



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
245 PEACHTREE CENTER AVENUE N.E., SUITE 1200  
ATLANTA, GEORGIA 30303-1200

February 11, 2019

Mr. Daniel G. Stoddard  
Senior Vice President  
and Chief Nuclear Officer  
Innsbrook Technical Center  
5000 Dominion Boulevard  
Glen Allen, VA 23060

SUBJECT: NORTH ANNA POWER STATION – NRC INTEGRATED INSPECTION  
REPORT 05000338/2018004, 05000339/2018004, AND 07200056/2018001

Dear Mr. Stoddard:

On December 31, 2018, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your North Anna Power Station, Units 1 and 2. On January 24, 2019, the NRC inspectors discussed the results of this inspection with Ms. L. Hilbert and other members of your staff. Inspectors documented the results of this inspection in the enclosed inspection report.

NRC inspectors did not identify any finding or violation of more than minor significance. 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 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Sincerely,

*/RA/*

Lundy F. Pressley, Acting Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Docket Nos.: 05000338, 05000339, 07200056  
License Nos.: NPF-4, NPF-7

Enclosure:  
IR 05000338/2018004, 05000339/2018004  
and 07200056/2018001

cc: Distribution via ListServ

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**ADAMS ACCESSION No. ML19042A104**

|        |           |           |           |           |
|--------|-----------|-----------|-----------|-----------|
| OFFICE | RII:DRP   | RII:DRP   | RII:DRP   | RII:DRP   |
| NAME   | GEatmon   | ASiwy     | JDodson   | DJackson  |
| DATE   | 1/29/2019 | 1/31/2019 | 1/31/2019 | 1/31/2019 |
| OFFICE | RII: DRS  | RII:DRS   | RII:DRP   | RII: DRP  |
| NAME   | PCapehart | RCarrion  | PNiebaum  | LPressley |
| DATE   | 1/25/19   | 1/28/19   | 1/31/2019 | 2/07/2019 |

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

Docket Numbers: 50-338, 50-339; 72-056

License Numbers: NFP-4, NFP-7

Report Numbers: 05000338/2018004; 05000339/2018004; 07200056/2018001

Enterprise Identifiers: I-2018-004-0049; I-2018-001-0152

Licensee: Virginia Electric and Power Company

Facility: North Anna Power Station, Units 1 and 2

Location: Mineral, VA

Dates: October 01, 2018 to December 31, 2018

Inspectors: G. Eatmon, Acting Senior Resident Inspector / Resident Inspector  
A. Siwy, Acting Senior Resident Inspector  
P. Capehart, Senior Operations Engineer (71111.11)  
R. Carrion, Senior Reactor Inspector (60853)

Approved By: Lundy F. Pressley, Acting Chief  
Reactor Projects Branch 4  
Division of Reactor Projects

Enclosure

## SUMMARY

The U.S. Nuclear Regulatory Commission (NRC) continued monitoring licensee's performance by conducting a quarterly integrated inspection at North Anna Power Station, Units 1 and 2 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

No findings or violations were identified.

### Additional Tracking Items

| Type | Issue number         | Title                                    | Report Section | Status |
|------|----------------------|--|----------------|--------|
| LER  | 05000338/2018-002-00 | 1J Emergency Diesel Generator Auto-Start | 71153          | Closed |

## **PLANT STATUS**

Unit 1 operated at or near 100 percent rated thermal power for the entire inspection period.

Unit 2 operated at or near 100 percent rated thermal power for the entire inspection period.

## **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 performed plant status activities described in IMC 2515, Appendix D, "Plant Status," and conducted routine reviews using IP 71152, "Problem Identification and Resolution." 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."

## **REACTOR SAFETY**

### 71111.04 - Equipment Alignment

#### Partial Walkdown (3 Samples)

The inspectors evaluated system configurations during partial walkdowns of the following systems/trains:

- (1) Unit 2 low head safety injection system, Train 'B' on October 19, 2018
- (2) Unit 2 control room chilled water system, Train 'B' and 'C' on October 30, 2018
- (3) Unit 2 component cooling system, Trains 'A' and 'B' on October 31, 2018

### 71111.05AQ - Fire Protection Annual/Quarterly

#### Quarterly Inspection (4 Samples)

The inspectors evaluated fire protection program implementation in the following selected areas:

- (1) Unit 1 and Unit 2, auxiliary building, 259 foot (ft) elevation on October 15, 2018
- (2) Unit 1 and Unit 2, emergency switchgear and air conditioning rooms on October 29, 2018
- (3) Unit 1 and Unit 2, safeguards equipment rooms and quench spray rooms on October 30, 2018
- (4) Unit 1 and Unit 2, service water pump house on November 8, 2018

## 71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance

### Operator Requalification (1 Sample)

The inspectors observed and evaluated a crew of licensed operators in the plant's simulator during licensed operator requalification training on November 6, 2018.

