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

Report Nos.: 50-338/85-16 and 50-339/85-16

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 1 and 2

Inspection Conducted: June 3 - July 7, 1985

Inspectors: Gregory A. Pick for — July 19, 1985
M. W. Branch, Senior Resident Inspector — Date Signed

Gregory A. Pick for — July 19, 1985
J. G. Luehman, Resident Inspector — Date Signed

Approved by: Gregory A. Pick for — July 19, 1985
S. Elrod, Section Chief — Date Signed
Division of Reactor Projects

SUMMARY

Scope: This routine inspection involved 226 inspector-hours onsite in the areas of licensee event reports (LER), previously identified items, licensee action on previous inspection findings, engineered safety features walkdown, operational safety verification, monthly maintenance, monthly surveillance and inspection of manual reactor trip circuit location.

Results: One violation was identified: multiple examples of failure to follow procedure, paragraphs 10, 11 and 12.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*E. W. Harrell, Station Manager
*A. L. Hogg, Jr., Quality Control (QC) Manager
G. E. Kane, Assistant Station Manager
*E. R. Smith, Assistant Station Manager
M. L. Bowling, Assistant Station Manager
R. O. Enfinger, Superintendent, Operations
*J. R. Harper, Superintendent, Maintenance
A. H. Stafford, Superintendent, Health Physics
*J. A. Stall, Superintendent, Technical Services
G. J. Paxton, Supervisor, Administrative Services
J. R. Hayes, Operations Coordinator
J. P. Smith, Engineering Supervisor
D. E. Thomas, Mechanical Maintenance Supervisor
E. C. Tuttle, Electrical Supervisor
R. A. Bergquist, Instrument Supervisor
F. T. Terminella, Quality Assurance (QA) Supervisor
R. C. Sturgill, supervisor Engineering
*G. H. Flowers, Nuclear Specialist
J. H. Leberstein, Licensing Coordinator
*T. R. Maddy, Station Security Supervisor

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

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on July 3, 1985, with those persons indicated in paragraph 1. The licensee acknowledged the inspectors findings.

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) Deviation 338, 339/84-27-02 Inoperable Radiation Monitor for Service Water (SW) Discharge to the SW Reservoir. The inspectors reviewed the licensee's response to this deviation dated September 26, 1984, and the supplemental response dated April 2, 1985. The inspectors have inspected the radiation monitor and the associated pump and piping, which are now operating. The licensee has committed to including an inspection of the

radiation monitor pump and piping in the periodic maintenance performed by the instrumentation technicians on the radiation monitor electronics.

(Closed) Violation 338, 339/84-27-03 Failure to Take Required Grab Samples While Discharging SW to Lake Anna With the Radiation Monitor Inoperable. The inspectors reviewed the licensee's response to this violation dated September 26, 1984. Additionally, the inspectors have verified the licensee has in place a radiation monitor status update system to keep plant management aware of any significant problems with any of the plant radiation monitor systems.

(Closed) Violation 338/84-44-01 Lockout of the 1B Charging Pump. The inspectors reviewed the licensee's response to this violation dated March 12, 1985. As was stated in the response, the licensee did undertake a program to reduce the number of lighted annunciator panels in the control room. During the first few months of this program, the number of lighted panels was significantly reduced; however, during the last couple of months, the number has steadily risen again. The inspectors have re-emphasized to plant management that in order for such a program to be successful it must be a continual effort.

(Closed) Violation 338, 339/85-01-04 Failure to Properly Conduct Technical Specification (TS) Required Channel Check Surveillances. The inspectors reviewed the licensee's response to this violation dated March 25, 1985. The licensee has revised the method by which the required Channel Checks are conducted on the auxiliary shutdown panel wide range steam generator level indicators and the inspectors verified this by reviewing 2-PT-41.1 dated April 23, 1985. The periodic rescaling of the overtemperature and overpressure delta T indications has been included in a Performance Test.

(Closed) Violation 339/84-38-03 Inadvertent Draining of the Casing Cooling Tank. The inspectors verified that 2-PT-66.3 has been revised by the licensee as required by the response to this violation dated January 2, 1985. As stated above, the problem with lighted control board annunciators has not been solved by the licensee but that work is continuing.

(Closed) Violation 339/84-44-01 Failure to Inspect Service Water Piping at the Frequency Required. The inspectors have reviewed the licensee's response to this violation dated March 12, 1985, and have verified that the piping inspection frequency has beer changed to conform with the requirements of the applicable license condition and referenced Regulatory Guide.

4. Unresolved Items

An unresolved item (UNR) is a matter about which more information is required to determine whether it is acceptable or may involve a violation or deviation.

One unresolved item was identified during this inspection and is discussed in paragraph 13.

