



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

January 28, 2009

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

**SUBJECT: NORTH ANNA POWER STATION – NRC INTEGRATED INSPECTION
REPORT 05000338/2008005 AND 05000339/2008005**

Dear Mr. Christian:

On December 31, 2008, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your North Anna Power Station Units 1 and 2. The enclosed integrated inspection report documents the inspection findings which were discussed on January 20, 2009, with Mr. Daniel Stoddard and other members of your staff.

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

Based on the results of this inspection, one NRC-identified finding was identified and determined to involve a violation of NRC requirements. However, because of its very low safety significance and because it was entered into your corrective action program, the NRC is treating this finding as a non-cited violation (NCV) consistent with Section VI.A.1 of the NRC Enforcement Policy. In addition, one licensee-identified violation, which was determined to be of very low safety significance (Green), is listed in Section 4OA7 of this report. If you contest these non-cited violations, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN.: Document Control Desk, Washington DC 20555-001; with copies to the Regional Administrator Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the North Anna Power Station.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response, if any, will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

/RA/

Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

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

Enclosure: Inspection Report 05000338/2008005 and 05000339/2008005
w/Attachment: Supplemental Information

cc w/encl. (See next page)

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SUBJECT: NORTH ANNA POWER STATION – NRC INTEGRATED INSPECTION
REPORT 05000338/2008005 AND 05000339/2008005

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos: 50-338, 50-339

License Nos: NPF-4, NPF-7

Report No: 05000338/2008005 and 05000339/2008005

Licensee: Virginia Electric and Power Company (VEPCO)

Facility: North Anna Power Station, Units 1 and 2

Location: 1022 Haley Drive
Mineral, Virginia 23117

Dates: October 1, 2008 through December 31, 2008

Inspectors: J. Reece, Senior Resident Inspector
R. Clagg, Resident Inspector
C. Welch, Senior Resident Inspector - Surry Power Station
R. Hamilton, Senior Health Physicist, Sections 2OS1, 2PS2, and
4OA5.4
W. Loo, Senior Health Physicist, Sections 2OS2 and 4OA1.2
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A. Vargas, Reactor Inspector, Section 4OA5.3

Approved by: Gerald J. McCoy, Chief
Reactor Projects Branch 5
Division of Reactor Projects

Enclosure

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SUMMARY OF FINDINGS

IR 05000338/2008-005, 05000339/2008-005; 10/01/2008 – 12/31/2008; North Anna Power Station, Units 1 and 2; routine integrated report, Fire Protection.

The report covered a three month period of inspection by resident and regional inspectors. One Green non-cited violation (NCV) was identified. The significance of most findings is identified by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process" Revision 4, dated December 2006.

A. NRC Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- Green. The inspectors identified a non-cited violation of the North Anna Power Plant Facility Renewed Operating Licensee NPF-4 & 7, Condition D, Fire Protection Program, which involved the failure to install adequate conduit penetration seals in various sections of the Units 1 and 2 reactor coolant pump motor oil collection systems, and inadequate oil lift pump enclosure vents which provided a direct escape path from the oil collection systems for potential oil spray from the lift pump and related oil piping leaks. The licensee entered these issues into their corrective action program which included development of compensatory actions until completion of all corrective actions.

The finding was more than minor because it impacted the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and the related attribute of protection against external factors such as fire which could impact the operability of a reactor coolant pump (RCP). This finding had a credible impact on safety because the inadequate installation and fabrication of the oil collection system presented a degradation of a fire confinement component which has a fire prevention function of not allowing an oil leak to reach hot surfaces. The finding was of very low safety significance or Green because of the low degradation rating of the fire confinement category related to the reactor coolant pump (RCP) motor oil collection system, the extremely low frequency of RCP oil leaks and no actual RCP oil leaks during the past operating cycle, and other area fire protection defense-in-depth features such as automatic fire detection, manual suppression capability (fire brigade), and safe shutdown capability from the main control room. There was no cross-cutting aspect due to the legacy aspect relating to both examples. (Section 1R05)

B. Licensee Identified Violations

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

Enclosure

REPORT DETAILS

Summary of Plant Status

Unit 1 began the period at full Rated Thermal Power (RTP) and operated at full RTP for the entire report period.

Unit 2 began the inspection period in a refueling outage (RFO), which began on September 14, 2008. On November 15, 2008, Unit 2 reached full RTP and operated at or near full RTP for the remainder of the inspection period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, Barrier Integrity

1R01 Adverse Weather Protection

.1 Seasonal

a. Inspection Scope

The inspectors reviewed the licensee's adverse weather preparations for cold weather operations specified in 0-GOP-4.2, "Extreme Cold Weather Operations," and 0-GOP-4.2A, "Extreme Cold Weather Daily Checks," and the licensee's corrective action data base for cold weather related issues. The inspectors walked down the two risk-significant areas listed below to verify compliance with the procedural requirement and to verify that the specified actions provided the necessary protection for the structures, systems, or components. The inspectors reviewed the licensee's corrective action program (CAP) database to verify that weather related problems due to temperature were being identified at the appropriate level, entered into the CAP, and appropriately resolved.

- Unit 1 and 2 Emergency Diesel Generator (EDG) Rooms
- Unit 1 and 2 Auxiliary Feedwater (AFW) Rooms

b. Findings

No findings of significance were identified.

.2 External Flooding

a. Inspection Scope

The inspectors assessed the external flooding vulnerability of the North Anna site from the service water pond and Lake Anna. The inspectors verified the condition of the emergency flood protection dike between the service water pond, and the plant and related drainage ditches and culverts, in addition to the west side flood protection dike. The inspectors also reviewed applicable station procedures and design documents to assess proper surveillance and maintenance for external flood protection features. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings of significance were identified.

.3 Review of Offsite Power and Alternate AC Power Readiness

a. Inspection Scope

The inspectors evaluated the readiness of the offsite and alternate alternating current (AC) power systems by reviewing the licensee's procedures that address measures to monitor and maintain the availability and reliability of the offsite and alternate AC power systems. The documents reviewed during this inspection are listed in the attachment.

b. Findings

No findings of significance were identified.

1R04 Equipment Alignments

.1 Partial Walkdowns

a. Inspection Scope

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

- Unit 2 '2H' EDG during planned maintenance on '2J' EDG
- Unit 2 'B' train low head safety injection (LHSI) pump during emergent maintenance on the 'A' train LHSI pump
- Unit 2 '2J' EDG during emergent work on '2H' EDG
- Unit 1 '1H' EDG during planned maintenance on the '1J' EDG

b. Findings

No findings of significance were identified.

.2 Complete Walkdown

a. Inspection Scope

The inspectors performed a detailed walkdown and inspection of the Unit 2 '2J' EDG and related support systems to assess proper alignment and to identify discrepancies that could impact its availability and functional capacity.

The inspection also included a review of the alignment and the condition of support systems including fire protection, room ventilation, and emergency lighting. Equipment deficiency tags were reviewed and the condition of the system was discussed with the engineering personnel.

b. Findings

No findings of significance were identified.

1R05 Fire Protection

a. Inspection Scope

The inspectors conducted tours of the five areas listed below that are important to reactor safety to verify the licensee's implementation of fire protection requirements as described in Virginia Power Administrative Procedure (VPAP)-2401, Revisions 28 and 29, "Fire Protection Program." The inspectors evaluated, as appropriate, conditions related to: (1) licensee control of transient combustibles and ignition sources; (2) the material condition, operational status, and operational lineup of fire protection systems, equipment, and features; and (3) the fire barriers used to prevent fire damage or fire propagation.

- Containment Unit 2 (fire zone 1-2a / RC-2)
- Auxiliary Service Water Pump House (fire zone 13a / ASWPH)
- Motor-Driven Fire Pump House (fire zone 26 / FPB)
- Main and Station Service Transformers (fire zone Z-8C / XFMRs)
- Security Auxiliary Power Supply Building (fire zone Z-39 / APSB)

b. Findings

Reactor Coolant Pump Motor Oil Collection System Installation and Design Problems

Introduction: A Green non-cited violation (NCV) of the North Anna Power Plant Facility Renewed Operating License NPF-4 & -7, Condition D, Fire Protection was identified by the NRC for the failure to adequately install adequate conduit penetration seals and oil lift pump enclosure vents on the oil collection system for the Units 1 and 2 RCP motors.

Description: On October 9, 2008, during a containment closeout tour that included a fire protection review, the inspectors identified two issues associated with the RCP motor oil collection system enclosures. The first issue involved enclosure penetrations for conduit that were not sealed in accordance with drawings from the modification that originally installed the RCP motor oil collection system. The second issue was inadequate lift pump oil enclosure vents. The vent boxes, two per enclosure, consisted of a baffle design which was intended to provide a tortuous path to preclude the release of any oil spray from a potential leak. However, the enclosure opening to which the vent box was attached was sufficiently large enough to allow a direct path for potential oil spray from the lift pump and related piping leaks to escape the enclosure. These problems affected all three RCP motors on Unit 2, and subsequent review determined that Unit 1 is also affected.

