



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

August 15, 2017

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

**SUBJECT: NORTH ANNA POWER STATION – NRC PROBLEM IDENTIFICATION
AND RESOLUTION INSPECTION REPORT 05000338/2017009 AND
05000339/2017009**

Dear Mr. Stoddard:

On July 27, 2017, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your North Anna Power Station Units 1 and 2. The enclosed report documents the inspection findings, which were discussed on July 27, 2017, with Ms. L. Hilbert and other members of your staff. The inspection team documented the results of this inspection in the enclosed inspection report.

The NRC inspection team reviewed the plant's corrective action program and the plant's implementation of the program to evaluate its effectiveness in identifying, prioritizing, evaluating, and correcting problems, and to confirm that the plant was complying with NRC regulations and licensee standards for corrective action programs. Based on the samples reviewed, the inspectors determined that your staff's performance in each of these areas adequately supported nuclear safety.

The inspectors also evaluated the plant's processes for use of industry and NRC operating experience information and the effectiveness of the plant's audits and self-assessments. Based on the samples reviewed, the inspectors determined that your staff's performance in each of these areas adequately supported nuclear safety.

Finally, the inspectors reviewed the plant's programs to establish and maintain a safety-conscious work environment, and interviewed plant personnel to evaluate the effectiveness of these programs. Based on the team's observations and the results of these interviews the inspectors found no evidence of challenges to your organization's safety-conscious work environment. Your employees appeared willing to raise nuclear safety concerns through at least one of the several means available.

D. Stoddard

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The NRC inspectors did not identify any findings or violations 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/

Reinaldo Rodriguez, Chief
Reactor Projects Branch 7
Division of Reactor Projects

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

Enclosure:
IR 05000338/2017009 and 05000339/2017009
w/Attachment: Supplemental Information

cc Distribution via ListServ

D. Stoddard

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| NAME | NStaples | DPiccirillo | DMerzke | DTerry-Ward | RRodriguez | |
| DATE | 8/11/2017 | 8/4/2017 | 8/4/2017 | 8/11/2017 | 8/15/2017 | |

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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos.: 50-338, 50-339

License Nos.: NPF-4, NPF-7

Report Nos.: 05000338/2017009 and 05000339/2017009

Licensee: Virginia Electric and Power Company

Facility: North Anna Power Station, Units 1 and 2

Location: Mineral, VA

Dates: July 10 – 14, 2017
July 24 – 27, 2017

Inspectors: N. Staples, Senior Project Inspector, Team Leader
D. Piccirillo, Senior Construction Inspector
D. Merzke, Senior Reactor Operations Engineer
D. Terry-Ward, Construction Inspector

Approved by: R. Rodriguez, Chief
Reactor Projects Branch 7
Division of Reactor Projects

Enclosure

SUMMARY

IR 05000338/2017009 and 05000339/2017009; July 10-14 – July 24-27, 2017; North Anna Power Station, Units 1 and 2; Biennial Inspection of the Problem Identification and Resolution Report.

The inspection was conducted by a senior project inspector, a senior construction inspector, a senior operations inspector, and a construction inspector. No findings were identified. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Identification and Resolution of Problems

The inspectors concluded that, in general, problems were properly identified, evaluated, prioritized, and corrected. The licensee was effective at identifying problems and entering them into the corrective action program (CAP) for resolution, as evidenced by the relatively few number of deficiencies identified by external organizations (including the NRC) that had not been previously identified by the licensee during the review period. Generally, prioritization and evaluation of issues were adequate, formal root cause evaluations for significant problems were adequate, and corrective actions specified for problems were acceptable. Overall, corrective actions developed and implemented for issues were generally effective and implemented in a timely manner.

The inspectors determined that overall, audits and self-assessments were adequate in identifying deficiencies and areas for improvement in the CAP, and appropriate corrective actions were developed to address the issues identified. Operating experience (OE) usage was found to be generally acceptable and integrated into the licensee's processes for performing and managing work, and plant operations.