5. Plant Status

Units 1 and 2:

On June 13, 1985, at 4:35 p.m. with both units at 100 percent power, a radiological release occurred through the boron recovery waste gas stripper surge tank relief valves. The relief valves lifted after the stripper surge tank filled with water, reducing it's volume while the gas compressor was still running. The radioactive gas went from the valves into the process vent system downstream of the filters then out the process vent. The release was terminated at 4:39 p.m. with an unusual event (UE) being declared at 5:05 p.m. State and local authorities were informed. The UE was terminated at 5:24 p.m. after a detailed dose assessment indicated that the gas release was well within TS limits, i.e., 1.21% of the instantaneous limit.

At 6:50 p.m. on July 4, 1985, with Unit 1 operating at 100 percent power, control rod B-10 (Control Bank A, Group 1, peripheral rod, located near Power Range Nuclear Instrument Channel N-42) dropped to the fully-inserted position due to a blown fuse in a power supply cabinet. A negative flux rate reactor trip signal was received only on channel N-42, Tave decreased about 0.5 degrees F, and reactor power decreased about 15 megawatts (MW) thermal. Licensee personnel initiated the requirements of TS 3.1.3.1 Action c, and at 8:31 p.m. on July 4, 1985, the rod was completely withdrawn and declared operable. During the course of the event, licensee personnel discovered that the present shutdown margin calculation procedures, 1 and 2-PT-10, were not well suited for the calculation of shutdown margin with a dropped rod. The licensee has committed to writing a dropped rod shutdown margin calculation procedure and making it part of the Abnormal Procedures for a dropped rod. This item is identified as Inspector Followup Item (IFI) 338, 339/85-16-01.

Units 1 and 2 operated at or near 100 percent power during the entire inspection period.

6. Licensee Event Report Follow-up

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 asterisks, 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 TS conditions had been identified.

338/85-06 Fire Suppression Water System Inoperable, Loss of Both High Pressure Pumps.

*339/83-77 Failure of a Fire Damper in the Safeguard Area Ventilation System (SAVS).

338/84-09 Rev. 1, Fire Suppression Water Supply Inoperable

*338/83-07 High Head Safety Injection Throttle Valve Found Out-of-Alignment

*338/84-20 Turbine Trip/Reactor Trip-Improper Procedure Sequencing

*338/85-07 Fire Barrier Penetration Left Unsealed Without Fire Watch

(Closed) LER 339/83-77 Failure of a Fire Damper in the SAVS. This item was discussed with licensee management, and the results of that discussion were documented in the closure of IFI 338, 339/84-09-01 in Inspection Reports 338, 339/85-12.

(Closed) LER 338/83-07 High Head Safety Injection Throttle Valve Out-of-Alignment. The inspectors verified that 1 and 2-PT-61.3 have been updated to require system throttle valves be set in accordance with the system operating procedure valve lineup.

(Closed) LER 338/84-20 Turbine Trip/Reactor Trip-Improper Procedure Sequencing. The inspectors reviewed 1 and 2-OP-15.1 and verified that a caution note was added, instructing the operator to perform the Overspeed Protection Controller test with the turbine on the turning gear or at low rpm and with the controller in throttle valve control.

(Closed) LER 338/85-07 Fire Barrier Penetration Left Unsealed Without Fire Watch. The inspectors have reviewed this report and the corrective action. The penetration that was left unsealed is located in the bottom of Unit 1 B service water pump (1-SW-P-1B) breaker cubicle and, because of the location, it is understandable why the breached penetration went undetected during routine operations and fire protection inspections. Because the event was identified by the licensee it was evaluated against and found to meet the criteria of 10 CFR Part 2, Appendix C; therefore, no Notice of Violation will be issued.

7. Follow-up of Previously Identified Items

(Closed) IFI 338/81-11-02 Followup of Licensee Administrative Controls of Procedure Revisions. The licensee has in place a group of document control procedures that outline not only the required distribution of procedure revisions but also such details as proper marking and disposal of the old copies.

(Closed) IFI 339/81-07-03 Modification of Two Motor Operated Valves (MOV) in Accordance With Vendor Recommendations. The recommended changes were made under Design Change 81-S33 which was installed in May of 1981.

(Closed) IFI 339/81-12-02 Licensee Long Term Corrective Actions for Failure of a Volume Control Tank (VCT) Level Indicator. The licensee's actions on this item are being tracked under LER 338/81-42.

(Closed) IFI 338, 339/DRP 85-01 Station Battery Inspection. The required inspection is documented in Inspection Reports 338, 339/85-05.

(Closed) IFI 338/83-08-01 Revision of the Reactor Trip Breaker Maintenance Procedure, Electrical Maintenance Procedure (EMP) EMP-P-EP-7. This item was closed for Unit 2 in inspection report 339/85-01 and, since the procedure is common to both units, this item is considered closed for Unit 1.

