UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
101 MARIETTA ST., N.W., SUITE 3100
ATLANTA, GEORGIA 30303

Report Nos. 50-338/82-13 and 50-339/82-13

Licensee: Virginia Electric and Power Company
P. O. Box 26666
Richmond, VA 23261

Facility Name: North Anna Units 1 and 2

Docket Nos. 50-338 and 50-339

License Nos. NPF-4 and NPF-7

Inspection at North Anna site near Mineral, Virginia

Inspectors: C. Julian for — 6/7/82
D. F. Johnson — Date Signed

C. Julian for — 6/7/82
M. B. Shymlock — Date Signed

Approved by: C. Julian — 6/7/82
C. A. Julian, Chief, Division of Project and Resident Programs — Date Signed

SUMMARY

Inspection on April 6 - May 5, 1982

Areas Inspected

This routine inspection by the resident inspector involved 261 inspector-hours on site in the areas of followup of previous inspection findings, licensee event reports, previously identified items, post implementation review of NUREG-0737 items, licensee conditions for Unit 2, refueling activities, outage items, surveillance, maintenance activities, plant operations, offsite Review Committee and offsite Support Staff.

Results

Of the twelve areas inspected, no violations or deviations were identified.

DETAILS

1. Persons Contacted

Licensee Employees

*W. R. Cartwright, Station Manager
E. W. Harrell, Assistant Station Manager
*J. A. Hanson, Superintendent - Technical Services
J. R. Harper, Superintendent - Maintenance
D. L. Benson, Superintendent - Operations
G. Paxton, Superintendent - Administrative Services
J. M. Mosticone, Operations Coordinator
R. A. Bergquist, Instrument Supervisor
A. H. Stafford, Health Physics Supervisor
J. P. Smith, Engineering Supervisor
F. Terminella, Engineering Supervisor
P. T. Knutsen, Engineering Supervisor
J. R. Stratton, Mechanical Maintenance Supervisor
D. E. Thomas, Electrical Supervisor
A. L. Hogg, Jr., Site QC, Manager
*M. E. Fellows, Staff Assistant
F. P. Miller, QC Supervisor
K. A. Huffman, Clerk

Other licensee employees contacted included technicians, operators, mechanics, and office personnel.

*Attended one or more exit interviews

2. Exit Interview

The inspection scope and findings were summarized on May 13, 1982, with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Inspection Findings

(Closed) Violation 339/80-28-03 Instrument stop valves on several feedwater flow transmitters were found to be isolated. The Pre-Startup Checkoff List was revised. The checklist 2-OP-1A rev 1 page 4 dated September 11, 1980 has signoff status required for all ESF and Reactor Protection transmitter valve lineups per instrument procedures. The inspector had no further questions. This item is closed.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Plant Status

Unit 1

During this inspection period the unit operated at or near capacity load except for the following. On April 16 at 1451 the unit was manually tripped from 100% power. The unit was tripped because power was lost to the 1G bus (due to supply breaker 15G1 tripping open on a momentary undervoltage spike, and breaker 15G1 failing to auto transfer) causing the loss of circulating water pumps. The unit was manually tripped and the vacuum breakers were opened to prevent damage to the LP turbine rupture disks. The unit was automatically tripped at 2047, April 16 while returning the unit to service when reactor power exceeded 10% with the generator output breakers open causing a turbine trip/reactor trip. The unit automatically tripped April 19 at 0934 from 100% power. This trip was caused when the reactor operator repositioned the N43 power range gain adjustment potentiometer. The repositioning of the potentiometer based on results of a calorimetric, caused a spike to be generated and caused a N43 high positive rate trip. N44 channel was in the trip condition, so 2/4 logic was completed for an automatic reactor trip. The unit was ramped down on May 1 to repair a steam generator blowdown valve (1-BD-2) leak and to repair 5B feedwater heater. The unit was automatically tripped from approximately 5% power when the instrument technician was adjusting N15 (power range) trip setpoints for 85% and did not clear Hi Rate flux (Ø) trip on one channel prior to entering another channel for testing.

Unit 2

During this inspection period Unit 2 remained shutdown while undergoing the first refueling outage. The unit went from Mode 6 to Mode 5 at 2000 on April 27, after the head was installed and refueling was completed.

