



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
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ATLANTA, GEORGIA 30303-1200

November 18, 2021

Mr. Daniel Stoddard
Senior Vice President and Chief Nuclear Officer
Dominion Energy
Innsbrook Technical Center
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION – DESIGN BASIS ASSURANCE INSPECTION
(PROGRAMS) INSPECTION REPORT 05000338/2021010 AND
05000339/2021010

Dear Mr. Stoddard:

On October 8, 2021, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at North Anna Power Station and discussed the results of this inspection with Fred Mladen and other members of your staff. The results of this inspection are documented in the enclosed report.

Three findings of very low safety significance (Green) are documented in this report. Three of these findings involved violations of NRC requirements. We are treating these violations as non-cited violations (NCVs) consistent with Section 2.3.2 of the Enforcement Policy.

If you contest the violations or the significance or severity of the violations documented in this inspection report, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region II; the Director, Office of Enforcement; and the NRC Resident Inspector at North Anna Power Station.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with Title 10 of the *Code of Federal Regulations* 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

/RA/

James B. Baptist, Chief
Engineering Br 1
Division of Reactor Safety

D. Stoddard

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Docket Nos. 05000338 and 05000339
License Nos. NPF-4 and NPF-7

Enclosure:
As stated

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SUBJECT: NORTH ANNA POWER STATION – DESIGN BASIS ASSURANCE
 INSPECTION (PROGRAMS) INSPECTION REPORT 05000338/2021010 AND
 05000339/2021010 Dated November 18, 2021

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**U.S. NUCLEAR REGULATORY COMMISSION
Inspection Report**

Docket Numbers: 05000338 and 05000339

License Numbers: NPF-4 and NPF-7

Report Numbers: 05000338/2021010 and 05000339/2021010

Enterprise Identifier: I-2021-010-0042

Licensee: Dominion Energy

Facility: NORTH ANNA POWER STATION

Location: Mineral, VA

Inspection Dates: September 20, 2021 to October 08, 2021

Inspectors: P. Braxton, Reactor Inspector
T. Fanelli, Senior Reactor Inspector
M. Schweg, Senior Reactor Inspector
T. Su, Reactor Inspector
Craig Baron, Mechanical Contractor
Maty Yeminy, Mechanical Contractor
Chase Franklin, Reactor Inspector (trainee)

Approved By: James B. Baptist, Chief
Engineering Br 1
Division of Reactor Safety

Enclosure

SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring the licensee’s performance by conducting a design basis assurance inspection (programs) inspection at North Anna Power Station, in accordance with the Reactor Oversight Process. The Reactor Oversight Process is the NRC’s program for overseeing the safe operation of commercial nuclear power reactors. Refer to <https://www.nrc.gov/reactors/operating/oversight.html> for more information.

List of Findings and Violations

Inadequate Calculation to Ensure Diesel Cooling System Met Pressure Transient Requirements			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000338,05000339/2021010-01 Open/Closed	None (NPP)	71111.21M
The inspectors identified a Green finding and an associated NCV of 10 CFR Part 50 Appendix B, Criterion 3, “Design Control,” for the licensee's failure to meet the DOM-QA-1 design verification requirements and the design control procedure requirements in calculation (USB-272, Emergency Diesel Generator Room Tornado Analysis).			
Failure to scope safety related MOVs into the MOV test program			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000338,05000339/2021010-02 Open/Closed	None (NPP)	71111.21M
The inspectors identified a Green finding and an associated NCV of 10 CFR Part 50.55a “Codes and Standards” for removing safety-related Charging (CH) pump Motor Operated Valves (MOVs) from the station MOV testing program. The required scope of the program was specified by the scoping provisions in NRC Generic Letter (GL) 89-10, “Safety-Related Motor-Operated Valve Testing and Surveillance Results of the Public Workshops (Generic Letter 89-10)” and GL96-05, “Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves (Generic Letter 96-05).”			
Inadequate procedure for handling age degraded safety related cable.			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000338,05000339/2021010-03 Open/Closed	None	71111.21M
The inspectors identified a Green finding and an associated NCV of 10 CFR Part 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensee’s failure to include work instructions to ensure the safety function of aged cables during and after handling.			

Additional Tracking Items

None.

