



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

Report Nos.: 50-338/85-01 and 50-339/85-01

Licensee: Virginia Electric and Power Company
Richmond, VA 23261

Docket Nos.: 50-338 and 50-339

License Nos.: NPF-4 and NPF-7

Facility Name: North Anna Units 1 and 2

Inspection Conducted: January 6 - February 5, 1985

Inspectors: Kenneth M Jensen for 20 Feb 85
H. W. Branch, Senior Resident Inspector Date Signed

Kenneth M Jensen for 20 Feb 85
J. G. Luehman, Resident Inspector Date Signed

Approved by: Virgil W Braundler for _____
S. Elrod, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This routine inspection by the resident inspectors involved 253 inspector hours on site in the areas of licensee event reports; IE Bulletins; followup of previously identified items; licensee action on previous enforcement matters; maintenance; surveillance; engineered safety feature (ESF) system walkdowns and plant operations.

Results: Of the 9 areas inspected, one violation was identified in one area, and it is discussed in paragraph 10.

REPORT DETAILS

1. Licensee Employees Contacted

- *E. W. Harrell, Station Manager
- G. E. Kane, Assistant Station Manager
- M. L. Bowling, Assistant Station Manager
- J. R. Harper, Superintendent, Maintenance
- *R. O. Enfinger, Superintendent, Operations
- S. B. Eisenhart, Licensing Coordinator
- J. R. Hayes, Operations Coordinator
- J. P. Smith, Engineering Supervisor
- R. C. Sturgill, Engineering Supervisor
- D. E. Thomas, Mechanical Maintenance Supervisor
- A. H. Stafford, Health Physics Supervisor
- E. C. Tuttle, Electrical Supervisor
- R. A. Bergquist, Instrument Supervisor
- F. P. Miller, QA Supervisor
- F. T. Terminella, QA Supervisor
- *J. A. Stall, Superintendent, Technical Services

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

2. Exit Interview

The inspection scope and findings were summarized on February 5, 1985, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspectors findings and committed to resolving outstanding items discussed in paragraphs 9, 10, and 11. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

3. Licensee Action on Previous Enforcement Matters

(Closed) Violation 339/83-31-03 Failure to update procedures in the auxiliary shutdown panel. This item was closed in inspection report 339/84-06 in conjunction with item 338/83-31-02 which concerned updating of the station fire barrier inspection procedure.

4. Unresolved Items

An unresolved item is a matter about which more information is required to determine if it is acceptable or may involve a violation or deviation. One unresolved item was identified during this inspection, and it is discussed in paragraph 9.

5. Plant Status

Unit 1

The unit began the inspection period at 100% power and operated at or about that level for the entire period.

Unit 2

The unit began the inspection period at 100% power. On February 4, 1984, the unit was ramped down to 30% power and subsequently taken off the line in order to repair main condenser leaks that were affecting secondary chemistry and condenser vacuum.

6. Licensee Event Report (LER) Followup

The following LERs 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.

- *339/81-23 2T Diesel battery performance data not usable for comparison
- *338/84-09 Fire suppression water supply inoperable
- *339/84-05 Main Feedwater Control Valve failure causes reactor trip
- 339/84-24 Surveillance procedures not performed
Rev. 0 and
Rev. 1
- *339/84-11 2H EDG trips
Rev 1
- *339/84-13 Forced shutdown of Unit 2
- *338/84-10 MOV Torque Switch settings not within limits
Rev. 0 and
Rev. 1
- *338/84-19 Reactor Trip due to loss of Vital Bus 1-III
Rev. 1
- *339/84-08 Loss of RHR due to failed level indication
Rev. 1

(Closed) LER 339/81-23 2J Diesel battery performance data not usable for comparison. The inspector has reviewed the licensee's report, and the corrective actions taken by the licensee's surveillance group. Both appeared adequate.

