2)
05000338, 339/2004003-05	NCV	Alternate Shutdown Panel Ventilation System Not Independent From Impacts of a Main Control Room Fire (Section 4OA5)
Closed		
2515/152, Rev. 1 (Unit 2)	TI	Reactor Pressure Vessel Lower Head Penetration Nozzles (NRC Bulletin 2003-02) (Section 4OA5.1)
05000338, 339/2003003-06	URI	Alternate Shutdown Panel Ventilation System Not Independent From Impacts of a Main Control Room Fire (Section 4OA5)
Discussed		
2515/153	TI	Reactor Containment Sump Blockage (NRC Bulletin 2003-01) (Section 4OA5.2)
2515/156	TI	Offsite Power System Operational Readiness (Section 4OA5.3

LIST OF DOCUMENTS REVIEWED

1R02/1R17 Evaluations of Changes, Tests or Experiments/Permanent Plant Modifications

Administrative Procedures (1R02 and 17)

STD-GN-0001, Instructions for DCP Preparation, Rev. 28
VPAP-0301, Design Change Process, Rev. 19
VPAP-3001, Safety and Regulatory Reviews, Rev. 9

Other Documents (1R02 and 17)

- 1-PT-71.1.Q, 1-FW-P-2, Turbine Driven Auxiliary Feedwater Pump and Valve Test, Rev. 39
- 1-OP-31.2, Steam Generator Auxiliary Feedwater System, Rev. 28
- 1-PT-71.9C, 1-FW-P-2 Post-Maintenance Performance Test, Rev. 5
- Temporary Modification 1695, Installation and test of orifice 1-FW-RO-102A in Feedwater System (DCP-02-133)
- US Filter Dwg: D1-D01, Outline Drawing Concentric Orifice Plates, Rev. 1 (DCP-02-133)
- Plant Issue N-2204-2362, (DCP-02-133)
- Plant Issue N-2204-2471, (DCP-02-133)
- Purchase Order: 45095518 (DCP-02-133)
- ICP-P-2-P-FW-201c, Aux. Feed Water Pump Discharge Pressure Transmitter Calibration Procedure, Rev. 8
- 1-ICP-QS-T-100A, Refueling Water Storage Tank Temperature Calibration Procedure (T-QS-100A), Rev. 7
- O-EPM-2501-01, 18 month cleaning and maintenance of single phase static inverters, Rev.1
- 1-OP-26.5, 120- Volt Vital Bus Distribution, Rev.19
- 2-ICP-RC-P-2444, Pressurizer Pressure Control (P-RC-2444) Calibration, Rev.9
- O-NAT-E-006, Model Case Circuit Breaker/ Overload Relay Test Record, Attachment 11.1, Rev. 0
- Job # C81552, Inverter Final Test Report, Serial # 0211
- EE-0099, NAPS Instrument Tolerance Document, Pages 86,89-91, Rev.0
- N-01159-1-1FEIBB, One line Diagram Electrical Distribution System NAPS Units 1&2, Rev. 0
- TESK-RS 003, Recirculating Spray System Casing Cooling Tank Chiller Unit 2-RS-MR-1, Rev. 6
- P-FW201C, Feedwater System Turbine Driven Auxiliary Feed Pump (2-FW-P-2) Discharge Pressure, Rev. 6
- 2-PT-83.4.1, Degraded Voltage/Loss of Voltage and CDA Functional Test of CRDM Fans, Rev. 4
- 2-PT-83.1, Simulated Loss of Offsite Power (LOOP) and ESF Actuation- H Bus, Rev. 38

- 2-PT-83.2, Simulated Loss of Offsite Power (LOOP) and ESF Actuation- J Bus, Rev. 42
- Work Order 466201-07, 2-SW-62 and 2SWEA-03, Allen-Bradley RTC Timer Setpoint Verification
- Plant Issue N-2004-2370, PDI Operability Review
- Request for Engineering Assistance R2002-170, 2-HV-PDI-200, 2-HV-PDI-201

Full Safety Evaluations (1R02)