INSPECTION SCOPES

Inspections were conducted using the appropriate portions of the inspection procedures (IPs) in effect at the beginning of the inspection unless otherwise noted. Currently approved IPs with their attached revision histories are located on the public website at <http://www.nrc.gov/reading-rm/doc-collections/insp-manual/inspection-procedure/index.html>. Samples were declared complete when the IP requirements most appropriate to the inspection activity were met consistent with Inspection Manual Chapter (IMC) 2515, "Light-Water Reactor Inspection Program - Operations Phase." The inspectors reviewed selected procedures and records, observed activities, and interviewed personnel to assess licensee performance and compliance with Commission rules and regulations, license conditions, site procedures, and standards. Starting on March 20, 2020, in response to the National Emergency declared by the President of the United States on the public health risks of the coronavirus (COVID-19), inspectors were directed to begin telework. In addition, regional baseline inspections were evaluated to determine if all or a portion of the objectives and requirements stated in the IP could be performed remotely. If the inspections could be performed remotely, they were conducted per the applicable IP. In some cases, portions of an IP were completed remotely and on site. The inspections documented below met the objectives and requirements for completion of the IP.

REACTOR SAFETY

71111.21M - Design Bases Assurance Inspection (Teams)

The inspectors evaluated the following components and listed applicable attributes, permanent modifications, and operating experience:

Design Review - Risk-Significant/Low Design Margin Components (IP Section 02.02) (9 Samples)

- (1) 2-EE-MCC 2J1-1 and 2-EE-MCC 2J1-1A
 - Compliance with UFSAR, Technical Specifications (TS), and TS Bases
 - Conformance with manufacturer instructions for installation, maintenance, and operation
 - Material condition and configuration (i.e. walkdown of area)
 - System health reports
 - Design requirements
 - Operating Environment
 - Maintenance and preventive maintenance effectiveness

- (2) Unit 1 - Diesel Driven Fire Pump System (01-FP-P-2-PUMP, 01-FP-P-2-ENGINE)
 - Design bases documents, system descriptions, and training documents
 - Primary design calculations
 - Normal and Emergency Operating Procedures
 - Surveillance Test Procedures and Recent Results
 - Material Condition of Pump and Associated Equipment
 - Vendor Manuals for Engine and Pump
 - Corrective Action History
 - Condition reports associated with component

- (3) Unit 1 CCW Heat Exchanger
- Reviewed heat Exchanger procurement specification
 - Reviewed heat Exchanger data sheet
 - Reviewed maximum allowed fouling factor
 - Reviewed maximum number for plugged tubes
 - Reviewed list of system & component CRs since last DBI. Review for Potential issues. Recorded in system health reports?
 - Reviewed GL 89-13 program plan
 - Reviewed licensee response letter(s) to GL 89-13
 - Reviewed completed surveillance test for the Heat Exchanger. Reviewed test set up and instrument uncertainty (compare the energy removed from the hot medium to the energy added to the cold medium).
 - Reviewed acceptance Criteria values
- (4) Service Water Valve House (Settling)
- Assess methodology for setting the monuments
 - Assess validity of benchmarking
 - Reviewed settling trend.
 - Reviewed the method North Anna used to release all stresses
- (5) Uni1 and Unit 2 EDG Sequencers
- Design bases documents, system description
 - Primary design calculations
 - Surveillance Test Procedures Recent Results
 - Preventative Maintenance Procedures
 - Vendor Manuals
 - Corrective Action History
 - Condition reports associated with component
- (6) Unit 1 DC System Switchgear
- Design bases documents, system description
 - Primary design calculations
 - Surveillance Test Procedures
 - Preventative Maintenance Procedures
 - Vendor Manuals for the Sequencer
 - Corrective Action History
 - Condition reports associated with component
- (7) Offsite Power (1E and non-1E) and High-Voltage Switchyard
- Design bases documents, system description
 - Primary design calculations
 - Surveillance Test Procedures Recent Results
 - Preventative Maintenance Procedures
 - Vendor Manuals for RSST

- Engineering design changes
 - Corrective Action History
 - Condition reports associated with component
- (8) Unit 1 Motor-Operated Valves MOV 1863 A/B, MOV-1267 A/B, 1269 A/B, 1270 A/B, and associated check valves
- Normal and Emergency Operating Procedures
 - Surveillance Test Procedures and Recent Results
 - Inservice Test Procedures and Recent Results
 - Setpoint for Automatic Opening of Valves MOV 1863 A/B
 - EQ Status of MOV Motors
 - MOV Program Scoping
 - Material Condition of Valves and Associated Equipment Corrective Action History
- (9) Unit 1 & 2 Flex Equipment, Including Portable Diesel Generators[List sampled component with description/number (e.g., Essential 4.16kV Switchgear EH12)
- Licensing Commitments associated with FLEX Equipment
 - Operating Procedures for Extended Station Blackouts
 - Maintenance and Testing of FLEX Equipment
 - Method of Delivering Fuel Oil to FLEX Equipment
 - Storage of FLEX Equipment
 - Corrective Action History

Design Review - Large Early Release Frequency (LERFs) (IP Section 02.02) (2 Samples)

