



UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA STREET, N.W., SUITE 2900
ATLANTA, GEORGIA 30323-0199

Report Nos.: 50-338/95-23 and 50-339/95-23

Licensee: Virginia Electric and Power Company
Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, VA 23060

Docket Nos.: 50-338 and 50-339

License Nos.: NPF-4 and NPF-7

Facility Name: North Anna 1 and 2

Inspection Conducted: December 17, 1995 through January 13, 1996

Lead Inspector: *R. McWhorter* 2-1-96
R. McWhorter, Senior Resident Inspector Date Signed

Inspector: D. R. Taylor, Resident Inspector

Approved by: *G. A. Belisle* 2/1/96
G. A. Belisle, Chief Date Signed
Reactor Projects Branch 5
Division of Reactor Projects

SUMMARY

Scope:

Inspections were conducted by the resident inspectors in the areas of plant operations, maintenance, engineering, and plant support activities.

Results:

Plant Operations

A weakness was noted in operator log-taking activities when operators failed to note an abnormal parameter for an extended time period (paragraph 2.2).

The Unit 2 containment vacuum system was being maintained in accordance with drawings and plant operating procedures. Minor discrepancies in nomenclature between plant equipment labeling and drawings and in system description documents were noted (paragraph 2.3).

ENCLOSURE

Defects in flexible wiring conduits were found not to be a safety concern, but reflected a lack of attention to detail during operations and maintenance activities (paragraph 2.5).

Tagging activities, containment penetration alignments, and event notifications were properly completed (paragraphs 2.4, 2.6, and 2.7).

Maintenance

Two maintenance activities and two surveillance activities were observed to be properly performed by operators and technicians (paragraphs 3.1 - 3.4).

Engineering

In-service testing corrective action requirements were complied with in response to "alert" data identified during a charging pump surveillance test (paragraph 4.1).

Management Review Board meetings continued to provide good assessments of station activities (paragraph 4.2).

Plant Support

Security emergency diesel generator testing was properly performed (paragraph 5.1).

During security modifications, a protected area fence deficiency was properly identified and corrected (paragraph 5.2).

REPORT DETAILS

Acronyms used throughout this report are listed in paragraph 8.

1.0 Persons Contacted

Licensee Employees

Edmonds, L., Superintendent, Nuclear Training
Funderburk, C., Superintendent, Outage and Planning
Hayes, J., Superintendent, Operations
*Heacock, D., Assistant Station Manager, Nuclear Safety and Licensing
Kemp, P., Supervisor, Licensing
Maddy, T., Superintendent, Security
*Matthews, W., Assistant Station Manager, Operations and Maintenance
Roberts, D., Supervisor, Station Nuclear Safety
*Royal, H., Director, Nuclear Oversight
Saunders, R., Vice President, Nuclear Operations
Schappell, D., Superintendent, Site Services
Shears, R., Superintendent, Maintenance
*Smith, J., Superintendent, Station Engineering
Stafford, A., Superintendent, Radiological Protection
*Stall, J., Station Manager

Other licensee employees contacted included office, operations, engineering, maintenance, chemistry/radiation protection, and corporate personnel.

2.0 PLANT OPERATIONS (71707)

The inspectors conducted frequent control room tours to verify proper staffing, operator attentiveness, and adherence to approved procedures. The inspectors attended daily plant status meetings to maintain awareness of overall facility operations and reviewed operator logs to verify operational safety and compliance with TS. Instrumentation and safety system lineups were periodically reviewed from control room indications to assess operability. Frequent plant tours were conducted to observe equipment status and housekeeping. DRs were reviewed to assure that potential safety concerns were properly reported and resolved.

2.1 Plant Status

Unit 1 began the inspection period at approximately 97 percent power in a coast down to a refueling outage scheduled to begin in mid-February 1996. At the inspection period's end, the unit was at approximately 82 percent power.

Unit 2 operated the entire inspection period at or near full power.

2.2 Operator Observations

On December 19, the inspectors observed Unit 1 CRO shift turnover and 7:30 p.m. log-taking rounds. The inspectors verified that turnover was properly conducted in accordance with OPAP-0005, Shift Relief and Turnover, revision 4. Additionally, the inspectors reviewed the adequacy of the control room logs and independently verified that all operating parameters were within specifications. TS table 4.3-1 and 4.3-2 requirements for instrumentation channel checks were reviewed and found to be properly implemented through the CRO logs. The inspectors concluded that the CRO turnover and log keeping practices were good.

