UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
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ATLANTA, GEORGIA 30303-8931

July 25, 2000

Virginia Electric and Power Company
ATTN: Mr. David A. Christian
Senior Vice President and
Chief Nuclear Officer
Innsbrook Technical Center - 2SW
5000 Dominion Boulevard
Glen Allen, VA 23060-6711

SUBJECT: NORTH ANNA POWER STATION - NRC INSPECTION REPORT NOS. 50-338/00-08, 50-339/00-08

Dear Mr. Christian:

On June 8, 2000, the NRC completed an inspection at your North Anna Power Station, Units 1 and 2. The enclosed report presents the results of that inspection. The results of this inspection were discussed on June 8, 2000, with Mr. W. Matthews and other members of your staff.

The inspection was an examination of activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. Within these areas, the inspection consisted of a selective examination of procedures and representative records, observations of activities, and interviews with personnel.

There was one green finding identified during this inspection associated with the problem identification process not recognizing an example of equipment testing preconditioning. This finding was determined to be a violation of NRC requirements. However, the violation was not cited due to its very low safety significance and because it had been entered into your corrective action program. If you contest this non-cited violation you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the United States Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001, with copies to the Regional Administrator, Region II; the Director, Office of Enforcement, United States Nuclear Regulatory Commission, Washington, DC 20555-0001; and the NRC Resident Inspector at the North Anna Power Station. The team concluded that generally problems were properly identified, evaluated and resolved within the problem identification and resolution programs.

In accordance with 10 CFR 2.790 of the NRC's "Rules of Practice," a copy of this letter and its enclosure will be available **electronically** for public inspection in the NRC Public Document Room **or** from the Publicly Available Records (PARS) component of NRC's document system

(ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/NRC/ADAMS/index.html (the Public Electronic Reading Room).

Sincerely,
/RA/

Robert Haag, Chief
Reactor Projects Branch 5
Division of Reactor Projects

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

Enclosure: NRC Inspection Report Nos. 50-338/00-08, 50-339/00-08

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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.:	50-338/00-08, 50-339/00-08
Licensee:	Virginia Electric and Power Company (VEPCO)
Facility:	North Anna Power Station, Units 1 & 2
Location:	1022 Haley Drive Mineral, Virginia 23117
Dates:	May 22 - June 8, 2000
Inspectors:	J. Brady, Senior Resident Inspector, Harris (Team Leader) S. Shaeffer, Senior Resident Inspector, McGuire S. Vias, Senior Reactor Inspector, RII
Approved by:	R. Haag, Chief Reactor Projects Branch 5 Division of Reactor Projects

SUMMARY OF FINDINGS

IR 05000338-00-08; IR 05000339-00-08; on 05/22-06/08/2000; Virginia Electric and Power Co.; North Anna Power Station Units 1 & 2; Effectiveness of Problem Identification, Prioritization and Evaluation of Issues and Effectiveness of Corrective Actions, and Effectiveness of Licensee Audits and Self Assessments.

This report includes the results of a region-based team inspection of the effectiveness of the problem identification and resolution programs. The inspection was accomplished in accordance with NRC Inspection Procedure 71152, "Identification and Resolution of Problems." The significance of issues are indicated by their color (green, white, yellow, red) and were determined by the Significance Determination Process in Inspection Manual Chapter 0609.

Identification and Resolution of Problems:

The licensee was adequately identifying and resolving problems; however, some negative findings were identified by the NRC. Issues were entered into the corrective action program and their evaluations were aggressive and appropriate corrective actions were identified. Issues were appropriately prioritized and categorized for evaluation based on risk and safety significance. Root cause evaluations and corrective actions were generally effective to prevent recurrence. Where issues recurred, the Plant Issue Review Team meetings were promptly identifying the repetitive nature in the corrective action program and assigning the appropriate level of root cause evaluation needed. One instance was found where the licensee was slow to respond to several operating experience items regarding a high head safety injection (HHSI) pump suction pipe gas accumulation issue.

The findings of the licensee's audits and self-assessments were consistent with NRC findings. The inspectors determined that the licensee maintains a safety conscious work environment.

Cornerstone: Mitigating Systems

- Green. A non-cited violation of 10 CFR 50, Appendix B Criterion XI, "Test Control," was identified for preconditioning the low head safety injection pumps prior to a surveillance test. The safety significance was low because the amount of gas vented during the testing, although not measured or evaluated, was relatively small (Section 4OA2.1).

