UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
245 PEACHTREE CENTER AVENUE, NE, SUITE 1200
ATLANTA, GEORGIA 30303-1257

May 7, 2013

Mr. David A. Heacock
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 05000338/2013002, 05000339/2013002, AND 07200056/2013001

Dear Mr. Heacock:

On March 31, 2013, the U. S. Nuclear Regulatory Commission (NRC) completed an inspection at your North Anna Power Station Units 1 and 2, and the Independent Spent Fuel Storage Installation. The enclosed integrated inspection report documents the inspection findings which were discussed on April 16, 2013, with Mr. G. Bischof 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.

One NRC-identified finding of very low safety significance (Green) was identified during the inspection. This finding was determined to involve a violation of NRC requirements. The NRC is treating the violation as a non-cited violation (NCV) consistent with Section 2.3.2 of the NRC Enforcement Policy. If you contest the violation or significance of the NCV, 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 DC 20555-0001, 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 Agencywide Document Access and Management 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

Enclosures: Inspection Report 05000338/2013002, 05000339/2013002 and 07200056/2013001
w/ Attachment: Supplemental Information

Docket Nos: 50-338, 50-339, 72-056
License Nos: NPF-4, NPF-7, SNM-2507

cc w/encls. (see page 3)

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Enclosure

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Letter to David A. Heacock from Gerald J. McCoy dated May 7, 2013.

SUBJECT: NORTH ANNA POWER STATION – NRC INTEGRATED INSPECTION REPORT 05000338/2013002, 05000339/2013002 AND 07200056/2013001

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-338, 50-339, 72-056
License Nos:	NPF-4, NPF-7, SNM-2507
Report Nos:	05000338/2013002, 05000339/2013002 and 07200056/2013001
Licensee:	Virginia Electric and Power Company (VEPCO)
Facility:	North Anna Power Station, Units 1 & 2 and Independent Spent Fuel Storage Installation
Location:	Mineral, Virginia 23117
Dates:	January 1, 2013 through March 31, 2013
Inspectors:	G.Kolcum, Senior Resident Inspector R. Clagg, Resident Inspector A. Sengupta, Reactor Inspector (Section 4OA5.3) R. Carrion, Senior Reactor Inspector (Section 4OA5.6) R. Temps, Senior Safety Inspector, Office of Nuclear Materials Safety and Safeguards (NMSS) (Section 4OA5.6) B. Tripathi, Senior Structural Engineer NMSS (Section 4OA5.6) M. Thomas, Senior Reactor Inspector (Section 1RO5.2) G. MacDonald, Senior Reactor Analyst (Section 1RO5.2)
Accompanied by:	M. Hiser, Nuclear Safety Professional Development Program (Training)
Approved by:	Gerald J. McCoy, Chief Reactor Projects Branch 5 Division of Reactor Projects

Enclosure

SUMMARY OF FINDINGS

IR 05000338/2013002, 05000339/2013002: 01/01/2013 – 03/31/2013; IR 07200056/2013001: 03/04/2013 – 03/05/2013; North Anna Power Station, Units 1 and 2; Independent Spent Fuel Storage Installation. Fire Protection.

The report covered a three month period of inspection by resident inspectors, three regional based inspectors, one regional based senior reactor analyst, one senior safety inspector and one senior structural engineer from NMSS. One finding was identified and was determined to be a non-cited violation (NCV). The significance of most findings is indicated by their color (Green, White, Yellow, Red) using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP). The cross-cutting aspect was determined using IMC 0310, "Components Within the Cross Cutting Areas." 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. An NRC-identified non-cited violation was identified for the licensee's failure to meet the requirements of North Anna Power Station (NAPS) Renewed Operating License Conditions 2.D, and the approved Fire Protection Program for Units 1 and 2. Specifically, the licensee failed to ensure that fire damage to cables associated with the opposite unit's service water (SW) pumps, located in each unit's emergency switchgear (ESWGR) room, would not prevent operation of the unaffected unit's SW pumps as described in Section 4.4.3.5 of the NAPS Appendix R Report. Postulated fire scenarios were identified in which the SW pumps for both units could be compromised due to a single fire in either unit's ESWGR room. The licensee had previously entered this issue in the NAPS corrective action program as condition report 500152 to evaluate this SW pump control circuit vulnerability and had implemented hourly roving fire watches in each unit's ESWGR room.

Failure to perform an adequate safe shutdown (SSD) analysis as required by the NAPS FPP is a performance deficiency. This finding was determined to be more than minor because it was associated with the reactor safety mitigating systems cornerstone attribute of protection against external events (i.e. fire), and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding had the potential to affect the ability to achieve post-fire SSD in the event of a fire in either unit's ESWGR. The finding was screened in accordance with NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated June 2, 2011, Attachment 4, "Initial Characterization of Findings," dated June 19, 2012, which determined that an IMC 0609 Appendix F, "Fire Protection Significance Determination Process," dated February 28, 2005, review was required as the finding affected fire protection safe shutdown. The inspectors evaluated this finding using the guidance in IMC 0609, Appendix F. The inspectors performed Phase 1 and Phase 2 SDP screening assessments using IMC

0609, Appendix F, Attachments 1 and 2, and were not able to screen out this issue in the SDP Phase 1 or Phase 2. A senior reactor analyst from the Region II office performed a Phase 3 SDP analysis to assess the significance of this finding. The analyst determined that this finding was of very low safety significance (i.e., Green) because the risk was mitigated by the availability of at least one SW pump and the fire growth scenarios were mitigated by the gaseous suppression system. The inspectors determined that there was no cross-cutting aspect associated with this finding because it was not reflective of current licensee performance. (Section 1R05.2)

B. Licensee Identified Violations

None.

REPORT DETAILS

Summary of Plant Status

Unit 1 and Unit 2 began the period at full rated thermal power and operated at full power for the entire report period.

1. REACTOR SAFETY

Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

1R01 Adverse Weather Protection

Impending Adverse Weather Conditions

a. Inspection Scope

The inspectors performed two site specific weather related inspections, listed below, due to anticipated adverse weather conditions in the area. Specifically, the inspectors reviewed licensee adverse weather response procedure 0-AP-41, "Severe Weather Conditions," Revision 54, and site preparations including work activities that could impact the overall maintenance risk assessments.

- Winter storm warning, forecasted snow and freezing precipitation, January 17, 2013
- Forecasted high winds in excess of 30 mph, January 30, 2013

b. Findings

No findings were identified.

