



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

Report Nos.: 50-338/88-05 and 50-339/88-05

Licensee: Virginia Electric & Power Company  
 Richmond, VA 23261

Docket Nos.: 50-338 and 50-339

Facility Name: North Anna 1 and 2

Inspection Conducted: February 24 - April 5, 1988

Inspectors:	<u>Mike Scott for</u>	<u>5-2-88</u>
	J. L. Caldwell, SRI	Date Signed
	<u>Mike Scott for</u>	<u>5-2-88</u>
	L. P. King, RI	Date Signed
Approved by:	<u>F. Cantrell</u>	<u>5/2/88</u>
	F. Cantrell, Section Chief	Date Signed
	Division of Reactor Projects	

SUMMARY

Scope: This routine inspection by the resident inspectors involved the following areas: plant status, licensee action on previous enforcement matters, review of inspector follow-up items, monthly maintenance observation, monthly surveillance observation, ESF walkdown, operator safety verification, operating reactor events, and information meetings with local officials. During the performance of this inspection, the resident inspectors conducted reviews of the licensee's backshift operations on the following days - March 3, 8, 9, 13, 15, 17, 24, 25, 28, 30, and 31.

Results: One violation was identified: It involved a violation of Technical Specification 4.6.3.1.1.b. for failure to conduct a stroke time test following maintenance on 11 containment isolation valves (paragraph 4).

## REPORT DETAILS

### 1. Licensee Employees Contacted

- \*E. W. Harrell, Station Manager
- \*R. F. Driscoll, Quality Control (QC) Manager
- \*G. E. Kane, Assistant Station Manager
- M. L. Bowling, Assistant Station Manager
- J. A. Stall, Superintendent, Operations
- \*M. R. Kansler, Superintendent, Maintenance
- A. H. Stafford, Superintendent, Health Physics
- D. A. Heacock, Superintendent, Technical Services (Acting)
- J. L. Downs, Superintendent, Administrative Services
- J. R. Hayes, Operations Coordinator
- \*E. S. Hendrixson, Engineering Supervisor (Acting)
- D. E. Thomas, Mechanical Maintenance Supervisor
- G. D. Gordon, Electrical Supervisor
- L. N. Hartz, Instrument Supervisor
- F. T. Terminella, QA Supervisor
- J. P. Smith, Superintendent, Engineering
- D. B. Roth, Nuclear Specialist
- \*J. H. Leberstein, Engineer
- G. G. Harkness, Licensing Coordinator

Other licensee employees contacted include technicians, operators, mechanics, security force members, and office personnel.

#### \*Attended exit interview

NRC Management Site Visit: On March 2 and 3, Floyd Cantrell visited the North Anna Power Station for the purpose of conducting meetings with the licensee and meetings with the local officials of the city of Mineral and the counties of Louisa, Orange, Hanover, Caroline, and Spotsylvania.

### 2. Exit Interview (30703)

The inspection scope and findings were summarized on March 25 and April 5, 1988, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspectors findings. The licensee did not identify as proprietary any of the material provided to or reviewed by the inspectors during this inspection.

(Open) Violation 338/88-05-01: Failure to conduct stroke time testing of nine containment isolation valves following maintenance as required by Technical Specification 4.6.3.1.1.b (paragraph 4).

(Open) Inspector Followup Item (IFI) 338/88-05-02: Request for additional information concerning the removal of valve 1-CH-T122 (paragraph 8).

(Open) IFI 338/88-05-03: Request for additional information concerning maintenance history on Unit 1 RTD bypass isolation valves (paragraph 10).

(Open) IFI 338/88-05-04: Request for additional information involving exposure, applicable procedures, and ALARA reviews concerning the Unit 1 containment entries at power on March 24, 1988 (paragraph 10).

### 3. Plant Status

#### Unit 1

Unit 1 began the inspection period operating at approximately 100% power. On March 11, the licensee requested and received discretionary enforcement involving the ASME Code Section XI and Technical Specification 4.0.5 requirements to perform monthly stroke testing of 1-CC-TV-102A which was in the alert condition for increased stroke time. This valve cannot be stroked with the Unit operating. Consequently, the licensee requested relief from the Technical Specification and Section XI requirement to stroke the valve in order to minimize unit shutdowns.