- Regulatory Evaluation Number (REN): 03-SE-PROC-01, Reactor Containment Pa Pressure Test
- REN 02-SE-OT-05, Commitment Change of Removal and Tensile Testing of Production Cadweld Splices
- REN 02-SE-OT-01, Engineering Evaluation of the Potential Effect of Environmentally Assisted Fatigue in Safety Injection Accumulator Nozzles and Charging Line Nozzle
- REN 03-SE-OT-01, Seismic Allowance Eliminated from Drop Rod Times
- REN 03-SE-OT-02, Zirconium Corrosion Design Criteria
- REN 03-SE-OT-03, Modification of NRC Commitment on MS and FW Leak Detection
- REN 03-SE-OT-05, Topical Report VEP-FRD-42

Screened 50.59 Reviews (1R02)

- DCP 02-119, Main Steam Safety Relief Valve Bolting Using "Superbolt"
- Torquenuts, Unit 2
- DCP-02-133, Replacement Terry Turbine Pump 1-FW-P-2 Restricting Orifice
- DCP-00-003, SW Pump Discharge Piping Repair/Replacement
- DCP-00-158, Casing Cooling Chiller Low Pressure Switch Replacement, Units 1&2
- DCP-01-131, Replacement QS, RS, and SW RTD's Associated with Containment Integrity Re-Analysis, Unit 1 (Mitigating Systems, Barrier Integrity)
- DCP-00-143, Pressurizer Pressure Transmitter Replacement, Unit 2 (Barrier Integrity)
- DCP-01-161, Replacement of Vital Bus Inverters 2-I & 2-II, Unit 2 (Mitigating Systems)
- DCP-02-173, MOV Wiring Mods - Close Limit Control, Unit 2
- DCP 04-100, Modify Torque Switch Bypass, Unit 2
- DCP 01-805, Increase Inside Recirculation Spray Pump to Support Containment Integrity Re-analysis/NAPS, Unit 2
- DCP 03-147, Cable Spreading Room Fire Detectors
- DCP-03-105, Unit 2 MCR Envelope to Turbine Building PDI Tubing Mods/NAPs, Unit 2

Self Assessments/Audits (1R02 & 1R17)

- Audit 04-09, Design Control and Engineering Programs, Audit Plan
- NAPS-SA-03-22, Self Assessment, Removal of Draft DCP's from Work Packages Prior to Transmittal to Station Records

- SLA-02-10 (NAPS), Implementation of the Amended 10 CFR50.59 Rule
- Audit 02-06: Design Control and Engineering Programs

1R07 Biennial Heat Sink Performance

Calculations

- MAT-0002, Wall Thickness Measurements of Selected Service Water Spray Array Piping Lines at North Anna, Rev. 2
- MAT-0003, Wall Thickness Measurements of Selected Service Water Piping Lines at North Anna, Rev. 1
- ME-0552, Determination of Recirculation Spray Coolers' UAs for New LOCTIC Analyses, Rev.0

Procedures

- NASES-3.20, Generic Letter L 89-13 Programs, Rev. 0
- 1-AP-22.5, Loss of Emergency Condensate Storage Tank 1-CN-TK-1, Rev. 5
- 1-MOP-49.31, Draining Recirc Spray Heat Exchangers (Service Water Side), Rev. 10
- 1-PT-62.2.1, RSHX SW In leakage, Rev. 13
- ½-PT-213.31, Valve Inservice Inspection (AFW Manual Valves), Rev. 5 & 6
- 1-PT-214.3, Valve Inservice Inspection (Auxiliary Building Service Water Valve Position Indication, Rev. 13

Plant Issues (PIs)

- N-2003-2840, Small Black Tie-Wrap Found on Upper Tube Sheet of 1-CC-E-1A During As-Found Inspection, 07/21/03
- N-2003-2906, Foreign Material Found on 2-CH-E-1B During As-Found Inspection, 07/28/03
- N-2003-4337, Charging Pump Gear Box Cooler Rear Channel Head Installed 90 degrees Out, 12/12/03
- N-2004-0426, Foreign Material Found in Service Water Channel Heads of 2-CC-E-1A, 02/09/04
- N-2004-0916, Foreign Material Found in 1-CC-E-1B During As-Found Inspection, 03/22/04
- N-2004-1258, Small Piece of Black Plastic Found on 2-CH-P-1B Gear Box Cooler During As-Found Inspection, 04/21/04