On December 20, the inspectors observed the Unit 1 safeguards watch perform morning rounds and log-taking activities. Areas monitored included the EDG, AFW, QS, and safeguards areas, as well as, the emergency switchgear rooms. The inspectors observed that the AO was knowledgeable about plant equipment and anticipated out-of-specification log readings. Minor equipment problems identified during the rounds were promptly brought to the attention of shift supervision for corrective action. The inspectors concluded that the rounds were adequate and demonstrated that safety-related equipment parameters were within specifications.

However, one problem was noted during vital bus inverter inspections. The inspectors observed that the operator logged the equipment status as "normal" when indicated frequency on two of the four inverters was 61 Hz. The inspectors found that the watchstation criteria contained in the supplemental notes for the hard-copy logs indicated that the frequency should be verified at 59.5 - 60.5 Hz. Hard-copy logs were in use on the date of the inspectors' observation due to a hand-held computer failure. The notes for the hand-held computer normally used by operators only required frequency to be checked at 60 Hz, and did not specify an acceptable range.

Concerning equipment operability, the inspectors reviewed the UFSAR and found that section 8.3.1.2 indicated that the inverter's output was rated at 118 vac \pm 2 % and 60 Hz \pm .5 Hz. The inspectors questioned the licensee concerning the inverters' abilities to meet these criteria. After review, the licensee informed the inspectors that the abnormal indications were previously identified in February 1994. At that time, a calibrated meter was used to verify that the frequency was actually within specifications, and technicians concluded that the inverter front-panel indicators were inaccurate. Work requests were later initiated for the faulty indicators, and additional checks with a calibrated instrument verified that the inverters' frequency remained within specification. Based on the above information, the inspectors did not have a concern with equipment operability.

Concerning operator performance, additional reviews by the inspectors of several past Unit 1 safeguard logs for November and December 1995 (hand-held computer generated) identified that the inverters were consistently being logged as "normal", without noting the abnormally high frequency

indication. The inspectors considered that this was due, at least in part, to the fact that the acceptable range values were missing from the hand-held computer notes. The inspectors informed license management that consistently logging the inverters' status as "normal" without noting or reporting the abnormally high frequency was a poor and inconsistent operating practice. As a result of the inspectors' concerns, action was taken to correct the problem, and a review of subsequent logs by the inspectors found that the abnormal readings were being noted. The inspectors concluded that the failure by operators to note an abnormal parameter for an extended time period was a weakness in operations.

2.3 CV System Walkdown

During the week of December 18, the inspectors performed a Unit 2 CV system walkdown. Areas walked down included the vacuum pump skid package and associated valves, and piping and valves up to the CIVs. The inspectors verified the configuration in accordance with drawing 12050-FM-092A, revision 21. The following discrepancies were noted:

- Four system strainers were mis-identified on the drawing.
- Two strainers were not shown on the drawing.
- UFSAR descriptions for system operation were inconsistent concerning normal positions for the vacuum pump suction CIVs. The UFSAR, page 6.2-139, referenced the CIVs as normally closed. However, UFSAR table 6.2-39 indicated the CIVs as normally open. The station drawing showed the CIVs as normally closed, and 2-OP-19, Operation of the Containment Vacuum Pumps, revision 9-P2, left the position to the discretion of the CRO. In practice, when the vacuum pumps were secured, the CIVs were left open.

These discrepancies were brought to the attention of the system engineer. The system engineer walked down both Units' CV systems and identified similar discrepancies including differences between the Unit 1 and Unit 2 drawings. The system engineer submitted DRs (N-96-66 and -67) and brought the labeling discrepancies to the attention of plant personnel responsible for configuration management. The inspectors concluded that the discrepancies did not represent an operational safety concern, but considered them as an example of a lack of attention to detail in system documentation.

2.4 Tagging Verifications

On December 27 and January 11, the inspectors obtained tagging records for six tagouts and verified that tags were properly hung and administrative requirements for tagging control were properly implemented. The inspectors walked down tags hung and verified tagging boundaries using system drawings. Tagouts reviewed included those for IA isolation to SFP gates (1-95-IA-16 and -17), RP filter changeout (1-95-RP-15), RHR sample cooler repair (1-95-CC-23), failed steam dump

isolation (1-95-MS-19), and fire hydrant repairs (1-95-FP-51). No discrepancies were identified.