- (1) NA-21-00056, Temporary Missile Shield for Unit 1 Containment, Rev. 0
- Quality of installation
 - Quality Assurance
- (2) EDG Fuel Oil System, EDG Cooling, and EDG Room Ventilation
- Reviewed critical parameters
 - Reviewed component procurement specifications
 - Reviewed vendor certified fuel oil pump Head Capacity curves
 - Reviewed pump NPSH curve
 - Reviewed vendor manuals for components
 - Reviewed equipment assembly drawings with Bill of Materials
 - Reviewed system normal operating procedure
 - Reviewed system abnormal operating procedure
 - Reviewed IST procedures for pumps and check valves
 - Reviewed IST acceptance criteria
 - Reviewed completed IST procedures
 - Reviewed system health report – last quarter
 - Reviewed protection from Tornado missiles

- Reviewed protection from Tornado under-pressure
- Verified day tank design pressure, vents and relief valves
- Reviewed check valves boundary between safety and non-safety equip
- Verified motor environment
- Verified motor HP

Modification Review - Permanent Mods (IP Section 02.03) (5 Samples)

- (1) NA-17-00248-05, Vital Bus 2-1, 2-II, 2-III and 2-IV Non-Safety Branch Circuit Fuse Installation
- (2) NA-19-00122-02, Remove Input From Loop Stop Valve Cabinet
- (3) NA-13-01190, Reserve Station Service Transformer "A" and "B" Replacement
- (4) DCP 96-106, Install Pressure Equalizing Line/ NAPS/ Unit 2, 05/15/96

Review of Operating Experience Issues (IP Section 02.06) (3 Samples)

- (1) IN2016-09, Recent Issues Identified When Using Reverse Engineering Techniques in the Procurement of Safety-Related Components
- (2) IN 2020-02 FLEX Diesel Generator Operational Challenges
- (3) IN 2021-01 Lessons Learned from U.S. Nuclear Regulatory Commission Inspections of Design-Basis Capability of Power-Operated Valves at Nuclear Power Plants

INSPECTION RESULTS

Inadequate Calculation to Ensure Diesel Cooling System Met Pressure Transient Requirements			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000338,05000339/2021010-01 Open/Closed	None (NPP)	71111.21M
The inspectors identified a Green finding and an associated NCV of 10 CFR Part 50 Appendix B, Criterion 3, "Design Control," for the licensee's failure to meet the DOM-QA-1 design verification requirements and the design control procedure requirements in calculation (USB-272, Emergency Diesel Generator Room Tornado Analysis).			
<u>Description:</u> The team reviewed calculation USB-272, Rev 0, "Emergency Diesel Generator (EDGR) Room Tornado Analysis," to determine the diesel cooling system response to a tornado event and verify whether it met the licensee's Quality Assurance (QA) requirements. The purpose of the calculation stated, "to determine the design basis transient pressure response of the Emergency Diesel Generator Room (EDGR) for the tornado event. The transient velocity, density, and differential pressure on the components in the air exhaust flow path will be determined."			
The team noted that the design of the EDGR components were determined by walkdowns to be used in the calculation. The calculation modeled the radiator and fan as thick-walled orifices instead of the actual design, which was a flat-tube and plate (fin) radiator six inches thick with 858 tubes arranged in six staggered layers of tubes forming a tortuous air path for increased heat transfer. It did not describe the details of the as-installed design of the radiator			

and the fan, but it did estimate how much blockage each caused to the respective flow path to estimate the diameter of the thick-walled orifice model. The calculation underestimated the blockage caused by the radiator because the walkdown misidentified the radiator tube blockage as only ten percent of the total blockage (see radiator design above). Additionally, the analysis did not identify the acceptance criteria for maximum loading to be applied to the radiator or axial fan to which the analysis results were to be compared. The EDGR room inlet dampers can be open letting in full air flow causing high dynamic pressures through these components which was not evaluated in the calculation. The calculation evaluated the barometric pressure drop from the tornado (-3 psi) but it did not evaluate the dynamic pressures developed from air flow through and across the radiator (tortuous path through small diverging apertures) or the fan blades (airfoils) that could cause damage.

The team determined that the calculation did not suitably model the potential tornado pressure responses for the radiator or axial fan, and thus did not meet the purpose stated in the calculation. The team noted that the licensee's referenced technical handbook discussed mathematical models for staggered flat-tube and plate radiator with six tube layers and axial fans, ("Handbook of Hydraulic Resistance, I.E. Idel'Chik, 1960").

The Quality Assurance Program Document's (DOM-QA-1) design control Section 3.2.3, "Design Verification," states, in part, that the design control program ensures that appropriate verification methods are used, the appropriate design parameters are chosen, the acceptance criteria are identified, the verification is satisfactorily accomplished, and the results are properly recorded. The administrative design control procedure for engineering calculations (CM-AA-CLC-301), Attachment 1, "Fundamental Expectations" specifies, in part, that calculations shall provide technically correct results that meet the objectives stated in the "Purpose" section of the calculation. The team determined that the calculation did not meet the QA requirements prescribed in DOM-QA-1 or the calculation design control procedure.