1R04 Equipment Alignment

.1 Partial Walkdowns

a. Inspection Scope

The inspectors conducted four equipment alignment partial walkdowns, listed below, to evaluate the operability of selected redundant trains or backup systems 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 'J' Emergency Diesel Generator (EDG) and Alternate AC (AAC) Diesel during emergent maintenance on Unit 2 'H' EDG
- Unit 2 'H' EDG and AAC Diesel during Unit 2 'J' EDG 2 year maintenance
- Unit 1 'H' EDG during Unit 1 'J' EDG maintenance

'B' train Spent Fuel Pit Cooling during 'A' Spent Fuel Pit Cooling pump motor replacement

b. Findings

No findings were identified.

.2 Complete System Walkdown

a. Inspection Scope

The inspectors performed a detailed walkdown and inspection of the Unit 2 'H' EDG lubrication system after a leak on the piping was welded 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 were identified.

1R05 Fire Protection

.1 Quarterly Fire Protection Walkdowns

a. Inspection Scope

The inspectors conducted focused tours of the six areas listed below that are important to reactor safety to verify the licensee's implementation of fire protection requirements as described in fleet procedures CM-AA-FPA-100, "Fire Protection/Appendix R (Fire Safe Shutdown) Program," Revision 6, CM-AA-FPA-101, "Control of Combustible and Flammable Materials," Revision 4, and CM-AA-FPA-102, "Fire Protection and Fire Safe Shutdown Review and Preparation Process and Design Change Process," Revision 3. 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. Documents reviewed are listed in the Attachment to this report.

- Unit 1 Battery Rooms 1-I, 1-II, 1-III, 1-IV and Unit 2 Battery Room 2-I, 2-II, 2-III, 2-IV
- Main Control Room
- Emergency Diesel Generator Unit 1 J 1 and Emergency Diesel Generator Unit 2 J
- Auxiliary Building
- Quench Spray Pump House and Safeguards Area Unit 2
- Service Water Pump House, Auxiliary Service Water Pump House, Motor-Driven Fire Pump Building, and Service Water Valve House

b. Findings

No findings were identified.

.2 (Closed) Unresolved Item 05000338, 339/2012012-01, Loss of Service Water for a Postulated Fire in Unit 1 ESWGR

a. Inspection Scope

This unresolved item (URI) was identified during the North Anna Power Station (NAPS) 2012 triennial fire protection inspection (TFPI) and involved a postulated fire scenario in which the service water (SW) pumps for both units could be compromised due to a fire in either unit's emergency switchgear (ESWGR) room. This issue was identified as unresolved pending further NRC review of licensee information to determine if a credible fire scenario could result in the loss of all four SW pumps due to a fire in either unit's ESWGR room. Subsequent to completion of the 2012 TFPI, the licensee provided additional information to the inspectors in the Region II office and during a followup onsite visit. The inspectors reviewed the additional information to determine if there were credible fire scenarios. Documents reviewed are listed in the Attachment to this report.

b. Findings

Introduction: An NRC-identified Green non-cited violation (NCV) was identified for the licensee's failure to meet the requirements of NAPS Renewed Operating License Conditions 2.D, and the approved Fire Protection Program (FPP) for NAPS Units 1 and 2. Specifically, the licensee failed to ensure that fire damage to cables associated with the opposite unit's SW pumps located in each unit's ESWGR would not prevent operation of the unaffected unit's SW pumps as described in Section 4.4.3.5 of the NAPS Appendix R Report. A postulated fire scenario was identified in which the SW pumps for both units could be compromised due to a single fire in either unit's ESWGR room. The licensee had previously entered this issue in the NAPS corrective program as condition report (CR) 500152 to evaluate this SW pump control circuit vulnerability, and had implemented hourly roving fire watches in each unit's ESWGR room.

Description: The SSD methodology described in the NAPS Appendix R Report for a postulated fire in either unit's ESWGR room (Unit 1 fire area 6-1; Unit 2 fire area 6-2) credited alternative shutdown capability by shutting down both units and using the opposite unit's charging pumps (via a manual cross-tie between Unit 1 and Unit 2) and the opposite unit's SW pumps to achieve post-fire SSD for the fire-affected unit and the unaffected unit. The NAPS SW system is shared between Units 1 and 2 and has a combined total of four SW pumps. The inspectors reviewed cable routing information for the SW pumps and noted that control cables for all four SW pumps were routed through each unit's ESWGR room. The NAPS Appendix R Report (Section 4.4.3.5) indicated that fire damage to cables for the opposite unit's SW pumps that were located in each unit's ESWGR room would not prevent operation of the opposite unit's SW pumps. However, it was determined that this conclusion in the NAPS Appendix R Report was not correct. During further review of the SW pump circuits and discussions with licensee personnel, it was determined that a postulated fire in one unit's ESWGR room could

potentially affect the SW pumps control circuits in the opposite unit. For example, a fire in the Unit 1 ESWGR room could create a hot short in the control circuit cables located in the fire affected Unit 1 ESWGR room that could energize the trip coil for the SW pumps of the unaffected Unit 2. The hot short could potentially shut down the running SW pumps and prevent the non-running SW pumps from starting. This could prevent the unaffected unit's SW pumps from providing SW flow for both the fire affected unit and the unaffected unit. During a followup onsite visit March 13-15, 2013, inspectors walked down each unit's ESWGR room and reviewed additional information provided by the licensee. Based on the walkdowns and information reviewed, the inspectors concluded that there were credible fire scenarios in each unit's ESWGR room which had the potential to affect the opposite unit's SW pumps. The licensee determined that this condition was only possible during a postulated fire in either unit's ESWGR room. The inspectors concluded that, because of the incorrect information in the NAPS Appendix R Report, the licensee failed to ensure the opposite unit's SW pumps would remain free of fire damage and available for alternative shutdown during postulated fire scenarios in either unit's ESWGR room. The licensee had initiated CR 500152 at the time of the TFPI to evaluate this service water pumps control circuit vulnerability. Subsequent to the onsite TFPI inspection, the licensee documented a Reasonable Assurance of Safety (RAS) for this issue in CR 500152-RAS 219, Rev. 0 and Rev. 1. The licensee implemented hourly roving fire watches in each unit's ESWGR room while this issue was being evaluated. The licensee was also preparing a design change to isolate the affected sections of the control circuits in order to restore compliance with the NAPS Appendix R Report.