6. Followup of Previously Identified Items

(Closed) 339/81-24-01, Inspection of loop isolation valve studs. All loop isolation valve studs and nuts were inspected under the following maintenance reports, 2-RC-MOV-2590 (N2-81-10260736), 2-RC-MOV-2591 (N2-81-10260737), 2-RC-MOV-2592 (N2-81-10260738), 2-RC-MOV-2593 (N2-81-10260739), 2-RC-MOV-2594, (N2-81-10260740), 2-RC-MOV-2595 (N2-81-10260741). The visual examination was conducted per NDE-VT-Form 1, and all were found acceptable.

(Closed) 339/80-29-02 Core cooling monitor cabinet movement. The core cooling monitor cabinet was moved to the left end of the Unit 2 benchboard per E&DCR 2727 and is designated as 2-EI-CB-01A section 2-3.

(Closed) 339/80-28-06 Pressurizer pressure protection channels out of calibration. Discussion by VEPCO engineering with the vendor concerning possible pressure set as high as 35-40 psi were discussed and decided not

possible. The vendor stated that a pressure set of very small magnitude such as 1/4 psi at 2500 psi does occur. Calibration records for the three identified pressure transmitters showed that the indicated pressure was 7.2, 2.2 and 13.6 psi below actual pressure when checked approximately four months after being placed into service. Since the transmitters drift is in the same direction (low), credibility to the pressure set characteristics of these transmitters has been shown.

7. Licensee Event Report (LER) Followup

The following LER's were reviewed and closed. The inspector verified that reporting requirements had been met, causes had been identified, corrective actions appeared appropriate, generic applicability had been considered, and the LER forms were complete. Additionally, for those reports identified by asterisk, a more detailed review was performed to verify that the licensee had reviewed the event, corrective action had been taken, no unreviewed safety questions were involved, and violations of regulations or Technical Specification conditions had been identified.

338/82-25	Individual Rod Position Indication deviated from bank position by greater than 12 steps.
*339/81-07	Dilution of Boron Injection Tank below technical specification limits.
*339/81-21	Dilution of Boron Injection Tank below technical specifications limits.

LER 339: 81-07, 81-21 both identified problems with the Boron Injection Tank (BIT) being sampled and the boron concentration below the Technical Specification limit of 20,000 ppm. It was determined that check valve 2-CH-155 in the boric acid supply line to the blender was allowing blender primary grade water to backflow via the recirc line to the BIT and diluting it contents.

During the current refueling outage this check valve (2-CH-155) was cut out and replaced using maintenance procedures MMP-C-P1 and MMP-CW-4 under MR #N2-82-03290901. These LER's are closed.

8. TMI Action Plan Requirements

Item II.E.4.2.6 requires that containment purge isolation valves shall be under administrative controls to assure that they cannot be inadvertently opened.

The inspector verified that containment purge supply and exhaust valves, including bypass flow control valves are chained and padlocked in the shut position in all plant modes other than cold shutdown or refueling. In addition the power supply breakers for operation of the MOV's are in the off position. Valve position indication is also available in the control room.

Item II.E.4.2.7 requires that containment purge and vent isolation valves must close on a high radiation signal.

The containment purge and vent isolation valves remain sealed closed as discussed above; therefore closure from radiation signals are not required. However radiation levels are routinely monitored during modes 1 through 4 and alarm set points and high radiation trip of the containment purge and vent valves are reinstated prior to entry into refueling mode (6).

9. Information Meeting with Local Officials and Inspection of the Local Public Document Room (LPDR)

   a. On May 4, 1982 the Senior Resident Inspector in accordance with Regional Instruction and manual chapter requirements visited the LPDR at Lousia County Courthouse, Lousia, Virginia. The resident inspector visited the LPDR at the Alderman Library at the University of Virginia, in Charlottesville to assess the condition of NRC and licensee documents filed there.