Report Details

4. OTHER ACTIVITIES

4OA2 Identification and Resolution of Problems

.1 Effectiveness of Problem Identification

a. Inspection Scope

The inspectors reviewed issues documented in NRC inspection reports and the plant issue matrix issued within the past two years and discussed the licensee's performance of problem identification with the resident inspectors who independently observe problem identification on a routine basis.

The inspectors also reviewed operating logs and clearance/tagout records, test deficiencies, maintenance rule functional failure list, and the Technical Specification (TS) Limiting Condition for Operation entry list to determine if deficiencies were being entered into the corrective action program. The inspectors also toured the plant to determine if deficiencies existed that had not been entered into the corrective action program. The inspectors attended numerous Plant Issue Review Team (PIRT) meetings that assess the significance and determine the level of evaluation required for recent plant issues. The inspectors also attended a Station Nuclear Safety and Operating Committee (SNSOC) meeting to determine whether plant issues were being properly reviewed and whether the appropriate level of management attention for significant and potentially significant plant issues was being recommended. The inspectors also attended a Management Safety Review Committee (MSRC) meeting to verify that they were providing an independent review of various significant plant issues and providing oversight to the plant on cross cutting industry issues.

The inspectors reviewed the following sample of operating experience (OE) items, information notices (INs), plant status (PS) reports, significant event notification (SEN) reports and Westinghouse documents to determine whether they were appropriately evaluated for applicability and whether problems identified through these reviews were entered into the corrective action program:

NUMBER	TITLE
IN 98-40	Design deficiencies can lead to reduced Emergency Core Cooling System pump net positive suction head during design basis accident
PS 35538	Possible gas binding of charging pumps during main control room fire
IN 88-23-S1 through S5	Potential for gas binding of high head safety injection (HHSI) pumps during Loss of Coolant Accident.
OE 10463	Air discovered in safety injection pump casings
OE 9087	Gas voids discovered in low head safety injection discharge piping

NUMBER	TITLE
IN 97-16	Preconditioning of plant structures, systems, and components before ASME Code Inservice Testing or Technical Specification Surveillance Testing
OE 9036	Diesel generator (EDG) governor failure
OE 9158	EDG inoperable due to speed control problems
IN 99-13	Insights from NRC inspections of low and medium voltage circuit breaker maintenance programs
IN 98-02	Nuclear Plant Cold Weather Problems and Protective Measures
IN 98-20	Problems with Emergency Preparedness Respiratory Protection Programs
IN 99-04	Unplanned radiation exposures to radiographers, resulting from failures to follow proper radiation safety procedures
SEN 201	Loss of emergency bus results in coincident loss of reactor coolant pump seal injection and thermal barrier cooling
OE 10672	Fuel rack linkage assembly problem with EDG
OE 10904	Inadvertent closure of EDG output breaker
WEST 98-05	Westinghouse Nuclear Safety Advisory Letter (NSAL) 98-009 DB-50 breaker failure to close
OE 9523	EDG electrical fault
OE 9613	Transformer tap changer causes inadvertent EDG start
OE 10311	Failure of ABB 5HK350-3000 Circuit Breaker due to inadequate design upgrade
PS 34330	Nuclear systems protection system power supply failure
OE 9565	Inverters drifting out of synch.
OE 9851	Loss of 120v vital bus
OE 10397	Westinghouse inverter capacitor failure
NSAL 99-007	Westinghouse NSAL 99-007 on “AR” and “ARD” relays

The inspectors reviewed the following licensee deviation trend reports and compared the results with items in the corrective action program to determine whether corrective action trends were being appropriately identified:

DATE	TITLE
12/07/98	Deviation Trend Report: July 1998 - September 1998
03/08/99	Deviation Trend Report: October 1998 - December 1998
06/14/99	Deviation Trend Report: January 1999 - March 1999
12/13/99	Deviation Trend Report: April 1999 - September 1999
01/20/00	Deviation Trend Report: October 1999 - December 1999

The inspectors reviewed quarterly System Health Reports for 3rd and 4th quarter 1999, and 1st quarter 2000 and discussed their contents with the system engineers to determine whether problems identified in the health reports were entered into the corrective action program. The licensee began these reports in the 3rd quarter 1999.

b. Issues and Findings

The inspectors determined that the licensee was adequately identifying problems and entering them into the corrective action program with the exception of very low safety significance items. These items were: 1) negative issues identified by the NRC and documented in previous issued inspection reports and in the Plant Issues Matrix and, 2) a non-cited violation (NCV) identified by the inspectors for preconditioning the low head safety injection (LHSI) pumps prior to surveillance testing. The latter item was not identified by the licensee during their operating experience items reviews. Based upon the review of OE reports, the inspectors concluded that the documentation of problems to support a no adverse trend determination was limited.