(Closed) LER 339/84-08, Rev. 1, Loss of RHR-Failed Level Indication. The plant has experienced other events similar to this one, and the corrective action instituted to prevent recurrence was to periodically vent the RHR pumps. Because of the timing involved in this event, pump venting did not occur before the pumps became air bound. The inspectors recommended to the licensee that they consider installation of a second independent channel of level indication, if they are going to continue to use temporary indicators that are likely to become crimped or blocked.

(Closed) LER 338/84-09 Fire Suppression Water Supply Inoperable. The inspector verified that the licensee had taken proper compensatory action for the inoperable diesel driven fire pump. On January 30, 1985 the electric driven fire pump was satisfactorily tested and returned to full service.

(Closed) LER 339/84-05 Main Feedwater Control Valve Failure Causes Reactor Trip. The inspector verified that the licensee incorporated checking of the load shed key switch in the turbine building operator's log (1-LOG-6C).

(Closed) LER 338/84-24 Rev. 0 and Rev 1, Surveillance procedures not performed. The inspectors have reviewed these reports. Clearly, the failure to perform the surveillance tests is a violation of Technical Specifications. However, since the violation was licensee identified and was found to meet the requirements of 10 CFR Part 2 Appendix C IV.A, a Notice of Violation will not be issued. Licensee corrective action centered on more clearly delineating the responsibilities for performance of surveillance tests and provides a method to identify to station management any surveillances that are in the allowed extension to the surveillance interval.

(Closed) LER 339/84-11 and 339/84-13 2H EDG Trips and Forced Shutdown of Unit 2 due to Inoperable Emergency Diesel Generators - The North Anna Unit 2 EDG's are discussed in detail in paragraph 8 of inspection reports 338, 339/84-44.

(Closed) LER 338/84-10 Rev. 0 and Rev. 1. MOV Torque Switch Settings are not within the limits specified by the North Anna setpoint Document. This subject was discussed in inspection reports 338, 339/84-19 and 338, 339/84-27.

(Closed) LER 338/84-019, Rev. 1 Reactor Trip Due to loss of Vital Bus 1-III. This updated report was reviewed by the inspector and appeared to be satisfactory. The original report was closed in an earlier inspection report.

7. Followup of Previously Identified Items

(Closed) IFI 339/82-29-04 Licensee evaluation of an overall surveillance testing tracking program. This item was closed for Unit 1 in inspection report 338/83-13, and since the evaluation was for a program common to both units, it should be considered closed on Unit 2 as well.

With few exceptions every surveillance requirement done on a frequency of less than once a day is accomplished by use of a performance test. The procedure may be nothing more than a cover sheet requiring a maintenance or operating procedure to be accomplished and, as discussed in inspection report 339/82-29, the accomplishment of performance tests is tracked by a computerized system. Tracking the accomplishment of surveillances done greater than daily is done through required log reviews, as almost all such surveillances are documented on one of the plant operating logs. To track the accomplishment of these items on a tracking system similar to that used for performance tests is felt to be unnecessary when performance frequency is contrasted with the delay times involved in updating the tracking system.

(Closed) IFI 338/82-25-02 Licensee actions to make nitrogen supply to over-pressure protection system more reliable. This subject is discussed in depth in paragraph 6 of inspection reports 338, 339/84-38.

(Closed) 339/83-08-01 Updating reactor trip breaker procedures with the latest vendor information. The licensee has completely revised the procedure, cancelling EMP-P-EP-7, and instituting EMP-P-EP-8 "Reactor Trip Breaker" dated June 8, 1984. This new procedure is the product of a combined effort of licensee personnel from both Surry and North Anna, with advice from the trip breaker vendor.

(Closed) IFI 339/83-13-01 Installation of environmentally qualified resistance temperature detectors (RTDs). The licensee has in place on both units environmentally qualified RTDs manufactured by the Weed Instrument Company. Presently, those on Unit 1 have been time response tested using the Loop Current Step Response Method, while those on Unit 2 are still awaiting testing. To date, there have not been any operational problems with the RTDs on either unit.