2.5 Flexible Conduit Defects

On December 21, during a routine Auxiliary Building tour, the inspectors noted defects in numerous flexible conduits. Specifically, the flexible conduits containing cabling to indication limit switches on two Unit 1 valves and five Unit 2 valves were partially cut and split open exposing the internal cables. It appeared to the inspectors that such a split resulted from conduit overstress due to physical forces such as personnel climbing on the cables. Of the seven identified by the inspectors, only two had WR tags attached. The inspectors reported the remaining five (1-CC-TV-104A, 2-CH-2204B, 2-CC-TV-204C, 2-BD-TV-200A, and 2-IA-TV-201B) to shift supervision, who determined that valve operability was not affected and initiated WRs.

On January 4, the inspectors noted a similar defect in a flexible conduit leading to 1-DA-SOV-110A. Unlike the previous cases, this cable led to a valve's actuation solenoid. The discrepancy was again reported to shift supervision for action, who determined that operability was not affected and initiated a WR. On January 9, the flexible conduit for this solenoid was repaired.

On December 22 and January 5, the inspectors reviewed the defects with station EQ engineers. The inspectors examined the designed EQ boundaries for valve components and cabling. The inspectors found that the flexible conduits served only for physical protection and did not form a EQ boundary for the components. The inspectors then agreed that none of the conduit defects presented equipment operability concerns. However, the inspectors concluded that the significant number of cable defects identified represented a lack of attention to detail in operations and maintenance activities. This was evidenced by the physical abuse necessary to cause the problem and by the fact that the defects had not been previously identified by plant personnel.

2.6 Containment Integrity Walkdown

On January 5, the inspectors performed a partial walkdown of containment penetrations using 1-PT-60.1, Containment Integrity, revision 20-P4, as a guide. The PT verified that penetrations not capable of being closed by an operable containment automatic isolation valve, and required to be closed during an accident, were closed or isolated as required by TS 4.6.1.1.a. The inspectors verified that approximately 15 penetrations were in the proper configuration.

2.7 NRC Notification

The inspectors reviewed the following licensee notification to the NRC to ascertain if the required report was adequate, timely and proper for the event.

On December 28, the licensee notified the NRC as required by 10 CFR 50.72 concerning the notification of off-site authorities. Specifically, the licensee notified the Virginia State Department of Water Quality concerning a small oil spill at the plant intake structure. The inspectors monitored the licensee's actions and found them to be appropriate for the situation.

No violations or deviations were identified.

3.0 MAINTENANCE (62703, 61726)

Maintenance activities were observed and reviewed to verify that activities were conducted in accordance with TS and procedures, and licensee commitments to regulatory guides and industry codes or standards. Surveillance testing activities were observed and reviewed to verify that testing was performed in accordance with procedures, test instrumentation was calibrated, LCOs were met, and any deficiencies identified were properly reviewed and resolved.

3.1 Service Water Pump Replacement

On December 17, the licensee completed maintenance activities to replace SW pump 2-SW-P-1A. The pump had repeatedly been placed into the "alert" category during surveillance testing due to high vibrations and marginal flow versus differential pressure (NRC Inspection Report Nos. 50-338, 339/95-15). The inspectors monitored the licensee's activities to replace the pump and associated activities to replace the pump discharge flexible coupling and refurbish the pump discharge check valve.

The inspectors reviewed the newly-procured pump's test data and found that it satisfactorily demonstrated the replacement pump's capability to perform the design safety functions. Additionally, the inspectors visited the work site periodically and found that work activities were being properly controlled and performed. The inspectors reviewed the post-maintenance test and verified that the tests were adequate and that acceptance criteria were properly met prior to returning the pump to service. The inspectors concluded that the maintenance was well planned and performed and successfully corrected a long-standing equipment problem.

3.2 Control Panel Switch Replacement

On December 20, the inspectors observed maintenance technicians replacing the Unit 2 control panel switch for makeup stop valve 2-CH-FCV-2114B. The work was performed under WO 00331005-01 and was necessary because operators identified that the switch to manually open the valve was very difficult to use. Prior to commencing the maintenance, the inspectors reviewed the adequacy of the tagout against system drawings and verified that work documentation was appropriate for the task. The inspectors also observed that technicians obtained and correctly verified controlled drawings for the circuit prior to starting the maintenance.

The inspectors observed technicians performing the switch replacement. Good coordination with CROs was noted, and the inspectors observed that technicians used procedure O-ECM-2801-02, Trouble-shooting and Repair of Electrical Circuits, revision 2, in performing the maintenance. The technicians correctly used procedural documentation and simultaneous verification to control the lifting and re-landing of switch leads. Following the maintenance, adequate post-maintenance testing was observed by the inspectors. The inspectors concluded that the maintenance had been well performed by the technicians with minimal disruption to control room activities.