Completed Procedures

- 0-MCM-0801-01, Cleaning, Removal, and Plugging of Component Cooling Heat Exchanger Tubes, completed 08/01/03, 01/06/04, 02/09/04, 03/25/04
- 0-MPM-0103-01, Preventive Maintenance of Charging/High-Head Safety Injection Pumps, completed 02/03/03, 06/15/03, 09/25/03, 12/11/03, 02/17/04, 04/21/04
- 0-PT-75.14, Service Water Wall Thickness Monitoring, completed 01/06/03

- 0-PT-75.14A, Service Water Spray Array Wall Thickness Monitoring, completed 07/03/03
- 0-PT-75.15, Generic Letter 89-13 Service Water System Testing Requirements Coordination, completed 09/08/03
- ½-PT-213.2A.1, Valve Inservice Inspection for SW Supply Check Valves to ½-CH-P-1A Lube Oil and Gear Box Coolers, completed 02/18/04, 02/04/04, 04/29/04
- ½-PT-213.2B.1, Valve Inservice Inspection for SW Supply Check Valves to ½-CH-P-1B Lube Oil and Gear Box Coolers, completed 01/17/04, 03/06/04, 04/23/04
- ½-PT-213.2C.1, Valve Inservice Inspection for SW Supply Check Valves to ½-CH-P-1C Lube Oil and Gear Box Coolers, completed 01/11/01, 01/27/04, 03/17/04, 03/31/04

Completed Work Orders

- WO 00466365-01, Pumps 1-CW-P-1D and 2-CW-P-1A Intake Bay Inspection, 05/09/02
- WO 00446843-01, Pump 2-CW-P-1A Intake Bay Inspection, 11/19/01

Miscellaneous

- Corbicula Survey Report, 10/02, 04/03, 10/03
- CTS 02-94-2229-044, Evaluate Keeping the SW to AFW Crosstie Valves Open Considering the Impact on RSHX Isolation
- ET SE 98-010, Discontinuing the Periodic Flush of SW System Pipelines that Supply the AFW Pumps Suction Pipelines NAPS Unit 1 and 2, Rev. 0
- ITC-SA-04-29, Dominion GL 89-13 Program Service Water System Problems Affecting Safety-Related Equipment, dated 05/04
- N99-118, PM Task Evaluation Request, Inspect Infrequently Accessed Areas (ASW Intake) for Material Condition and Equipment Degradation, dated
- Report No. ME-0025, NRC Generic Letter 89-13 Activities, Rev. 1
- System Health Report, Service Water System, 1st Quarter 2004

1R08 Inservice Inspection (ISI)

Procedures:

- Procedure NDE-UT-703, Rev.3, Ultrasonic Examination of Vessel Welds Greater Than 2" in Thickness
- Procedure NDE-PT-701, Rev. 5, Liquid Penetrant Examination
- Procedure NDE-RT-101, Rev. 10, Radiographic Examination
- Administrative Procedure DNAP-1004, Rev. 2, Boric Acid Corrosion Control (BACC) Program
- Procedure 2-PT-48.3, Rev. 0, Visual Inspection Borated System in Containment
- Procedure 2-PT-46.21, Rev. 21, RCS Pressure Boundary Components Affected by Boric Acid Accumulation
- Procedure 2-PT-48, Rev. 15, Visual Inspection of ASME XI Class 1 Pressure Boundary Components

Other Documents:

- Weld No. 4 for a 88" Joint Length of Pressurizer Tank Shell and Bottom Head of Line 2-RC-E-2: Ultrasonic Examination Data Record, Calibration Data Record, UT Metallurgical and Geometric Indication Record, UT Partial Records, and Percent Volume by Scan Direction
- Weld No. 8 for a 88" Joint Length of Pressurizer Tank Bottom Head and Supporting Skirt of Line 2-RC-E-2: Ultrasonic Examination Data Record, Calibration Data Record, UT Metallurgical and Geometric Indication Record, UT Partial Records, and Percent Volume by Scan Direction
- Weld No. 1 for a 4" Vertical Seam Joint Length of Pressurizer Tank Shell above the joint of Tank Shell and Bottom Head of Line 2-RC-E-2: Ultrasonic Examination Data Record, Calibration Data Record, UT Metallurgical and Geometric Indication Record, UT Partial Records, and Percent Volume by Scan Direction
- Liquid Penetrant Report for Weld 48H, Lug Welds, of Support 2-RC-CSH-24 on Line 4"-RC-415-1502-Q1
- Radiographic Technique and Interpretation Reports for four Thermal Sleeve Tack Welds connected to 6"-RC-419-1502-Q1 B Loop on Cold Leg, 6"-RC-417-1502-Q1 A Loop on Cold Leg, 12"-RC-422-1502-Q1 A Loop on Cold Leg, and 14"-RC-410-2501R-Q1 C Loop on Hot Leg
- Engineering Evaluation for Indications for Weld WS-2 of Line 2-RH-E-1B
- Engineering Evaluation for Indication repairs for Weld 50H of Line 16"- WFPD-424-601-Q2
- Work Orders (WOs) 00478381-01 & 00469746-04
- Plant Issue (PI) N-2004-1717

1R14 NonRoutine Plant Evolutions and Events

Drawings

- 11715/12050-1.27-157A, “Reactor Trip Switchgear Connection Diagram #1"
- 11715/12050-1.27-158A, “Reactor Trip Switchgear Connection Diagram #2"
- 12050-ESK-6W, “Reactor Trip Switchgear,” Sheets 1 through 4
- 12050-FE-5K-8, “Wiring Diagram - Reactor Trip Switchgear”

Section 2OS1: Access Controls to Radiologically Significant Areas

Procedures, Guidance Documents, and Manuals

Common Health Physics Procedure (C-HP)-1020.011, Radiological Protection Action Plan During Diving Activities, Revision (Rev.) 3
C-HP-1031.022, RWP Dosimetry: Exposure Control Support, Rev. 7
C-HP-1031.030, Dosimetry Processing and Dose Determination, Rev. 3
C-HP-1032.020, Radiological Survey Criteria and Scheduling, Rev. 4
C-HP-1032.030, Radiation Surveys, Rev. 3
C-HP-1032.060, Radiological Posting and Access Control, Rev. 1
C-HP-1032.061, High Radiation Area Key Control, Rev. 2
C-HP-1032.080, Controlled Area and Unrestricted Area Radiological Surveys, Rev. 6
C-HP-1041.010, Evaluation and Tracking Intakes of Radioactive Material, Rev.7
C-HP-1061.110, Radiological Control Areas, Rev. 3
C-HP-1081.010, Radiation Work Permits: Preparing and Approving, Rev. 7
C-HP-1081.020, Radiation Work Permits: RWP Briefing and Controlling Work, Rev. 4

C-HP-1081.040, Radiation Work Permits: Providing HP Coverage During Work, Rev. 1
HP-1071.02, Controlling Contaminated Material, Rev. 3
Virginia Power Administrative Procedure (VPAP) 1601, Corrective Action, Rev. 18

Radiation Work Permits (RWPs)

RWP 04-2-2209, Install and remove scoffolding, Rev. 1
RWP 04-2-2210, Remove and replace insulation, Rev 1
RWP 04-2-2215, Dissemble, inspect, repair, repack, cut out and replace valves and flanges, Rev. 1
RWP 04-2-2223, Provide rigging, crain operator, and outage coordinators, Rev. 1
RWP 04-2-2231, Split pin replacement for Upper Internals, Rev. 1
RWP 04-2-2507, Vacuum debris from Cavity/Transfer canal during refueling operations, Rev. 1

Records and Data

High Radiation Area Gate Status Log - High Radiation Key Locker, 4/7/04
Internal dose assessment records for intakes by two individuals on 3/25/03
Radiological Survey Map 58, Unit 2 Containment 216 Foot Elevation, 5/3/04
Radiological Survey Map 60, Unit 2 Containment 241 Foot Elevation, 5/3/04

Audits and Self-Assessments

Audit 03-06: Radiological Protection/Chemistry, 9/22/04
Self-Assessment Report ITC-SA-04-02, Assessment of Nuclear Business Unit for Adverse Trends in Radiological Protection Events, 4/29/04