      The following comments are a result of this visit:

      (1) All documents required by the NRC published accession list were neatly stored and properly filed;

      (2) The filing system is in accordance with the NRC recommended filing procedures;

      (3) Changes to specific documents such as license amendments, Technical Specifications etc, are being adequately made to reflect current status of the facility;

      (4) Other documents such as NRC inspection reports, license event reports (LER's) etc, were current up to December 1981. 1982 documents were received in a timely manner but were not filed to date;

      (5) An LPDR users manual is provided for location and ease of retrievability of documents for any interested parties;

      (6) All documents reviewed were in excellent condition.

   b. The SRI met with the chairman of the Board of Supervisors of Louisa County.

      The following topics were discussed:

      (1) The role of the resident inspector;

      (2) Current status of North Anna Units 1 and 2;

      (3) The NRC's relationship to the community;

(4) Name and telephone number of the residents' office was left with the chairman in the event any future correspondence or assistance was requested.

10. Unit 2 License Conditions

The following items relate to specific license conditions as identified in previous inspection report 339/82-08.

a. License Condition (LC) 2.C(4)(b) 339/82-08-05, Pressure transmitters and differential pressure transmitter replacement.

There were 30 pressure transmitters and differential pressure transmitters replaced; 21 in containment and 9 in the quench spray area. These transmitters have been installed and testing is being conducted.

Followup by the resident inspectors on this modification is still continuing.

b. LC 2.C.(4)(c) 339/82-08-06, Wide range resistance temperature detector (RTD) shall be qualified for radiation exposure for 40 years plant life and conditions due to design basis accidents. The Commission issued Amendment No. 23 dated May 4, 1982 to the license for Unit 2. The following are the requirements vice those originally stated in the license:

(1) VEPCO shall test the narrow and wide-range resistance temperature detectors (RTD) for the reactor coolant system by the Loop Current Step Response method each calender quarter until a qualified RTD is available. The RTD will be replaced if unsatisfactory Loop Current Step Response test results are acquired.

(2) For narrow and wide-range RTD's not replaced at a given refueling outage, VEPCO shall assure that RTD detector cable connectors are adequately sealed and shall use the Arrhenius methodology to affirm that the RTD material has not endured significant degradation due to environmental parameters. The results of this affirmation shall be added to central environmental qualification files.

The Loop Current Step Response method test has been conducted on the wide and narrow-range RTDs. The Raychem connectors on all the RTDs were inspected per IMP-C-PROC-24 under MR #N2-82-05080853. The degradation analysis per the Arrhenius methodology is not complete. Followup by the resident inspectors on this action is still continuing.

(3) LC 2.c(4)(e) 339/82-08-07 Safety-related electrical equipment in the facility shall be qualified per NUREG-0588. The 81-07 design change relates to solenoid operated valves (SOV). There were 87 SOV originally identified as needing replacement, one has since

been deleted. There have been 79 SOV worked; seven were not yet worked. The 79 SOV that were worked all but three have been tested. Many of the valves worked were checked by the inspector. They were checked to specific requirements of the design change package. Followup by the inspectors is continuing.

The 81-09 design change relates to motor operated valves (MOV's). There were 10 MOV's reworked during this outage period. Testing of these valves has not been completed. Many of the valves worked were checked by the inspector, per the design change package requirements. Followup by the resident inspectors on this modifications is still continuing.

(4) LC 2.c.(10), 339/82-08-08, Backup overcurrent protection system for containment electrical penetrations.

On May 3, 1982 the Commission issued Amendment No. 21 for Unit 2. It revised the implementation date of License Condition 2.c.(10). The revised date is the second refueling outage for installing and having operational the backup overcurrent protection system for containment electrical penetrations.

The plant is working on design package 81-21B and plans on having approximately 30% of the circuits identified as requiring backup overcurrent protection complete and tested. Followup by the resident inspectors on this modification is still continuing.

(5) LC 2.c.(12)(c), 339/82-08-09, Diverse power supply for Th and Tc.

This design package 80-52B has been completed and testing of system is being conducted. Followup by the resident inspectors on this modification is still continuing.

(6) LC 2.c(15)(a), 339/82-08-10, Submit inspection program for control rod guides thimble tube wall wear for Commission approval.

The licensee submitted the results of the guide thimble surveillance program conducted at Salem Unit 1 to the Commission on March 1, 1982 (Serial No. 124).