Based on discussions and interviews conducted with plant employees from various departments, the inspectors determined that personnel at the site felt free to raise safety concerns to management and use the CAP to resolve those concerns.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution

.1 Assessment of the Corrective Action Program

a. Inspection Scope

The inspectors reviewed the licensee's Corrective Action Program (CAP) procedures which described the administrative process for initiating and resolving problems primarily through the use of condition reports (CRs). To verify that problems were properly identified, appropriately characterized, and entered into the CAP, the inspectors reviewed CRs that had been issued between March 2015 and July 2017, including a detailed review of selected CRs associated with the following risk-significant systems: High Head Safety Injection (HHSI), Reactor Protection System (RPS), and Reactor Coolant (RC). Where possible, the inspectors independently verified that the corrective actions (CA) were implemented as intended. The inspectors also reviewed selected common causes and generic concerns associated with root cause evaluations (RCE) to determine if they had been appropriately addressed. To help ensure that samples were reviewed across all cornerstones of safety identified in the Reactor Oversight Process (ROP), the inspectors selected a representative number of CRs that were identified and assigned to the major plant departments, including quality assurance, health physics, chemistry, emergency preparedness and security. These CRs were reviewed to assess each department's threshold for identifying and documenting plant problems, thoroughness of evaluations, and adequacy of corrective actions. The inspectors reviewed selected CRs, verified corrective actions were implemented, and attended meetings where CRs were evaluated for significance to determine whether the licensee was identifying, accurately characterizing, and entering problems into the CAP at an appropriate threshold.

The inspectors conducted plant walkdowns within the selected systems listed above and other plant areas to assess the material condition and to identify any deficiencies that had not been previously entered into the CAP. The inspectors reviewed CRs, maintenance history, CAs, completed work orders (WOs) for the systems, and reviewed associated system health reports. These reviews were performed to verify that problems were being properly identified, appropriately characterized, and entered into the CAP. Items reviewed generally covered a two-year period; however, in accordance with the inspection procedure, a five-year review was performed for selected systems for age-dependent issues.

Control room walk-downs were also performed to assess the main control room (MCR) deficiency list and to ascertain if deficiencies were entered into the CAP and tracked to resolution. Operator workarounds (OWA) and operator burden screenings were reviewed, and the inspectors verified compensatory measures for deficient equipment which were being implemented in the field.

The inspectors conducted a detailed review of selected CRs to assess the adequacy of the cause evaluations of the problems identified. The inspectors reviewed these evaluations against the descriptions of the problem described in the CRs and the

guidance in licensee procedure PI-AA-300-3001, "Root Cause Evaluation." The inspectors assessed if the licensee had adequately determined the cause(s) of identified problems, and had adequately addressed operability, reportability, common cause, generic concerns, extent-of-condition, and extent-of-cause. The review also assessed if the licensee had appropriately identified and prioritized corrective actions to prevent recurrence.

The inspectors reviewed selected industry operating experience (OE) items, including NRC generic communications, to verify that they had been appropriately evaluated for applicability and that issues identified through these reviews had been entered into the CAP.

The inspectors reviewed site trend reports, to determine if the licensee effectively trended identified issues and initiated appropriate corrective actions when adverse trends were identified.

The inspectors reviewed licensee audits and self-assessments, including those which focused on problem identification and resolution programs and processes, to verify that findings were entered into the CAP and to verify that these audits and assessments were consistent with the NRC's assessment of the licensee's CAP.

The inspectors attended various plant meetings to observe management oversight functions of the corrective action process. These meetings included Condition Report Review Team (CRT) and Corrective Action Assignment Review Team (CAART).

Documents reviewed are listed in the Attachment.

b. Assessment

Problem Identification

The inspectors determined that the licensee was generally effective in identifying problems and entering them into the CAP and there was an appropriately low threshold for entering issues into the CAP. This conclusion was based on a review of the requirements for initiating CRs as described in licensee procedure PI-AA-200, "Corrective Action," in addition to management's expectation that employees were encouraged to initiate CRs for any reason. Trending was generally effective in monitoring equipment performance. Site management was actively involved in the CAP and focused appropriate attention on significant plant issues.

Problem Prioritization and Evaluation

Based on the review of CRs sampled by the inspection inspectors during the onsite period, the inspectors concluded that problems were generally prioritized and evaluated in accordance with the licensee's CAP procedures as described in the CR significance determination guidance in PI-AA-200. Each CR was assigned a priority level at the CR screening meeting, and adequate consideration was given to system or component operability and associated plant risk.

The inspectors determined that station personnel had conducted root cause and apparent cause analyses in compliance with the licensee's CAP procedures and assigned cause determinations were appropriate, considering the significance of the issues being evaluated. A variety of formal causal-analysis techniques were used depending on the type and complexity of the issue consistent with procedures.

Effectiveness of Corrective Actions

Based on a review of corrective action documents, interviews with licensee staff, and verification of completed corrective actions, the inspectors determined that overall, corrective actions were timely, commensurate with the safety significance of the issues, and effective, in that conditions adverse to quality were corrected and non-recurring. For significant conditions adverse to quality, the corrective actions directly addressed the cause and effectively prevented recurrence in that a review of performance indicators, CRs, and effectiveness reviews demonstrated that the significant conditions adverse to quality had not recurred. Effectiveness reviews for corrective actions to prevent recurrence were sufficient to ensure corrective actions were properly implemented and were effective.

c. Findings

No findings were identified.