Analysis: Failure to perform an adequate safe shutdown analysis as required by the NAPS FPP is a performance deficiency. This finding was determined to be more than minor because it was associated with the reactor safety mitigating systems cornerstone attribute of protection against external events (i.e. fire), and it affected the cornerstone objective of ensuring the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. The finding had the potential to affect the ability to achieve post-fire SSD in the event of a fire in either unit's ESWGR. The finding was screened in accordance with NRC Inspection Manual Chapter (IMC) 0609, "Significance Determination Process (SDP)," dated June 2, 2011, Attachment 4, "Initial Characterization of Findings," dated June 19, 2012, which determined that an IMC 0609 Appendix F, "Fire Protection Significance Determination Process," dated February 28, 2005, review was required as the finding affected fire protection safe shutdown. The inspectors evaluated this finding using the guidance in IMC 0609, Appendix F. The finding was assigned to the safe shutdown finding category with a duration factor of 1.00 (i.e., finding duration >30 days) using IMC 0609 Appendix F, Table 1.1.1 , Examples of Finding Category," dated February 28, 2005 and Table 1.4.1, "Duration Factors," dated February 28, 2005. The finding was assigned a high degradation rating using IMC 0609 Appendix F, Attachment 2, "Degradation rating guidance Specific to Various Fire Protection Program Elements." dated February 28, 2005 because the finding was associated with an inadequate/incorrect post-fire SSD analysis and it affected the credited SSD path. The finding did not screen out in the Phase 1 SDP using Appendix F, Attachment 1, "Application of Fire Protection SDP Phase 1 and Phase 2 worksheets", dated February 28, 2006(i.e., the results of Task 1.4.3 was $\Delta CDF > 1E^{-6}$) and a Phase 2 SDP was required to be performed. Based on the high degradation rating, the duration factor, and using the generic fire frequency for a switchgear room ($2E^{-2}$), the inspectors

were not able to screen out this finding in the SDP Phase 2. A senior reactor analyst from the Region II office performed a Phase 3 SDP analysis to assess the significance of this finding. The analyst determined that this finding was of very low safety significance (i.e., Green) because the risk was mitigated by the availability of at least one SW pump and the fire growth scenarios were mitigated by the gaseous suppression system. A detailed risk analysis was performed in accordance with the guidance of NRC IMC 0609 Appendix F and its attachments and NUREG/CR 6850, Revision 0 and Revision 1. Fire modeling analyses were done using the NUREG1805 Fire Dynamics Tools spreadsheets. Separate risk evaluations were performed for each unit's ESWGR fire scenarios using risk information from both the NRC North Anna Spar model and the licensee's North Anna PRA model. The credible scenarios evaluated for Unit 1 included: Service Water A Logic Cabinet (1-EP-CB-28H), Service Water B Logic Cabinet (1-EP-CB-28J), Auxiliary Relay Cabinet G (1-EP-CB-28G), and the TSC Multiplexer Cabinet (1-EI-CB-301-C). All the Unit 1 scenarios were located in the Unit 1 Instrument Rack Room portion of the Unit 1 ESWGR fire area. The major analysis assumptions included: a one year duration factor, thermoset damage criteria used for SW cables, automatic detection in <1 minute, a bounding conditional core damage probability (CCDP) for loss of Service Water from licensee model used for all scenarios, Halon system credited for all scenarios >7 minutes, ignition frequency, severity factor, probability of non-suppression and hot short probability taken from NRC IMC 0609 Appendix F and its attachments. The Unit 1 dominant sequence was an internal cabinet fire in either the A or B SW logic cabinet which progressed to the overhead cable trays and prompted entry into SSD procedures, loss of the SW system and failure of the operators to utilize either the Primary Grade or Fire Protection systems to provide charging pump cooling, which would lead to reactor coolant pump seal loss of coolant accident and ultimately core damage without reactor coolant system makeup. The analysis result for Unit 1 was an increase in core damage frequency (CDF) of $\leq$ 1E-6/year, a GREEN finding of very low safety significance.

The credible scenarios evaluated for Unit 2 included: Service Water A Logic Cabinet (2-EP-CB-28H), Service Water B Logic Cabinet (2-EP-CB-28J), and Auxiliary Cabinet (2-EI-CB-23E) located in the Unit 2 Instrument Rack Room; Motor Control Center (MCC) 2H1-1, located in the 2H Switchgear Room; and 480V MCC 2J1-1 and Emergency Switchgear 2J located in the 2J Switchgear Room within the Unit 2 ESWGR fire area. The major analysis assumptions included: a one year duration factor, thermoset damage criteria used for SW cables, automatic detection in < 1 minute, high energy arc faults only for the breaker sections of Emergency Switchgear 2J, a bounding CCDP for loss of Service Water from licensee model used for all scenarios, Halon system credited for all scenarios >7 minutes, MCC heat release rates doubled due to wall proximity, ignition frequency, severity factor, probability of non-suppression and hot short probability taken from NRC IMC 0609 Appendix F and its attachments. The Unit 2 dominant sequence was an internal cabinet fire in the B SW logic cabinet which progressed to the overhead cable trays and prompted entry into SSD procedures, loss of the SW system and failure of the operators to utilize either the Primary Grade or Fire Protection systems to provide charging pump cooling, which would lead to reactor coolant pump seal loss of coolant accident and ultimately core damage without reactor coolant system makeup. The analysis result for Unit 2 was an increase in CDF of $\leq$ 1E-6/year, a GREEN finding of very low safety significance. The inspectors determined that there was no cross-cutting

aspect associated with this finding because it was not reflective of current licensee performance.

Enforcement: North Anna Power Station Renewed Operating License Conditions 2.D, Fire Protection, for Units 1 and 2, state in part, that the licensee shall implement and maintain in effect all provisions of the approved FPP as described in the Updated Final Safety Analysis Report (UFSAR) for the facility and as approved in the SER dated February 1979. Section 9.5.1 of the UFSAR, Fire Protection System, states in part, that one of the ways the station's fire protection program complies with the regulatory criteria is through the NAPS 10 CFR 50 Appendix R Report. The UFSAR further states that the Appendix R Report includes a description of systems, equipment, and manpower required for SSD; and an overview of the SSD circuit analysis. The NAPS Appendix R Report, Rev. 31, Section 4.4.3.5 (Support Systems), states in part that cables associated with one unit's SW pumps were located in the opposite unit's ESWGR room and a loss or hot short of those cables would not prevent operation of the unaffected unit's SW pumps.

Contrary to the above requirements, on March 15, 2013, the inspectors determined that the licensee failed to meet the requirements of NAPS Renewed Operating License Conditions 2.D and the approved FPP for NAPS Units 1 and 2. Specifically, the licensee failed to ensure that fire damage to cables associated with the opposite unit's SW pumps located in each unit's ESWGR would not prevent operation of the unaffected unit's SW pumps (as described in Section 4.4.3.5 of the NAPS Appendix R Report). Licensee personnel stated that the conclusion in Section 4.4.3.5 of the Appendix R Report was part of the original safe shutdown analysis for the Unit 1 and Unit 2 ESWGR rooms and the violation has existed since that time. Because of very low safety significance, this violation is being treated as an NCV, consistent with Section 2.3.2 of the NRC Enforcement Policy. The violation was entered into the licensee's corrective action program as condition report CR 500152. NCV 05000338, 339/2013002-01, Failure to Ensure Opposite Unit's Service Water Pumps Were Free of Fire Damage for a Postulated Fire in Either Unit's ESWGR.