Reviews of OE 10463, “Air Discovered in Safety Injection Pump Casings,” were completed by the licensee on March 8, 2000. The licensee reviews of post 1996 plant information for negative trend data noted that several air entrainment events involving safety-related equipment had occurred. This OE analysis report contained no details of the identified events; however, it did conclude that the inadequate venting or vent paths events were addressed by some form of corrective action including plant design or procedural changes.

Based on the OE 10463 review, the inspectors performed an expanded review of the licensee’s practice for venting emergency core cooling system (ECCS) pumps. The inspectors noted that procedural steps in 1-PT-57.1B, “Emergency Core Cooling Subsystem-Low Head Safety Injection (LHSI) Pump (1SI-P-1B),” vented the pump casing and seal housing prior to performing the quarterly TS surveillance test. This venting evolution was being performed for all of the LHSI pumps since 1993 based on implementations of recommendations from a Reliability Centered Maintenance (RCM) study which recommended venting prior to pump starting to preclude premature seal failure.

Preconditioning is discussed in NRC IN 97-16, “Preconditioning of Plant Structures, Systems, and Components before ASME Code Inservice Testing or Technical

Specification Surveillance Testing," and NRC Inspection Manual, Part 9900, "Technical Guidance on Maintenance - Preconditioning of Structures, Systems, and Components before Determining Operability." Venting a pump prior to a surveillance test is clearly identified in IN 97-16 as unacceptable preconditioning. The inspectors reviewed the available documentation supporting the procedure changes that added venting of LHSI pump 1SI-P-1B. No technical engineering evaluation for the unacceptable preconditioning was documented to justify why the venting on the equipment was acceptable and that the design and licensing basis remained satisfied. In addition, the procedure implementing the venting practice did not require monitoring the amount of air or gas vented from the pumps for trending or other purposes. Per discussions with engineering personnel, no significant amount of air or gas had been identified since the venting was established in 1993. Based on initial reviews of the pump design and lack of significant amount of gas identified, the inspectors concluded that no operability concerns existed.

10 CFR 50, Appendix B, Criterion XI, "Test Control," requires, in part, "that the test is performed under suitable environmental conditions." Suitable environmental conditions include conditions representative of the expected conditions when the equipment is required to perform its safety function. The incorporation of venting of the LHSI pumps' casing and seal housing in 1993, prior to performance of quarterly TS required testing, represented a failure to test under expected conditions, i.e., the equipment was pre-conditioned. This violation of Criterion XI was characterized by the Significance Determination Process as having very low safety significance (i.e.,green finding) and is being treated as an NCV (50-338, 339/00-08-01) consistent with Section VI.A.1 of the NRC Enforcement Policy. This violation is in the licensee's corrective action program as Plant Issue N-2000-1535. Since the LHSI system is a mitigating system, this finding affects the mitigating system cornerstone.

.2 Prioritization and Evaluation of Issues and Effectiveness of Corrective Actions

a. Inspection Scope

Samples of corrective action documents were selected to evaluate proper prioritization and evaluation of plant issues and to determine whether corrective actions were completed. The licensee categorizes its plant issues as significant, potentially significant and routine. Evaluations of the issues were then categorized as Category 1, 2 or 3, based on the depth-of-review required and the significance level of the issue(s). Virginia Power Administrative Procedure (VPAP) 1601, "Corrective Action," Rev. 12, provides guidance for this program.

The inspectors reviewed the following sample of significant corrective action documents to determine whether the licensee found the appropriate causes, identified corrective action to prevent recurrence (including common cause and generic concerns), and completed the corrective actions:

DR NUMBER	DESCRIPTION	CAT LEVEL

N-98-2845	U1 Reactor Trip on Over-temperature delta T (OTDT)	1
N-99-2976	U2 Reactor Trip Feedwater Transient	1

The inspectors reviewed the following sample of potentially significant corrective action documents to determine whether the licensee found the appropriate causes and identified corrective action to prevent recurrence (including common cause and generic concerns), and completed the corrective actions:

DR NUMBER	DESCRIPTION	CAT LEVEL
N-2000-0399	U1 'C' charging pump oil temperature found high	2
N-1999-3146	BIT heat trace declared inoperable	3
N-1999-3044	Two problems identified with station service transformer	3
N-1999-2098	Main steam radiation monitor high range tube out of specification.	3
N-1999-2102	Hot particle found on worker exiting containment	3
N-1999-1736	Delayed removal of U2 deborating Ion exchanger from service	1
N-1999-2708	Battery charger sizing	2
N-1999-1526	Basis for battery / chargers TS	2
N-1999-0331	Pipe support deviations	2
N-1999-2605	Industry noncompliance with testing of safety-related ventilation systems	3
N-1998-1881	"As-Built " piping and support discrepancies	2
N-1998-2236	Inoperability of Unit 1 'B' casing cooling pump	1

The inspectors reviewed the following sample of routine corrective action documents to determine whether the licensee found the appropriate causes and completed the corrective actions:

DR NUMBER	DESCRIPTION	CAT LEVEL
N-1999-0587	Pitting corrosion of stainless steel service water components	1
N-1998-2797	Incorrect valve alignment	1
N-1998-3741	1B Charging Pump High Vibrations	1

Inspectors reviewed the following sample of NCVs to determine whether corrective actions were properly implemented:

NCV No.	DESCRIPTION
339/99005-01	Placement of a Unit 2 deborating demineralizer in service for one hour
339/99001-02	2-CC-TV-203B stroked too quickly during 2-PT-213.15
339/99001-03	Damage to Raychem splice due to overheating
338/98009-02	Failure to vent casing coolant pump 1-RS-P-3B

The inspectors reviewed plant issue reports and deficiency reports for systems identified in the site specific significance determination process worksheets to determine if risk significant conditions existed that increased plant risk. For those that did, the inspectors reviewed whether they were appropriately prioritized for correction based on the risk. The inspectors also reviewed condition reports to determine if they were properly classified based on the licensee's definition of significant from procedure VPAP-1601.

In addition, one issue related to high head safety injection (HHSI) pump suction pipe gas accumulation was reviewed based on the results of the operating experience information reviewed from the Effectiveness of Problem Identification section above.

b. Issues and Findings

Generally, the evaluation of issues was aggressive and appropriate corrective actions were identified. Issues were appropriately prioritized and categorized for evaluation based on risk and safety significance. Root cause evaluations and corrective actions were generally effective to prevent recurrence. Where issues recurred, the Plant Issue Review Team meetings were promptly identifying the repetitive nature in the corrective action program and assigning the appropriate level of root cause evaluation needed. One instance was found where the licensee was slow to respond to several operating experience items regarding a high head safety injection (HHSI) pump suction pipe gas accumulation issue.

The inspectors' review of operating experience items for the safety injection system, which ranked highest on the licensee's risk profile, revealed several inconsistencies in the licensee's 1989 evaluation of a HHSI pump suction pipe gas accumulation issue. The evaluation was performed as corrective action for Licensee Event Report (LER) 50-338, 339/88-022. Since the issue was identified and evaluated (nearly 10 years ago) the licensee has been willing to operate with the voiding and gas accumulation in the HHSI suction piping. During that time the licensee had evaluated several operating and industry experience items concerning this issue and potential actions which could correct the condition. Recently the licensee has initiated actions to correct this issue. Hardware changes (new multi-stage orifices in the recirculation lines for each pump) which corrects this condition have been made for some of the HHSI pumps and the change has been scheduled for the remaining pumps.

.3 Effectiveness of Licensee Audits and Self Assessments

a. Inspection Scope

The inspectors reviewed the following licensee audits and self assessments of problem identification and resolution to determine whether they were consistent with NRC findings:

DATE	TITLE
11/5/98	Nuclear Oversight Audit 98-10: Corrective Action
10/20/99	Nuclear Oversight Audit 99-09: Corrective Action
1/21/00	Department Self Assessment: Category 2 Root Cause Effectiveness
1/27/99	Station Self Assessment: Corrective Action Effectiveness Assessment Report
2/22/00	Department Self Assessment: Implementation of Electronic Corrective Action System at NAPS
11/6/98	Station Self Assessment: Corrective Action Effectiveness Assessment Report
9/22/98	Nuclear Licensing and Operations Support and Station Nuclear Safety Self Assessment of the operating Experience Program
12/30/99	Department Self Assessment: NAPS Operating Experience Program

b. Issues and Findings

No findings were identified. Audit and self-assessment findings were consistent with the NRC conclusions.