3.3 EDG Slow Start Test

On January 10, the inspectors observed operators performing 1-PT-82J, 1J Emergency Diesel Generator Slow Start Test, revision 14. Specifically, the inspectors observed the EDG operation after being loaded to between 2500 and 2600 kw, and observed unloading and EDG shut down. The inspectors verified that EDG parameters met specified test acceptance criteria. During the shut down sequence the inspectors observed minor problems implementing procedure verification sign-off steps. These observations were brought to the operators' attention and immediate corrective actions were taken. The inspectors concluded that the test adequately demonstrated EDG operability.

3.4 Motor-driven AFW Pump Test

On January 11, the inspectors observed operators performing 2-PT-71.2Q, 2-FW-P-3A, A Motor-Driven AFW Pump and Valve Test, revision 12-P1. The test was required by TS 4.7.1.2.b.1 and TS 4.0.5 to demonstrate the pump's ability to develop adequate discharge pressure and flow and to demonstrate operability for various valves in the pump's flow paths. The inspectors observed operator manipulations of equipment and procedure usage and verified that equipment performance was within test acceptance criteria. No discrepancies were noted.

No violations or deviations were identified.

4.0 ENGINEERING (37551, 40500)

On-site engineering activities were reviewed to determine their effectiveness in preventing, identifying and resolving safety issues, events and problems.

4.1 HHSI Pump Testing Review

On December 27, during routine tours, the inspectors noted that WR 046381 was hung on HHSI/Charging pump 2-CH-P-1A. The WR stated that the pump vibrations were found to be in the "alert" range during testing on October 5, 1995. The inspectors obtained and reviewed completed copies of 2-PT-14.1, Charging Pump 2-CH-P-1A, revision 24, to verify that the licensee had complied with IST program requirements. The inspectors reviewed the test completed on October 5 and verified that

the data for the pump had been properly recorded and categorized. The inspectors also verified that the frequency for performing the surveillance test had been appropriately increased from quarterly to every six weeks. Additional surveillance tests were found to be properly completed on November 20 and December 28 with pump vibrations in the normal range. The inspectors concluded that the licensee had correctly responded to the high vibration test results and complied with IST program requirements.

4.2 Management Review Board Meeting

On December 18, the inspectors attended a Management Review Board meeting. These weekly meetings provided station senior managers with opportunities to review the status of selected station issues. The inspectors noted that the board reviewed the status of CVCS system boron reduction projects and the final RCE for the November 1995 Unit 2 reactor trip. The inspectors found that the meetings continued to be a positive initiative.

No violations or deviations were identified.

5.0 PLANT SUPPORT (71750, 92904)

Plant support activities were observed and reviewed to ensure that programs were implemented in conformance with facility policies and procedures and in compliance with regulatory requirements. Activities reviewed included radiological controls, physical security, and fire protection.

5.1 Security EDG Surveillance Test

On January 3, the inspectors observed operators performing O-OP-26.14, Monthly Exercise of 1-SEC-EG-1, Security Emergency Diesel Generator, revision 7-P3. The test was performed to verify the security EDG's ability to automatically start and power security loads during a loss of normal power to security systems. The inspectors observed operator adherence to procedure, procedural adequacy, and equipment performance. No discrepancies were identified and operator performance was good.

5.2 Vehicle Barrier Modifications

During the inspection period, the inspectors monitored the physical protection modifications being installed by the licensee to comply with 10 CFR 73.55 requirements. The inspectors verified that modification installation activities did not reduce or compromise existing physical protection barriers. On January 4, the inspectors observed testing activities associated with installing a new vehicle gate at a protected area entrance. The inspectors observed that the new gate was insufficient in physical coverage in one small area. The inspectors discussed this problem with Security supervision and found that the problem had already been identified by the licensee. The inspectors verified that proper compensatory actions were taken by the licensee

throughout the time that the deficiency existed. The problem was later corrected by the licensee, and the inspectors verified that the proper physical coverage had been established.

5.3 Close Out Issues

The following previous inspection item was reviewed and closed. The licensee's actions in response to the violation were reviewed to establish that corrective actions had been completed and that programs and practices had been strengthened to prevent recurrence.

(Closed) VIO 50-338, 339/94-21-02: Missed Fire Damper Surveillances

The violation concerned the fact that adequate fire damper surveillances had not been performed for several years due to inadvertent deletions of damper inspection requirements from surveillance requirements contained in the TRM. At the time of the violation, the problem was identified during a QA audit. Additional reviews found that the issue had been identified several years earlier within the licensee's engineering organization, but had not been properly resolved due to various failures to recognize the issue's significance. Immediately following the problem's identification by QA personnel, the licensee prepared proper surveillance implementing procedures and completed all required inspections for the dampers. The licensee made a report to the NRC concerning the missed fire protection surveillance by letter dated January 17, 1995.