(Closed) IFI 338, 339/85-03-04 Required Procedure and Log Changes Identified During Routine Safety Inspection. The licensee reemphasized to operations personnel the importance of ensuring breaker charging switches are in the correct position. Further inspections have revealed no other such charging switch misalignments. The rescaling of the delta temperature indications has been incorporated by the licensee into a performance test that will be accomplished during each refueling. The four log problems identified in this item have been corrected by the licensee and verified by the inspectors.

(Closed) IFI 338, 339/84-19-02 Correction of Motor Operated Valve Operator Torque Switch Settings. After the initial problem was identified the licensee checked the torque switch settings of selected valves. This check revealed some additional problems and the licensee decided to check the settings on all safety-related MOVs. Some additional improper settings were discovered as well as some incorrect setting requirements in the plant setpoint document. The switches that needed resetting were reset and the errors in the setpoint document have been corrected. Additionally, retraining for station electricians has been conducted in the training center on a Limitorque valve operator much like those actually used on plant MOV's.

(Closed) UNR 338, 339/84-44-02 Chemical Effects on SW Piping and the Proper Method of Pipe Procurement. In a memo dated March 25, 1985, the Superintendent of Technical Services was informed by the corporate office that the concentration of sodium hypochlorite in the SW was sufficiently low that it would not be a problem for the SW piping. Discussions with Calgon (the supplier of other SW chemical additives) about the effects of their chemicals on SW piping are documented and state that none of the additives will have any adverse effects. The followup of the procurement of SW piping will be done as part of UNR 338, 339/84-41-06.

(Closed) IFI 338, 339/84-06-14 Clarification of North Anna Power Station Fire Protection Plan, section 3.5.2. The licensee has chosen to use administrative procedures for the control of the fire loading in particular areas due to transient combustibles. Any transient combustibles brought into an area must be attended and removed when the work is not in progress or has completed.

8. Monthly Maintenance

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 that those activities were in conformance with Technical Specifications. Activities inspected during this monthly inspection included the electrical repair of service water pump 1-SW-P-1B under work order number (No.) 5901009234 using EMP-C-PH/PL-15, General Trouble Shooting and Repair of Electrical Motors. During the performance of the work, the inspectors independently verified (using North Anna Specification 1010 as the reference) the bolt torque values used by the electricians to make the connections in the pump breaker cubicle. Additionally, the inspectors closely followed the mechanical cleaning of the service water piping in accordance with Design Change 84-74 as well as reviewing for technical adequacy. Mechanical Maintenance Procedure (MMP)-C-SW-5, Permanent Repair of the Service Water Spray Header Piping, and MMP-C-RC-9.1, Flux Thimble Tubing Ferrule Replacements.

No violations or deviations were identified.

9. Monthly Surveillance

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. Some of the activities reviewed/inspected included on June 11, 1985, observing performance of a portion of 1-PT-85, D. C. Distribution Systems, which involved station electricians checking the voltage and electrolyte level for the diesel fire pump 24 volt batteries. Additionally, 1-PT-172.2, Monitoring of the Early Warning System Sirens Activation Test, was reviewed for technical adequacy.

No violations or deviations were identified.

10. ESF System Walkdowns

The following selected ESF systems were verified operable by performing a walkdown of the accessible and essential portions of the systems on June 20, 1985:

Unit 1

Casing Cooling (1-OP-7.10A dated 7-13-83)

Unit 2

Casing Cooling (2-OP-7.10A dated 5-30-85)

Upon completion of the walkdowns, the inspectors had the following comments:

a. On both units, with the chiller secured, the outlet valves (1-RS-165 and 2-RS-144, respectively) were found open. The valve lineups and the operating procedures for the systems require that both the chiller

inlet and outlet valves be shut when the chillers are secured. Although these value positions do not effect system operation, the improper valve lineup is the same type of lineup problem that was documented concerning the Unit 1 casing cooling system in Inspection Reports 338,339/83-13 and on the refueling water storage tank system in Inspection Reports 338, 339/85-03.

b. 2-OP-7.10A has been revised to require a second verification of valve positions while 1-OP-7.10A only requires single verification. The licensee subsequently revised 1-OP-7.10A to require a second verification of valve positions.

Item a. is an example (item 2) of the violation for failure to follow procedure (338, 339/85-16-02).

11. 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 inspectors verified compliance with selected TS and LCO.

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 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 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 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, annuciator alarms and housekeeping.

During a plant tour on June 25, 1985, the inspectors noted the following items while in the post sccident sample system sample sink area of the auxiliary building:

- One stick of bare welding wire, identified as No. 21960/308-1/16, a safety-related controlled welding material, was found on the floor and was not being properly controlled per the December 4, 1984, revision of station Administrative Control Procedure (ADM) 9.6., Control of Welding Materials.