1R11 Licensed Operator Requalification Program and Licensee Operator Performance

.1 Resident Inspector Quarterly Review

a. Inspection Scope

The inspectors reviewed the two licensed operator requalification program performance sessions listed below. The scenarios required classifications and notifications that were counted for NRC performance indicator input.

- Simulator Examination Guide, SXG-19, on January 16, 2013, which involved a power range nuclear instrument failure, a leak in the reactor coolant system letdown line, and a large break loss of coolant accident
- Simulator Examination Guide, SXG-2, on February 6, 2013, which involved an uncontrolled rod insertion, a main generator voltage regulator failure, a RCS pressure transmitter failure, a maintenance trip, and a loss of offsite power with 1J EDG failure to 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 instructor and reviewed with the operators.

b. Findings

No findings were identified.

.2 Quarterly Control Room Operator Performance Observations

a. Inspection Scope

During the inspection period, the inspectors conducted observations of licensed reactor operators actions and activities to ensure that the activities were consistent with the licensee procedures and regulatory requirements. These observations took place during both normal and off-normal plant working hours. As part of this assessment, the inspectors observed the following elements of operator performance: (1) operator compliance and use of plant procedures including technical specifications; (2) control board/in-plant component manipulations; (3) use and interpretation of plant instruments, indicators and alarms; (4) documentation of activities; (5) management and supervision of activities; and, (6) communication between crew members.

The inspectors observed and assessed licensed operator performance during the following events:

- During a Unit 1 Pressurizer Relief Tank temperature card problem on February 1, 2013
- During an Station Blackout (SBO) EDG periodic testing on February 15, 2013
- During the performance of 2-PT-13.4, “Moderator Temp Coefficient Measurement,” Revision 4, on February 22, 2013

b. Findings

No findings were identified.

1R12 Maintenance Effectiveness

a. Inspection Scope

For the two equipment issues listed below, the inspectors evaluated the effectiveness of the 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 licensee staff. The inspectors compared the licensee’s actions with the requirements of the Maintenance Rule (10 CFR

50.65), and licensee procedure ER-AA-MRL-10, “Maintenance Rule Program,” Revision 4.

- WO (Work Order) 59102286857, 1H EDG after two year preventative maintenance
- WO59102264717 and WO59102264733 2J EDG after the two year preventative maintenance

b. Findings

No findings were identified.

1R13 Maintenance Risk Assessments and Emergent Work Control

a. Inspection Scope

The inspectors evaluated, as appropriate, the five 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 in compliance with the requirements of 10 CFR 50.65 (a)(4), procedure WM-AA-100. “Work Management,” Revision 20, and the data output from the licensee’s safety monitor associated with the risk profile of Units 1 and 2. The inspectors reviewed the corrective action program to verify that deficiencies in risk assessments were being identified and properly resolved.

- Updated maintenance risk assessment and Yellow risk condition due to emergent work on 2H EDG lube oil system on January 3, 2013
- Updated maintenance risk assessment due to 0-AP-41 entry for tornado watch on January 31, 2013
- Maintenance risk assessment due to replacement of ‘A’ spent fuel pool cooling motor on February 15, 2013
- Maintenance risk assessment due to removal of Unit 2 ‘B’ Main Feed Pump from service on February 22, 2013
- Updated maintenance risk assessment due to emergent work on ‘B’ spent fuel pool pump due to motor failure on February 23, 2013

b. Findings

No findings were identified.

1R15 Operability Determinations and Functionality Assessments

a. Inspection Scope

The inspectors reviewed four operability determinations and functionality assessments, listed below, affecting risk-significant mitigating systems, 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 Significant Determination Process. The inspectors' review included a verification that operability determinations (OD) were made as specified by procedure OP-AA-102, "Operability Determination," Revision 3. Documents reviewed are listed in the Attachment to this report.

- OD000159, "Document Acceptability of Missile Vulnerability on Unit 2 Safeguards"
- CR503650, "2H EDG Standby Jacket cooling pump seal leak quantified at 3 dpm"
- OD000527, "2H EDG Small candle fire during performance of 2-PT-82.2A"
- OD000530, "Step change noted in 2H EDG vibrations"

b. Findings

No findings were identified.

1R18 Plant Modifications

Permanent Modification

a. Inspection Scope

The inspectors reviewed the completed permanent plant modification design change package DC-NA-12-00068, "Technical Support Center Backup Power." The inspectors conducted walkdowns of the installation, discussed the desired improvement with system engineers, and reviewed the 10 CFR 50.59 Safety Review/Regulatory Screening, technical drawings, test plans and the modification package to assess the TS implications.

b. Findings

No findings were identified.

1R19 Post Maintenance Testing

a. Inspection Scope

The inspectors reviewed six post maintenance test procedures and/or test activities, listed below, for selected risk-significant mitigating systems to assess whether: (1) the effect of testing on the plant had been adequately addressed by control room and/or engineering personnel; (2) testing was adequate for the maintenance performed; (3) acceptance criteria were clear and adequately demonstrated operational readiness consistent with design and licensing basis documents; (4) test instrumentation had current calibrations, range, and accuracy consistent with the application; (5) tests were performed as written with applicable prerequisites satisfied; (6) jumpers installed or leads lifted were properly controlled; (7) test equipment was removed following testing; and, (8) equipment was returned to the status required to perform in accordance with VPAP-2003, "Post Maintenance Testing Program," Revision 14.

- WO 59102546526, Repair of piping weld leak on 2H EDG lube oil line
- WO 59102254496, Clean/Inspect/Service 2J EDG
- WO 59102550834, Replacement of torque switch on 2-FW-MOV-200C, auxiliary feedwater inlet isolation valve Unit 2 'C' steam generator, failed to close during 2-PT-71.3Q
- WO 59102544811, Exhaust gasket extension pipe manifold bolting replacement on 1J EDG
- WO 59102046629, Replace motor on, 1-FC-P-1A, 'A' spent fuel pit cooling pump
- WO 59077924201, Mechanical preventative maintenance/replace mechanical seals, 2-CC-P-1B, Unit 2 'B' Component Cooling Pump

b. Findings

No findings were identified.

1R22 Surveillance Testing

a. Inspection Scope

For the five surveillance tests listed below, the inspectors examined the test procedures, 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. Documents reviewed are listed in the Attachment to this report.

In-Service Test:

- 2-PT-77.11C, "Control Room Chiller 2-HV-E-4C Pump and Valve Test," Revision 37

Other Surveillance Tests:

- 2-PT-71.2Q, "2-FW-P-3A, A Motor-Driven AFW Pump and Valve Test," Revision 37
- 1-PT-71.3G, "1-FW-P-3B, B Motor-Driven AFW Pump and Valve Test," Revision 47
- 1-PT-57.13, "Emergency Core Cooling Subsystem – Low Head Safety Injection Pump (1-SI-P-1B)," Revision 53
- 1-PT-82J, "1J Emergency Diesel Generator Slow Start Test," Revision 48

b. Findings

No findings were identified.