.4 Assessment of Safety Conscious Work Environment

a. Inspection Scope

The inspectors interfaced with over 60 licensee employees, including all departments that perform regulated activities, and the NRC resident inspectors, to determine whether any conditions exist that would cause employees to be reluctant to raise safety concerns.

b. Issues and Findings

Employees were not reluctant to raise nuclear safety issues. Employees felt that the corrective action program was successful in resolving issues. The licensee maintains a safety conscious work environment.

4OA6 Management Meetings

Exit Meeting Summary

The inspectors presented the inspection results to Mr. W. Matthews and other members of licensee management at the conclusion of the inspection on June 8, 2000. The licensee acknowledged the findings presented.

The inspectors asked the licensee whether any of the material examined during the inspection should be considered proprietary. No proprietary information was identified.

PARTIAL LIST OF PERSONS CONTACTED

Licensee

R. Berryman, Project Engineer, Configuration Management Project
B. Foster, Superintendent Station Engineering
C. Funderburk, Manager, Station Operations and Maintenance
J. Hayes, Manager, Station Safety and Licensing
D. Heacock, Site Vice President
P. Kemp, Supervisor, Director, Nuclear Oversight
L. Lane, Superintendent, Operations
W. Matthews, Vice President - Nuclear Operations

NRC

M. Morgan, Senior Resident Inspector, North Anna
J. Canady, Resident Inspector, North Anna
L. Plisco, Director, Division of Reactor Projects

ITEMS OPENED AND CLOSED

50-338, 339/0008-01	NCV	Failure to met Appendix B, Criterion XI, by preconditioning LHSI pumps prior to performing technical specification surveillance testing. (Section 4OA2.1)

ATTACHMENT 1

NRC'S REVISED REACTOR OVERSIGHT PROCESS

The federal Nuclear Regulatory Commission (NRC) revamped its inspection, assessment, and enforcement programs for commercial nuclear power plants. The new process takes into account improvements in the performance of the nuclear industry over the past 25 years and improved approaches of inspecting safety performance at NRC licensed plants.

The new process monitors licensee performance in three broad areas (called strategic performance areas): reactor safety (avoiding accidents and reducing the consequences of accidents if they occur), radiation safety (protecting plant employees and the public during routine operations), and safeguards (protecting the plant against sabotage or other security threats). The process focuses on licensee performance within each of seven cornerstones of safety in the three areas:

Reactor Safety	Radiation Safety	Safeguards
● Initiating Events	● Occupational	● Physical Protection
● Mitigating Systems	● Public	
● Barrier Integrity		
● Emergency Preparedness		

To monitor these seven cornerstones of safety, the NRC uses two processes that generate information about the safety significance of plant operations: inspections and performance indicators. Inspection findings will be evaluated according to their potential significance for safety, using the Significance Determination Process, and assigned colors of GREEN, WHITE, YELLOW or RED. GREEN findings are indicative of issues that, while they may not be desirable, represent little effect on safety. WHITE findings indicate issues with some increased importance to safety, which may require additional NRC inspections. YELLOW findings are more serious issues with an even higher potential to effect safety and would require the NRC to take additional actions. RED findings represent an unacceptable loss of safety margin and would result in the NRC taking significant actions that could include ordering the plant shut down.

Performance indicator data will be compared to established criteria for measuring licensee performance in terms of potential safety. Based on prescribed thresholds, the indicators will be classified by color representing incremental degradation in safety: GREEN, WHITE, YELLOW, and RED. The color for an indicator corresponds to levels of performance that may result in increased NRC oversight (WHITE), performance that results in definitive, required action by the NRC (YELLOW), and performance that is unacceptable but still provides adequate protection to public health and safety (RED). GREEN indicators represent performance at a level requiring no additional NRC oversight beyond the baseline inspections.

The assessment process integrates performance indicators and inspection so the agency can reach objective conclusions regarding overall plant performance. The agency will use an Action Matrix to determine in a systematic, predictable manner which regulatory actions should be taken based on a licensee's performance. As a licensee's safety performance degrades, the NRC will take more and increasingly significant action, as described in the matrix. The NRC's

actions in response to the significance (as represented by the color) of issues will be the same for performance indicators as for inspection findings.

More information can be found at: http://www.nrc.gov/NRR/OVERSIGHT/index.html.