Corrective Actions: In response to the inspectors' concerns, the licensee-initiated condition report CR1182226 on October 8, 2021 and CR1183893 on October 26, 2021 to correct the tornado analysis.

Corrective Action References: CR1182226, CR1183893

Performance Assessment:

Performance Deficiency: The inspectors determined that the calculation (USB-272, Emergency Diesel Generator Room Tornado Analysis) failed to meet the DOM-QA-1 design verification requirements and the design control procedure requirements, which was a performance deficiency. The calculation did not suitably identify the as-installed design of the EDG radiator and EDG fan. It did not model the EDG room configurations pertinent to both the static and dynamic pressure responses. Nor did it use appropriate mathematical models or appropriate acceptance criteria for the radiator and cooling fan during tornado events. Based on this, the analysis did not meet the QA requirements and stated purpose of the calculation.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Design Control attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to adequately verify the performance of the EDG

cooling system during tornado events affected the availability and reliability of the emergency power system when needed during external events and a loss of offsite power.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." A risk evaluation was performed by a regional senior reactor analyst using SAPHIRE Version 8.2.5 and NRC North Anna SPAR model Version 8.56. The conditional analysis assumed failure of the EDGs and operator recovery actions for all tornado initiating events with a one-year exposure time. The dominant sequences involved a tornado initiator accompanied by a loss of offsite power with failures of the emergency diesel generators, FLEX equipment and operator actions to recover offsite power. The analysis determined that the estimated increase in core damage frequency was less than 1E-06/year and did not involve sequences associated with an increase in large early release frequency, representing a finding of very low safety significance (Green).

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: 10 CFR 50, Appendix B, Criterion 3, "Design Control," that states, in part, that design control measures shall provide for verifying or checking the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program... Design control measures shall be applied to items such as the following: reactor physics, stress, thermal, hydraulic, and accident analyses; and the delineation of acceptance criteria for inspections and tests.

Contrary to Criterion 3, since 1/7/1992 the site failed to provide design control measures for verifying or checking the adequacy of the diesel cooling system during design such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program..., and failed to apply design control measures to items such as analyses for design basis pressure responses; and the delineation of acceptance criteria for inspections and tests of the EDG cooling system.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Failure to scope safety related MOVs into the MOV test program			
Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000338,05000339/2021010-02 Open/Closed	None (NPP)	71111.21M
The inspectors identified a Green finding and an associated NCV of 10 CFR Part 50.55a "Codes and Standards" for removing safety-related Charging (CH) pump Motor Operated Valves (MOV) from the station MOV testing program. The required scope of the program was specified by the scoping provisions in NRC Generic Letter (GL) 89-10, "Safety-Related Motor-Operated Valve Testing and Surveillance Results of the Public Workshops (Generic Letter 89-10)" and GL96-05, "Periodic Verification of Design-Basis Capability of Safety-Related Motor-Operated Valves (Generic Letter 96-05)."			

Description: The inspectors reviewed Engineering Transmittal (ET)-CME-07-0003, "Justification for Removal of CH Pump Suction Valves from the Scope of the NAPS MOV Program," Rev. 0, approved on May 23, 2007. The ET evaluation included Unit 1 valves 1-CH-MOV-1267A/B, 1-CH-MOV-1269A/B, 1-CH-MOV-1270A/B and Unit 2 valves 2-CH-MOV-2267A/B, 2-CH-MOV-2269A/B, 2-CH-MOV-2270A/B. The ET reviewed the Inservice Testing (IST) basis document, the Updated Final Safety Analysis Report (UFSAR), and Emergency Operating Procedures (EOPs). Because the MOVs were not identified in the documents to establish alternate flow paths for any events, the licensee determined that they did not perform a safety related function. Based on this, the MOVs were removed from the MOV test program on January 15, 2008, with Addendum No. 2 to Technical Report EP-0020, "Engineering Position and Technical Overview for Generic Letter 96-05 - Periodic Verification of Design-Basis Capability of Safety Related Motor Operated Valves," Rev. 0.

The inspectors noted that the EOPs did not identify every alternate flow path for every emergency condition. The inspectors identified that station operators could use these MOVs in response to certain emergency conditions based on applicable maintenance operating procedures to isolate a portion of the system during the long-term phase of an accident. For example, procedure 1-MOP-8.01, 1-CH-P-1A – A Charging Pump, Revision 67 directed that valves 1-CH-MOV-1267A and 1267B be closed from the control room to isolate the unit 1 "A" charging pump. The inspectors determined that these MOVs had a safety related function to establish an alternate flow path for certain events such as charging pump seal failures.