2. Assessment of the Use of Operating Experience

a. Inspection Scope

The inspectors examined the licensee's use of industry OE to assess the effectiveness of the plant. In addition, the inspectors selected OE documents (e.g., NRC generic communications, 10 CFR Part 21 reports, licensee event reports, vendor notifications, and plant internal OE items, etc.) which had been issued since June 2015, to verify whether the licensee had appropriately evaluated each notification for applicability to the North Anna Power Station, and whether issues identified through these reviews were entered into the CAP. Documents reviewed are listed in the Attachment.

b. Assessment

Based on a review of selected documentation related to operating experience issues, the inspectors determined that the licensee was generally effective in screening operating experience for applicability to the plant. Industry OE was evaluated at either the corporate or plant level depending on the source and type of the document. Relevant information was then forwarded to the applicable department for further action or informational purposes. OE issues requiring action were entered into the CAP for tracking and closure. In addition, operating experience was included in all root cause evaluations in accordance with licensee procedure PI-AA-300-3001, "Root Cause Evaluation."

c. Findings

No findings were identified.

.3 Self-Assessments and Audits

a. Inspection Scope

The inspectors reviewed audit reports and self-assessment reports, including those which focused on problem identification and resolution, to assess the thoroughness and self-criticism of the licensee's audits and self-assessments, and to verify that problems identified through those activities were appropriately prioritized and entered into the CAP for resolution in accordance with licensee procedure PI-AA-100-1004, "Self Assessments."

b. Assessment

The inspectors determined that the scopes of assessments and audits were adequate. Self-assessments were generally detailed and critical, as evidenced by findings consistent with the inspector's independent review. The inspectors verified that CRs were created to document areas for improvement and findings resulting from the self-assessments, and verified that actions had been completed consistent with those recommendations. Generally, the licensee performed evaluations that were technically accurate.

c. Findings

No findings were identified.

.4 Assessment of Safety-Conscious Work Environment

a. Inspection Scope

During the course of the inspection, the inspectors assessed the station's safety-conscious work environment through review of the station's Employee Concerns Program (ECP) and interviews with various departmental personnel. The inspectors reviewed a sample of ECP issues to verify that concerns were being properly reviewed and identified deficiencies were being resolved and entered into the CAP when appropriate.

b. Assessment

Based on the interviews conducted and the CRs reviewed, the inspectors determined that licensee management emphasized the need for all employees to identify and report problems using the appropriate methods established within the administrative programs, including the CAP and ECP. These methods were readily accessible to all employees. Based on discussions conducted with a sample of plant employees from various departments, the inspectors determined that employees felt free to raise issues, and that management encouraged employees to place issues into the CAP for resolution. The inspectors did not identify any reluctance on the part of the licensee staff to report safety concerns.

c. Findings

No findings were identified.

40A6 Exit

Exit Meeting Summary

On July 27, 2017, the inspectors presented the inspection results to Ms. Lisa Hilbert and other members of the site staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

ATTACHMENT: SUPPLEMENTAL INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee personnel:

W. Belcher, ECP Specialist
J. Tew, Engineering
D. McGinnis, Station Licensing
L. Hembree, Engineering
J. Schleser, Manager Organization Effectiveness
F. Errico, CAP Supervisor
P. Harper, CAP Coordinator
L. Hilbert, Plant Manager
B. Standley, Director Station Safety and Licensing
C. Staub, System Engineer – SI
A. Dowell, System Engineer – 7300 System
C. Allmond, Buried Piping Engineer
A. McEnroe, Maintenance Rule Engineer
M. Bordeaux, Maintenance Rule Engineer

NRC personnel:

G. Eatmon, Resident Inspector

LIST OF REPORT ITEMS

Opened and Closed

None

Closed

None

Discussed

None

LIST OF DOCUMENTS REVIEWED

Procedures

0-MCM-0412-02, Mechanical Corrective Maintenance, Repair of the Terry Turbine Governor Valve, Rev.12
1-FCA-11, Safeguards/Quench Spray Pump House/MSVH Fire (with Eight Attachments), Rev. 8
1-MPM-0412-02, Mechanical Preventive Maintenance, Disconnecting and Stroking the Unit 1 Terry Turbine Governor Valve Stem, Rev. 2
2-MPM-0412-02, Mechanical Preventive Maintenance, Disconnecting and Stroking the Unit 2 Terry Turbine Governor Valve Stem, Rev 5.
ER-AA-MRL-10, Maintenance Rule Program, Rev. 4, 6
ER-AA-MRL-100, Implementing Maintenance Rule, Rev. 11
ER-AA-PRS-1002, Equipment Reliability Health Report, Rev. 8
ER-AA-PRS-1003, Equipment Reliability Component Classification, Rev. 8
ER-AA-PRS-1005, Single Point Vulnerability Reviews, Rev. 5
ER-AA-PRS-1010, Preventative Maintenance Task Basis & Maintenance Strategy, Rev. 10
ER-AA-SYS-1001, System Health Report, Rev. 11
ER-AA-SYS-1003, System Performance Monitoring, Rev. 6
ER-AA-5003, Life Cycle Management Planning, Rev. 8
NCRODP-77-NA Module, Reactor Protection Systems, dated 01/27/14
OP-AA-102, Operability Determination, Rev. 15
PI-AA-100-1004, Self-Assessments, Rev.14
PI-AA-100-1007, Operating Experience Program, Rev. 11
PI-AA-200, Corrective Action, Rev. 33
PI-AA-300-3001, Root Cause Evaluation, Rev. 4
PI-AA-300-3004, Cause Evaluation Methods, Rev. 14
PI-AA-300-3006, Equipment Apparent Cause Evaluation (E-ACE), Rev. 2

Condition Reports Reviewed

| | | | |
|---------|---------|---------|---------|
| 1066672 | 1053159 | 1034958 | 1017291 |
| 1066043 | 1052562 | 1034362 | 1017291 |
| 1065665 | 1051150 | 1033334 | 1017083 |
| 1063116 | 1051148 | 1032774 | 1016138 |
| 1061681 | 1050193 | 1032635 | 1014249 |
| 1060157 | 1050034 | 1032194 | 1013669 |
| 1059499 | 1049899 | 1032073 | 1013471 |
| 1058694 | 1049360 | 1030340 | 1012468 |
| 1058146 | 1049138 | 1030226 | 1012062 |
| 1058021 | 1049083 | 1029740 | 1010887 |
| 1057678 | 1048545 | 1029600 | 1010787 |
| 1057271 | 1046790 | 1028572 | 1010424 |
| 1057083 | 1046295 | 1026841 | 1009815 |
| 1057028 | 1043540 | 1026762 | 1006865 |
| 1057008 | 1043504 | 1026761 | 1005386 |
| 1056808 | 1036687 | 1026760 | 1005293 |
| 1056668 | 1036685 | 1022542 | 1003896 |
| 1056445 | 1036685 | 1021404 | 1000248 |
| 1056261 | 1035531 | 1018274 | 1045674 |
| 1054993 | 1035524 | 1018149 | 1039593 |
| 1053945 | 1035423 | 1018121 | 1039545 |
| 1053945 | 1035092 | 1018070 | 1046659 |

| | | | |
|---------|--------|--------|--------|
| 1017083 | 577601 | 573729 | 568000 |
| 1064702 | 575828 | 573617 | 567185 |
| 1065752 | 575498 | 573505 | 567122 |
| 1065817 | 575447 | 573491 | 560854 |
| 558708 | 575433 | 573349 | 559591 |
| 572760 | 575430 | 572803 | 553025 |
| 582757 | 575429 | 572803 | 540937 |
| 581157 | 575390 | 572768 | 532383 |
| 580183 | 575223 | 572760 | 001138 |
| 579372 | 575035 | 572757 | 001135 |
| 578896 | 574869 | 571983 | |
| 578841 | 574800 | 571591 | |
| 572760 | 574429 | 570769 | |

Condition Reports Generated

1074281, CAPR Effectiveness

Work Orders Reviewed

59102953486
 59103009068
 59102858264
 59102971001
 59102971021
 59103045083
 59102858264
 59102962896
 59102644515
 59103032787
 59102850984
 59102851277
 59102888162

Self-Assessments

Audit 16-04, Nuclear Oversight Audit Report, RP/Chemistry/PCP/Millstone Refueling, dated June 22, 2016

ACE 019889, PI-AA-300-3002, Attachment 1, CR#572803, 1-FW-P-2 governor did not maintain speed during PT, event dated 12/27/2015

ACE 019889, PI-AA-200-202, Attachment 2, Apparent Cause Evaluation Effectiveness Review, 1-FW-P-2 governor did not maintain speed during PT, review date 3/27/15

E-ACE/CR #1049899, PI-AA-300-3006, Equipment Cause Evaluation Checklist, Attachment 1, validated 10/31/2016