The inspectors reviewed design change, DC 80-S47, "Addition of oil containment enclosures, oil drain piping, and drain collection tanks to each reactor coolant pump motor," to determine:

- Installation requirements of the conduit penetrations, and
- Design requirements for the lift pump enclosure vents.

The inspectors subsequently determined from drawing, 5251M2509, that penetrations for conduits must be sealed by the use of grommets to eliminate gaps. The inspectors also determined from drawing, 5251M2514, that the enclosure vents had been fabricated and installed as specified and, therefore, concluded that the installed vents were designed inadequately.

Analysis: The inspectors determined that the failure to adequately seal enclosure penetrations and to install inadequate enclosure vents for the oil lift pump on the RCP oil collection systems was a performance deficiency. This finding had a credible impact on safety because the inadequate installation and design of the oil collection system presented a degradation of a fire confinement component which has a fire prevention function of not allowing an oil leak to reach hot surfaces. The inspectors determined the finding was more than minor because it impacted the mitigating systems cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences, and the related attribute of protection against external factors such as fire which could impact the operability of a RCP. The inspectors determined that the finding was of very low safety significance or Green because of the low degradation rating of the fire confinement category related to the RCP motor oil collection system, the extremely low frequency of RCP oil leaks and no actual RCP oil leaks during the past operating cycle, and other area fire protection defense-in-depth features such as automatic fire detection, manual suppression capability (fire brigade), and safe shutdown capability from the main control room. This finding involved a legacy issue associated with a modification for original installation; therefore, there are no cross-cutting aspects were assigned.

Enforcement: North Anna Power Plant Facility Renewed Operating License N.F.-4 & 7, Condition D, Fire Protection, states in part that VEPCO shall implement and maintain in effect all provisions of the approved Fire Protection Program as stated in the UFSAR of which section 9.5.1.1 includes 10 CFR 50, Appendix R, Section III.O, which requires in part that the RCP shall be equipped with an oil collection system which shall be so installed that failure will not lead to fire during normal or design basis accident conditions and such collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems. Contrary to the above, on October 9, 2008, the licensee failed to adequately seal enclosure penetrations and install appropriate enclosure vents for the oil lift pump on the RCP oil collection systems that were capable of collecting oil from pressurized leakage sites. Because the finding is of very low safety significance and because it has been entered into the licensee's corrective action program (CAP) as Condition Reports 113116, 113670, 113243, and 120397, this violation is being treated as a Green NCV, consistent with Section VI.A of the NRC Enforcement Policy: NCV 05000338, 339/2008005-01, Reactor Coolant Pump Motor Oil Collection System Installation and Design Problems.

1R07 Heat Sink Performance

a. Inspection Scope

The inspectors selected the risk significant Unit 2 recirculation spray (RS) heat exchangers (HX) and reviewed inspection records, test results, maintenance work orders, and other documentation to ensure that deficiencies which could mask or degrade performance were identified and corrected. The test procedures and records were also reviewed to verify that they were consistent with Generic Letter 89-13 licensee commitments, and Electric Power Research Institute (EPRI) Heat Exchanger Performance Monitoring Guidelines. In addition, the inspectors reviewed inspection documentation of the related service water piping to assess general material condition and to identify any degraded conditions. Documents reviewed included VPAP-0811, Revision 6, "Service Water Inspection and Maintenance Program," and Procedure ER-AA-HTX-1003, Revision 0, "Heat Exchanger Monitoring and Assessment."

b. Findings

No findings of significance were identified.

1R11 Licensed Operator Requalification Program

.1 Annual Review of Licensee Requalification Examination Results

a. Inspection Scope

On February 8, 2008, the licensee completed administering the annual requalification operating tests which are required to be given to all licensed operators in accordance with 10 CFR 55.59(a) (2). The inspectors performed an in-office review of the overall pass/fail results of the individual operating tests, as well as the crew simulator operating tests. These results were compared to the thresholds established in Manual Chapter 0609 Appendix I, Operator Requalification Human Performance Significance Determination Process.

b. Findings

No findings of significance were identified

.2 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors reviewed a crew examination on December 2, 2008 which involved a loss of a main turbine first stage pressure channel, a loss of a main feedwater pump, a failure of a reactor coolant pump number one seal, a failure of the main turbine to automatically trip from a reactor trip, and a faulted steam generator.

The inspectors observed crew performance in terms of communications; ability to take timely and proper actions; prioritizing, interpreting, and verifying alarms; correct use and implementation of procedures, including the alarm response procedures;

timely control board operation and manipulation, including high-risk operator actions; and oversight and direction provided by the shift supervisor, including the ability to identify and implement appropriate TS actions. The inspectors observed the post training critique to determine that weaknesses or improvement areas revealed by the training were captured by the instructor and reviewed with the operators.

b. Findings

No findings of significance were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the equipment issue listed below, the inspectors evaluated the effectiveness of the corresponding licensee's 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 ER-AA-MRL-10, Revision 2, "Maintenance Rule Program."

- Maintenance Rule Evaluation, MRE007103: 'C' Reserve Station Service Transformer (RSST) tap changer does not function in automatic which resulted in placing the RSST load tap changer relays in (a)(1) status.

b. Findings

No findings of significance were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, the four activities listed below for the following: (1) effectiveness of the risk assessments performed before maintenance activities were conducted; (2) management of risk; (3) upon identification of an unforeseen situation, necessary steps were taken to plan and control the resulting emergent work activities; and (4) maintenance risk assessments and emergent work problems were adequately identified and resolved. The inspectors verified that the licensee was complying with the requirements of 10 CFR 50.65 (a)(4) and the data output from the licensee's safety monitor associated with the risk profile of Units 1 and 2.

- Emergent work to repair seat leakage on 2-SI-MOV-2867A, boron injection tank inlet isolation valve, while Unit 2 was in Mode 2 and the 2J EDG was inoperable
- Emergent work to repair control rod leak on Unit 2 'A' train LHSI pump
- Unit 2 planned outage work on November 4, 2008, associated with replacement of the C main transformer and Unit 1 C waterbox work.
- Emergent work to repair Unit 2 '2H' EDG air start system

b. Findings

No findings of significance were identified.

1R15 Operability Evaluations

a. Inspection Scope

The inspectors reviewed three operability evaluations affecting the risk-significant mitigating system, listed below, to assess, as appropriate: (1) the technical adequacy of the evaluations; (2) whether continued system operability was warranted; (3) whether other existing degraded conditions were considered as compensating measures; (4) whether the compensatory measures, if involved, were in place, would work as intended, and were appropriately controlled; and (5) where continued operability was considered unjustified, the impact on TS Limiting Conditions for Operation and the risk significance in accordance with the SDP. The inspectors' review included a verification that determinations of operability followed procedural requirements of OP-AA-102, Revision 3, "Operability Determination."

- Operability Determination (OD) 000206, "NAPS Unit 1 and Unit 2 Reactor Coolant System (RCS) Flow Potentially in Excess of Mechanical Design Flow"
- Condition Report (CR) 317398, "Perform common cause failure analysis prior to 12/17/08, 2345 hours, on 2 'H' EDG"
- OD000243, "ECST vent not missile protected"

b. Findings

The enforcement aspects relating to OD000243 are discussed in section 4OA7 of this report.

1R18 Plant Modifications

a. Inspection Scope

The inspectors reviewed two temporary modifications to verify that the modifications did not affect system operability or availability as described by the TS and UFSAR. In addition, the inspectors verified that the temporary modifications were in accordance with VPAP-1403, Revision 11, "Temporary Modifications," and the related work package, and that adequate controls were in place, procedures and drawings were updated, and post-installation tests verified the operability of the affected systems. The temporary modifications reviewed were:

- Procedure controlled temporary modification for 0-ECM-1202-01 for pressurizer heater #65 lead lifted due to a grounded condition, and
- Temporary Modification 1804, "Unit 1 Cable Spreading Room CO2 System installation of temp vent on south exterior wall."

b. Findings

No findings of significance were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed five post maintenance test procedures and/or test activities, as appropriate, for selected risk-significant mitigating systems to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) test were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and (8) equipment was returned to the status required to perform in accordance with licensee procedure VPAP-2003, Revision 13, "Post Maintenance Testing Program." Documents reviewed are listed in the Attachment to this report.