Plant Issue (PIs) Reports

N-2003-2620, Routine plant walkdown identified several radioactive material labeling deficiencies within the RCA, 7/3/03
N-2003-2622, Individual entered a posted High Radiation Area without alternative means of dosimeter alarm recognition required by the RWP, 7/3/03
N-2003-3794, Document and track follow-up actions from Station Nuclear Safety audit of station Radiation Protection practices, 10/22/03
N-2003-4310, Several individuals were allowed to exit a contaminated pad, traverse a “clean” area and enter a second contaminated area, 12/9/03

Section 2OS2: ALARA Planning and Controls

Procedures, Guidance Documents, and Manuals

C-HP-1032.060, Radiological Posting and Access Control, Rev. 1
C-HP-1041.024, Declared Pregnant Woman, Rev. 2
Chemistry Procedure (CH)-93.120, Chemistry Controls: Refueling Outage, Rev. 16
Operating Procedure, 2-OP-3.4, Unit Shutdown from Cold Shutdown (Mode 5) at 200°f or less to Cold Shutdown (Mode 5) at 140°f or less with Keff of 0.95 or less., Rev. 52
Shutdown Chemistry and Operations Review Team White Paper, 2004 Unit 2-Refueling Outage Controlled Shutdown Considerations, Not Dated
VPAP-2101, Radiation Protection Program, Rev.14
VPAP-2102, Station ALARA Program, Rev. 10

VPAP-2105, Temporary Shielding Program, Rev. 7
VPAP-2201, Nuclear Plant Chemistry Program, Rev. 15

ALARA Packages and RWPs

ALARA Evaluation 04-008, Install & Remove Scaffolding During Unit 2 2004 Refueling Outage, 5/29/04
ALARA Evaluation 04-009, Remove, Replace Insulation In Support of Unit Two 2004 Refueling Outage. Includes Installing New Insulation in "C" Loop Room On RCS Loop Piping, 3/8/04
ALARA Evaluation 04-016, Disassemble/Reassemble RX Head, Lift and Set Head, Incore Drive Maintenance, Replace Incore Detector(s), Seal Table Eddy Current, 3/11/04
ALARA Evaluation, 04-019, Perform Valve Maintenance During Unit Two 2004 Refueling Outage. Repacks, Packing Adjustments, Valve Replacements, Valve Rebuilds., 3/26/04
ALARA Evaluation 04-025, Decon RX Cavity, Decon Transfer Canal, Decon I/S RC,Routine Decon O/S RC, Decon of Circular Sump, 3/30/04
RWP 04-2-2203, Fuel Movement and Misc cavity work. Upper internal inspection, removal and replacement. Fuel movement and Misc Spent Fuel Pit work in Fuel Building. Fuel reconstitution. To include all associated support, Rev. 3
RWP 04-2-2213, Perform Elec/Mech PM's, PT's, Inspections and corrective maintenance on fans, pump motors, fan internals and cranes in Unit 2 Rx Containment, Rev.1
RWP 04-2-2215, Disassemble, inspect, repair, repack, cut out and replace valves and flanges in support of the U-2 Outage. To include calibrations and repairs on 2-RC-LT-RVLIS sensors. To include all associated support., Rev.1
RWP 04-2-2209, Install and remove scaffolding in support of the Unit 2 Outage. Includes "Hot Particle Areas" and "High Radiation Areas"., Rev.1
RWP 04-2-2509, Routine Duties & Surveys By Health Physics Personnel. To include all associated support., Rev.1

PIs Reports

PI N-2003-0430, New requirements of VPAP-2105, Temporary Shielding Program, Rev. 6, step 6.4.5 are vague and confusing. (Administrative problem)
PI N-2003-1396, In RWP 03-2-3077, a TEDE ALARA evaluation for the worker task of machining/milling to prep the inside of "12" SI pipe was not performed prior to the job.
PI N-2004-1497, During supervisory review of whole body count documentation it was determined that administrative follow-up actions were not completed.
PI N-2004-1570, Individual received a DAD alarm while climbing on a scaffold in U2 "B" loop room.
PI N-2004-1665, Worker received a DAD Dose rate alarm while installing new insulation back on U-2 RC "C" cold leg piping. DAD alarmed when it came in contact with pipe. DAD data was consistent to the survey map that the workers were briefed to.