### Operator Exams (1 Sample)

The inspectors reviewed and evaluated requalification exam results on December 28, 2018.

### Operator Performance (1 Sample)

- (1) a. The inspectors observed and assessed control rod operability surveillance testing on October 2, 2018
- b. The inspectors observed and assessed fast start surveillance testing of the Unit 2 'J' emergency diesel generator (EDG) on October 16, 2018
- c. The inspectors observed and assessed Unit 1 and Unit 2 operator performance during prolonged elevated risk due to 'A' reserve station service transformer (RSST) replacement on October 19, 2018
- d. The inspectors observed and assessed fast start testing of the Unit 1 'J' EDG on October 22, 2018

## 71111.12 - Maintenance Effectiveness

### Routine Maintenance Effectiveness (2 Samples)

The inspectors evaluated the effectiveness of routine maintenance activities associated with the following equipment and/or safety significant functions:

- (1) Unit 1 incore detector 'A' on October 16, 2018
- (2) Unit 1 charging pump 'C' on November 6, 2018

### Quality Control (1 Sample)

The inspectors evaluated maintenance and quality control activities associated with the following equipment performance issues:

- (1) Field review for control of quality parts during the maintenance process of the following components: component cooling seismic pipe restraint adjustment, EDG lube oil addition, repair charging pump motor bearing leaks, and reinstallation of internal flood barrier was completed on November 27, 2018.

## 71111.13 - Maintenance Risk Assessments and Emergent Work Control (5 Samples)

The inspectors evaluated the risk assessments for the following planned and emergent work activities:

- (1) Unit 1 high risk plan associated with the casing cooling tank level channel calibration on October 18, 2018
- (2) Unit 2 increased risk during Train 'B' solid state protections system slave relay test on October 19, 2018
- (3) Unit 1, increased risk during Train 'B' reactor protections and engineered safety features logic test on October 25, 2018
- (4) Unit 1, increased risk during 'B' low head safety injection pump testing on November 9, 2018
- (5) Unit 1 and Unit 2, cumulative impact of increased risk with the 'A' RSST, Unit 1 'C' charging pump, and Unit 2 'B' component cooling pump maintenance and return to service delays on November 9, 2018

#### 71111.15 - Operability Determinations and Functionality Assessments (4 Samples)

The inspectors evaluated the following operability determinations and functionality assessments:

- (1) Unit 1 casing cooling pump 'B' discharge valve 1-RS-MOV-100B missed periodic verification test on October 16, 2018
- (2) Unit 1 control rod drive cooling fan power supply breaker abnormal noise on October 18, 2018
- (3) Unit 1 motor-driven auxiliary feedwater pump 'A' packing leak on October 25, 2018
- (4) Unit 1 and Unit 2, potential impact to dose consequence for main steam line break due to delayed natural circulation cooldown on October 26, 2018

#### 71111.19 - Post Maintenance Testing (4 Samples)

The inspectors evaluated the following post maintenance tests:

- (1) Unit 1 'C' charging pump repairs on October 17, 2018
- (2) Unit 1 'A' incore detector repairs on November 7, 2018
- (3) Unit 2 'C' component cooling pump seal and motor replacement on November 9, 2018
- (4) Unit 1 turbine-driven AFW pump steam supply valve repair on November 28, 2018

#### 71111.22 - Surveillance Testing

The inspectors evaluated the following surveillance tests:

##### Routine (1 Sample)

- (1) Unit 1 control rod operability on October 2, 2018

### **OTHER ACTIVITIES – BASELINE**

#### 71151 - Performance Indicator Verification

The inspectors verified licensee performance indicators submittals listed below for the period from October 1, 2017, through September 30, 2018. (4 Samples)

- (1) Unit 1 residual heat removal system

- (2) Unit 2 residual heat removal system
- (3) Unit 1 emergency ac power system
- (4) Unit 2 emergency ac power system

The inspectors verified licensee performance indicators submittals listed below for the period from April 1, 2017, through June 30, 2017. (Partial Samples)

- (1) Unit 1 and Unit 2, high pressure injection system
- (2) Unit 1 and Unit 2, reactor coolant system leakage
- (3) Unit 1 and Unit 2, cooling water systems

#### 71153 - Follow-up of Events and Notices of Enforcement Discretion

##### Licensee Event Reports (1 Sample)

The inspectors evaluated the following licensee event reports which can be accessed at <https://lersearch.inl.gov/LERSearchCriteria.aspx>:

- (1) Licensee Event Report (LER) 05000338/2018-002-00, 1J Emergency Diesel Generator Auto-Start on September 3, 2018.