- Work order (WO) 59101782908, Assemble valve after welders
- WO 59101793029, 2-SI-MOV-2867B, rebuild valve due to leaking
- WO 59101791375, Repair valve seat leakage on 2-MS-TV-211B, 'B' train steam supply to turbine drive AFW pump
- WOs 59101802477 and 59101802650 associated with replacement of 2-MS-TV-211B
- WO 59101800244, Adjust packing for 2-MS-TV-201C, 'C' Main Steam trip valve in accordance with engineering instructions

b. Findings

No findings of significance were identified.

1R20 Refueling and Other Outage Activities

a. Inspection Scope

The inspectors used NRC Inspection Procedure 71111.20, "Refueling and Outage Activities," to continue their observation portions of the refueling, maintenance activities, and startup activities to verify that the licensee maintained defense-in-depth commensurate with the outage risk plan and applicable TS for the Unit 2 RFO, which began September 14, 2008. The inspectors monitored licensee controls over the outage activities listed below.

- Licensee configuration management, including daily outage reports, to evaluate defense-in-depth commensurate with the outage safety plan and compliance with the applicable TS when taking equipment out of service.
- Controls over the status and configuration of electrical systems and switchyard to ensure that TS and outage safety plan requirements were met.
- Licensee implementation of clearance activities to ensure equipment was appropriately configured to safely support the work or testing.
- Decay heat removal processes to verify proper operation and that steam generators, when relied upon, were a viable means of backup cooling.

- Controls to ensure that outage work was not impacting the ability to operate the spent fuel pool cooling system during and after core offload.
- Reactor water inventory controls including flow paths, configurations, and alternative means for inventory addition, and controls to prevent inventory loss.
- Reactivity controls to verify compliance with TS and that activities which could affect reactivity were reviewed for proper control within the outage risk plan.
- Refueling activities for compliance with TS, to verify proper tracking of fuel assemblies from the spent fuel pool to the core, and to verify foreign material exclusion was maintained.
- Containment closure activities, including a detailed containment walkdown prior to startup, to verify that evidence of leakage did not exist and that debris had not been left which could affect the performance of the containment sump.
- Heatup and startup activities to verify that TS, license conditions, and other requirements, commitments, and administrative procedure prerequisites for mode changes were met prior to changing modes or plant conditions. Reactor Coolant System (RCS) integrity was verified by reviewing RCS leakage calculations and containment integrity was verified by reviewing the status of containment penetrations and containment isolation valves.

b. Findings

No findings of significance were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the three surveillance tests listed below, the inspectors examined the test procedure, witnessed testing or reviewed test records and data packages, to determine whether the scope of testing adequately demonstrated that the affected equipment was functional and operable, and that the surveillance requirements of TS were met. The inspectors also determined whether the testing effectively demonstrated that the systems or components were operationally ready and capable of performing their intended safety functions.

RCS Leakage:

- 2-PT-52.2A, Revision 35, "Reactor Coolant System Leak Rate (Computer Calculation)"

In-Service Testing:

- 1-PT-71.2Q, Revision 33, "1-FW-P-3A, A Motor-Driven AFW Pump and Valve Test"

Containment Isolation Valve:

- 2-PT-61.3, Revision 38, "Containment Type C Testing"

b. Findings

No findings of significance were identified.

Cornerstone: Emergency Preparedness1EP6 Drill Evaluationa. Inspection Scope

On October 21, 2008, the inspectors observed the performance of a simulator drill that involved a RCS leak, reactor vessel loose parts alarm, the failure of a motor driven AFW pump, spurious trips of the 1H and 1J emergency bus feeder breakers, fuel failure, a large break Loss of Cooling Accident, Technical Support Center uninterruptable power supply breaker trip, and a leak on a discharge check valve for a low head safety injection pump, which required an Alert and General Emergency to be declared over the course of the drill. The inspectors assessed emergency procedure usage, emergency plan classification, notification, and the licensee's identification and entrance of any problems into their corrective action program. This inspection evaluated the adequacy of the licensee's conduct of the drill and critique performance. Drill issues were captured by the licensee in the corrective action system as CR115199.

b. Findings

No findings of significance were identified.

2. RADIATION SAFETY**Cornerstone: Occupational Radiation Safety**2OS1 Access Control to Radiologically Significant Areasa. Inspection Scope

Access Controls. The inspectors reviewed and evaluated licensee guidance and its implementation for controlling and monitoring worker access to radiologically significant areas and tasks associated with the 2008 Unit 2 RFO. The inspectors evaluated changes to, and adequacy of, procedural guidance; directly observed implementation of established administrative and physical radiological controls; appraised radiation worker and technician knowledge of, and proficiency in implementing, Radiation Protection (RP) activities; and assessed radiation worker exposures to radiation and radioactive material.

The inspectors directly observed the administrative and engineered controls for radiologically significant areas. Controls and respective implementation for Locked High Radiation Areas (LHRA) and Very High Radiation Areas (VHRA). This included the review and discussion of keys and storage of irradiated material within the spent fuel pool. Established radiological controls were evaluated for selected RFO tasks including transfer canal blind flange removal, upper internals set, head set, refueling operations, valve maintenance, radioactive waste (radwaste) processing and storage,

and radioactive material/waste shipping activities. In addition, licensee controls for areas where dose rates could change significantly because of plant shutdown and refueling operations were reviewed and discussed. The inspectors discussed the expected response to unexpected radiological conditions on backshift with two responsible RP Supervisors.

For selected tasks, the inspectors reviewed Radiation Work Permit (RWP) details and attended pre-job briefings to assess communication of radiological control requirements to workers. Occupational worker adherence to selected RWPs and Health Physics Technician (HPT) proficiency in providing job coverage were evaluated through direct observations, remote observations, and interviews with licensee staff. Electronic dosimeter alarm set points and worker stay times were evaluated against applicable radiation survey results. For High Radiation Area (HRA) tasks involving significant dose gradients, the inspectors evaluated the use and placement of whole body and extremity dosimetry to monitor worker exposure.

Postings and physical controls established within the radiologically controlled area (RCA) for access to the Unit 2 reactor containment building (RCB), the Unit 1 and Unit 2 reactor auxiliary building (RAB) locations, radioactive material storage locations, decontamination building, and Independent Spent Fuel Storage Installation (ISFSI) were evaluated during facility tours. Results were compared to current licensee surveys and assessed against established postings and radiation controls. Licensee controls were observed for selected Unit 1 and Unit 2 RAB, LHRA, and VHRA locations.

The inspectors evaluated implementation and effectiveness of licensee controls for both airborne and external radiation exposure. The inspectors directly observed processes used for externally contaminated individuals, including those with potential uptakes of radioactive material.

The inspectors reviewed administrative and physical controls including air sampling, barrier integrity, engineering controls, and postings for tasks having the potential for individual worker internal exposures to exceed 30 millirem committed effective dose equivalent.

Radiation protection activities were evaluated against the UFSAR, TS, and 10 CFR Parts 19 and 20 requirements. Detailed procedural guidance and records reviewed for this inspection area are listed in Sections 2OS1 and 4OA5 of the Attachment to this report.

Problem Identification and Resolution. Licensee CAP documents associated with access controls to radiologically significant areas were reviewed and assessed. The inspectors evaluated the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with procedure PI-AA-200, Revision 2, "Corrective Actions." Licensee CAP documents associated with access control issues, personnel radiation monitoring, and personnel exposure events which were reviewed and evaluated in detail during inspection of this program area are identified in Sections 2OS1, 4OA1, and 4OA5 of the Attachment to this report.

The inspectors completed the 21 specified line-item samples detailed in NRC Inspection Procedure 71121.01.

b. Findings

No findings of significance were identified.

2OS2 ALARA Planning and Controls

a. Inspection Scope

As Low As Reasonably Achievable (ALARA). Implementation of the licensee's ALARA program during the 2008 U2 RFO was observed and evaluated by the inspectors. The inspectors reviewed ALARA planning, dose estimates, and prescribed ALARA controls for outage work tasks expected to incur the maximum collective exposures that included insulation removal and installation, reactor head disassembly and reset, and outage health physics (HP) coverage. Incorporation of planning, established work controls, expected dose rates, and dose expenditure into the ALARA pre-job briefings and RWPs for those activities were also reviewed. Work in progress reviews were inspected for select RWPs in which the actual dose was approaching the estimated dose for the job. Selected elements of the licensee's source term reduction and control program were examined to evaluate the effectiveness of the program in supporting implementation of the ALARA program goals. Shutdown chemistry program implementation and the resultant effect on RCB and RAB dose rate trending data were reviewed and discussed with cognizant licensee representatives.