The Commission issued a letter to the licensee dated April 21, 1982 stating that the submittal was acceptable and met in full the stipulations of License Condition 2.c(15)(a). Item 339/82-08-10 is closed.

(7) LC 2.c(15)(b), 339/82-08-11, Install inspection ports in steam generator.

Each steam generator had a 2½" inspection port installed between the fifth and sixth tube support plates. Followup by the resident inspectors on this modification is still continuing.

(8) LC 2.c(15)(c), 339/82-08-12 Remove and inspect the inside recirculation spray pumps.

The inside recirculation spray pumps were removed, the bearing were replaced, in the pumps were optically aligned and then a test run was conducted. Review of final package by the resident inspector is still needed.

(9) LC 2.c(15)(d), 339/82-08-13 Install leak test connections on the RHR isolation valves.

The leakage test connections on the two 10" outlet valves MOV-2720A and MOV-2720B (Darling Valve) and the two 14" inlet valves MOV-2700 and MOV-2701 (Copes-Vulcan) have been installed. These isolation valves are double disc motor operated gate valves.

The original intent was to pressurizer the area between the discs via the 3/4" globe valve welded on the valve body drain nipple. However the design of the inlet valves MOV-2700 and MOV-2701 prevents this. There is a mechanical keeper between the two discs preventing each disc from seating simultaneously. Therefore, since only one disc can seat at a time, no pressure boundary is provided.

The performance of the leak rate tests on these valves will be conducted using a test procedure that accounts for the design of these valves.

This item will be further inspected to determine adequacy.

(10) LC 2.c(15)(e), 339/82-08-14, Demonstrate by test the backup depressurization capability of the PORV's.

Per SER NUREG-0053 Supplement No. 11 pg 5-4 and license condition, depressurization using the PORV to avoid rupture of the PRT disc was conducted on March 7, 1982. The specific procedure 2-OP-3.2 dated July 23, 1980 per license condition was used. Following completion of the test Engineering Study No. 82-4 PORV Depressurization Capability Test dated May 3, 1982 was written. This study and the actual test were reviewed by the inspector and it was determined that the license condition was met. Item 339/82-08-14 is closed.

(11) LC 2.c(15)(f), 339/82-08-15, Submit the result of the tests applicable to Unit 2, of a study concerning mixing of borated water and cooldown under natural circulation conditions.

This test was conducted on March 7, 1982 following stabilization of the reactor coolant system and tripping of the reactor coolant pumps.

The test report was submitted to the Commission on April 5, 1982 (Serial No. 200). In a letter from the Commission dated April 22, 1982 it was stated that the test results submitted met in full the stipulations of the license condition. Based on this letter and witnessing of the test this item (339/82-08-15) is closed.

(12) LC 2.c(15)(g), 339/82-08-16 Retest all engineered safety features reset control actions to verify proper reset action.

This test will be conducted prior to startup and will be followed by the resident inspectors.

(13) LC 2.c(15)(h)(1), 339/82-08-17 Complete a formal training program for all the mechanical and electrical maintenance and quality control personnel; including supervisors, who are responsible for the maintenance and availability of the diesel generators.

During March and November 1981, 28 maintenance personnel and some supervisors, three Quality Assurance personnel, and one each from Operations and Training attended a factory training school. The training course covered maintenance of the 38 TD 8 1/8 diesel engine of the type installed at the North Anna site. The course was held by Fairbanks Morse Engine Division in Beloit, Wisconsin.

License condition 2.c(15)(h)(1) is complete and item 339/82-08-17 is closed.

(14) LC 2.c(15)(h)(2) 339/82-08-18 AC prelube pumps shall be modified to DC power operation.

The Commission has issued Amendment No. 22 dated May 3, 1982 to the Unit 2 license that revised the completion of license condition 2.c(15)(h)(2) until the October 1982 fall maintenance outage. This item will be followed during the October 1982 fall maintenance outages by the residents.

(15) LC 2.c(15)(h)(3), 339/82-08-19 The diesel generator operating procedures shall be modified to require loading the engine up to 50-75 percent of full load for one hour after eight hours of continuous no load operation.

This items has been completed and was closed in inspection report 50-339/80-31. Therefore item 339/82-08-19 is closed.