On March 17, Unit 1 reactor power was reduced to 30% after exceeding the chemistry action level guidelines for cation conductivity. The unit had been operating at 100% power with the "A" condenser water box out of service being inspected for leaks. Reactor power level was further reduced to 22% in order to allow securing of all the main feed regulating valves for replacement of the packing.

At approximately 1800 on March 17, the resident inspector was notified by the Station Manager that Unit 1 would be shutdown to perform work on the solenoid for 1-CC-TV-102A. As discussed above, the licensee had requested enforcement discretion regarding inservice testing of the valve at power (See Section 6 for details).

Unit 1 reactor was returned to criticality at 2056 on March 18. On March 19 at 0133 Unit 1 experienced a turbine trip and reactor trip from approximately 3% reactor power. The turbine trip resulted from a Solenoid Turbine Trip Signal that was caused by a Turbine Impulse pressure spike which exceeded 15% power with the main breaker open. The cause for the impulse pressure spike was attributed to problems with the EHC system.

On March 20 at 2237 Unit 1 reactor achieved criticality and the power was increased to 3% for a chemistry hold. On March 22, the primary chemistry hold was released and power was increased to approximately 24%. On March 23, Unit 1 reactor power was increased to 100%.

On March 24 at 1801 Unit 1 experienced greater than 10 gpm identified Reactor Coolant System (RCS) leak rate. Technical Specification Action Statement 3.4.6.2.b was entered and the licensee commenced actions to identify and reduce the leak rate. After approximately four hours with the leak rate still not reduced, the licensee commenced a unit shutdown

and declared an unusual event. At 0229 on March 25 with the unit at approximately 30% power the licensee had successfully decreased the identified leak rate to less than 10 gpm and secured from the unit shutdown and the unusual event (see Section 10 for details). Unit 1 was returned to approximately 100% power operation on March 25, 1988, at 2026 and remained there through the rest of the inspection period.

#### Unit 2

Unit 2 began and ended the inspection period operating at approximately 100% power.

#### Both Units

On March 2 and March 3 meetings were conducted with the local officials in the town of Mineral and counties of Louisa, Orange, Hanover, Caroline and Spotsylvania by the resident inspectors and Floyd Cantrell (see Section 11 for details).

On March 8, VEPCO announced a major reorganization of the Corporate Structure with many of the changes dealing with the nuclear operations department. The changes affecting North Anna Power Station involve the present Station Manager moving to the corporate office to become Manager of Fossil and Hydro Operations Support, the present Assistant Station Manager for Operations and Maintenance becoming the Station Manager and the previous Operations Superintendent becoming the Assistant Station Manager for Operations and Maintenance. These organization changes will become effective on April 1, 1988.

On March 28, 1988, the NRC conducted a enforcement conference with the licensee in the Region II Atlanta office. The enforcement conference involved a discussion of violations of the ASME Code Section II and Technical Specification requirements for containment isolation valve stroke time testing (see Inspection Report 338,339/88-02).

#### 4. Licensee Action on Previous Enforcement Matters (92702)

(Closed) Unresolved Item 339/88-01-01: Potential for failure to perform a post maintenance test. As discussed in Inspection Report 338,339/88-01, the licensee made a modification, per Engineering Work Request (EWR) 86-498A,B and C, to several of the ASCO solenoid valves which operate containment isolation valves. This modification involved placing an elbow on the vent port of the solenoid directing the vent path downward to minimize moisture from entering the valve. This modification, for several of the valves, resulted in a reduction in the size of the vent port which caused an increase in the stroke time. The inspector requested that the licensee demonstrate that all the valves which were modified had been tested before the unit entered Mode 4 on September 15, 1986. The licensee informed the inspectors and wrote a deviation report stating that 11 solenoids were not stroked following the elbow tubing installation and prior to the unit entering Mode 4. The valves were later successfully tested between June 10, 1987 and June 13, 1987.