#### **OTHER ACTIVITIES – TEMPORARY INSTRUCTIONS, INFREQUENT AND ABNORMAL**

##### 60853 - Onsite Fabrication of Components and Construction of an Independent Spent Fuel Storage Installation

The inspectors conducted a review of licensee and vendor activities in preparation for the concrete placement of the independent spent fuel storage installation (ISFSI) Pad #3. The licensee will use the Transnuclear Inc. Standardized NUHOMS® Horizontal Modular Storage System. The inspectors walked down the construction area of the ISFSI pad and examined the rebar installation for compliance to licensee-approved drawings, specifications, procedures, and applicable codes, the Certificate of Compliance, and technical specifications. The inspectors also evaluated the concrete formwork installation for compliance to the licensee-approved drawings. The inspectors interviewed licensee and contract personnel to verify knowledge of the planned work. When the 7-day and 28-day compression tests were completed by the independent laboratory, the inspectors reviewed the results to verify that the acceptance criteria were met. The inspectors noted that all tested samples satisfied the acceptance criteria.



## INSPECTION RESULTS

| Observation   | <u>71153 - Follow-up of Events and Notices of Enforcement Discretion</u> |
|---|--|
| The inspectors determined that the LER was accurate. The licensee's corrective action to install animal guards while replacing the RSST was appropriate. 'A' RSST was completed Fall 2018 through DC NA-13-01190, 'B' RSST will be implemented Fall 2019 through DC NA-13-01190, and 'C' RSST will be implemented Summer 2019 through DC NA-16-01034. The inspectors concluded that it was not reasonable to foresee or correct the cause discussed in the LER, therefore no performance deficiency was identified. The inspectors also concluded that no violation of NRC requirements occurred. This LER is closed. |  |

## EXIT MEETINGS AND DEBRIEFS

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

- On December 21, 2017, the inspector discussed the results of the ISFSI pad inspection with Mr. D. Taylor, North Anna Licensing Manager.
- On January 24, 2019, the inspector presented the quarterly integrated inspection report results to Ms. L. Hilbert, and other members of the licensee staff.

## **DOCUMENTS REVIEWED**

### **71111.04 - Equipment Alignment**

#### Procedures

- 0-OP-21.6A, Valve Checkoff – Control and Relay Room Chilled Water, Revision 11
- 2-OP-51.1A, Valve Checkoff – Component Cooling, Auxiliary Building and Main Steam Valve House, Revision 22
- 2-OP-7.1A, Valve Checkoff – Low Head Safety Injection, Revision 19

### **71111.05AQ - Fire Protection Annual/Quarterly**

#### Procedures

- 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 13
- 2-FS-S-3, Unit 1 Emergency Switchgear Instrument Rack and Air Conditioning Rooms Service Building Elev. 254 FT (S-54) Safe Shutdown Equipment, Revision 111-FS-SG-1, Safeguards Area Safe Shutdown Equipment Unit 1, Revision 5
- 1-FS-QS-1, Quench Spray Building (SG-74) Unit 1, Revision 5
- 2-FS-SG-1, Safeguards Area Safe Shutdown Equipment Unit 2, Revision 4
- 2-FS-QS-1, Quench Spray Building 274' (SG-74) Safe Shutdown Equipment Unit 2, Revision 3
- 1-FS-SW-1, Service Water Pump House Units 1 and 2, Revision 2
- 1-FS-AB-1, Auxiliary Building (All Elevations) Fire Fighting Strategy Safe Shutdown Equipment, Revision

### **71111.11 - Licensed Operator Requalification Program and Licensed Operator Performance**

#### Procedures:

- 1-PT-17.1, Control Rod Operability, Revision 37
- 2-PT-82.4B, 2J Diesel Generator Test (Start by ESF Actuation), Revision 72
- 1-PT-82.2B, 1J Diesel Generator Test (Simulated Loss of Off-Site Power), Revision 61

### **71111.12 - Maintenance Effectiveness**

#### Procedures

- 1-PT-23.1, Quadrant Power Tilt Ratio Determination Using the Incore Detector System, Revision 14
- MS-AA-WHS-131, Storage and Handling, Revision 8
- MS-AA-WHS-131-Attachment 3, Annual SCM Storage Area Inspection dated 5/31/2018
- MS-AA-WHS-131-Attachment 5, SCM Storage Area Weekly Temperature and Humidity Verification dated 11/20/2018
- MS-AA-WHS-131-Attachment 5, SCM Storage Area Weekly Temperature and Humidity Verification dated 10/16/2018
- MS-AA-WHS-131-Attachment 5, SCM Storage Area Weekly Temperature and Humidity Verification dated 9/18/2018
- MS-AA-WHS-131-Attachment 5, SCM Storage Area Weekly Temperature and Humidity Verification dated 8/21/2018