Corrective Actions: In response to the inspectors' concerns, the licensee-initiated condition report CR1181633 on September 29, 2021. On October 26, 2021, the licensee approved prompt operability determination (OD) CA 8587871 to address reasonable assurance of operability of these motor operated valves. The OD concluded that these valves were non-conforming due to their removal from the site MOV program but were considered operable. The OD also included the results of an evaluation performed to ensure the valves' ability to close under the most limiting differential pressure.

Corrective Action References: CR1181633
CA 8587871

Performance Assessment:

Performance Deficiency: The failure include safety related MOVs in the scope of the testing program as required by GL89-10 and GL96-05 was a performance deficiency

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Equipment Performance attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to ensure that MOV performance was in accordance with the MOV testing program affected the reliability of the ECCS system in the event of a passive failure after an accident.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance because it was a design deficiency confirmed not to result in a loss of operability.

Cross-Cutting Aspect: Not Present Performance. No cross-cutting aspect was assigned to this finding because the inspectors determined the finding did not reflect present licensee performance.

Enforcement:

Violation: 10 CFR Part 50.55a(b)(3)(ii), "Motor-Operated Valve Testing," requires, in part, that licensees comply with the provisions for testing MOVs in ASME OM Code, ISTC 4.2, 1995 Edition with the 1996 and 1997 Addenda, or ISTC-3500, 1998 Edition through the latest edition and addenda incorporated by reference in paragraph (a)(1)(iv) of 10 CFR 50.55a, and establish a program to ensure that MOVs continue to be capable of performing their design basis safety functions. 10 CFR 50.55a(b)(3)(ii) also requires that licensees implementing ASME OM Code, Mandatory Appendix III, "Preservice and In-service Testing of Active Electric Motor Operated Valve Assemblies in Light-Water Reactor Power Plants," of the 2009 Edition, 2011 Addenda, and 2012 Edition shall comply with specific conditions.

Contrary to 50.55a(b)(3)(ii), since 2008, the licensee failed to include the subject MOVs in a testing program to ensure they could perform their design basis safety function.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

Inadequate procedure for handling age degraded safety related cable.

Cornerstone	Significance	Cross-Cutting Aspect	Report Section
Mitigating Systems	Green NCV 05000338,05000339/2021010-03 Open/Closed	None	71111.21M

The inspectors identified a Green finding and an associated NCV of 10 CFR Part 50 Appendix B, Criterion V, "Instructions, Procedures, and Drawings," for the licensees failure to include work instructions to ensure the safety function of aged cables during and after handling.

Description: Based on the walkdown pictures. For Unit 1 safety related battery 1-2, the cables terminated on the negative post of Cell 60 exceeded the bend radius of 3.52". The cable involved was 250 MCM Aluminum Triplex 600 V NGP-07 cable. The measured cable radius was 1.75". The inspectors noted that bend radii was exceeded on multiple safety related batteries around the plant. The Unit 2 safety related battery 2-II and the 1H diesel generator battery exceeded the minimum bend radii.

The inspectors determined that these cables in question were the original cables from initial installation more than 40 years old. Because aging can cause degradations that can damage insulation during handling such as micro fracturing, the inspectors reviewed work order (WO) to determine the work practices established to ensure the safety function of the cables during and after handling. The inspectors noted that the WO disassembled the batteries and storage racks from the room and then reassembled them. The cables could not be removed from the room as they went to a floor penetration to switchgear below. No work instruction concerning the handling of aged cables or minimum bend radii were included in the WOs to ensure the safety function of the cables during and after handling.

Corrective Actions: The licensee entered this into the corrective action program to determine the condition of the cables and correct the deficiency.

Corrective Action References: CR1181138, CR1181190

Performance Assessment:

Performance Deficiency: The failure to include work instructions to ensure the safety function of aged cables during and after handling was a performance deficiency.

Screening: The inspectors determined the performance deficiency was more than minor because it was associated with the Procedure Quality attribute of the Mitigating Systems cornerstone and adversely affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the failure to ensure the safety function of the safety related cables failed to ensure their reliability and capability of safety related battery systems.

Significance: The inspectors assessed the significance of the finding using Appendix A, "The Significance Determination Process (SDP) for Findings At-Power." Using Exhibit 2, "Mitigating Systems Screening Questions," the finding was determined to be of very low safety significance because it was a design deficiency confirmed not to result in a loss of operability.

Cross-Cutting Aspect: None

Enforcement:

Violation: 10 CFR 50, Appendix B criterion V, "Instructions, Procedures, and Drawings" states in part that "instructions, procedures, or drawings shall include appropriate quantitative or qualitative acceptance criteria for determining that important activities have been satisfactorily accomplished."

Contrary to the above, since 2019 the site failed to include appropriate quantitative ... acceptance criteria in instructions and procedures to ensure the safety function of aged cables during and after handling.