Miscellaneous Documents

2004 Unit 2 Refueling Outage ALARA Evaluation & RWP Man-Rem Data as of 4/12/04
ALARA Daily Reports, 5/19/04, 5/20/04
North Anna Nuclear Status Report for 5/18/04, 5/19/04
Power Point Presentation: Source Term Gap Analysis North Anna U-1 and U-2 Primary Piping, Due 12/31/03.
Source Term Data Sheet, Total Source Term Removed in 2004, 1st quarter

Section 2PS2: Radioactive Material Processing and Transportation

Procedures, Guidance Documents, and Manuals

Dominion, North Anna Power Station (NAPS), Procedure No. 0-OP-20.6, Dewatering Chem-Nuclear 14-215 or Smaller Liners Containing Bead Resin or Activated Carbon, Rev. 8
Dominion, NAPS, Procedure No. 0-OP-20.7, Dewatering Procedure for Chem-Nuclear 14-195 or Smaller Liner Containing Ecodex, Powdex Resin, or Diatomaceous Earth, Rev. 1
Dominion, NAPS, Procedure No. HP-1071.030, Receiving Radioactive Material, Rev. 8
Dominion, NAPS, Procedure No. HP-1071.040, Packaging and Shipment of Radioactive Material, Rev. 10
Dominion, NAPS, Procedure No. HP-1072.010, Packaging Radioactive Waste, Rev. 7
Dominion, NAPS, Procedure No. HP-1072.020, Sampling, Analyzing, and Classifying Solid Radioactive Waste, Rev. 7
Dominion, NAPS, Procedure No. HP-1072.030, Computer Programs for Radwaste and Radioactive Material, Rev. 5
Dominion, NAPS, Procedure No. HP-1072.050, Radioactive Waste Transfer to Licensed Waste Processors, Rev. 12
Dominion, NAPS, Procedure No. HP-1091.272, Solid Radioactive Waste Control Program: Surveillance and Evaluation, Rev. 8
Dominion, Nuclear Health Physics (NHP), Procedure No. C-HP-1072.021, Storing Radioactive Material Outside the Protected Area, Rev. 12
Dominion, NHP, Procedure No. C-HP-1072.040, Radioactive Waste Disposal Using the Barnwell Disposal Facility, Rev. 1
Dominion, NHP, Procedure No. C-HP-1091.232, Radiological Survey Program: Surveillance and Evaluation, Rev. 4
Dominion, Station Administrative Procedure (SAP), Procedure No. VPAP-1501, Deviations, Rev. 16
Dominion, SAP, Procedure No. VPAP-1601, Corrective Action, Rev. 18
Dominion Nuclear Training, Generic Hazmat Training, TIR N04-0138, HazMat Training: Transportation Safety, Rev. 1
North Anna Power Station -Updated Final Safety Analysis Report, Sections 11.2 and 11.3, Rev. 36

Records and Data

2003 and 2004 Radioactive Waste Shipment Summary Forms
Annual Radioactive Effluent Release Report, North Anna Power Station (January 01, 2003 to December 31, 2003)
Dominion Virginia Power, Hazmat Transportation Safety Status Report, Dated 05/18/04
Flow Valve Operating Numbers Diagram (FVOND), Liquid Waste System (Duratek System), North Anna Power Station - Unit 1 (NAPSU1), Drawing No. 11715-FM-87F, Revs. 2 and 14
FVOND, Waste Disposal System, NAPSU1, Virginia Power (VAP), Drawing No. 11715-FM-087A, Rev. 33
FVOND, Waste Disposal System (WDS), NAPSU1, VAP, Drawing No. 11715-FM-087B, Revs. 23 and 24
FVOND, WDS, NAPSU1, VAP, Drawing No. 11715-FM-087C, Revs. 20, 30, and 38
FVOND, WDS, NAPSU1, VAP, Drawing No. 11715-FM-087D, Revs. 18 and 33
New Waste Stream Data Reports, Dated 11/16/2002, 03/13/2003, 03/27/2003, 04/23/2003, 04/25/2003, 08/01/2003, 08/12/2003, 09/17/2003, 11/20/2003, 12/17/2003
Radioactive Material Receipt Log, 2003 and 2004 (Year-to-Date)

