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

October 31, 2016

David A. Heacock
Virginia Electric & Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA NUCLEAR PLANT, UNIT 1 – U.S. NUCLEAR REGULATORY COMMISSION POST-APPROVAL SITE INSPECTION FOR LICENSE RENEWAL, INSPECTION REPORT 05000338/2016009

Dear Mr. Heacock:

On September 22, 2016, the U.S. Nuclear Regulatory Commission (NRC) completed a Post-Approval Site Inspection for License Renewal at your North Anna Nuclear Plant, Unit 1. The enclosed report documents the inspection results that were discussed on September 22, 2016, with Mr. Jerry Bischof, and members of your staff.

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

Based on the results of this inspection, no findings were identified.

In accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 2.390, "Public inspections, exemptions, requests for withholding" of the NRC's "Agency Rules of Practice and Procedure," 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 NRC's Agencywide Documents Access and

Management System (ADAMS); accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html(the Public Electronic Reading Room).

Sincerely,

/RA/

Shakur A. Walker, Chief
Engineering Branch 3
Division of Reactor Safety

Docket No.50-338
License No.NPF-4

Enclosure:
NRC Inspection Report 05000338/2016009
w/Attachment:Supplementary Information

cc: Distribution via Listserv

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ADAMS: ☒ Yes ACCESSION NUMBER:_____ ☒ SUNSI REVIEW COMPLETE ☐ FORM 665 ATTACHED

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NAME	ASENGUPTA	PCOOPER	SWALKER				
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket No:	05000338
License No:	NPF-4
Report No:	05000338/2016009
Licensee:	Dominion
Facility:	North Anna Nuclear Plant, Unit 1
Location:	Mineral, VA 23117
Dates:	September 19-22, 2016
Inspector:	A. Sengupta, Reactor Inspector P. Cooper, Reactor Inspector
Approved by:	Shakur A. Walker, Branch Chief Engineering Branch 3 Division of Reactor Safety

Enclosure

SUMMARY

Inspection Report (IR) 05000338/2016009; 9/19/2016 – 9/22/2016; North Anna Nuclear Plant, Unit 1; Post-Approval Site Inspection for License Renewal.

The report covers an inspection conducted by two regional inspectors in accordance with the U.S. Nuclear Regulatory Commission (NRC) Inspector Manual Chapter (IMC) 2515, and NRC Inspection Procedure 71003, Post-Approval Site Inspection for License Renewal, dated July 18, 2016.

Based on the sample selected for review, the inspectors determined that commitments, license conditions, and regulatory requirements associated with the renewed facility operating license were either being met; or where commitment actions had not been completed, that the licensee had administrative controls in place to ensure completion before the period of extended operation.

The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

No findings were identified during this inspection.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA5 Other Activities

.1 Post-Approval Site Inspection for License Renewal (Phase 1)

a. Inspection Scope

Implementation of License Conditions and Commitments, including Aging Management Programs: The inspectors reviewed a sample of license renewal activities scheduled for the Unit 1 Fall 2016 refueling outage, which was the second to the last outage prior to the period of extended operation (PEO). The objective of the inspection was to maximize observations of the actual implementation of license renewal activities before the beginning of the PEO (April 1, 2018), and verify that the licensee has completed the necessary actions to:(a) comply with the conditions stipulated in the renewed facility operating license; (b) meet the license renewal commitments described in NUREG-1766, "Safety Evaluation Report (SER) Related to the License Renewal of the North Anna Nuclear Plant, Units 1 and 2 and Surry Power Station, Unit 1 and 2" (ADAMS Accession Number ML030160853); and (c) meet the future activities, including the Aging Management Programs (AMPs), described in the Updated Final Safety Analysis Report (UFSAR) supplement submitted pursuant to 10 CFR 54.21(d).

The inspectors performed a walkdown to assess the general condition of containment with regard to age-related issues to verify the overall condition of the systems, structures, and components (SSCs) was acceptable; this has been credited under the Boric Acid Corrosion Surveillance Program and the Inservice Inspection (ISI) Program – Component and Component Support Inspections.

The inspectors reviewed the supporting documents, conducted interviews with the licensee staff, observed in-process outage activities, and performed visual inspection of SSCs including those which were not accessible during the power operation. The commitment items and AMPs selected for the inspection sample are summarized below based on their description in Appendix A of the License Renewal Application. The specific inspection activities conducted for each AMP are also described below. Specific documents reviewed are also listed in the report Attachment.