Trends in individual and collective personnel exposures at the facility were reviewed. The inspectors examined the dose records of all declared pregnant workers from April 2006 to 2008 year-to-date to evaluate total or current gestation doses. Applicable procedures were reviewed to assess licensee controls for declared pregnant workers. Trends in the plant's three-year rolling average collective exposure history, outage, non-outage, and total annual doses for selected years were reviewed and discussed with licensee representatives.

The licensee's ALARA program implementation and practices were evaluated for consistency with UFSAR Chapter 12, Radiation Protection; 10 CFR Part 20 requirements; Regulatory Guide 8.29, Instruction Concerning Risks from Occupational Radiation Exposure, February 1996; and licensee procedures. Documents reviewed during the inspection of this program area are listed in Section 2OS2 of the Attachment to this report.

Problem Identification and Resolution. The inspectors reviewed the CAP documents listed in Section 2OS2 of the report Attachment that were related to the licensee's ALARA program. The inspectors assessed the licensee's ability to identify, characterize, prioritize, and resolve the identified issues in accordance with PI-AA-200.

The inspectors completed 20 of the specified line-item samples detailed in NRC Inspection Procedure 71121.02 (minimum sample size is 15; however, additional line items were completed since the licensee was in the 2nd quartile 3 year rolling average for occupational collective dose ranking). All samples have now been completed for this NRC inspection procedure.

b. Findings

No findings of significance were identified.

Cornerstone: Public Radiation Safety

2PS2 Radioactive Material Processing and Transportation

a. Inspection Scope

Waste Processing and Characterization. During system walk-downs, the inspectors observed selected liquid and solid radwaste processing system components for material condition and system configuration agreement with the UFSAR and Process Control Program (PCP). The inspectors compared the capabilities of the previous vendor liquid processing skid with the new vendors skid to determine if a change in capability or effectiveness would be expected.

The inspectors reviewed the 2008 Annual Effluent Report and the 10 CFR 61 radionuclide characterizations for each major waste stream. The inspectors evaluated analyses for hard-to-detect nuclides, reviewed the use of scaling factors, and examined comparison results between licensee waste stream characterizations and outside laboratory data. The licensee's waste stream mixing and concentration averaging methodology was evaluated and discussed with radwaste personnel. The inspectors also discussed the licensee's guidance for monitoring changes in waste stream isotopic mixtures with knowledgeable personnel.

Radwaste processing activities were reviewed for compliance with the licensee's PCP and UFSAR, Chapter 11. Waste stream characterization analyses were reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 61, and guidance provided in the Branch Technical Position on Waste Classification and Waste Form. Reviewed documents are listed in the Attachment to this report.

Transportation. The inspectors directly observed preparation activities for the shipment of pressurizer safety relief valves. The inspectors noted appropriateness of package markings and placarding and interviewed shipping technicians regarding Department of Transportation (DOT) regulations. The inspectors observed radiation surveys of the transport vehicle prior to shipment.

A total of eight shipping records were reviewed for consistency with licensee procedures and compliance with NRC and DOT regulations, four of which underwent detailed review. The inspectors reviewed emergency response information, DOT shipping package classification, radiation survey results, and evaluated whether receiving licensees were authorized to accept radioactive materials. Licensee procedures for opening and closing Type B shipping casks were compared to recommended vendor protocols and Certificate of Compliance requirements. In addition, training records for selected individuals currently qualified to prepare radioactive material shipments were reviewed.

Transportation program implementation was reviewed against regulations detailed in 10 CFR Part 20, 10 CFR Part 71, 49 CFR Parts 172-178, and the guidance provided in NUREG-1608. Training activities were assessed against 49 CFR Part 172 Subpart H. Documents reviewed during the inspection are listed in the Attachment to this report.

Problem Identification and Resolution. Several condition reports were reviewed and assessed. The inspectors evaluated the licensee's ability to characterize, prioritize, and resolve the identified issues in accordance with procedure PII-AA-200. Documents reviewed for problem identification and resolution are listed in the Attachment to this report.

The inspectors completed the six specified line-item samples detailed in NRC Inspection Procedure 71122.02.

b. Findings

No findings of significance were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

.1 Mitigating Systems PI

a. Inspection Scope

The inspectors reviewed the licensee's procedures for developing the data for Safety System Functional Failures. The inspectors examined Unit 1 and Unit 2 data reported to the NRC for the period October 2007 through September 2008.

Procedural guidance for reporting PI information and records used by the licensee to identify potential PI occurrences were also reviewed for both units. The inspectors reviewed the licensee event reports, CAP documents, and maintenance rule records as part of the verification process. The inspection was conducted in accordance with NRC Inspection procedure 71151, "Performance Indicator Verification." NEI 99-02, Revision 5, "Regulatory Assessment Performance Indicator Guidelines," was used as reference criteria.

b. Findings

No findings of significance were identified.

.2 Radiation Safety PI

a. Inspection Scope

The inspectors sampled licensee data to verify the accuracy of reported PI data for the periods listed below.

To verify the accuracy of the PI data reported during that period, PI definitions and guidance contained in Nuclear Energy Institute (NEI) 99-02 and the NEI Frequently Asked Questions list were used to verify the basis in report for each data element.

Occupational Radiation Safety Cornerstone. The inspectors reviewed the Occupational Exposure Control Effectiveness Performance Indicator results for the period of July 2007 through June 2008. For the assessment period, the inspectors reviewed HP shift log entries, electronic dosimeter alarm logs, and licensee procedural guidance for collecting and documenting Performance Indicator data. Condition Reports (CRs) were reviewed for uptakes and abnormal TLD results. Report section 2OS1 contains additional details regarding the inspection of controls for high dose areas and review of related CRs. Documents reviewed are listed in the Attachment to this report.

Public Radiation Safety Cornerstone. The inspectors reviewed the Radiological Control Effluent Release Occurrences PI results for the Public Radiation Safety Cornerstone from July 2007 through June 2008. For the assessment period, the inspectors reviewed cumulative and projected doses to the public, out-of-service effluent radiation monitor data logs, and selected plant issue reports related to Radiological Effluent Technical Specifications (RETS)/ODCM issues. Documents reviewed are listed in the Attachment to this report.

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

b. Findings

No findings of significance were identified.

4OA2 Identification and Resolution of Problems

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

As required by NRC 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 CAP. This review was accomplished by reviewing daily CR report summaries and periodically attending daily CR Review Team meetings.

.2 Semi-Annual Trend Review – Fire Protection Hydropneumatic Tank Air Compressor

a. Inspection Scope

The inspectors performed a review of the licensee's correction action program documents to identify trends that could indicate the existence of a more significant safety issue. The inspectors' review was focused on repetitive equipment and corrective maintenance issues but also considered the results of daily inspector corrective action program item screening discussed in Section 4OA2.1. The review included issues documented outside the normal correction action program in system health reports, corrective maintenance work orders, component status reports, site

monthly meeting reports, and maintenance rule assessments. The inspectors' review nominally considered the six month period of July through December, 2008, although some examples may have expanded beyond those dates when the scope of the trend warranted.

The inspectors compared and contrasted their results with the results contained in the licensee's latest integrated quarterly assessment report. Corrective actions associated with a sample of the issues identified in the licensee's trend report were reviewed for adequacy.

b. Assessment and Observations

No findings of significance were identified. In general, the licensee has identified trends and has addressed the trends with their corrective action program. However, the inspectors identified an adverse trend in the equipment status of the fire protection air compressor. Specifically, the inspectors identified the following CRs involving repeated instances where water was noted in the compressor oil:

- CR105616, Oil high in 1-FP-C-1
- CR107814, 1-FP-C-1 oil in sightglass cloudy
- CR108800, Evidence of water present in lube oil for 1-FP-C-1
- CR109492, 1-FP-C-1 has water in the oil
- CR109795, 1-FP-2 check valve back leakage of water into 1-FP-C-1 oil sump
- CR110387, 1-FP-C-1 oil contains water
- CR111370, 1-FP-C-1 out of service for > 7 days
- CR116182, 1-FP-C-1 flush and change oil
- CR118144, Water found in oil on motor for 1-FP-C-1
- CR120019, Oil level high in fire protection air compressor
- CR120693, Oil in sightglass of 1-FP-C-1 (FP hydropneumatic Tk compressor) is foamy white

Additionally, the inspectors identified the following CRs involving repeated instances where low oil level was noted for the fire protection air compressor:

- CR110044, 1-FP-C-1 low on oil
- CR114174, Low oil on 1-FP-C-1 (Fire Protection Air Compressor)
- CR115045, 1-FP-C-1 oil level below minimum spec
- CR116886, 1-FP-C-1 (Fire Protection Air Compressor) has low oil level
- CR120333, 1-FP-C-1 oil level low (below minimum level line)

The licensee has identified this negative trend and initiated corrective action, CA088157, which will investigate installing a compressor style more appropriate to this particular application.