Cornerstone: Emergency Preparedness

1EP6 Drill Evaluation

Emergency Preparedness (EP) Drill

a. Inspection Scope

On February 26, 2013, the inspectors reviewed and observed the performance of an emergency planning training evaluation drill that involved a large break loss of coolant accident, a failure of 'A' and 'B' quench spray pumps, a loss of 'A' low head safety injection pump, and a loss of fuel clad and reactor coolant system barriers with a potential loss of containment, which required a general emergency to be declared. The inspectors assessed emergency procedure usage, emergency plan classification, notifications, and the licensee's identification and entrance of any problems into their corrective action program. This inspection evaluated the adequacy of the licensee's conduct of the drill and critique performance. Exercise issues were captured by the licensee in their corrective action program (CAP) as CR506584.

b. Findings

No findings were identified.

4. OTHER ACTIVITIES

4OA1 Performance Indicator (PI) Verification

a. Inspection Scope

The inspectors performed a periodic review of the following three Unit 1 and 2 PIs to assess the accuracy and completeness of the submitted data and whether the performance indicators were calculated in accordance with the guidance contained in Nuclear Energy Institute (NEI) 99-02, "Regulatory Assessment Performance Indicator Guideline," Revision 6. The inspection was conducted in accordance with NRC inspection procedure 71151, "Performance Indicator Verification." Specifically, the inspectors reviewed the Unit 1 and Unit 2 data reported to the NRC for the period January 1, 2012 through December 31, 2012. Documents reviewed included applicable NRC inspection reports, licensee event reports, operator logs, station performance indicators, and related CRs.

- Unplanned Scrams per 7000 Critical Hours (IE01)
- Unplanned Scrams With Complications (IE02)
- Unplanned Power Changed per 7000 Critical Hours (IE03)

b. Findings

No findings were identified.

4OA2 Problem Identification and Resolution

.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 summaries and periodically attending daily CR Review Team meetings.

.2 Annual Sample: Review of ACE 019394 1-FC-P-1B ('B' Spent Fuel Cooling Pump) had to be secured for motor HI temp

a. Inspection Scope

The inspectors performed a review regarding the licensee's assessments and corrective actions for ACE019394, "1-FC-P-1B ('B' Spent Fuel Pit Cooling Pump) had to be secured for motor HI temp," to ensure that the full extent of the issue was identified, an appropriate evaluation was performed, and appropriate corrective actions were specified and prioritized. The inspectors also evaluated the CR against the requirements of the licensee's CAP as specified in procedure, PI-AA-200, "Corrective Action Program," Revision 21, and 10 CFR 50, Appendix B.

b. Findings and Observations

No findings were identified. In general, the inspectors verified that the licensee had identified problems at an appropriate threshold and entered them into the CAP database, and had proposed or implemented appropriate corrective actions.

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 were identified.

.2 (Closed) NRC Temporary Instruction (TI) 2515/187, "Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns"

a. Inspection Scope

The inspectors reviewed the following three licensee flood walkdown packages and verified that they contained the elements specified in NEI 12-07 Walkdown Guidance document:

- NA-F-2012-818-00, U2 Service Building Door 2-BLD-STR-S71-10
- NA-F-2012-017-00, Yard Manhole 01-EP-MH-1
- NA-F-2012-423-00, Pipe Tunnel in Decon Building Basement

The inspectors accompanied the licensee on their walkdown of the yard storm drainage systems and verified that the licensee performed the following flood protection features confirmations:

- Visual inspection of the flood protection feature was performed. An external visual inspection was performed for indications of degradation that would prevent its credited function from being performed;
- Critical system, structure and component dimensions measurements;
- Available physical margin, where applicable, determination; and,
- Flood protection feature functionality determination using either visual observation or by review of other documents.

The inspectors independently performed their walkdowns of the following flood protection areas:

- NA-F-2012-301-00, Topography Units 1 and 2
- NA-F-2012-304-00, Flood Dike west of Unit 2

The inspectors verified that the necessary flood protection features were in place. The inspectors assessed the external flood vulnerability of the North Anna site. The inspectors also reviewed applicable station procedures and design documents to assess proper surveillance and maintenance for external flood protection features.

The inspectors verified that no noncompliance with current licensing requirements was identified. Documents reviewed are listed in the Attachment to this report.

b. Findings

No findings were identified.

.3 (Discussed) TI 2515/182, “Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks“ Phase 1

a. Inspection Scope

Leakage from buried and underground pipes has resulted in ground water contamination incidents with associated heightened NRC and public interest. The industry issued a guidance document, NEI 09-14, “Guideline for the Management of Buried Piping Integrity,” (ADAMS Accession No. ML1030901420), to describe the goals and required actions (commitments made by the licensee) resulting from this underground piping and tank initiative. On December 31, 2010, NEI issued Revision 1 to NEI 09-14, “Guidance for the Management of Underground Piping and Tank Integrity,” (ADAMS Accession No. ML110700122), with an expanded scope of components which included underground piping that was not in direct contact with the soil and underground tanks. On November 17, 2011, the NRC issued TI-2515/182 “Review of the Industry Initiative to Control Degradation of Underground Piping and Tanks,” to gather information related to the industry’s implementation of this initiative.

The inspectors reviewed the licensee’s programs for buried pipe and underground piping and tanks, in accordance with TI-2515/182, to determine if the program attributes and completion dates identified in Sections 3.3 A and 3.3 B of NEI 09-14, Revision 1, were contained in the licensee’s program and implementing procedures. For the buried pipe and underground piping program attributes, with completion dates that had passed, the inspectors reviewed records to determine if the attribute was in fact complete and to determine if the attribute was accomplished in a manner which reflected good or poor practices in program management. Documents reviewed are listed in the Attachment to this report.

b. Observations and Findings

The licensee’s buried piping and underground piping and tanks program was inspected in accordance with paragraphs 03.01.a through 03.01.c of TI-2515/182 and was found to meet all applicable aspects of NEI 09-14 Revision 1, as set forth in Table 1 of the TI.

Based upon the scope of the review described above, Phase I of TI-2515/182 was completed.

No findings were identified.

.4 Review of the Operation of an Independent Spent Fuel Storage Installation (ISFSI) (Inspection Procedure 60855.1)

a. Inspection Scope

Inspectors verified, by direct observation and independent evaluation of selected activities, that the licensee had performed the cask loading and unloading in a safe manner and in compliance with approved procedures. The inspectors walked down the ISFSI pad to assess the material condition of the casks, the installation of security equipment and the performance of monitoring systems. The inspectors reviewed

licensee cask loading and handling procedures, and reviewed previous cask loading and ISFSI related plant issues and corrective action status.

b. Findings

No findings were identified.