Commitment Item # 6 – Fire Protection Program (18.2.7)

This commitment specified that the licensee is to incorporate the requirements of NFPA-25, Section 2-3.1.1 for sprinklers into the Fire Protection Program. This section requires replacement or testing of a representative sample of sprinklers that have been in service for 50 years. A representative sample consists of a minimum of not less than 4 sprinklers or 1 percent of the number of sprinklers per individual sprinkler sample, whichever is greater. When testing is utilized, it shall be repeated every 10 years.

The inspector reviewed the Engineering Technical Evaluation and interviewed plant personnel to verify the administrative controls were in process to ensure the commitment will be met, as described in licensee correspondence and the NRC SER, at or before the

sprinklers reached their 50 year service life. The inspector conducted a walkdown of the fire protection system to evaluate the general condition of the piping system and to verify the aging mechanisms described in the SER would be managed by the described program.

Commitment Item #8 – General Condition Monitoring Activities (18.2.9)

This commitment specified the licensee will develop procedural guidance for inspection criteria that puts a focus on aging effects. The General Condition Monitoring Activities Program assesses and manages the aging of components in normally accessible areas. This monitoring is based on the observations that are made during focused inspections that are performed on a periodic basis, such as, the Boric Acid Corrosion Control Program, and the ASME Section XI Program.

The inspectors performed a walkdown inside containment to assess general conditions with regard to age-related issues and verified the overall condition of SSCs credited under the program.

The inspectors reviewed the implementing procedures, and the other documents to verify that the inspection program was conducted as described in the NRC SER.

Commitment Item # 10 –Tank Inspection Activities (18.1.3)

This commitment specified that prior to the PEO, the licensee will perform a one-time inspection of tanks and will use a representative sampling of each type of tank. The licensee committed to perform the tank inspection activities between year 30 and the end of the current operating license term.

The inspectors performed a walkdown of all above-ground tanks including the refueling water storage tank (RWST) and emergency condensate storage tank.

The inspectors reviewed the commitment completion forms, licensing basis, implementing procedures, engineering evaluations, personnel qualifications, and work orders to verify that the one-time inspection was conducted as stated in the commitment; and to verify that the commitment was completed as described in the licensee correspondence and the NRC SER. The inspectors also verified that for those one-time inspections which were not complete at the time of the inspection, the licensee had a plan in place to complete these inspections prior to the start of the PEO (e.g., the licensee will be completing the RWST inspection by November 2016.)

Commitment Item # 13 – Inspection Activities - Load Handling Cranes and Devices (18.2.10)

This commitment specified that a one-time inspection of a representative sample of the box girders for the polar cranes shall be performed between year 30 and the end of the current operating license term. Visual inspections can be used to verify the overall condition of the cranes and monorails, aging mechanisms and overall condition.

The inspectors reviewed the work order associated with the visual examination of the polar crane box girder to verify that the activities were completed during this refueling outage and to confirm the results of the inspection were acceptable. The inspector also

conducted a walkdown of containment to visually inspect the exterior condition of the polar crane and to verify the aging mechanisms described in the SER would be managed by the described program.

Commitment Item # 14 – Reactor Vessel Internals Inspection (18.2.15)

This commitment specified that the licensee will follow industry activities related to reactor vessel internal issues (i.e., void swelling, thermal and neutron embrittlement, etc.) and will evaluate industry recommendations. The licensee committed to a one-time inspection between 30-40 years of operation prior to entering the PEO.

The inspectors conducted a walkdown inside containment accessible areas. The inspectors also observed the ultrasonic testing data collection for the baffle-former bolts.

The inspectors reviewed the commitment completion forms, licensing basis, and implementing procedures to verify that the one-time inspection program was conducted as stated in the commitment; and to verify that the commitment was completed as described in the licensee correspondence and the NRC SER. Specifically, the inspectors verified that the licensee had had a plan in place to complete this inspection in accordance with MRP-227 for both units.

Commitment Item # 17 – Infrequently Accessed Area Inspection Activities (18.1.2)

This commitment specified that the licensee will develop and implement an inspection program for infrequently accessed areas. This commitment also specified that prior to the PEO, the licensee will perform a one-time inspection of infrequently accessed areas, between years 30-40. Additional inspections will be every 10 years thereafter.

The inspectors conducted a walkdown inside the volume control tank cubicle.

The inspectors reviewed the commitment completion forms to verify that the one-time inspection program was conducted as stated in the commitment; and to verify that the commitment was completed as described in the licensee correspondence and the NRC SER. The inspectors also verified that for those inspections which were not completed at the time of the inspection, the licensee had a plan in place to complete these inspections prior to the start of the PEO.