.4 Annual Samples

Review of Operator Workarounds

a. Inspection Scope

The inspectors performed a review regarding the licensee's assessments and corrective actions for operator workarounds (OWAs). The inspectors reviewed the cumulative effects of the licensee's OWAs and procedure OP-AA-1700, Revision 0, "Operations Aggregate Impact." The inspectors reviewed the data package associated with this procedure which included an evaluation of the cumulative effects of the OWAs on the operator's ability to safely operate the plant and effectively respond to abnormal and emergency plant conditions. The inspectors reviewed and monitored licensee planned and completed corrective actions to address underlying equipment issues causing the OWAs. The inspectors also evaluated OWAs against the requirements of the licensee's corrective action program as specified in PII-AA-200, 10 CFR 50, Appendix B, and procedure OP-AA-100, Revision 5, "Conduct of Operations."

b. Findings and Observations

No findings of significance were identified. In general, the inspectors verified that the licensee has identified operator workaround problems at an appropriate threshold and entered them in the corrective action program, and has proposed or implemented appropriate corrective actions. The inspectors noted one OWA specified for Unit 2 that involves corrective actions to upgrade the reserve station service transformers and adding a similar main generator breaker to Unit 2 as currently used on Unit 1. This would eliminate potential conditions of degraded bus voltage based on secondary plant component alignments.

The inspectors also identified that OD000190, Underground Fuel Oil Storage Tank Vents Not Tornado Missile Protected, specified compensatory actions; however, it was not identified as an OWA. The licensee evaluated and subsequently included this deficiency as an OWA. The enforcement aspects of the performance deficiency relating to OD000190 are discussed in section 4OA7 of this report.

4OA3 Event Followup

(Closed) Licensee Event Report (LER) 05000339/2008-001-00: Manual Reactor Trip Due to Shutdown Bank 'A' Group Step Counter Deviation Greater Than Allowed

On February 8, 2008, with Unit 2 in Mode 3, zero percent power and preparing for a unit restart following a planned maintenance outage, the operators received a rod control urgent failure alarm during withdrawal of the 'A' shutdown bank control rods. The operators noted that the respective group step counters had deviated by three steps and consequently, in accordance with Technical Requirements Manual 3.1.3, initiated a manual reactor trip. The most likely cause was determined as an intermittent open circuit on the slave cyclor moveable decoder card, A503, due to two spread pins.

The licensee revised their procedures to incorporate a vendor practice to periodically reform the pins. The licensee documented the corrective actions associated with this event in CR090778. The inspectors reviewed the LER and related cause evaluations and identified no findings of significance. This LER is closed.

4OA5 Other Activities

.1 Quarterly Resident Inspector Observations of Security Personnel and Activities

a. Inspection Scope

During the inspection period, the inspectors conducted observations of security force personnel and activities to ensure that the activities were consistent with the licensee security procedures and regulatory requirements relating to nuclear plant security. These observations took place during both normal and off-normal plant working hours.

These quarterly resident inspector observations of security force personnel and activities did not constitute any additional inspection samples. Rather, they were considered an integral part of the inspectors' normal plant status review and inspection activities.

.b Findings

No findings of significance were identified.

.2 (Open) Temporary Instruction (TI) 2515/176, Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing

a. Inspection Scope

The objective of this TI was to gather information to assess the adequacy of nuclear power plant EDG endurance and margin testing as prescribed by plant-specific TS. The inspector interfaced with the appropriate station staff to obtain the information specified in Attachment 1 of the TI Worksheet. The TI applies to all operating nuclear power reactor licensees that use EDGs as the onsite standby power supply. The inspector verified the accuracy of the information by review of TS, EDG Design Basis Event (DBE) loading calculations, EDG endurance run test procedures, test data from the last three endurance tests performed on each EDG, EDG ratings, and EDG operating history. The information gathered will be forwarded to Nuclear Reactor Regulation/Division of Engineering/Electrical Engineering Branch (NRR/DE/EEEB) for further review to assess the adequacy and consistency of EDG testing at nuclear stations. Documents reviewed are listed in the attachment.

b. Findings and Observations

The TI is presently scheduled to be open until August 31, 2009, pending completion of the NRR/DE/EEEB review.

.3 (Open) Temporary Instruction (TI) 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds (DMBW)

a. Inspection Scope

From December 3 to 10, 2008, the inspector reviewed the licensee's activities related to the inspection and mitigation of DMBW in the Reactor Coolant System (RCS) to ensure that the licensee activities were consistent with the industry requirements established in the Materials Reliability Program (MRP) document MRP-139, Primary System Piping Butt Weld Inspection and Evaluation Guidelines, July 2005. This inspection was limited to the review of licensee activities with regard to the scoping, classification, inspection, and mitigation of dissimilar metal butt welds in accordance with the industry requirements of MRP-139.

A portion of this TI 2515/172 was completed prior to this inspection. The direct observation and documentation review of baseline volumetric Ultrasonic examination (UT) and the application of Full Structural Weld Overlays (FSWOLs) was completed and documented in Integrated Inspection Report 05000339/2008004, Section 4OA5.

b. Findings and Observations

No findings of significance were identified.

MRP-139 Baseline Inspections

- 1) Have the baseline inspections been performed or are they scheduled to be performed in accordance with MRP-139 guidance

Yes. The licensee has performed all required baseline inspections at the time of this review and the licensee has scheduled the remaining baseline inspections in accordance with MRP-139 guidance.

Pressurizer – The licensee installed Full Structural Weld Overlays on all PRZ DMBW within the scope of the MRP-139 program during the fall 2007 refueling outage for Unit 1, and the spring 2007 refueling outage for Unit 2. There were no ultrasonic (UT) examinations performed prior to the installation of weld overlays.

Reactor Vessel Nozzles – The hot and cold leg nozzles from the reactor vessel are stainless steel and not susceptible to PWSCC. Therefore, no MRP-139 inspections are required for those welds.

Steam Generator (SG) – When the SGs for Unit 2 were replaced in February 1996, an Alloy 52 inlay was installed over the DMBW for the hot and cold Leg nozzles. Therefore, the SG hot and cold leg DMBW for Unit 2 are not in contact with the RCS and no subsequent MRP-139 inspections are required for those welds.

The Steam Generators for Unit 1 were replaced in 1994, but there were no inlays applied to the DMBW of Unit 1. The licensee has scheduled the remaining baseline volumetric examinations for Unit 1 hot legs greater than 14

inches and the cold legs during the spring 2009 outage, which will meet the MRP-139 implementation deadline of December 31, 2009 for the hot legs.

- 2) Is the licensee planning to take any deviations from MRP-139 requirements?

No, the licensee has not submitted any requests for deviation from MRP-139 requirements.

Volumetric Examinations

The inspectors selected the following DMBW for the volumetric examination review:

- a) Unit 2: Pressurizer Surge Line DMBW after mitigation by FSWOL (Weld RC-410/SW-5)

- 1) For each examination inspected, was the activity performed in accordance with the examination guidelines in MRP-139, Section 5.1, for unmitigated welds or mechanical stress improved welds and consistent with NRC staff relief request authorization for overlaid welds?

Yes. For details, see Integrated Inspection Report 50-339/2008-004, Section 4OA5.

- 2) For each examination inspected, was the activity performed by qualified personnel?

Yes. For details, see Integrated Inspection Report 50-339/2008-004, Section 4OA5.

- 3) For each examination inspected, was the activity performed such that deficiencies were identified, dispositioned, and resolved?

Yes. For details, see Integrated Inspection Report 50-339/2008-004, Section 4OA5.

Weld Overlays

The inspectors selected the following FSWOL for review:

- a) Unit 2: Pressurizer Surge Line DMBW after mitigation by FSWOL (Weld RC-410/SW-5)

- 1) For each weld overlay inspected, was the activity performed in accordance with ASME Code welding requirements and consistent with NRC staff relief requests authorizations? Has the licensee submitted a relief request and obtained NRR staff authorization to install weld overlays?

Yes. For details, see Integrated Inspection Report 50-339/2008-004, Section 4OA5.

- 2) For each weld overlay inspected, was the activity performed by qualified personnel?

Yes. For details, see Integrated Inspection Report 50-339/2008-004, Section 4OA5.

- 3) For each weld overlay inspected, was the activity performed such that deficiencies were identified, dispositioned, and resolved?

Yes. For details, see Integrated Inspection Report 50-339/2008-004, Section 4OA5.

Mechanical Stress Improvement (Not Applicable)

The licensee has not implemented Mechanical Stress Improvement as a mitigation method for DMBWs.

In-service Inspection Program

- 1) Has the licensee prepared an MRP-139 in-service inspection program?