.5 Licensee Strike Contingency Plans (IP 92709)

a. Inspection Scope

The inspectors reviewed the content of the licensee's nuclear business continuity to determine if reactor operations, facility security, and fire protection were to be maintained consistent with site technical specifications and regulatory requirements in the event of a strike. A review of the areas of operations, maintenance, supply chain, security, emergency preparedness, first aid, and fire brigade personnel was done to determine if the minimum number of qualified personnel would be available as required for the proper operations and safety of the facility.

b. Findings

No findings were identified.

.6 On-Site Operation of an Independent Spent Fuel Storage Installation (ISFSI) at Operating Plants (60855.1)

a. Inspection Scope

The North Anna ISFSI uses two spent fuel storage systems manufactured by Transnuclear, Inc. (TN) to store spent fuel. The systems are located on adjacent ISFSI pads. One system includes twenty-seven (27) vertical TN-32 metal casks licensed under a 10 CFR Part 72 site specific license, located on Pad #1. The second system includes twenty-six TN NUHOMS HD-32PTH horizontal storage modules (13 are currently loaded) under a 10 CFR Part 72 general license, located on Pad #2. This inspection focused on the ISFSI on Pad #2.

After the seismic event of August 23, 2011, a licensee inspection of the ISFSI pads was conducted by the North Anna Fuel Handling team, Nuclear Analysis and Fuel personnel, and Transnuclear personnel following the guidance of Regulatory Guide 1.166, "Pre-Earthquake Planning and Immediate Nuclear Power Plant Operator Post-Earthquake Actions."

For some of the TN NUHOMS-32PTH horizontal storage modules (HSMs), slight cosmetic damage was identified around the inlet and outlet vents and some surface cracking indications were noted. Specifically, the licensee repaired the following: the inlet vents between HSMs #1 and #3; the outlet covers to the vents between HSMs #15 and #17, HSMs #18 and #20, HSMs #24 and #26; and the outlet cover to HSM #25. The surface cracking was considered to be minor because it met the criteria to be considered insignificant per the guidance of Electric Power Research Institute (EPRI)

NP-6695, “Guidelines for Nuclear Plant Response to an Earthquake.” In addition, some modules showed gaps of less than 1.5 inches between adjacent vertical walls, which indicated that some minor movement had occurred. The licensee determined that the damage identified (surface cracking, gaps, etc.) on the HSMs was minor and would not impact the structural load-carrying or radiation shielding capability of the HSMs. With the exception of two HSMs, damage to the HSM array was limited to unloaded HSMs.

The NRC undertook several initiatives to establish agency actions in response to the seismic event to ensure that the ISFSI is acceptable for continued operation without undue risk to the health and safety of the public and to identify generic implications resulting from the review of this issue. The NRC developed an action plan (Accession No. ML113290182) that described and tracked the ongoing actions related to the ISFSI as a result of the seismic event.

This inspection was conducted to assess and verify, by direct observation of selected activities and independent evaluations, that licensee activities to repair the ISFSI dry cask storage system and components on Pad #2 were adequate to ensure that they are still capable of performing their required safety functions. Specifically, the inspection verified that outstanding issues, including the acceptability of all repairs made to damaged ISFSI HSMs, were addressed; assessed the adequacy of licensee corrective actions with respect to the ISFSI; and evaluated long-term issues that the licensee had committed to complete prior to the next ISFSI loading campaign. The inspectors walked down the ISFSI on Pad #2 to confirm that the material condition of the HSMs was sound and that repairs had been made to the identified structures. The inspectors also assessed the licensee’s CRs and associated corrective actions for completeness and adequacy. The inspectors reviewed the licensee’s seismic calculations, revised 72.212 report, and 72.48 evaluations associated with the seismic event’s affect on the ISFSI and determined that they were adequate. The inspectors concluded that the ISFSI on Pad #2 remains capable of performing its safety functions of heat removal, shielding, confinement, structural integrity, and criticality control for future storage of spent fuel.

The documents and calculations reviewed are listed in the Attachment to this report.

b. Findings

No findings were identified.

4OA6 Meetings, Including Exit

Quarterly Exit Meeting Summary

On April 16, 2013, the senior resident inspector presented the inspection results to Mr. G. Bischof and other members of the staff, who acknowledged the findings. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.
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ATTACHMENT: SUPPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:
V. Armentrout, Fleet Underground Piping Program Owner
M. Becker, Manager, Nuclear Outage and Planning
G. Bischof, Site Vice President
D. Blakeney, Director, Nuclear Station Safety & Licensing
J. Daugherty, Manager, Nuclear Maintenance
R. Evans, Manager, Radiological Protection
B. Gaspar, Manager, Nuclear Site Services
R. Hanson, Manager, Nuclear Protection Services
E. Hendrixson, Director, Nuclear Site Engineering
S. Hughes, Manager, Nuclear Operations
P. Kemp, Supervisor, Station Licensing
J. Leberstien, Technical Advisor, Station Licensing
C. McClain, Manager, Nuclear Training
F. Mladen, Plant Manager
S. Osbourn, Underground Piping Program Owner
J. Plossl, Supervisor, Nuclear Station Procedures
P. Rittenhouse, Underground Piping Program Owner (in training)
J. Schleser, Manager, Nuclear Organizational Effectiveness
B. Wakeman, Nuclear Spent Fuel
M. Whalen, Technical Advisor, Station Licensing

LIST OF ITEMS OPENED, CLOSED AND DISCUSSED

Opened and Closed		
05000338, 339/2013002-01	NCV	Failure to Ensure Opposite Unit's Service Water Pumps Were Free of Fire Damage for a Postulated Fire in Either Unit's ESWGR (Section 1R05.2)
Closed		
TI 2515/187	TI	Inspection of Near-Term Task Force Recommendation 2.3 Flooding Walkdowns (Section 4OA5.2)
05000338, 339/2012012-01	URI	Loss of Service Water for a Postulated Fire in Unit 1 ESWGR (Section 1R05.2)
Discussed		
TI 2515/182	TI	Review of the Implementation of the Industry Initiative to Control Degradation of Underground Piping and Tanks (Section 4OA5.3)