Self-Assessment, PIR Number 1019503, Radiological Protection –Chemistry Quality Control, Performance Improvement, Report Due Date 4/30/2016

Self-Assessment, PIR Number 1010037, Diesel Fuel Oil Program, Report Due Date 11/30/2015

Self-Assessment PIR Number 1059147, Respiratory Protection Program, Report Due Date 06-30-2017

Self-Assessment PIR Number 1064399, Radiological Protection, dated Feb. 2017

Self-Assessment PIR1008212, North Anna Maintenance Rule (a) (3) Periodic Assessment, report due date 12/17/2015

Self-Assessment PIR1020781, Pre-PI&R Assessment, report due date 7/22/16

RCE001135, Root Cause Evaluation, U-1 Voltage Regulator Failed High Resulting in U1 Manual Reactor Trip, North Anna Power Station/Unit 1, 07/15/2015

Other Documents

Calc ME-0584, Addendum ODA, Maximum AFW Pump Flow and NPSH Analysis

Calc ME-0572, Addendum D, TDAFW Pump Operation at the Point the RHR System is Placed in Service

OD: 2-SI-P-1A Seal Leakage Operability Determination

RCE001134, Unit 1 Reactor Trip on 'B' Steam Generator Low-Low Level Due to 'B' Main Feed Regulating Valve Failing Closed

System Health Report – Safety Injection Q4-2016

SAR PIR1008212 – NAPS Maintenance Rule (a)(3) Self-Assessment

Trip Report N1-02-26-15, North Anna Unit 1 Trip 02-26-15

DOM-QA-1, Dominion Energy, Nuclear Facility Quality Assurance Program Description, Topical Report, Rev. 25

SDBD-NAPS-RPS, System Design Basis Document for Reactor Protection System, Rev. 17

LER 2015-002-00, Manual Reactor Trip Due to Inability to Maintain Main Generator Voltage in Specification, report date 05/22/2015

LER 2015-002-01, Manual Reactor Trip Due to Inability to Maintain Main Generator Voltage in Specification, report date 09/03/2015

CA3012691, CR Assignment Details, North Anna Design to create an ETE to formally document results so they may be added to the AP, complete 02/19/2016

CA3015121, CR Assignment Details, During the 2015 TFPI, a discrepancy was noted in Appendix R procedure 2-FCA-11 (SG/QS/MSVH Fire), complete 11/19/2015

CA3016110, Implement revisions to procedure 1 / 2-FCA-11, complete 02/16/2016

CA3017882, Perform MRule Functional Failure evaluation for TSC UPS UV transfer light lite, complete 12/17/2015

CA303242, ER-AA-PRS-1003, Criticality Classification Revision Request, Attachment 1, page 1, approval date 8/3/15

CA3035136, Perform MRule Functional Failure evaluation-TSC UPS Battery Ground, complete 08/11/2016

CA3036784, Perform MRule Functional Failure evaluation (1-EP-27C-1NNSF05-RELAY-F (0B-C), complete 08/11/2016

CA3047691, Perform MRule Functional Failure evaluation TSC UPS "Bypass Breaker Closed" & "UPS OFF" Alarms on 1, complete 01/25/2017

ETE-NA-2016-0013, Vital Bus Appendix R Evaluation of Associated Circuits for ½ cycle instantaneous faults, Rev. 0

MRE 017888, Unit 2 SSPS train "A" power supply 2 has excessive noise, Rev. 0

MRE 018459, Perform Maintenance Rule Functional Failure evaluation (1-RPS-PS-2B), Rev.0

MRE 018427, 1-FW-P-2 (Steam Driven AFW pump) governor did not maintain speed, Rev. 0

NCRODP-77-NA, Nuclear Training Module, Reactor Protection Systems

N1-04-02-15, Trip Report, North Anna Unit 1 Trip, review date 04/30/15

RP-AA-221, Map Number 8, Auxiliary Building 244', review date 10/14/15

RP-AA-221, Map Number 8J, Demin Alley Weekly Dose Rate Trending Survey, review date 10/17/15

RP-AA-221, Map Number 8, Auxiliary Building 244', review date 10/17/15

RP-AA-221, Map Number 8i, Auxiliary Building 244', weekly Dose Rate Trending Survey, date 10/17/15

TR-AA-100 – Attachment 1, Training Request and Needs Analysis, ACE 19889, date 5/5/2015

PI-AA-5003, CR number 1036687, Engineering Personnel identified that 1-CH-P-1C, Unit 1 "C" Charging pump, had exceeded its unavailability performance criteria back in December 2015, completed 5/11/16