Enforcement Action: This violation is being treated as a non-cited violation, consistent with Section 2.3.2 of the Enforcement Policy.

EXIT MEETINGS AND DEBRIEFS

The inspectors verified no proprietary information was retained or documented in this report.

- On October 8, 2021, the inspectors presented the The team performed exit meeting inspection results to Fred Mladen – Site VP and other members of the licensee staff.

DOCUMENTS REVIEWED

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
71111.21M	Calculations	11715-ES-103	LHSI Pump NPSH	Rev. 0
71111.21M	Calculations	12050-ES-220	Containment Floor Volume with Respect to Elevation, Addendum H	Rev. 0
71111.21M	Calculations	13075.49-ES-194	Maximum Sump Water Level – Final NPSH Modification, Addendum H	Rev. 2
71111.21M	Calculations	19096.0510-E-4	125V DC MAXIMUM VOLTAGE ANALYSIS (CLASS IE BUSES)	Rev. 0
71111.21M	Calculations	CALC 59-01-PT-213.8A	Valve Inservice Inspection	Rev. 4
71111.21M	Calculations	CALC 59-01-PT-213.8B	Valve Inservice Inspection	Rev. 3
71111.21M	Calculations	CALC 59-02-PT-213.8A	Valve Inservice Inspection	Rev. 4
71111.21M	Calculations	CALC 59-02-PT-213.8B	Valve Inservice Inspection	Rev. 3
71111.21M	Calculations	CE- 1559	Containment Liner & Concrete Parametric Study Addendums A, C, and D	Rev. 0
71111.21M	Calculations	EE-0008	North Anna Voltage Profiles	Rev. 3
71111.21M	Calculations	EE-0008	North Anna Voltage Profiles	Rev. 3
71111.21M	Calculations	EE-0009	125 Vdc System Analysis	Rev. 2
71111.21M	Calculations	EE-0025	North Atlanta Station Electrical Load List	Rev. 4
71111.21M	Calculations	EE-0027	Emergency Diesel Generator Load Sequencing	Rev. 3
71111.21M	Calculations	EE-0395	Safety Related 480V Load Center Coordination	Rev. 6
71111.21M	Calculations	EE-0806	NAPS 4160V and 480V Short Circuit Analysis	Rev. 2
71111.21M	Calculations	EE-0845	4160V and 480V Emergency Buses- Voltage Drops to Switchgear DC Control Circuit Components	Rev. 0
71111.21M	Calculations	EEE-0500	Motor Terminal Voltage for Motor Operated Valves Addendums A and B	Rev. 6
71111.21M	Calculations	ET-N-06-0043	Evaluation of Emergency Diesel Generator Ambient Room Temperature	Rev. 1
71111.21M	Calculations	ME-0314	Maximum Differential Pressure, High Pressure Safety Injection and Auxiliary Feedwater Valves	Rev. 0
71111.21M	Calculations	ME-0492	Thrust Band Calculation for North Anna Safety Related Motor	Rev. 1

Inspection Procedure	Type	Designation	Description or Title	Revision or Date
			Operated Valves, Addendums 1 and 1A	
71111.21M	Calculations	ME-0595	NAPS Fire Pumps Hydraulic Model	0
71111.21M	Calculations	ME-0700	MOV Differential Pressure (DP) Calculation for the Subject Valves	Rev. 0
71111.21M	Calculations	ME-0792	Fire hose station design calculation	0
71111.21M	Calculations	ME-3069	JOG Calculation of Required Thrust Settings for MOV 1-SI-MOV-1863A	Rev. 2
71111.21M	Calculations	ME-3070	JOG Calculation of Required Thrust Settings for MOV 1-SI-MOV-1863B	Rev. 2
71111.21M	Calculations	ME-3200	JOG Calculation of Required Thrust Settings for MOV 2-SI-MOV-2863A	Rev. 2
71111.21M	Calculations	ME-530	Component Cooling Heat Exchanger Tube Plugging Study	Rev. 0
71111.21M	Calculations	NA-Calc-ZZZ-01040.4910-M-1	Emergency Diesel Generator Room and Battery Area Temperature Profile	Rev. 1
71111.21M	Calculations	NA-CALC-ZZZ-11715-12050-7.1-FO-3	Fuel Oil System	03/11/1978
71111.21M	Calculations	SM-1176	Impact of Maintaining NA Automatic RMT Setpoint at 19.4% RWST Level, Addendum A	Rev. 1
71111.21M	Calculations	SM-1511	Design Inputs for GOTHIC Containment Analysis for NA Power Station	Rev. 1
71111.21M	Calculations	US(B)-272	Emergency Diesel Generator Room Tornado Analysis	Rev. 0
71111.21M	Calculations	ZZZ-11715_12050-7.1-FP-2	Fire Pumps	0
71111.21M	Corrective Action Documents		CR3052285, CR3052405, CR3064396, CR7616236, CR7618752, CR7707420, CR7866652, CR8467896, CR1177118, CR1177264, CR1003896, CR0361181, CR0358809, CR0356650, CR1149511, CR1162288, CR1166642, CR1172946, CR1175367	
71111.21M	Corrective Action Documents Resulting from	CR1175367	NRC Identified: Cracked cable jackets on RSST overhead cables	