Technical Specification 4.6.3.1.1b requires that prior to returning a containment isolation valve to service after maintenance, repair or replacement work is performed on the valve, it shall be demonstrated operable by performing a stroke time test. This operability demonstration must be performed prior to the unit entering Mode 4. The failure of the licensee to demonstrate the operability of containment isolation valves following maintenance will be identified as a violation 338/88-05-01.

5. Review of Inspector Follow-up Items (92701)

(Closed) IFI 338/87-24-02: Evaluation of Loose Parts Monitor Alarm. The licensee has performed an evaluation of the alarm on the loose parts monitor and concluded it was as a result of the ruptured tube.

6. Monthly Maintenance (62703)

Station maintenance activities affecting safety related systems and components were observed/reviewed, to ascertain that the activities were conducted in accordance with approved procedures, regulatory guides and industry codes or standards, and in conformance with Technical Specifications.

The resident inspector expressed concerns regarding Rubidium contaminations in the auxiliary building. The inspector noted that on March 23, 1988, several people alarmed the portal monitors when exiting the auxiliary building. In inspection report 338,339/86-28 this was identified as a problem on December 12, 1986. At that time the inspector was told that the contaminations were a result of taking a primary sample. The report also indicated that on December 23, 1986, that a problem again existed and could not be traced to taking a primary sample. The inspector requested in IFI-338,339/86-28-05 that the licensee (1) examine the flow across the sample hood, (2) investigate the technique for taking primary samples, and (3) check for leaks on the discharge side of the air handling system. The licensee's response to item (2) was that the cold leg sample and the influent to the demineralizers are recirculated and sent to the gas stripper or they are routed to the VCT after notification of the shift supervisor. Contrary to this, on March 22, 1988, the resident inspector examined a personnel contamination report that occurred as a result of purging the inlet to the demineralizer to the sample sink which drains to the auxiliary building sump. The inspector has learned that orders are presently in place to require purging back to the gas stripper.

As a result of the present problems with gas contaminations, the licensee secured the auxiliary building ventilation system to detect areas where a buildup occurred. The highest levels were found in the A gas stripper area and 1-CH-P-1C cubicles. The source of the leaks were identified and the following Work Requests (WR) were generated and sent to maintenance for repair:

- a. WR 530388, Weld Leak on Valve 1-BR-E-6A
- b. WR 530386, Diaphragm Leak on Valve 1-BR-364



- c. WR 530387, Leak by the seat on Valve 1-BR-12
- d. WR 454980, Bonnet/Body leak on Valve 1-CH-550
- e. WR 531856, Packing leak on Valve 1-CH-293
- f. WR 531858, Packing leak on Valve 1-CH-297
- g. WR 531859, Packing leak on Valve 1-CH-306
- h. WR 531860, Leak by the seat on Valve 1-CH-470

Items e, f, g and h cannot be repaired until the charging system seal water injection filter, 1-CH-FL-4A, is changed out due to high dose rates. These items were identified to maintenance on March 24, 1988. The inspectors will follow progress on the work requests generated as a result of gas leaks.

On March 17, 1988, the inspector observed the MOVATS testing of valve 1-QS-MOV-102B, the outlet valve from the Unit 1 Sodium Hydroxide tank. This testing was performed per EMP-SP-MOV-3.1. The valve had been leaking by the seat as identified by sodium hydroxide in the Refueling Water Storage Tank (RWST) water samples. The licensee increased the torque switch setting as a result of the MOVATS data and the problem was corrected.

A NRC Quality Assurance Inspection Team identified in inspection report 338,339/88-02 problems with stroke times of containment isolation valves. As a result the licensee identified that during stroke testing of 1-CC-TV-102A on January 28, 1988, the stroke time had increased and the valve should have been placed in alert with the test frequency increased. Since the test frequency cannot be increased because this valve cannot be tested at power the licensee requested and received discretionary enforcement on March 11, in order not to have to shutdown Unit 1 to test the valve.