Radioactive Material Shipment Log, 2003 and 2004 (Year-to-Date)
Radioactive Waste Burial Log - Barnwell, 2003
Radioactive Waste/Material Qualification List, Undated
Radwaste Shipment to Barnwell - Type B Exclusive Use Cask Checklists for Shipment Nos. 03-CNS-02 dated 03/12/03 and 03-CNS-04 dated 089/19/03; Various shipping records to include Inspection and Survey of Radioactive Waste Packages, Radiological Survey Map and Record, LLD Based Value Calculation Worksheet, Package Characterization Report, 1 R @ 3 Meter Calculation Summary for L501323-8, High Integrity Container Use Record and Disposal Certification, Transport Vehicle Inspection Checklist and Record, Emergency Response Information, Shipping Cask User Checkoff Sheet, Straight Bill of Lading, and Waste Manifest
SCO, Type A, Exclusive Use Vehicle Shipment Checklists for Shipment Nos. 03-1012 dated 03/01/03, 03-1015 dated 03/05/03; 03-1038 dated 05/16/03, 03-1056 dated 09/30/03, and 04-1016 dated 05/06/04; Various shipping records to include Radioactive Material Manifest, Radiological Survey Map and Record, Special Instructions to Carrier, Emergency Response Information, Straight Bill of Lading, SCO Package Characterization Input Calculations, Survey Data for Container, and Package Characterization Report
Valve Operating Numbers Diagram, Decontamination Systems, NAPSU1, Drawing No. 11715-FM-101A, Rev. 29

Audits and Self-Assessments

C-HP-1091.271, Attachment 1, Radioactive Material Control Program Evaluation, Revision 2, for the period 4th Quarter 2000 to 2nd Quarter 2003
C-HP-1091.272, Attachment 1, Solid Radioactive Waste Program Evaluation, Rev. 7, for the period 1/1/2002 to 12/31/2002
Nuclear Oversight Audit Report, Audit No. 03:06, Scope - Radiological Protection/Chemistry, Dated 09/22/03

PIs Reports

N-2003-0309, RAMSHP software version 6.2 was found to incorrectly scale waste stream radionuclides when the scaling option was used and the cesium-137 radionuclide was entered as a base radionuclide, 01/25/2003
N-2003-1779, Water leaked from a shipping box that contained the temporary reactor vessel cover as it was being loaded onto the transport vehicle, Dated 04/22/2003
N-2003-2008, The Unit 1 reactor head waste shipment, 03-ENV-02, was involved in an accident near Kingman, Kansas, 05/15/2003
N-2003-2409, Periodic training was not conducted for all personnel involved in the transfer, packaging, and transport of radioactive material, Dated 06/17/2003
N-2003-3193, Certain mechanical maintenance employees involved in the preparation of radioactive material shipping casks under the direction of Health Physics personnel had not received required hazmat training, Dated 08/22/2003
N-2004-1543, Upon receipt of pressurizer safety valves at Wyle Labs, it was discovered that safety valve 2-RC-SV-2551A had not been properly secured in its shipping container, Dated 05/07/2004
N-2004-1869, A programmatic deficiency was identified in the area of radioactive material/ waste shipping regarding the certification by individuals involved in preparing the package that the container was properly prepared for shipment, Dated 05/19/2004

Section 4OA1: Performance Indicator Verification

Procedure

HPAP-2802, NRC Performance Indicator Program, Rev. 2

Records and Data

Annual Radioactive Effluent Release for calendar year 2003, 4/27/04
Listings of radiation protection and radiological effluent related corrective action program records (Plant Issues) generated from June 2003 through March 2004
Personnel Radiation Exposure Management System report of individual exposures for the period June 1, 2003 through May 5, 2004
RWP 04-2-2507, Vacuum debris from Cavity/Transfer canal during refueling operations, Rev. 1

4OA5 Other Activities

ISFSI Documents Reviewed

0-HSP-ISFSI-001, Independent Spent Fuel Storage (ISFSI), Health Physics TLD Survey Surveillance, Rev. 0
0-PT-4.7, Independent Spent Fuel Storage (ISFSI), Health Physics TLD Survey Surveillance, Rev. 0
HP-1020.012, Radiological Protection Action Plan During Dry Storage Cask Activities, Rev. 13