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	Inspection			
71111.21M	Corrective Action Documents Resulting from Inspection	CR1181038	NRC DBAI inspector noticed a typographical error on CALC EE-0009	9/21/2021
71111.21M	Corrective Action Documents Resulting from Inspection	CR1181138	NRC DBAI Inspector noted a incorrect bend radius on Battery 1-2	9/22/2021
71111.21M	Corrective Action Documents Resulting from Inspection	CR1181190	Incorrect bend radius on cable in the 2-II Battery Room	9/23/2021
71111.21M	Corrective Action Documents Resulting from Inspection	CR1181493	DBAI Inspector noted improvements needed in CALC EE-0009	9/28/2021
71111.21M	Drawings	11715-FB-035A	Fuel Oil Lines	Rev. 44
71111.21M	Drawings	11715-FB-41A	Flow Diagram Fire Protection and Domestic Water	37
71111.21M	Drawings	11715-FB-41B	Valve Operating Numbers Fire Protection & Domestic Water	55
71111.21M	Drawings	11715-FB-4B	Yard Fuel Oil Lines Sh. 2	Rev. 17
71111.21M	Drawings	11715-FB-9A	Floor Drainage Auxiliary Building Sh-1	01/17/1990
71111.21M	Drawings	11715-FC-24B-12	Plan EL 244' Outline Sh 1 Auxiliary Building	12
71111.21M	Drawings	11715-FV-56A-8	Underground Fuel Oil Storage Tanks 1-EG-TK-2A & 2B	Rev. 8
71111.21M	Engineering Changes	03-122	Emergency Generator Load Sequencing Timer Replacements /NAPS /Unit #2	3/30/2004
71111.21M	Engineering Changes	NA-13-01190	Reserve Station Service Transformer "A" and "B" Replacement	23

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71111.21M	Engineering Changes	NA-14-00022	Spare Conductors of RSST A to Transfer Bus "D' Due to Damaged Insulation	04/04/2014
71111.21M	Engineering Changes	NA-15-00061	Installation of Voltage Unbalance Protection (1H)	06/06/2017
71111.21M	Engineering Changes	NA-16-01034	Reserve Station Service Transformer C Replacement	7
71111.21M	Engineering Changes	NA-17-00214	Diesel Driven Fire Pump (1-FP-P-2) Appendix R Fused Circuit Protection	0
71111.21M	Engineering Changes	NA-19-00122	Remove Input from Loop Stop Valve Cabinet	Rev. 2
71111.21M	Engineering Evaluations	GOTHIC Evaluation 1	NAPS EDG Room Louver dP during Tornado - Normal Exhaust Fan and EDG OFF	9/28/2021
71111.21M	Engineering Evaluations	GOTHIC Evaluation 2	NAPS EDG Room Louver dP during Tornado - Normal Exhaust Fan and EDG OFF with dirtier radiator	9/29/2021
71111.21M	Engineering Evaluations	GOTHIC Evaluation 3	NAPS EDG Room Louver dP during Tornado - Normal Exhaust Fan and EDG Running	9/29/2021
71111.21M	Miscellaneous		Dominion- Virginia Power North Anna Environmental Zone Description, Units 1 & 2	Rev. 28
71111.21M	Miscellaneous	59-G533-00080	Installation, Operation and Maintenance Manual - Power Transformers	2
71111.21M	Miscellaneous	59-N104-00005	Klockner Moeller 100 Series Motor Control Center Cubicles	Rev. 9
71111.21M	Miscellaneous	59-R217-00004	Load Tap Changer Type RMV-II 1500A/2000A/2500A VACUTAP	1
71111.21M	Miscellaneous	DNES-VA-EEN-0002	Design Standard for Cable	Rev. 1
71111.21M	Miscellaneous	GC Cable Install Manual	GC Cable Install Manual	Rev. 9
71111.21M	Miscellaneous	MODULE NCRODP-55-NA	STATION DIESEL GENERATOR SYSTEMS	04/15/2020
71111.21M	Miscellaneous	MS-AA-PTE-401-1004	Commercial Grade Dedication	Rev. 10
71111.21M	Miscellaneous	NA-220/1220	Procurement Specification Emergency Diesel Generator Sets	Rev. 3
71111.21M	Miscellaneous	NA-SPEC-000-NAS-0087A	Specification for miscellaneous Vertical Sump Pumps	10/05/1970