No, the licensee does not have a MRP-139 in-service inspection program document. The licensee's MRP -139 inspection program consists of the documents listed below, which were previously prepared documents, and the inclusion of MRP-139 requirements as augmented inspections in the ASME Section XI In-service Inspection Program (ISI Program). Therefore, the licensee is managing the MRP-139 commitments.

- 2) Are welds appropriately categorized?

Yes. All welds were appropriately categorized. The inspectors reviewed all welds categorized at the time of the inspection for appropriate categorization in accordance with MRP-139, Section 6.

- 3) Are inspection frequencies consistent with the requirements of MRP-139?

Yes, planned inspection frequencies for welds in the MRP-139 program are consistent with the requirements of MRP-139.

- 4) What is the licensees' basis for categorizing welds as H or I and plans for addressing potential PWSCC?

No welds were categorized as Categories H or I after application of a FSWOL. Therefore, all welds were able to be volumetrically inspected to greater than 90%.

- 5) What deviations has the licensee incorporated and what approval process was used?

No deviations to MRP-139 have been incorporated by the licensee, therefore no approval was needed.

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

a. Inspection Scope

The inspectors conducted independent gamma and neutron surveys of the ISFSI facility and compared the results to previous surveys. The inspectors also observed and evaluated implementation of radiological controls, including RWPs and postings, and discussed the controls with an HPT and HP supervisory staff. Radiological controls for loading the ISFSI casks were also reviewed and discussed. The inspectors reviewed environmental thermoluminescent dosimeter records and discussed the use of the dosimeters and resultant neutron/gamma data with cognizant HP supervisory staff.

Radiological control activities for ISFSI areas were evaluated against 10 CFR Part 20, 10 CFR Part 72, and applicable licensee procedures. Documents reviewed are listed in the Attachment to this report

b. Findings

No findings of significance were identified.

.5 (Closed) URI 05000338/2007004-03: Containment Type C Test and Corrective Maintenance Evaluation

a. Inspection Scope

As described in Unresolved Item (URI) 05000338/2007004-03, NRC inspectors identified an issue related to the adequacy of corrective actions associated with 1-SW-MOV-103D, service water (SW) supply to 'D' recirculation spray heat exchanger isolation valve, containment type C leakage testing test results as compared to similar testing during a previous outage.

The inspectors performed an extensive review of the licensee's type C leakage testing procedures and corrective actions relating to the valve in question, along with its' function and placement within the associated system. Consequently, the inspectors concluded that there were no findings of significance. This URI is closed.

b. Findings

No findings of significance were identified.

4OA6 Meetings, Including Exit

.1 Exit Meeting Summary

On January 20, 2009, the senior resident inspector presented the inspection results to Mr. Daniel Stoddard and other members of the staff, who acknowledged the findings. The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

.2 Occupational RP Baseline Inspection Exit Meeting

On October 2, 2008, the inspectors discussed the results of the Occupational RP Inspection with Mr. Bruce Evans and other members of his RP staff.

.3 Temporary Instruction (TI) 2515/172, Reactor Coolant System Dissimilar Metal Butt Welds (DMBW's) Exit Meeting

An exit meeting was conducted on December 10, 2008 with licensee management to discuss the results of this inspection.

4OA7 Licensee Identified Violations

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

- 10 CFR 50, Appendix B, Criterion III, requires in part that measures shall be established to assure that applicable regulatory requirements and the design basis are correctly translated into specifications, drawings, procedures, and instructions. Contrary to this, on September 5, 2008, during a field walkdown of the fuel oil system to identify single point vulnerabilities, the licensee discovered that the design basis for the missile protection of vent lines associated with the underground fuel oil storage tanks were incorrectly translated into specifications and drawings. The absence of tornado missile protection impacted safety significance since a single missile could crimp both vent lines impacting both UGFOSTs which would impact both trains of EDGs on each unit. This issue is in the licensee's CAP as CR108328 and the licensee has established compensatory measures to provide a redundant vent path when a tornado watch or warning exists on site. Also contrary to these requirements, on December 17, 2008, during an extent of condition walkdown connected to CR 108328, the licensee discovered that the design basis for the missile protection of vent and vacuum breaker lines for the emergency condensate storage tanks (ECST) were incorrectly translated into specifications and drawings. The absence of tornado missile protection impacted safety significance since each unit's ECST provides suction to all three trains of the AFW system. This issue is in the licensee's CAP as CR317304 and the licensee has established compensatory measures to inspect the ECSTs if a tornado has been sighted on site and to enter the related abnormal procedure to provide alternative suction sources to the AFW pumps as necessary.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

V. Armentrout, SG Programs, ISI Corporate
M. Bradley, Supervisor, HP Operations
J. Breeden, Supervisor, Radioactive Analysis and Material Control
W. Corbin, Director, Nuclear Engineering
E. Dreyer, Supervisor, Health Physics (HP) Technical Services
R. Evans, Manager, Radiological Protection and Chemistry
E. Hendrixson, Director, Nuclear Safety and Licensing
T. Huber, Director, Site Engineering
S. Hughes, Manager, Nuclear Operations
W. Hunsberger, Supervisor, Engineering
P. Kemp, Supervisor, Station Licensing
W. Anthes, Manager, Nuclear Maintenance
L. Lane, Plant Manager
M. Lane, Supervisor, Operations
G. Lear, Manager, Organizational Effectiveness
T. Maddy, Manager, Nuclear Protection Services
M. Main, Component Engineer
G. Marshall, Manager, Nuclear Outage and Planning
C. McClain, Manager, Nuclear Training
F. Mladen, Manager, Nuclear Site Services
B. Morrison, Supervisor Nuclear Engineering
D. Plemen, HP Supervisor – ALARA
J. Rayman, Nuclear Emergency Preparedness
J. Scott, Supervisor, Nuclear Training (operations)
D. Stoddard, Site Vice President
R. Williams, Component Engineer
M. Young, Supervisor, Radioactive Material Control

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened

2515/176	TI	Emergency Diesel Generator Technical Specification Surveillance Requirements Regarding Endurance and Margin Testing (Section 4OA5.2)
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Opened and Closed

05000338, 339/2008005-01	NCV	Reactor Coolant Pump Motor Oil Collection System Installation and Design Problems. (Section 1R05)
05000339/2008-001-00	LER	Manual Reactor Trip Due To Shutdown Bank 'A' Group Step Counter Deviation Greater Than Allowed (Section 4OA3)

Closed

05000338/2007004-03	URI	Containment Type C Test and Corrective Maintenance Evaluation (Section 4OA5.5)
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Discussed

05000339/2515/172	TI	Reactor Coolant System Dissimilar Metal Butt Welds (DMBW) (Section 4OA5.3)
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LIST OF DOCUMENTS REVIEWED

Section 1R01: Adverse Weather Protection

- UFSAR Section 2.4.2, "Floods"
- UFSAR Section 2.4.3, "Probable Maximum Flood on Streams and Rivers"
- UFSAR Section 2.4.10, "Flood Protection Requirements"
- UFSAR Section 2.4.14, "Station and Emergency Operation Requirements"
- UFSAR Section 2A.3, "Safety Implications"
- UFSAR Section 3.4, "Water Level (Flood) Design Criteria"
- UFSAR Section 3.8.6, "Flood Protection Dike"
- NAPS Non-Seismic IPEEE Section 5.3, "External Floods"
- Technical Requirements Manual TR 3.7.4, "North Anna Reservoir", and TR 3.7.16, "Flood Protection"
- Procedure 1-PT-9.3, "Erosion Control Inspection – Station Site," annual frequency and completed on January 23, 2008
- Procedure 0-AP-40, "Abnormal Level in North Anna Reservoir (Lake)"
- Procedure 0-OP-59.1, "Reservoir Spillway"
- CR099612, parts of the main dam crest are slightly lower than the 256' design
- 0-AP-8, "Response To Grid Instability," Revision 6
- 1-OP-15.2, "Main Generator Operation," Revision 47
- 1-OP-26.8, "500 KV Switchyard Voltage," Revision 13
- 1-MISC-32, "Electrical Disturbance Report," Revision 7