8. IE Bulletins

(Closed) 338, 339/84-BU-02 "Failure of General Electric Type HFA Relays in use in Class IE Safety Systems." The inspectors have reviewed the licensee's response dated July 31, 1984, as well as the supplemental response dated October 25, 1984. It has been verified that the licensee has in place a monthly inspection program for these relays, as was stated in the initial response to the bulletin. Further, the inspectors verified that the commitments made by the licensee to change out the relays have been entered on their commitment tracking system.

(Closed) 338, 339/84-BU-03 "Refueling Cavity Water Seals" Inspection of the licensee's actions taken as a result of this bulletin is documented in inspection reports 338, 339/84-33. A follow-up inspection based on the requirements of TI 2515/66 has been performed, and the licensee's actions appear satisfactory.

9. Safety System Valve Lineup Verification

A review of the valve lineups for the Low Head Safety Injection and the Outside Recirculation Spray System against the system flow drawings revealed the following:

Flow Drawing 11715-FM-96A, Revision 13, showed the cross connect valves 1-SI-312 and 1-SI-315 as being open, whereas valve lineup 1-OP-7.1A dated November 27, 1984 calls for these valves to be shut. The inspectors recognize that the positions of these valves are not crucial to safe system operation as the valves downstream are also shut. Since the significance of the valve positions shown in the drawings and/or FSAR is not clear because of plant operation per written procedure, this item is being referred to NRC Region II for clarification. This item is identified as Inspector Followup Item 338/85-01-01.

The required positions for Unit 1 Low Head Safety Injection to Hot Leg valves (MOV-1890A&B) differ from those of the corresponding valves for Unit 2 (MOV-2890A&B). Specifically, a comparison between valve lineup procedures 1-OP-7.1A and 2-OP-7.1 A revealed:

<u>Valve #</u>	<u>Normal Position</u>	<u>Procedure</u>
MOV 1890A&B	Power Available Valve Closed	1-OP-7.1A
MOV 2890A&B *	Locked Closed	2-OP-7.1A

Neither position appears to be correctly stated in that, Technical Specification (TS) 4.5.2 for both units requires the valves to be closed with power removed. The position stated in Technical Specifications is the present actual valve position and is verified, as such, every four hours by 1&2-LOG-4, which requires the power to be removed from the valve and the position indicator to be green (closed). Valve lineups 1&2-OP-7.1A should be changed to reflect the correct valve position. This item will be assigned as inspector followup item (IFI 338, 339/85-01-02).

No violations or deviations were identified in this area.

10. Instrument Channel Check

During the inspection period, the inspectors noted that several channels of control room instruments monitoring the same process varied greater than expected between channels. The question arose as to whether the channels

were acceptable based on the Channel Check requirements contained in the licensee's Technical Specifications. The inspectors discussed the issue with station management and initiated a detailed evaluation of the licensee's program being utilized to satisfy the Technical Specification Channel Check surveillance requirement.

After reviewing the requirements and guidelines available that govern instrument Channel Checks, the inspectors discovered the following:

Channel Check tests are required and generally defined in Technical Specifications.

Regulatory Guide 1.118, Revision 2, dated June 1978, specifies an acceptable method to conduct periodic testing of electrical power and protection systems. It should be noted that the licensee has not specifically committed to this Reg. Guide, however, it represents the method described in industry accepted standard IEEE 338-1977.

IEEE 338-1977 (Criteria for Periodic Testing of Nuclear Power Generating Station Safety Systems) requires in Section 6.3.1 that the operability of instrument channels which have indication available shall be verified by one of three ways. The first way described, which is widely used by the industry, is to compare readings on channels which monitor the same variable (i.e. compare Channel 1 with Channel 2 and 3), however, this standard does not describe an acceptable method to derive a tolerance for evaluation of the compared values.

Discussion with plant management personnel indicate that the channel comparison method used at North Anna is different from the method discussed above. Specifically, all channels that monitor the same variable are averaged together, and the individual channels are compared against this average value. Since the method utilized by the licensee differed from the method described in the industry standard, the inspectors contacted Region II and NRR personnel for guidance.

Based on the above discussions, the inspectors determined that the licensee's statistical approach to indicated values may be acceptable, provided the acceptance criteria established by the licensee were derived using a similar statistical approach.