Records and Data

ISFSI Fence TLD Data for: 4Q02, 1Q03, 2Q03, 3Q03, and 4Q03
Radiological Survey Map 70, ISFSI, 3/18/04
Spent Fuel Cask Grid Survey, Cask TN-32-43, 3/13/04

PIs Report

N-2003-4250, Methodology specified in ISFSI TS Amendment 2, issued on 6/30/03, for average dose rates from top and sides of spent fuel storage casks, was not accurately incorporated into cask survey procedure, 12/3/03

Procedures:

0-FCA-0, Fire Protection - Operations Response, Rev. 8
0-FCA-1, Control Room Fire, Rev. 25

Miscellaneous:

UFSAR Sections 9.4 and 9.5
Appendix R Report, Rev. 21
Firefighting Strategy, 1-FS-CR-1, Control Room - Units 1 &2 Safe Shutdown Equipment, Rev. 1

Corrective Action Program Plant Issue Report:

N-2003-1585, Concerns Regarding Whether a MCR Fire Would Affect Habitability of the ESGR.

LIST OF ACRONYMS

ALARA - As Low As Is Reasonably Achievable
AMSAC - ATWS Mitigation Actuation Circuitry
ATWS - Anticipated Transient Without Scram
ANS - American National Standard
ANSI - American National Standards Institute
ARM - Area Radiation Monitor
ASME - American Society of Mechanical Engineers
B&PV - Boiler and Pressure Vessel
CAP - Corrective Action Program
CETNA - Core Exit Thermocouple Nozzle Assembly
cfm - cubic feet per minute
CFR - Code of Federal Regulations
CNTMT - Containment
CRDM - Control Rod Drive Mechanism
CY - Calendar Year
DCP - Design Change Package
dpm - disintegrations per minute
EAD - Electronic Alarming Dosimeter
EDG - Emergency Diesel Generator
EHC - Electro-Hydraulic Control
FRV - Feedwater Regulating Valve
HHSI - High Head Safety Injection
HP - Health Physics
HPT - Health Physics Technician
HRA - High Radiation Area
ISFSI - Independent Spent Fuel Storage Installation
ISI - Inservice Inspection
LER - Licensee Event Report
LHRA - Lcked High Radiation Area
LHSI - Low Head Safety Injection
LLD - Lower limit of Detection
MR - Maintenance Rule
MT - Magnetic Particle Examination
NAPS - North Anna Power Station
NCV - Non-Cited Violation
NDE - Nondestructive Examination
NEI - Nuclear Energy Institute
No. - Number
NRC - Nuclear Regulatory Commission
NRMCA - National Ready Mixed Concrete Association
ODCM - Offsite Dose Calculation Manual
OS - Occupational Radiation Safety
OWA - Operator Work-Around
PARS - Publicly Available Records
PCM - Personnel Contamination Monitor
PI - Performance Indicator
PM - Portal Monitor
PMT - Post-Maintenance Test
PORV - Power Operated Relief Valve

ppm - parts per million
PS - Public Radiation Safety
PSI - Preservice Inspection
PT - Liquid Penetrant Examination
QA - Quality Assurance
QC - Quality Control
RCA - Radiological Controlled Area
RCS - Reactor Coolant System
REMP - Radiological Environmental Monitoring Program
RG - Regulatory Guide
RP - Radiation Protection
RPV - Reactor Pressure Vessel
RPVH - Reactor Pressure Vessel Head
RS - Recirculation Spray
RWP - Radiation Work Permit
SAM - Small Article Monitor
SCBA - Self Contained Breathing Apparatus
SDP - Significance Determination Process
SSC - Systems, Structures, and Components
SW - Service Water
SWS - Service Water System
TM - Temporary Modification
TLD - Thermoluminescent Dosimeter
TS - Technical Specification
TSC - Technical Support Center
UFSAR - Updated Final Safety Analysis Report
UT - Ultrasonic Examination
VHP - Vessel Head Penetration
VHRA - Very High Radiation Area
VPAP - Virginia Power Administrative Procedure
VT - Visual Examination
WO - Work Order
WPIR - Work Plan and Inspection Record
WR - Work Request