On March 17, after reducing power to 22%, a decision was made by the licensee to shutdown Unit 1. During the shutdown, the solenoid for 1-CC-TV-102A was disassembled, inspected and reassembled. No problems were identified and the valve stroked satisfactorily.

Problems were identified in a previous Inspection Report 338,339/87-38, Item 14, concerning meeting the channel check criteria for steam flow instrumentation. The channel check criteria was a constant value from 0 to 100% power. The engineering staff, after discussion with Westinghouse, has issued a curve of channel check criteria versus power level. The curve is less restrictive at low power than the previous channel check criteria but more restrictive at high power.

As a result of the steam flow indication problems an engineering work request has been written to replace the manifold valves for the steam flow transmitters during the next outage.

No violations or deviations were identified.

## 7. Monthly Surveillance (61726)

The inspectors observed/reviewed technical specification required testing and verified that testing was performed in accordance with adequate procedures, that test instrumentation was calibrated, that limiting conditions for operation (LCO) were met and that any deficiencies identified were properly reviewed and resolved.

On March 13 the inspectors witnessed portions of Surveillance Test 1-PT-41.1, Auxiliary Shutdown Panel Monitoring Instrumentation Channel Check. No problems were identified.

On March 15 the inspectors witnessed portions of Surveillance Test 1-PT-63.1B, Quench Spray System - "B" Subsystem. This test was being performed following maintenance on a vent valve off the discharge line for the Quench Spray Pump 1-QS-P-1B. The first attempt resulted in cavitation of the pump. The pump was secured and subsequently refilled and vented. The second attempt demonstrated successful operation of the Quench Spray pump. Following the test performance the inspector observed that another vent valve just upstream of the one worked was also leaking by the seat as demonstrated by water dripping into a bag connected to the vent line. The inspector informed the licensee of this observation and requested the licensee to determine why both valves had not been worked at the same time since the pump conditions, pump tagged out and discharge line drained would be the same for both repairs.

On March 18, the inspectors witnessed the stroking of all three main feedwater regulating valves on Unit 1 per Periodic test 1-PT-212.4. This test was performed following the repacking of all three valves. No problems were identified.

The inspector reviewed 1-PT-57.1B which is the periodic test of 1-S1-1B (low head safety injection pump). No problems were identified.

No violations or deviations were identified.

## 8. ESF System Walkdown (71710)

The following selected ESF systems were verified operable by performing a walkdown of the accessible and essential portions of the systems on March 23 and 24.

On March 23 and 24, 1988, a walkdown was made of the CVCS Boric Acid Transfer system using valve checkoff sheets 1-OP-8.3A. The following comments were noted.

- a. 1-CH-66, 1-CH-107, and 1-CH-125 are not marked locked open on print 11715-FM-095A, Rev. 12, Sheets 2 and 4 even though they are required to be locked open in Administrative Procedure 19.29 and 1-OP-8.3A. The actual position of these valves is locked open.

- b. 1-CH-529 and 1-CH-405 which are the lower and upper isolation valves for Level Transmitter 1108 were closed and work request tags were hanging on the valves. This Boric Acid tank level transmitter is one of two therefore the tagged out transmitter was not required but it has been out of service since November 1986.
- c. Several of the vent and drain valves are not labeled.
- d. 1-CH-T122, Vent Valve for Level Transmitter LT-1106, is indicated as being closed on sheet 3 of 1-OP-8.3A. However there is no such valve present in the system and the line is capped off. The licensee has been requested to determine when the valve was removed and what controls were used to remove the valve. This item will be identified as an IFI 338/88-05-02.

No violations or deviations were identified.

#### 9. Operational Safety Verification (71707)

By observations during the inspection period, the inspectors verified that the control room manning requirements were being met. In addition, the inspectors observed shift turnover to verify that continuity of system status was maintained. The inspectors periodically questioned shift personnel relative to their awareness of plant conditions.

Through log review and plant tours, the inspectors verified compliance with selected Technical Specification (TS) and Limiting Conditions for Operations.