Commitment Item # 19 – Non- Environmentally Qualified (EQ) Cable Monitoring (18.1.4)

This commitment specified that the licensee will develop and implement an inspection program for non-EQ cables. This program shall assure that the non-EQ cables exposed to adverse localized environments caused by heat, radiation, or moisture, will be maintained consistent with the current licensing basis through the PEO. Additionally, a one-time inspection of this program shall be performed between year 30 and the end of the current operating license term, and then every 10 years thereafter.

The inspector reviewed the Engineering Technical Evaluation and work orders associated with the visual inspection of the non-EQ cables inside containment to verify the inspection was completed prior to the PEO, and to confirm the results of the inspection were acceptable. The inspectors also conducted a walkdown of containment

to visually inspect the current condition of the non-EQ cables and to verify the aging mechanisms described in the SER would be managed by the program.

Commitment Item # 22 – Work Control Process (18.2.19)

This commitment specified that the licensee will perform an audit of work control processes to ensure representation by all systems in-scope of license renewal and to determine the need for supplemental inspections. This commitment specified that the licensee will conduct the inspections prior to the PEO. Additional inspections will be every 10 years thereafter. Supplemental inspections will be within 5 years of the audit.

The inspectors performed a walkdown and observed the main steam safety valve license renewal inspection. The inspectors also observed the butterfly valve replacement on the bearing cooling water system.

The inspectors reviewed the commitment completion forms, licensing basis, implementing procedures, work orders and other documents to verify that the inspection program was conducted as stated in the commitment; and to verify that the commitment was completed as described in the licensee correspondence and the NRC SER. The inspectors also verified that for those inspections which were not completed at the time of the inspection, the licensee had a plan in place to complete these inspections prior to the start of the PEO.

Commitment Item # 24 – Augmented Inspection Activities (18.2.1)

This commitment specified that the licensee will provide inspection details to ensure representation of all the systems in-scope of license renewal and to determine the need for supplemental inspections. This commitment specified that the licensee will conduct these inspections prior to the PEO.

The inspectors conducted a walkdown inside containment near the pressurizer surge line.

The inspectors reviewed the commitment completion forms, licensing basis, implementing procedures, work orders and other documents to verify that the inspection program was conducted as stated in the commitment; and to verify that the commitment was completed as described in the licensee correspondence and the NRC SER. The inspectors also verified that for those inspections which were not completed at the time of the inspection, the licensee had a plan in place to complete these inspections prior to the start of the PEO.

Secondary Piping and Component Inspection/ Flow Accelerated Corrosion (18.2.16)

The licensee credited this inspection program with implementing a standardized method of identifying and inspecting components that are susceptible to flow-accelerated corrosion (FAC).

The inspectors observed the ultrasonic inspection of the main steam line to high pressure turbine line.

The inspectors reviewed the commitment, implementing procedures, work orders, and other documents to verify that the inspection was conducted as stated in the commitment; and to verify that the commitment was completed as described in the licensee correspondence and the NRC SER.

Review of Newly-Identified SSCs: This inspection requirement will be completed during the Phase 2 implementation of inspection procedure (IP) 71003.

Descriptions of AMPs and Time-Limited Aging Analysis (TLAA) in the UFSAR Supplement: The review of the description of AMPs and TLAAs in the UFSAR supplement submitted pursuant 10 CFR 54.21(d) will be completed during the Phase 2 implementation of IP 71003.

Review of License Renewal Commitment Changes: This inspection requirement will be completed during the Phase 2 implementation of IP 71003.

b. Findings and Observations

No findings were identified.

4OA6 Management Meetings

.1 Exit Meeting Summary

On September 22, 2016, the inspector presented the inspection results to Mr. Jerry Bischof, Senior Vice President, and other members of station staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTARY INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel
M. Whalen, Licensing
M. Bourdeau, License Renewal

NRC
G. Croon, Senior Resident Inspector
G. Eatmon, Resident Inspector

LIST OF DOCUMENTS REVIEWED

Commitment #6 – Fire Protection Program (18.2.7)
Other Documents
ETE-NA-2016-0024, Engineering Technical Evaluation, Incorporate NFPA 25, Section 2-3.1.1, 3/29/16

Commitment #8 – General Condition Monitoring (18.2.9)
Procedures
1-PT-161, Rev. 1, License Renewal General Condition Monitoring Review Unit 1 Containment
1-PT-57.3, Rev. 27, Containment Recirculation Spray Pump and LHSI Suction Header/ Recirculation Spray Suction Header Visual Examination (General Condition Monitoring)