Attachment

LIST OF DOCUMENTS REVIEWED

Section 1R05: Fire Protection

- 0-FS-CT-1, "Fire Fighting Preplan For Cable Tray Spreading and Battery Room 2-1, 1-1, 2-3, 1-3," Revision 2
- 1-FS-S-3, "Unit 1 Emergency Switchgear Instrument Rack and Air Conditioning Rooms Service Building Elev. 254 FT (S-54) Safe Shutdown Equipment," Revision 11
- 1-FS-AB-1, "Auxiliary Building (All Elevations) Fire Fighting Strategy Safe Shutdown Equipment," Revision 5
- 1-FS-ESG-BR-1, "Firefighting Strategy for Battery Rooms 1-2 and 1-4," Revision 3
- 2-FS-S-3, "Unit 2 Emergency Switchgear Instrument Rack and Air Conditioning Rooms Service Building Elev. 254 FT (S-54) Safe Shutdown Equipment," Revision 9

(Closed) Unresolved Item 05000338, 339/2012012-01, Loss of Service Water for a Postulated Fire in Unit 1 ESWGR

Procedures

- 0-AP-12, Loss of Service Water, Revision 38
- 0-FCA-0, fire Protection – Operations Response, Revision 14
- 1-FCA-2, Emergency Switchgear Room Fire, Revision 29
- 2-FCA-2, Emergency Switchgear Room Fire, Revision 29
- CM-AA-FPA-100, Fire Protection/Appendix R (Fire Safe Shutdown) Program, Revision 5

License Basis Documents

- Title 10 of the Code of Federal Regulations, Part 50, Appendix R, section III, G, J,L and O
- Title 10 of the code of Federal Regulations, Part 50.49, Fire Protection
- North Anna Operating License Condition 2.D, Fire Protection for Units 1 and 2 North Anna Appendix R, report Revision 31
- North Anna USFAR Chapter 9, Section 9.5.1, Fire Protection System, Revision 48

List of Condition reports (CRs) Reviewed During Inspection

- CR 500152, Vulnerability identified in SW Pump control circuit during NRC TFPS
- CR 500152 – RAS 219, Revision 1
- CR 500152 – RAS 219, Revision 1

Section 1R15: Operability Determinations and Functionality Assessments

- ET-N-06-0074, "Emergency Diesel Generator Engine Coolant Water Leakage," Revision 0

Section 1R18: Plant Modifications

- NUREG-0696, "Functional Criteria for Emergency response Facilities", Revision 0
- NUREG-0737, "Clarification of TMI Action Plan Requirements", Supplement 1
- NAS-3014, "Specification for Electrical Installation for North Anna Power Station Units 1 & 2", Revision 15
- Calculation, 14938, 70-E-1, "Electrical Loading – TSC UPS and UPS Panelboards", Revision 3
- Calculation, EE-0025, "North Anna Station Electrical Load List", Revision 3

Section 1R19: Post Maintenance Testing

- 0-ECM-1401-03, "General Maintenance of Electrical Motors', Revision 39
- 0-ECM-1414-01, "PdMA Offline Testing of Low Voltage Motors", Revision 4

Section 1R22: Surveillance Testing

- NA-CALC-MEC-ME-0579, "Minimum Delivered (Design Basis) AFW Flow and Acceptance Criteria for AFW Pump Operability Verification Testing," Revision 4

Section 4OA5: Other Activities

Temporary Instruction 2515/182

Corrective Action Documents Reviewed
- LA001693, Develop an Inspection Plan
- LA001692, Complete Risk Ranking
- LA001691, Establish Procedures and Oversight
- CA203507, Complete 2318-07, condition assessment plan for additional scope
- CA203502, Complete 2318-06, condition assessment plan for buried rad piping
- CA203499, Complete 2318-05, develop or identify existing condition assessment plan
- CA203497, Complete 2318-04, prioritize additional scope underground piping and tanks
- CA203487, Complete 2318-03, implement the buried piping inspection plan
- SAR001156, Buried Piping risk ranking self assessment SA001156
- CA203531, Complete 2318-10, Complete development of asset management plan
- CA203524, Complete 2318-09, condition assessment of addl scope underground pipe/tanks
- CA203516, Complete 2318-089, develop asset management plan for buried piping

Corrective Action Documents Generated
- 505431, Document Observations from NRC debrief for TI-182, Buried Pipe Pgrm Insp

Procedures
- 0-EPM-2303-01, Electrical Preventive Maintenance, Revision 10
- ER-AA-BPM-101, Underground Piping and Tank Integrity Program, Revision 5
- ER-AA-BPM-10, Underground Piping and Tank Integrity Program Description, Revision 3
- CM-AA-13, Fleet Engineering Program management, Revision 8
- PI-AA-100-1004, Guidance and Reference Document, Revision 8
- SA-AA-106, Drilling, Digging, and Cutting, Revision 8

Other Documents
- EPRI TR 1016456, Recommendations for an Effective Program to Control the Degradation of Buried Pipe
- Nuclear Energy Institute (NEI) 09-14, Guideline for the Management of Buried Piping Integrity, Revision 1
- Underground Piping and Tank Integrity Program Fleet call minutes, Dated 12-15-2012
- Russell Corrosion Consultants Site Soil Analysis, Project No. 1137, Dated January 2, 2012
- Health Report, Q4-2009-2012
- NAPS UPTI LCM Plan, Dated 2012-6-01

Temporary Instruction 2515/187

- CM-AA-BDB-1002, "Beyond Design Basis – Walkdowns of Flood Protection and Mitigation Features," Revision 0
- 0-GEP-31, "Walkdown of Flood Protection Features," Revision 0
- Engineering Transmittal, ETE-NA-2012-0056, "Transmittal of Flooding Walkdown Information Related to the March 12, 2012 NRC 50.54(f) Request for Information," Revision 0
- NA-F-2012-301-00, "Topography Units 1 & 2," Revision 0
- NA-F-2012-304-00, "Flood Dike West of Unit 2," Revision 0

ISFSI On-Site Operation Inspection

Dominion Calculations

- Calculation 10494-183, HSM-H Seismic Stability Evaluation for 8/23/2011 Seismic Event, Revision 1
- Calculation 10494-184, Impact on the HSM-H Dose Rates Due to Gaps Between HSM-H Modules, Revision 0
- Calculation 10494-185, 32 PTH DSC Structural Evaluation for 8/23/2011 Seismic Event, Revision 0
- Calculation 10494-186, HSM-H Structural Evaluation for 8/23/2011 Seismic Event, Revision 1
- CE-1973, Reanalysis of ISFSI Pad # 2 for Revised Ground Motion Following 8/23/11 Earthquake
- CE-1974, SSI Analysis of Pad # 2 for Revised Ground Motion Following 8/23/11 Earthquake
- CE-1821, Development of Seismic Time-Histories for ISFSI, 12/05, Revision 0
- CE-1822, Soil Parameters for ISFSI Pad #2 Foundation Design, 06/06, Revision 0
- CE-1823, ISFSI Pad #2 Seismic Soil Structure Interaction Analysis, 06/06, Revision 0
- CE-1824, Design of ISFSI Pad #2, 06/06, Revision 0

Condition Reports (CRs)