(16) LC 2.c(15)(h)(4), 339/82-08-20 The day tank overflow line shall be rerouted to return excess fuel to the seven day fuel oil storage tank.

The Commission has issued Amendment No. 22 dated May 3, 1982 to the Unit 2 license that revised the completion of license condition 2.c(15)(h)(2) until the October 1982 fall maintenance outage. This item will be followed by the residents.

(17) LC 2.c(15)(h)(5), 339/82-08-21 Each seven day fuel oil storage tank shall be provided with a seismic Cat I, tornado missile, and flood protected emergency fill line.

This design change 81-02 has been completed however, review of final package is pending by the resident inspectors.

(18) LC 2.c(15)(h)(6), 339/82-08-22 Floor mount the skid mounted panels and control equipment presently furnished with the diesel generator.

This design package 81-04B is being worked, however review of the final package is pending by the resident inspectors.

b. Unit 2 Steam Generator Inspection

During this refueling outage extensive steam generator (S/G) inspection was conducted. This inspection program included eddy current (EC) examination of approximately 98% of all tubes in A steam generator, 99% in B steam generator, and 92% in C steam generator. A visual inspection of the internals was conducted through the existing 6" inspection ports and through the newly installed 2½" ports.

The visual examination revealed no indication of flow slot obstruction or closure. No other visual evidence of degradation was noted.

The EC inspection of A and B steam generator indicated minor corrosion in the tube to support plate intersections. However this was previously noted during the inspection conducted in 1979. There was no evidence of tube denting as that noted in C steam generator.

The EC inspection of C steam generator indicated that approximately 95% of the tubes on the hot leg side showed evidence of minor denting.

The denting was noted at approximately 35% of the tube and tube support plate intersections. The denting was estimated to be less than one mil (0.001") at all locations.

The licensee plans on conducting a boric acid conditioning program on these steam generators similar to that conducted on Unit 1 steam generators. A boric acid soak at low power followed by intermittent boric acid treatment during power operations is planned. This process inhibits corrosion by chemically combining with magnetite, a corrosion product, thus forming borasite which is a less permeable compound. The borasite compound is less subject to corrosion activity.

The inspector had no further questions at this time.

11. Plant Operation

Numerous containment enteries were made during the current Unit 2 refueling outage. These entries were made to review work in progress, overall housekeeping and safety during work activities, assure adherence to licensee Health Physics Policies.

On a regular basis radiation work procedures (RWP's) were reviewed and the specific work activity was monitored to assure the activities were being conducted per the RWP's. Radiation protection instruments were verified operable and calibration/check frequencies were reviewed for completeness.

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

The inspectors conducted various plant tours and made frequent visits to the control room. Observations included: witnessing work activities in progress, status of operating and standby safety systems and equipment, confirming valve positions, instrument readings and recordings, annunciator alarms, housekeeping and vital area controls.

No violations were identified in these areas.

12. Offsite Review Committee (40701)

The inspector reviewed the Safety Evaluation and Control (SEC) organization to verify that it is conducting the independent review function as described in the referenced documents. The SEC has replaced the committee type review organization for the performance of offsite independent reviews. The inspector reviewed monthly reports between April 1981 and March 1982 and verified that the SEC was reviewing those activities required by the Technical Specifications. The qualifications of the SEC staff were also reviewed for Technical Specification adequacy. In addition to the SEC, the inspector reviewed the operation of the Nuclear Overview Committee, a license imposed senior management review group organized to periodically review various aspects of nuclear power plant operations. This area was evaluated in conjunction with inspection 280, 281/82-02.

Based on this review, no violations or deviations were identified.

13. Offsite Support Staff (40703)

The inspector reviewed the referenced documents to verify that the licensee has identified positions and responsibilities in the company offices to perform the offsite function of Quality Assurance, Design, Engineering and Procurement. The inspector interviewed individuals in each functional area at the managerial level. During the interview, the inspector verified that each individual was qualified for his position and was aware of his responsibilities and authority in relation to the company organization and

the Quality Assurance Program. This area was evaluated in conjunction with inspection 280, 281/82-02.

Based on this review, no violations or deviations were identified.