Section 1R04: Equipment Alignments

- Drawing, 12050-FM-107A, Sheets 3 & 4, Emergency Diesel Air Services
 - Drawing, 11715/12050-1.30-201A, Revision 4, Emergency Diesel Generator Jacket Coolant Schematic"
 - Drawing, 11715/12050-1.30-202A, Revision 4, Emergency Diesel Generator Lube Oil System Schematic"
 - Drawing, 11715/12050-1.30-266B, Revision 2, Emergency Diesel Generator Fuel Oil System Schematic"
 - Procedure, 2-OP-6.2A, Revision 9, "Valve Checkoff - 2J Diesel Cooling Water
 - Procedure, 2-OP-6.4A, Revision 6, "Valve Checkoff - 2J Diesel Engine Lube Oil System"
 - Procedure, 2-OP-6.7A, Revision 3, "Valve Checkoff - Diesel Air"
 - Procedure, 2-OP-6.8A, Revision 8, "Valve Checkoff - Emergency Generator Fuel Oil System"
 - Procedure, 2-OP-6.5A, Revision 42, "2H and 2J Emergency Diesel Generator Post-Operational Check"
 - Procedure, 2-OP-26A, Revision 43, "Breaker Checklist"
 - TS 3.8.1, AC Sources - Operating and related TS Bases
 - TS 3.8.3, Diesel Fuel Oil and Starting Air and related TS Bases
 - TS 3.8.4, DC Sources - Operating and related TS Bases
- USFAR Section 8.3, Onsite Power Systems

Section 1R19: Post Maintenance Testing

- Procedure ET-N-08-0092, "Reconciliation of spare body for use in 2-MS-TV-211B," Revision 0
- Procedure 0-MCM-0450-02, "Repair of Fisher Valves Designs EC, ED, ES, ET, EAT, and EWT," Revision 14

- Procedure 0-MCM-0450-52, "Inspection and Repair of Fisher Type 476 Piston Actuators," Revision 8
- Procedure 0-ICM-XX-AOV-001, "AOV Inspection and Diagnostic Testing," Revision 14
- Repair/Replacement Plan Program # 2008-132
- Repair/Replacement Plan Program # 2008-133
- Procedure 2-PT-213.20, "Valve Inservice Inspection (2-MS-TV-211A and 211B)," Revision 15-P1
- Procedure 2-PT-214.7, "Valve Inservice Inspection (Main Steam Valve Position Indication)," Revision 16

Section 20S1: Access Controls to Radiologically Significant Areas

Procedures, Manuals, and Guidance Documents

- RP-AA-201, Access Controls for High and Very High Radiation Areas, Revision 2
- RP-AA-202, Radiological Posting, Revision 0
- RP-AA-221, Radiological Survey Records, Revision 0
- RP-AA-222, Radiation Surveys, Revision 0
- RP-AA-223, Contamination Surveys, Revision 0
- RP-AA-224, Airborne Radioactivity Surveys, Revision 0
- RP-AA-225, Unrestricted Release of Material, Revision 0
- RP-AA-230, Personnel Contamination Monitoring and Decontamination, Revision 0
- RP-AA-231, Radiological Control Areas, Revision 0
- RP-AA-240, Discrete Radioactive Particle Control, Revision 0
- RP-AA-260, Control of Radiography, Revision 1
- RP-AA-261, Control of Radiological Diving Activities, Revision 0
- RP-AA-262, Steam Generator Primary Side Work Controls, Revision 0
- RP-AA-263, Steam Generator Secondary Side Work Controls, Revision 0
- C-HP-1031.023, RWP Dosimetry: Exposure Control Support, Revision 4
- C-HP-1031.024, Administrative Dose Control, Revision 4
- C-HP-1031.025, Dosimetry Requirements for Site Restricted Areas, Revision 3
- C-HP-1031.032, Dosimetry Processing and Dose Determination, Revision 3
- C-HP-1041.011, Evaluating and Tracking Intakes of Radioactive Material, Revision 3
- C-HP-1041.020, DAC-Hour Determination Based On Bioassay Results, Revision 3
- C-HP-1041.021, Radionuclide Intake Determination Based On Bioassay Results, Revision 5
- C-HP-1041.022, Internal Dose Calculation Based On DAC-Hour Exposure, Revision 4
- C-HP-1041.023, Internal Dose Calculation Based On Radionuclide Intake, Revision 6

Surveys, Data, Records

- Extensive documentation of 3 uptake evaluations in 2007

CAP Documents (Condition Reports)

- CR 022085, NOD observation on 01-HV-F-8C & 01-HV-MOD-163C
- CR 105683, Follow up CR for BMA 000840 (identification of program gaps)
- CR 110652, Radiological boundary moved such that radioactive material breached demarcation
- CR 111391, Air sampler motor at equipment hatch failed
- CR 111102, Worker lost their TLD due to lanyard failure
- CR 111194, Worker entered the Protected Area without a TLD
- CR 111364, Worker entered the Protected Area before being issued a TLD

- CR 111569, Worker left TLD at Containment Step-Off Pad
- CR 100852, Digital Alarming Dosimeter indicated a dose rate higher than the ambient dose rates accessed. Electrical interference suspected
- CR 108633, Worker received a dose rate alarm while installing canning on the spare RCP
- CR 026682, Worker received a DAD dose rate alarm
- CR 022375, Individual received DAD dose rate alarm during 1-CH-FL-2 change out
- CR 021590, Worker received a DAD dose alarm while working in Unit#1 PZR cube 291
- CR 021480, DAD dose rate alarm (defective DAD)
- CR 026682, Worker received a DAD dose rate alarm while tightening lid on primary resin HIC
- CR 102619, Individual received DAD dose rate alarm while installing camera cable
- CR 096830, Need to determine scope of training for “Radiological Craft Training”

Section 2OS2: As Low As Reasonably Achievable (ALARA)

Procedures

- C-HP-1041.025, Declared or Expected Pregnant Woman, Revision 2
- C-HP-1081.012, Radiation Work Permits: Preparing and Approving, Revision 2
- C-HP-1081.022, Radiation Work Permits: RWP Briefing and Controlling Work, Revision 0
- C-HP-1081.030, Radiation Work Permits: Extending, Revising and Terminating, Revision 4
- C-HP-1081.040, Radiation Work Permits: Providing HP Coverage during Work, Revision 4
- C-HP-1091.251, ALARA Program: Surveillance and Evaluation, Revision 2
- C-HP-1091.281, Radiation Work Permit Program: Surveillance and Evaluation, Revision 6
- HPAP-1032, Radiological Survey Program, Revision 4
- HPAP-2119, Radiation Work Permit Program: Technical Bases, Revision 2
- PI-AA-200, Corrective Action, Revision 2
- RP-AA-222, Radiation Surveys, Revision 0
- RP-AA-261, Control of Radiological Diving Activities, Revision 0
- VPAP-2101, Radiation Protection Program, Revision 32
- VPAP-2102, Station ALARA Program, Revision 12
- VPAP-2105, Temporary Shielding Program, Revision 9

Records and Data Reviewed

- North Anna Power Station (NAPS), 2007 Unit One, Refueling Outage ALARA and Planning Report
- NAPS, Outage ALARA Guide, Unit Two Refueling Outage September 2008
- Radiation Work Permit (RWP) 08-009, Remove and Replace Insulation in Support of the Unit 2 Outage
- RWP 08-2203, Upper Internal Remove and Replacement
- RWP 08-2205, Remove & Replace 2-NM-NFD-2270 & 290
- RWP 08-2214, Perform as Found as Left Small & Large Bore Snubber Inspections
- RWP 08-2215, Disassemble, Inspect, Repair, Repack, Cut Out and Replace Valves and Flanges in Support of the U-2 Outage
- RWP 08-2218, Perform 2-PT-138.1 and 2-PT-138.3 series HHSI Flow Balance Test/Verification
- RWP 08-2219, Perform Repairs to 2-RC-PCV-2455A & B

- RWP 08-2240, U-2 Containment Sump Modification, Includes All Associated Support
- RWP 08-2251, Reassembly Unit 2 Reactor Head
- RWP 08-2252, Lift and Set Reactor Vessel Head, Includes Inspection in Cavity and All Support Functions
- Temporary Shielding Request No. 08-TSR-022, Reduce General Area Dose Rates for Work under Pressurizer and in Cube, Also for Valve Work

ALARA Evaluations (AE)

- AE No. 08-007, Lift & Set Reactor Head During Unit Two 2008 Refueling Outage
- AE No. 08-009, Install/Remove/Repair Insulation during the Unit 2 2008-Refueling Outage
- AE No. 08-015, Replace 2-NM-NFD-2270 & 290 in the U-2 Keyway
- AE No. 08-016, Reassembly Unit 2 Reactor Head
- AE No. 08-019, Perform Valve Maintenance to Include Repack, Adjustment, Cut Out, Inspection of Valves & Check Valves during Unit Two 2008 Refueling Outage
- AE No. 08-021, Perform PMs, PTs on 2-RC-PCV-2455A & 2455B during Unit Two Refueling Outage
- AE No. 08-034, RS Sump GSI-191 Sump Modifications during Unit Two Refueling Outage

CAP Documents (Condition Reports)