- CR439319, ISFSI Pad 2 Seismic Inspection
- CR 439921, Evaluate ISFSI Following Seismic Event of 8/23/11
- CR 440200, Post-Seismic Inspection of HSM 25 Roof Has Cosmetic Damage
- CR 440205, Repair Cosmetic Concrete Damage to NUHOMS HSM 1-3 Intake Vent
- CR 440987, ISFSI Pad 2 HSM Fasteners
- CR 440991, ISFSI Pad 1 & 2 Walkdown
- CR 441197, ISFSI Minor Work Order
- CR 449504, NUHOMS HSM Debris Screen
- CR 449506, NUHOMS HSM 18 and 20 Outlet Vent Cover Crack
- CR 458780, Alignment of HSMs at ISFSI Pad 2
- CR 459216, Alignment Checks of HSMs at ISFSI Pad 2
- CR 459360, Inspection and Alignment Checks of HSMs at ISFSI Pad 2
- CR 459532, Post-Seismic Inspection Results for Loaded HSMs 1, 3, and 12 at ISFSI Pad 2
- CR 468304, Preliminary Translated 8/23/2011 Seismic Accelerations Exceed NUHOMS FSAR Values

Corrective Actions (CAs)

- CA 225133, Track Reinstatement of 0-OP-4.55
- CA 228216, Develop a Repair Plan for the NUHOMS Components
- CA 229558, Obtain Disposition of Water Observed on Pad 2 at the ISFSI from Transnuclear
- CA 229598, CR Is Being Submitted to Allow Processing of a Formal OD on the ISFSI
- CA 231060, Review OD 000440 to Determine if an Update Is Warranted
- CA 235775, Submit CR to TN and Obtain from TN a NCR
- CA 242849, Perform a Periodic Review of OD 440 in Six Months
- CA 255498, CR Is Being Submitted to Allow Processing of a Formal OD on the ISFSI

Other Documents

- ACI-NES Report No. R0726002, North Anna Power Station ISFSI and Heavy Haul Path Hazards Evaluation
- AREVA E-32651 (July 20, 2012)
- AREVA E-3239 Rev. 1 (Feb. 28, 2012)
- Engineering Technical Evaluation (ETE)-CEM-2012-0001 Rev. 0, Seismic Design Input for ISFSI
- ETE-NAF-2010-003, North Anna Power Station Independent Spent Fuel Storage Installation 10 CFR 72.212 Evaluation Report
- ETE-NAF-2011-0170, North Anna ISFSI NUHOMS Horizontal Storage Modules (HSM) Concrete Gap Inspection
- ETE-NAF-2011-0188, Empty North Anna ISFSI NUHOMS Horizontal Storage Modules (HSM) Inspections
- ETE-NAF-2011-0189, Loaded North Anna ISFSI NUHOMS Horizontal Storage Modules (HSM) Inspection
- ETE-NAF-2012-0019, North Anna ISFSI NUHOMS Horizontal Storage Modules (HSM) Post Seismic Inspection Results
- Letter E-32651 from Transnuclear to Dominion Power with respect to standing water in North Anna HSMs, dated July 20, 2012
- Letter E-34066 from Transnuclear to NRC, Subject: Submittal of Biennial Report of 72.48 Evaluations Performed for the NUHOMS HD System, CoC 1030, for the Period 01/08/11 to 01/07/13, Docket No. 72-1030, dated January 7, 2013
- Prompt Operability Determination (OD) 000440 of ISFSI after Seismic Event of August 23, 2011, Revision 2, dated January 14, 2013
- Supplier Nonconformance Evaluation (Transnuclear) 2012-090, Evaluation of Seismic Damage to HSMs and Repair Options, dated May 25, 2012
- Transnuclear 10 CFR 72.48 Screening of LR No. 721030-329 to address two nonconforming conditions identified during ISFSI inspections after the seismic event of 8/23/2011
- Transnuclear Revised Certificates of Conformance for HSMs 1 through 12
- Transnuclear Revised Certificates of Conformance for HSMs 13 through 26
- Work Order (WO) 59102348852, Paint a Stripe or Line on the Concrete Pad on the North and South Side of Each TN-32 Cask, Clean/Remove Algae Patches on ISFSI Pad 2, Replace the Protective Coating on the ISFSI EDG
- WO 59102349359, Clean/Remove Algae Patches on ISFSI Pad 2

(Closed) Unresolved Item 05000338, 339/2012012-01, Loss of Service Water for a Postulated Fire in Unit 1 ESWGR

Procedures
- 0-AP-12, Loss of Service Water, Rev. 38
- 0-FCA-0, Fire Protection - Operations Response, Rev. 14
- 1-FCA-2, Emergency Switchgear Room Fire, Rev. 29
- 2-FCA-2, Emergency Switchgear Room Fire, Rev. 29
- CM-AA-FPA-100, Fire Protection/Appendix R (Fire Safe Shutdown) Program, Rev. 5

License Basis Documents
- Title 10 of the Code of Federal Regulations, Part 50, Appendix R, Sections III.G, J, L, and O
- Title 10 of the Code of Federal Regulations, Part 50.48, Fire Protection
- North Anna Operating License Conditions 2.D, Fire Protection, for Units 1 and 2 North Anna Appendix R Report Rev. 31
- North Anna UFSAR Chapter 9, Section 9.5.1, Fire Protection System, Rev. 48

List of Condition Reports (CRs) Reviewed During Inspection
- CR 500152, Vulnerability identified in SW Pump control circuit during NRC TFPI
- CR 500152 - RAS 219, Rev. 0
- CR 500152 - RAS 219, Rev. 1

LIST OF ACRONYMS

ACE	Apparent Cause Evaluation
ADAMS	Agencywide Document Access and Management System
CA	Corrective Action
CAP	Corrective Action Program
CFR	Code of Federal Regulations
CR	Condition Report
EDG	Emergency Diesel Generator
IMC	Inspection Manual Chapter
ISFSI	Independent Spent Fuel Storage Installation
JPM	Job Performance Measures
LHSI	Low Head Safety Injection
NCV	Non-cited Violation
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
OD	Operability Determination
PARS	Publicly Available Records
PI	Performance Indicator
PRT	Pressurizer Relief Tank
QS	Quench Spray
RCE	Root Cause Evaluation
RCP	Reactor Coolant Pump
RCS	Reactor Coolant System
RTP	Rated Thermal Power
SBO	Station Blackout
SDP	Significance Determination Process
SR	Surveillance Requirements
TDAFWP	Turbine Driven Auxiliary Feedwater Pump
TI	Temporary Instruction
TS	Technical Specifications
UFSAR	Updated Final Safety Analysis Report
URI	Unresolved Item
VEPCO	Virginia Electric and Power Company
VPAP	Virginia Power Administrative Procedure
WO	Work Order