Other Procedures
ER-AA-NDE-140, Rev. 5, Processing of Dominion NDE Data
ER-AA-AMP-101, Rev. 6, Implementation of Activities Performed by License Renewal Aging Management Coordinators

Commitment Item #10 –Tank Inspection Activities (18.1.3)
New CR generated
1048163, A discrepancy on NDE form BOP-UT-16-079 discovered during License Renewal Inspection

CRs Reviewed
1047487, Initial Internal Coatings of 1–CN-TK-1 (WO#59102920494)
416769, Excessive Moss/Vegetation Found During Maintenance Rule Inspection

Work Orders (WO)
59102920494, Perform Internal Coating Inspection for Unit 1 Condensate Storage Tank for License Renewal
59102920494, Report on Low Frequency Electromagnetic Technique with Ultrasonic Thickness
59102858806, DC NA-16-00031 Unit 1 RWST License Renewal Inspection

Modified WO
59102275253, Excessive Moss/Vegetation Found During Maintenance Rule Inspection

Procedures
ER-AA-NDE-UT-701, Rev. 6, Ultrasonic Thickness Measurements Procedure

Other Documents
Design Change NA-16-00031, Unit 1 RWST License Renewal Inspection (Tank- One-Time Inspection Program)

Commitment #13 – Inspection Activities – Load Handling Cranes and Devices (18.2.10)
Work Orders
59101831387, Visual Inspection of Polar Crane Girder Interior, 9/15/16

Commitment Item #14 –Reactor Vessel Internals Inspection (18.2.15)
Procedures
54-ISI-902-003, Rev. 0, Ultrasonic Examination of Slotted Hex (Type C) and Round Head (Type D) Baffle Bolts (Reactor Vessel Internals)

Commitment #19 – Non-EQ Cable Monitoring (18.1.4)
Other Documents
ETE-NA-2015-008, Engineering Technical Evaluation, Visual Inspections of Accessible Non-EQ Cables and Connectors, 3/3/15

Work Orders
59102578028, Engineering Outage Related Cable Walkdowns, 9/11/13
59102578029, Engineering Outage Related Cable Walkdowns, 4/14/13

Commitment Item #22- Work Control Process (18.2.19)
Work Orders
5910119875, Main Steam Safety Valve License Renewal Inspection (01-MS-SV-101C-Valve)
59102780429, Bearing Cooling Water – Replace Butterfly Valve

Procedures
1-MCM-0415-02, Rev. 3, Mechanical Corrective Maintenance

Other Documents
NDE Certification of Pat Naughton, Matt Anderson

Commitment Item #24 –Augmented Inspection Activities (18.2.1)
Work Orders
59102983133, Pressurizer Surge Line PT, UT (Weld 37 14-RC-10 & Weld SW-31 29-RC-7)

Procedures
ER-NA-AUG-101, Rev. 5, North Anna Augmented Inspection Program
ER-AA-NDE-PT-300, Rev. 7, ASME Section XI Liquid Penetrant Examination Procedure
ER-AA-NDE-UT-802-NPQR, Rev. 3, Ultrasonic Examination of Austenitic Piping Welds in Accordance with ASME Section XI, Appendix VIII

Other Documents
NDE Certifications of Jeff Odegard, Aaron Stevermer, Wayne Thomas, Brenton Thompson, James Shelton, Gary Fuechtmann, Darrel Popp

Secondary Piping and Component Inspection/ Flow Accelerated Corrosion (18.2.16)
Work Orders

59102847742, FAC-Mainsteam System to HPT (1-MS-PP5B-8 and 1-MS-PPs-906, Pipe# 1-MS-PP-28.00-SHP-PIPE-5-601)

Procedures
ER-AA-NDE-UT-701, Rev. 6, Ultrasonic Thickness Measurements Procedure
ER-AA-FAC-1002, Rev. 10, Flow-Accelerated Corrosion (FAC) Inspection and Evaluation Activities

Other Documents
NDE Certification of Bruce Matowitz

LIST OF ACRONYMS

AMPs	Aging Management Programs
IP	Inspection Procedure
PEO	Period of Extended Operation
SER	Safety Evaluation Report
SSCs	Systems, Structures, or Components
TLAA	Time-Limited Aging Analysis
UFSAR	Updated Final Safety Analysis Report
UT	Ultrasonic Examination
WOs	Work Orders