The inspectors were unable to determine how the acceptance criteria for evaluating Channel Check acceptability were derived. Licensee management has been asked to provide the inspectors with the basis for the acceptance criteria as well as specific calculations for a representative sample of Technical Specification instruments. This item is identified as inspector followup item (IFI 338, 339/85-01-03).

The inspectors also discovered that the Channel Checks required by Technical Specification 4.3.1.1.1 for over-temperature Delta T and over-pressure Delta T are not being properly performed. Specifically, a Channel Check as

defined in Technical Specifications requires a qualitative assessment of channel behavior during operations by a comparison of the channel indication with other indications derived from independent instrumentation channels measuring the same parameter. The implementation of this surveillance at North Anna is satisfied by Units 1 and 2 LOG-4 which compares Delta T protection channel instruments TI-1-412A, TI-1-422A and TI-1-432A for Unit 1 against the average of the three instruments. A similar condition exists for Unit 2 with instruments TI-2-412A, TI-2-422A and TI-2-432A. These instruments do not monitor the same parameter, in that, the Delta T's across the three steam generators have been demonstrated to not always be the same under dynamic conditions. A truer channel check would be to compare the control and protection channel for a given loop after establishing adequate acceptance tolerances.

A similar problem was discovered when reviewing 1-PT-41.1 "Auxiliary Shutdown Panel Monitoring Instrumentation Channel Check". In doing Channel Checks of the steam generator wide range level indicators, the levels are compared one generator against another. This is done despite the fact that narrow range level indication could be used to check wide range indication with use of a conversion factor or, at a minimum, indicators of the single wide range transmitter could be compared.

These failures to properly conduct Technical Specification required surveillances are identified as a violation (338, 339/85-01-04).

11. Post Accident High Range Effluent Monitor

During a review of outstanding TMI action items, the inspectors noted that the high range effluent monitors required by item II.F.1 of NUREG 0737 are not providing reliable indication and are, at best, only conditionally operable. In their letter of May 31, 1982, to NRR, VEPCO provided a status of this item and stated that the final system provided by KAMAN Sciences would be operable by January 1, 1983, and in the interim the short-term system provided by the Nuclear Research Corporation would be used.

Several of the specific problems associated with the KAMAN system were identified in inspection report 338, 339/83-22. However, the inspectors have learned that the KAMAN system, and the short-term Nuclear Research Corporation system have been experiencing many problems. Without a dedicated effort and a long term commitment the systems may never provide reliable service. Discussions with Health Physics management indicate that the licensee has the equipment and procedures to get grab samples from the various effluent streams; however, calculations to verify that samples could be obtained without exceeding exposure guidelines were not available for inspector review. This method is the one that would be used under accident conditions in lieu of the method described in VEPCO's commitment to NRR.

Additionally, the KAMAN and the Nuclear Research Corporation equipment is referenced in the licensee's Emergency Plan Implementing Procedures and are used in determining emergency action levels for proper classification of accident severity.

The inspector discussed these items with licensee management and received a commitment to update the information provided to the NRC as well as modifying their Emergency Plan Implementing Procedures. This item continues to remain open and is assigned as Inspector Followup Item (IFI 338, 339/85-01-05).

No violations or deviations were identified in this area.

12. ESF System Walkdown

The following selected engineered safety feature systems were verified operable by performing walkdowns of the accessible and essential portions of the systems.

Unit 1

January 2, 1985, NaOH Chemical Addition System (1-OP-7.8A)

Unit 2

January 25, 1985, NaOH Chemical Addition System (2-OP-7.8A)

No violations or deviations were identified in this area.

13. Routine Inspection

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 inspector verified compliance with selected Technical Specifications and Limiting Conditions for Operations.

During the course of the inspection, observations relative to protected and vital area security were made, including access controls, boundary integrity, search, escort and badging.

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

The inspector kept informed, on a daily basis, of the overall status of both units and of any significant safety matters 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 inspector 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 recording readings, annunciator alarms, housekeeping and vital area controls.

No violations or deviations were identified in this area.