- CR 009280, Worker's CEDE Exceeded the TEDE ALARA Evaluation Internal Dose Projection
- CR 010257, Worker Potentially Exceeded Internal Dose Value Shown in TEDE ALARA Evaluation
- CR 010649, Unnecessary Dose Exposure during Implementation of DCP 07-004 in Support of GSI-191
- CR 021322, High Radiation Levels Result in the Suspension of Fuel Off-Load, Dated 10/01/07
- CR 021977, NANN-RWP 07-3210 Dose Estimate for Insulation Work Had to Be Re-Evaluated Two Times
- CR 023911, Radiological Protection ALARA Program Informal Self-Assessment SAR 000138 Summer
- CR 028207, Informal Self-Assessment Summary for SAR-164, HIS-20, Exposure Management System
- CR 105197, SAR000509 (Fleet Collective Radiation Exposure) Results, Dated 08/04/08
- CR 106642, Exceeded Projected Dose for Work Activities Associated with 2-SI-TIC-2934B
- Self-Assessment No. SAR000138, Assessment of North Anna ALARA Program, Cumulative Dose Reduction

Section 2PPS2: Radioactive Material Processing and Transportation

Procedures, Guidance Documents, and Manuals

- C-HP-1071.040, Packaging and Shipment of Radioactive Material, Revision 4
- HP-1071.021, Storing Radioactive Material Outside The Protected Area, Revision 15
- C-HP-1072.040, Radioactive Waste Disposal Using the Barnwell Disposal Facility, Revision 7
- C-HP-1072.030, Computer Programs for Radwaste and Radioactive Material, Revision 0
- C-HP-1071.030, Receiving Radioactive Material, Revision 0

- C-HP-1072.010, Packaging Radioactive Waste, Revision 0
- C-HP-1072.071, Radioactive Waste Disposal Using The Energy Solutions Bulk Waste Facility, Revision 0
- 0-OP-20.2, High Activity Resin Transfer Checklist, Revision 2
- VPAP-2104, Radioactive Waste Process Control Program (PCP), Revision 6

Records and Data

- Annual Radioactive Effluent Release Report, 04/28/08
- 10 CFR 61 waste stream analysis reports for Unit 1 DAW, Unit 2 DAW, Common DAW, Unit 2 CVCS Filters, Unit 1 CVCS Filters, Spent Fuel Pool Filtration, Primary Resin, Liquid Waste Resin, Oil, Powdex Resin and Sewage, 07/15/08
- Design Change No. 07-160, Replacement of Duratek System with Energy Solutions Ion-Exchange System, 03/11/08
- Training attendance record for: Radioactive Waste Packaging, Transportation, and Disposal, Training Cycle 08-02 covering the period of 03/19 through 04/25/08

Shipping Papers

- Shipment 08-1013, Confirmatory Sr-89/90, Fe-55 samples (LQ)
- Shipment 08-1016, Samples (Exempt Quantity)
- Shipment 08-1014, Confirmatory samples to Surry (LQ)
- Shipment 08-1007, Package 9140036, Loaded with U-2 "A" RCP seals.

CAP Documents (Condition Reports)

- CR 097673, Events surrounding abnormal Duratek Filter system loading
- CR 110652, Radiological boundary moved such that radioactive material breeched demarcation
- CR 096723, Inaccurate shipping documentation on incoming shipment
- CR 092450, Received notification from vendor of error in RADMAN software
- CR 021539, Shipping paper for radioactive material shipment did not include a recent regulatory change.
- CR 021250, Increasing level of the HLLWT's (High Level Liquid Waste Tanks) and overflowing to LLLWT's (Low Level Liquid Waste Tanks)
- CR 028477, Zone 2 Tell-tale Drains of SFP Indicate Possible Weld Leak

Section 40A1: Performance Indicator Verification

- Procedure HPAP 2802, NRC Performance Indicator Program, Revision 4
- NAPS NRC Performance Indication Data for the Months of July 2007 to June 2008

Section 40A5: Other Activities

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Procedures and Specifications

- EPRI Materials Reliability Program (MRP) 139, Primary System Piping Butt Weld Inspection and Evaluation Guideline, July 14, 2005
- EPRI MRP-126, Generic Guidance for Alloy 600 Management
- 1-PT-11, "Reactor Coolant Test"
- 2-PT-11, "Reactor Coolant Test"
- WDI-STD-088, "Underwater Visual Examination for Reactor Vessel and Reactor Vessel Internals," Revision 2

Corrective Action Documents

NCR 2007-1381, After starting the sever cut it was noticed that the permanent name tag was approx. 1" below the cut. This would not allow room for the PSI UT examinations.

NCR 2007-1472, Relief nozzle thickness discrepancies

2007-1551, Spray (RC-415) nozzle axial shrinkage with the average number is greater than 0.100"

NCR 2008-3473, Thickness values contained in NDE report 51-9044593-00, RC-438-NDE-280-00, are incorrect

Other Records

Inservice Inspection Manual, Revision 3

Augmented Inservice Inspection Manual

ER-AA-MAT-11, "Alloy 600 Management Program", Revision 2

Technical Report MT-0037, "Identification and Evaluation of the RCS Alloy 600 Locations," June 5, 2007

RCS Loop B Isometric Drawing

RCS Loop C Isometric Drawing

Work Order #:771185-01, 02, 03 ,"Channel Head Drain Connections Removal and Replacement"

Design Change Package #06-004, "Alloy 600 - Pressurizer Nozzle Repair/ NAPS/Unit 2"

WCAP-16468-NP, "Risk Assessment of Potential Cracking in BMI Nozzles"

WCAP-15990, "Design Drawing Information on Dissimilar Metal Welds for North Anna and Surry Pressurizer and Boron Injection Tank"

Underwater Visual Examination for Reactor Vessel and Reactor Vessel Internals Inspection Results

TI 2515/176

- UFSAR: Chapter 8, 8.3.1 Alternating Current Power System
- NA-VTM-000-59-F173-00002, Rev. 34, Emergency Diesel Engines
- NA-VTM-000-59-F173-00002, PT-001, Rev. 34, Emergency Diesel Engines
- NA-VTM-000-59-F173-00002, PT-002, Rev. 34, Emergency Diesel Engines
- NA-VTM-000-59-F173-00003, PT-002, Rev. 2, Alternating Current High & Low Speed Synchronous Machines Ball and Sleeve Bearings
- NA-VTM-000-59-B622-00002, Type SBSR-HV Boost Exciter-Regulator
- Tech Spec Bases, 3.8.1
- Procedure: 1-PT-83.7H, Rev. 14, "1H EDG 24-Hour Run"
- Calculations: Emergency Diesel Generator Load Sequencing, various revisions
- Specification: Emergency Diesel Generator Sets, 05/26/71, Revision 3
- Procedure: VPAP-0808, Revision 11, "Emergency Diesel Generator Reliability Program"

ISFSI Radiological Controls Procedures

- 0-HSP-ISFSI-001, Independent Spent Fuel Storage Installation (ISFSI), Health Physics TLD Survey Surveillance, Revision 3, 4 and 5
- 0-HSP-ISFSI-002, Nuhoms Dry Spent Fuel Storage System; Preparation, Loading, Transport, and T. S. Surveillance Surveys, Revision 2

ISFSI Surveys, Data, and Records

- Quarterly ISFSI Survey Results 05/21/07- 05/25/08

- ISFSI Environmental TLD results for 2006, 2007 and 2008
- ALARA Evaluation Package 08-003, Load, transport, and store spent fuel dry storage cask. Includes all associated support.
- Radiation Work Permit 08-1224
- Various Radiological Surveys associated with loading and transport of Nuhoms casks under RWP 08-1102 and 08-1224

LIST OF ACRONYMS

ADAMS	Agencywide Document Access and Management System
ALARA	As Low As Reasonably Achievable
CA	Corrective Action
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
DOT	Department of Transportation
EDG	Emergency Diesel Generator
HP	Health Physics
HPT	Health Physics Technician
HPAP	Health Physics Administrative Procedure
HRA	High Radiation Area
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
JPM	Job Performance Measures
LHSI	Low Head Safety Injection
NAPS	North Anna Power Station
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	Operability Determination
PARS	Publicly Available Records
PCP	Process Control Program
PI	Performance Indicator
QS	Quench Spray
RAB	Reactor Auxiliary Building
RCE	Root Cause Evaluation
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RFO	Refueling Outage
RP	Radiation Protection
RTP	Rated Thermal Power
RWP	Radiation Work Permit
SDP	Significance Determination Process
SR	Surveillance Requirements
TDAFWP	Turbine Driven Auxiliary Feedwater Pump
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VEPCO	Virginia Electric and Power Company
VHRA	Very High Radiation Area
VPAP	Virginia Power Administrative Procedure
WO	Work Order