Condition Reports

CR1106422  
CR1097066  
CR1036685  
CR1106340  
CR1098844  
CA7477831

Work Orders

WO59203277914  
WO59203267921  
WO59102916693  
WO59203278721  
WO59203279185  
WO59102411563

**71111.13 - Maintenance Risk Assessments and Emergent Work Control**

Procedures

2-PT-36.5.3B, Solid Stat Protection System Output Slave Relay Test (Train B), Revision 40  
1-PT-36.1B, Train B Reactor Protection and ESF Logic Actuation Logic Test, Revision 74  
1-PT-57.1A, Emergency Core Cooling Subsystem – Low Head Safety Injection Pump  
(1-SI-P-1A), Revision 61  
WM-AA-301, Operational Risk Assessment, Revision 20  
WM-AA-301-Attachment 15, High Risk Plan Actions – Casing Cooling Tank Level Calibration  
dated 9/25/2018  
1-PT-45.2.2, Casing Cooling Tank Level (1-RS-L-103) Channel Calibration, Revision 8  
1-ICP-RS-L-103A, Casing Cooling Tank Level (1-RS-L-103A) Calibration, Revision 12

**71111.15 - Operability Determinations and Functionality Assessments**

Procedures

ER-AA-MOV-101, Motor-Operated Valve Program Process, Revision 3  
1-PT-36.1B, Train B Reactor Protection and ESF Logic Actuation Logic Test, Revision 74

Condition Reports

CR1038288  
CR1107325  
CR1107460  
CR1105603  
CR1107642

Other Documents

SM-1152, NAPS Emergency Condensate Storage Tank Heat Removal Capacity Using TS  
Minimum Volume, Addendum C, Revision 0  
NE-1141, A Review of the Secondary Calorimetric Calculation on the P-250 and the PCS  
Computer Programs, Revision 1  
PA-0199, North Anna Dose Analysis, Main Steam Line Break, Alternate Source Term, Revision  
0  
Westinghouse Technical Bulletin TB-09-4, Impact of Auxiliary Pump Heat on Westinghouse and  
Combustion Engineering Analyses/Methodologies, Revision 0  
Supplier Nonconformance Report 70289926-SNCR-04

## **71111.19 - Post Maintenance Testing**

### Procedures

1-PT-14.3, Charging Pump 1-CH-P-1C, Revision 58

1-PT-22.1, Incore/Excore Axial Offset Evaluation, Revision 12

2-PT-74.2B, Component Cooling Pump 2-CC-P-1B Test, Revision 32

1-PT-213.20, Valve Inservice Inspection (1-MS-TV-111A and 1-MS-TV-111B), Revision 21

### Condition Reports

CR1111263

### Work Orders

WO59203280269

## **71151 - Performance Indicator Verification**

### Procedures

ER-AA-SPI-102, Maintaining the Mitigating System Performance Index (MSPI) Basis Document, Revision 0

Technical Report SE-0007, NRC Mitigating System Performance Index (MPSI) Basis Document, North Anna Power Station Units 1 and 2, Revision 3

## **71153 - Follow-up of Events and Notices of Enforcement Discretion**

### Condition Report

CR1104577

CR1104560

CA7374644

CA7374643

CA7374642

CA7374629

CA7374628

### Other Documents

LER 2018-002

## **60853 - Onsite Fabrication of Components and Construction of an Independent Spent Fuel Storage Installation**

### Specifications

NAI-0035, Installation Specification for Reinforced Concrete ISFSI Facility Pad #2 North Anna Power Station Units 1 And 2

NAI-0036, Specification for Excavation, Fill, Compaction, Testing and Landscaping Dry Cask Independent Spent Fuel Storage Installation North Anna Power Station Units 1 and 2, Revision 0

### Drawings

1601092-11715-FC-49C, Plans, Sections & Details ISFSI (Dry Storage) Facility #3, North Anna Power Station, Revision 5

## **Concrete Compressive Strength Test Results**

### 7-Day Results

Samples: 185389, 185390, 185391, 185392, 185503, 185506, 185507, 185686, 185687, 185688, 185785, 185786, and 185787

28-Day Results

Samples: 185389, 185390, 185391, 185392, 185503, 185506, 185507, 185686, 185687, 185688, 185785, 185786, and 185787

Other Documents

ACI Certification for J. Thompson and A. Dobbertin

Design Change Number NA-16-01092, ISFSI Pad #3 Construction (Civil)

- Design Change Update Request Numbers 1 through 9

Golden Sands General Contractors, Inc., Submittal 033000.13.03, Concrete Slab Formwork Shop Drawings - Revision 3

National Ready Mixed Concrete Association (NRMCA) Certificate of Conformance for Concrete Production Facilities for Louisa Plant 5, Mineral, Virginia, of the Allied Concrete Company (expires October 15, 2020)

NRMCA Fleet Inspection Reporting Form - Truck Mixers 5.7 Inspection Record of Delivery Fleet Certification