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71111.21M	Miscellaneous	NA-VTM-000-59-C550-00001	Cummins Diesel NH/NT/NTA 855 C.I.D. Engines	4
71111.21M	Miscellaneous	NA-VTM-000-59-C550-00002	H, NH, NT Series Operations & Maintenance Manual	4
71111.21M	Miscellaneous	NA-VTM-000-59-P276-00001	Vertical Turbine Pumps Open Lineshaft Construction	3
71111.21M	Miscellaneous	NAS-227	Procurement Specification, Fuel Oil Pumps	Rev. 2A1
71111.21M	Miscellaneous	NAS-96	Procurement Specification Component Cooling Water Heat Exchangers	Rev. 2A1
71111.21M	Miscellaneous	SDBD-NAPS-CC	System Design Basis Document for Component Cooling System	Rev. 20
71111.21M	Miscellaneous	SDBD-NAPS-ED	SYSTEM DESIGN BASIS DOCUMENT FOR 125 VDC EMERGENCY POWER SYSTEM	Rev. 19
71111.21M	Miscellaneous	SDBD-NAPS-EG	SYSTEM DESIGN BASIS DOCUMENT FOR EMERGENCY DIESEL GENERATOR SYSTEM	Rev. 20
71111.21M	Miscellaneous	SDBD-NAPS-EV	SYSTEM DESIGN BASIS DOCUMENT FOR EMERGENCY POWER AND VITAL BUS (120-240V) SYSTEM	Rev. 20
71111.21M	Miscellaneous	SDBD-NAPS-FP	SYSTEM DESIGN BASIS DOCUMENT FOR FIRE PROTECTION SYSTEM	20
71111.21M	Miscellaneous	SDBD-NAPS-SW	System Design Basis Document for Service Water System	Rev. 28
71111.21M	Procedures	0-AP-10	LOSS OF ELECTRICAL POWER	Rev. 94
71111.21M	Procedures	0-AP-10	LOSS OF ELECTRICAL POWER	Rev. 94
71111.21M	Procedures	0-AP-8	RESPONSE TO GRID INSTABILITY	Rev. 14
71111.21M	Procedures	0-MCM-0107-02	REPAIR OF DIESEL-DRIVEN FIRE PUMP 1-FP-P-2 AND MOTOR-DRIVEN FIRE PUMP 1-FP-P-1	8
71111.21M	Procedures	0-MPM-0107-01	DIESEL FIRE PUMP PREVENTIVE MAINTENANCE	23
71111.21M	Procedures	0-MPM-0107-01	DIESEL FIRE PUMP PREVENTIVE MAINTENANCE	23
71111.21M	Procedures	0-MPM-0107-02	DIESEL FIRE PUMP HOSE REPLACEMENT	3
71111.21M	Procedures	0-PT-100.1.2	DIESEL-DRIVEN FIRE PROTECTION PUMP 1-FP-P-2 EXERCISE	25
71111.21M	Procedures	1-LOG-6E	OUTSIDES LOG	117
71111.21M	Procedures	1-OP-26.1	TRANSFERRING 4160-VOLT BUSES	43
71111.21M	Procedures	1-PT-142.9A.1	Valve Inservice Inspection Associated with 1-EG-TK-IH FOR 1-	Rev. 42

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			EG-254	
71111.21M	Procedures	1-PT-80.2	TESTING OF THE EMERGENCY BUS ALTERNATE POWER SUPPLY	6
71111.21M	Procedures	1-PT-81.1A	Emergency Diesel Generator Fuel Oil Transfer Pumps 1EP-P-1HA and 1EP-P-1HB	Rev. 26
71111.21M	Procedures	1-PT-83.3A	LOAD SEQUENCING TIMERS VERIFICATION TEST	Rev. 1
71111.21M	Procedures	1-PT-83.3B	LOAD SEQUENCING TIMERS VERIFICATION TEST	Rev. 0
71111.21M	Procedures	2-LOG-6F	UNIT 2 SAFEGUARDS LOG	134
71111.21M	Procedures	MS-AA-PTE-401	Procurement Technical Evaluation Determination	Rev. 17
71111.21M	Procedures	O-PT-100.2	FIRE PROTECTION PUMPS — ANNUAL TESTING	28
71111.21M	Work Orders	59102428535	FOPH Strainer Inspection/Cleaning 02-EG-2HA-Filter	02/30/20
71111.21M	Work Orders	59203307849, 59203307881, 59203308857, 59203324848, 59203355689, 59203365694, 59203136470, 59203275091, 59203275093, 59203275095, 59203284437, 59203284472, 59203284473, 59203284475, 59203284476, 59303284493, 59203284532, 59102126128, 59102948061, 59102126136		