The inspectors reviewed the licensee's additional corrective actions. To address concerns with overall fire protection program implementation, the licensee initiated a programmatic review to ensure that responsibilities for the program met regulatory requirements and were clearly defined and properly coordinated between the numerous groups responsible for the various portions of the program. The inspectors reviewed the review's results and action item implementation. The inspectors found that the program's controlling document, VPAP-2401, Fire Protection Program, was revised in May 1995 (revision 3) to incorporate the review's results. With the exception of the Appendix R program, most fire protection responsibilities were consolidated under the Safety and Loss Prevention Department.

To address issues concerning the adequacy of the TRM fire protection surveillance requirements, former TS and UFSAR requirements were reviewed to ensure that all information had been incorporated into the TRM. The inspectors verified that the review was completed and its results were properly incorporated into the TRM. The licensee also reviewed existing surveillance procedures to ensure that all required surveillance tests were adequate to comply with TRM requirements.

The inspectors also reviewed the licensee's implementation of corrective actions for the event's associated DR (N-94-1139). These included additional enhancements to damper surveillance procedures, resolution of damper nomenclature discrepancies, and resolution of non-safety related

damper accessibility issues. The inspectors verified that these corrective actions had been appropriately implemented or were being tracked for future implementation by the licensee. During these reviews, the inspectors noted that two completed CTS items (02-94-2217-003 and 02-94-2217-004) had not been signed off for final review by the licensee's NS&L organization. Action on the two items had been completed in November and December 1994, respectively, but the final review block had not been signed at the time of the inspectors' review in January 1996. The inspectors discussed this problem with licensee management who pointed out that although the form had not been fully signed off, a review for corrective action adequacy for each action item had been completed.

The inspectors concluded that the licensee's NOV response dated November 7, 1994, and corrective actions were appropriate and had been properly implemented.

No violations or deviations were identified.

6.0 Other NRC Personnel On Site

None

7.0 EXIT

The inspection scope and findings were summarized on January 16, 1996, by Mr. R. D. McWhorter with those persons indicated by an asterisk in paragraph 1. The inspectors described the areas inspected and discussed in detail the inspection results. A listing of inspection findings is provided. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.

<u>Type</u>	<u>Item Number</u>	<u>Status</u>	<u>Description and Reference</u>
VIO	50-338, 339/94-21-02	Closed	Missed Fire Damper Surveillances (paragraph 5.3).

8.0 ACRONYMS

AFW	AUXILIARY FEEDWATER
AO	AUXILIARY OPERATOR
CFR	CODE OF FEDERAL REGULATIONS
CIV	CONTAINMENT ISOLATION VALVE
CRO	CONTROL ROOM OPERATOR
CTS	COMMITMENT TRACKING SYSTEM
CV	CONTAINMENT VACUUM
CVCS	CHEMICAL AND VOLUME CONTROL SYSTEM
DR	DEVIATION REPORT
EDG	EMERGENCY DIESEL GENERATOR
EQ	ENVIRONMENTAL QUALIFICATION
FCV	FLOW CONTROL VALVE
HHSI	HIGH-HEAD SAFETY INJECTION

Hz	HERTZ
IA	INSTRUMENT AIR
IFI	INSPECTION FOLLOW-UP ITEM
IST	IN-SERVICE TESTING
kw	KILOWATTS
LCO	LIMITING CONDITION FOR OPERATION
NO.	NUMBER
NOV	NOTICE OF VIOLATION
NRC	NUCLEAR REGULATORY COMMISSION
NS&L	NUCLEAR SAFETY AND LICENSING
PT	PERIODIC TEST
QA	QUALITY ASSURANCE
QS	QUENCH SPRAY
RCE	ROOT CAUSE EVALUATION
RHR	RESIDUAL HEAT REMOVAL
RP	REFUELING PURIFICATION
SFP	SPENT FUEL POOL
SW	SERVICE WATER
TRM	TECHNICAL REQUIREMENTS MANUAL
TS	TECHNICAL SPECIFICATION
UFSAR	UPDATED FINAL SAFETY ANALYSIS REPORT
vac	VOLTS ALTERNATING CURRENT
VIO	VIOLATION
WO	WORK ORDER
WR	WORK REQUEST