In the course of the monthly activities, the resident inspectors included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities to include: protected and vital areas access controls, searching of personnel, packages and vehicles, badge issuance and retrieval, escorting of visitors, patrols and compensatory posts. In addition, the resident inspectors observed protected area lighting, protected and vital areas barrier integrity and verified an interface between the security organization and operations or maintenance.

On a regular basis, radiation work permits (RWP) were reviewed and the specific work activity was monitored to assure the activities were being conducted per the RWPs. Selected radiation protection instruments were periodically checked and equipment operability and calibration frequency was verified.

The inspectors kept informed, on a daily basis, of overall status of both units and of any significant safety matter related to plant operations. Discussions were held with plant management and various members of the operations staff on a regular basis. Selected portions of operating logs and data sheets were reviewed daily.



The inspectors conducted various plant tours and made frequent visits to the Control Room. Observations included: witnessing work activities in progress; verifying the status of operating and standby safety systems and equipment; confirming valve positions, instrument and recorder readings; annunciator alarms; and housekeeping.

No violations or deviations were identified.

#### 10. Operating Reactor Events (93702)

The inspectors reviewed activities associated with the below listed reactor events. The review included determination of cause, safety significance, performance of personnel and systems, and corrective action. The inspectors examined instrument recordings, computer printouts, operations journal entries, scram reports and had discussions with operations, maintenance and engineering support personnel as appropriate.

On March 24, 1988 the licensee identified that the primary drain transfer tank level was increasing at an abnormally high rate. An RCS leak rate calculation was performed on the computer and by hand. The computer leak rate indicated a 10.13 gallons per minute (gpm) identified leakage rate and 0.4437 gpm unidentified leakage rate. The action statement required by Technical Specification (TS) 3.4.6.2.d for an identified leak rate greater than 10 gpm was entered at 1801 on March 24. This TS Action Statement requires the identified leakage to be less than 10 gpm in four hours or be in hot standby within the next 6 hours. At 2146 the NRC Operations Center was notified that the RCS leakage had not been reduced below 10 gpm and Unit 1 would commence a shutdown and declare an unusual event.

A total of five entries were made into the containment between 1800 on March 24 and 0322 on March 25. During the first entry no visible leaks were identified and the 40 point temperature monitoring panel for valve leakage to the Primary Drain Transfer Tank (PDTT) indicated high temperature for HCV-1142. This valve was stroked with no noticeable effect on the leakage. Two more entries were made to determine input into the temperature monitoring panel. Electricians identified approximately four additional lines that were reading abnormally high temperatures. Review of the system drawings indicated possible leakage from valves in the "B" RTD loop bypass lines. A fourth entry was made on a special radiation work permit to enter "B" cubicle and backseat valve 1-RC-55 and 1-RC-63 which are isolation valves in the RTD loop bypass lines. The backseating of 1-RC-55 stopped the increasing trend in the primary drain transfer tank. Another leak rate calculation was performed which indicated that the identified leakage had been reduced to approximately 3 gpm (similar to the pre-event rate). The unusual event was terminated at 0229 on March 25, 1988.

The inspector requested the maintenance history on all valves in the RTD bypass manifold. This will be identified as IFI 338/88-05-03. The inspector also requested data from the health physics

superintendent concerning the entry on the special radiation work permit consisting of the applicable procedures, dose received and ALARA report. This is identified as IFI 338/88-05-04.

No violations or deviations were identified.

11. Information Meetings With Local Officials (94600)

On March 2 and 3, 1988, the resident inspectors and Floyd Cantrell, Section Chief in charge of North Anna from the Region II office in Atlanta, conducted meetings with the Mayor of Mineral, Virginia, and local emergency officials from the counties of Louisa, Orange, Hanover, Caroline, and Spotsylvania. These meetings were conducted to introduce the resident inspectors and regional management to the local officials and provide them with telephone numbers and NRC contacts for any questions they may have in the future.

The NRC staff also provided the local officials with a description of the mission and responsibilities of the NRC, along with a description of the present NRC organization, and answered any questions the local officials had concerning the NRC or the North Anna Power Station.