- Plant Operating Procedure 1-OP-12.3, High Radiation Liquid Sampling System, completed on May 16, 1985, was still in the area when, in fact, it should have been reviewed and filed in Station Records as required by the November 8, 1984, revision of station ADM 6.5.

- Mechanical Danger tag No. 403180 for tag-out N1 203091 was found on the floor and the tag was still active and required.

The above items are further examples (items 4, 3 and 1) of the violation for failure to follow station procedures (338, 339/85-16-02).

During the inspection period, excessive seat leakage past both Unit 2 primary power operated relief valves (PORV) has resulted in both PORV Limitorque block valves, MOV-2535 and MOV-2536, being shut. Additionally, when attempts to open the block valves failed, power was removed from their operators. It appears the high differential pressure across the seat (ie, 2235 psig) is causing the torque switch to actuate; thereby, cutting off power to the electric motor before the valve can open. The inspectors consulted the North Anna Setpoint Document and determined the setpoint are inconsistent between valves and appear to be low when considering the high differential pressure across the valve seat. It should be noted that the block valves being shut and deenergized is required by Technical Specifications whenever control of the block valves is lost.

12. Design, Design changes and Modifications (37700)

The inspectors reviewed Design Change Package (DCP) 84-26, Addition of Emergency Lighting North Anna 1 and 2, and some of the work performed as part of the design change. After reviewing the sections of the DCP involving the auxiliary feedwater pumphouses and inspecting the lighting as installed, the inspectors had one concern. The note at the beginning of the "Instruction" subsection required that all the lamp heads be installed eight feet above finished floor (AFF) with a tolerance of plus or minus one foot. It was clear by observation that this note had not been followed as a number of lamp heads were mounted either below seven feet or above nine feet AFF. When site engineering personnel were asked about this apparent problem, they explained that eight feet was merely a recommended height and that area walkability and readability of equipment indications were the actual criteria against which lamp head mounting height needed to be judged. It appears that the height requirements specified in the design change should have been deleted by a field change in accordance with section 3 of the

VEPCO Nuclear Power Station Quality Assurance Manual if, in fact, they had no technical basis and could not be adhered to due to space considerations.

During a general walkdown of the emergency lighting installed in various areas of the plant, including the auxiliary feedwater pumphouses, the inspectors noted that the straps that secured a number of the emergency lighting battery packs to their mounting brackets had loose or missing fastening nuts or washers or both. This problem, when brought to the licensee's attention, was quickly corrected and it appeared that such conditions arose due to frequent battery pack relocation during installation testing. If frequent battery pack movement continues once the lighting is turned over to the station, proper securing of the straps should be addressed to ensure all seismic requirements in safety-related areas are met. Additionally, during the walkdown the inspectors noted one battery pack that had failed and a number of others on which the battery charge indicator was inoperable or installed improperly. Though the latter two conditions do not affect battery operability, they would hinder periodic checks to ensure operability. The licensee determined the failed battery pack was probably due to a failed circuit card rather than a defective battery and that a number of other battery packs have had circuit cards replaced. The failed cards will be examined by the licensee to determine if any potential generic problem exists. The other conditions noted were corrected prior to the completion of the inspection.

The failure to locate the emergency lights at the required eight plus or minus one foot height as required by the DCP is another example (item 5) of the violation for failure to follow station procedures (338, 339/85-16-02).

13. Location of Manual Reactor Trip Circuit in Westinghouse Solid State Protection System (SSPS). Temporary Instruction 2500/14.

As required by the inspection instruction, the inspectors verified the actual location of the manual trip circuit in relation to the SSPS undervoltage (UV) output transistors Q3 and Q4. The actually installed system is as shown on revision K to sheet 13 of Westinghouse drawing 108H41 with the manual reactor trip circuit downstream of output transistors Q3 and Q4. Additionally, the inspectors requested that the Westinghouse site representative verify, through record review and field inspection, that documentation exists to support the actual installation. The Westinghouse review revealed that the system was modified on July 18, 1977, and April 18, 1978, by field changes VRA/FCN-10609 and VRA/FCN-10593 for Units 1 and 2, respectively.

The inspectors also verified that the SSPS technical manual has been updated, and the drawings that depict the manual reactor trip circuit were correct at the time of inspection. However, it should be noted that current station procedures do not require updating of vendor reference drawings contained in technical manuals. The licensee has committed to issuing a notice to be inserted in all technical manuals stating that drawings contained in the manuals are for reference only and that controlled station drawings should be consulted for details. The licensee further stated that

control of technical manual drawings is still an open issue and a change to their current policy is under review. The failure to include vendor drawings as part of technical manual update and control appears to be inconsistent with the intent of Generic Letter 83-28 recommendations and is considered to be Unresolved Item (338, 339/85-16-03), pending review by NRC Regional and Headquarters personnel.

No violations or deviations were identified.