



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

Report Nos.: 50-280/84-20 and 50-281/84-20

Licensee: Virginia Electric and Power Company  
Richmond, VA 23261

Docket Nos.: 50-280 and 50-281

License Nos.: DPR-32 and DPR-37

Facility Name: Surry 1 and 2

Inspection Dates: June 3 - 30, 1984

Inspection at Surry site near Williamsburg, Virginia

Inspectors: *KJM Jensen for* 7/27/84  
D. J. Burke, Senior Resident Inspector Date Signed

*KJM Jensen for* 7/27/84  
M. J. Davis, Resident Inspector Date Signed

Approved by: *S. Elrod for* 7/27/84  
S. Elrod, Section Chief Date Signed  
Division of Reactor Projects

SUMMARY

Areas Inspected:

This inspection involved 200 inspector-hours on site in the areas of plant operations and operating records, plant maintenance and surveillance, plant security, followup of events, licensee events reports, and IE Bulletin review.

Results:

In the areas inspected, one violation was identified in the plant maintenance area (paragraph 6.c - inadequate maintenance procedure).

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

J. L. Wilson, Station Manager (Through June 30, 1984)  
R. F. Saunders, Station Manager (From July 1, 1984)  
D. L. Benson, Assistant Station Manager  
H. L. Miller, Assistant Station Manager  
D. A. Christian, Superintendent of Operations  
M. R. Kansler, Superintendent of Technical Services  
H. W. Kibler, Superintendent of Maintenance  
D. Rickeard, Supervisor, Safety Engineering Staff  
S. Sarver, Health Physics Supervisor  
R. Johnson, Operations Supervisor  
R. Driscoll, Director, QA, Nuclear Operations

Other licensee employees contacted included control room operators, shift technical advisors (STAs), shift supervisors, chemistry, health physics, plant maintenance, security, engineering, administrative, records, and contractor personnel and supervisors.

### 2. Exit Interview

The inspection scope and findings were summarized on a biweekly basis with certain individuals in paragraph 1 above.

### 3. Licensee Action on Previous Enforcement Matters

Not inspected.

### 4. Unresolved Items

Unresolved items were not identified during this inspection.

### 5. Operations

Unit 1 and 2 operations were inspected and reviewed during the inspection period. The inspectors routinely toured the control room and other plant areas to verify that plant operations, testing and maintenance were being conducted in accordance with the facility technical specifications (TS) and procedures. Within the areas inspected, no violations were identified. Specific areas of inspection and review included the following:

- a. Review was made of annunciated alarms in the control room and inspection of safety-related valve, pump, and equipment alignments on the consoles and in the plant.

- b. Unit 1 began the reporting period in a cold shutdown condition completing a nine day snubber inspection and maintenance outage. The unit started up and went on line on June 4, 1984.
- c. Unit 1 experienced a reactor trip from full power on June 13, on 'A' steam generator low-low water level due to the loss of the 'A' main feedwater (MFW) pump. The 'A' MFW pump tripped on loss of lubricating oil system pressure. Low level vibrations apparently resulted in the loosening of the bearing capscrews which eventually allowed the bearing housing to spin with the main feed pump shaft. This caused the oil supply and return lines, which are attached to the housing, to shear, resulting in a loss of oil pressure. A manual turbine load runback was initiated to compensate for the reduced feedwater flow and falling generator levels, however the reactor tripped on a low water level condition in the 'A' steam generator. Following the trip, the mechanical seal on the 'A' MFW pump failed resulting in wetting of the 'A' and 'B' main feed pump motors (following manual shutdown of 'B' pump) and motor control centers 1A1-2 and 1B1-3 in the area. All were removed from service and dried. The 'A' main feedwater block valve (MOV-FW-154A) also failed due to a grounded motor lead. All damaged parts of the 'A' main feed pump were subsequently replaced. The bearing capscrews were tightened in accordance with manufacturers' specifications. A review of applicable corrective maintenance procedures revealed that the bolt torque settings were not specified. The licensee intends to specify capscrew and bolt torque settings in revised corrective maintenance procedures.
- d. During the subsequent control rod withdrawal on June 14, Unit 1 experienced a stuck peripheral rod; rod b-6 in control Bank 'A' stuck at 27 steps. Rods were driven in to five steps and tripped. Rod B-6 failed to trip and remained at five steps. Subsequent exercising and tripping of the rod resulted in the rod becoming stuck at 61 steps and immovable.

Following completion of hot rod drop testing on the remaining rods and performance of safety evaluations for accidents, including ejected, misaligned, and dropped rods, the unit was returned to restricted power operations. The power range nuclear instrumentation high flux trip setpoints were reduced to limit reactor power to 80% of full power. Analysis of shutdown margins, flux anomalies, and non-uniform fuel depletion were also performed to ensure safe operating margins. Daily in-core flux maps and special tests were performed to verify acceptable hot channel factors and flux tilts. An LER will be submitted on the quadrant power tilt, which is currently at approximately 3% (maximum).

- e. During the Unit 1 startup on June 19, 1984, the reactor tripped from some 10% power when the "At power" permissives P-10 unblocked P-7 with the turbine previously tripped. Testing of the turbine-driven auxiliary feedwater (AFW) pump at approximately 9% reactor power, combined with a partially open AFW valve (subsequently repaired) to reduce the RCS temperature a few degrees. The negative temperature

coefficient of the reactor coolant resulted in a power increase of approximately 1%, which was sufficient to drive two of the four power range (NI) detectors above 10% and unblock the permissives, which caused the reactor trip. An LER will be submitted on the event.

- f. The subsequent startup on June 20, was successful and Unit 1 operated at reduced power (80%) for the remainder of the reporting period.
- g. Unit 2 operated at power during the reporting period. No shutdowns or reactors trip occurred.

#### 6. Surveillance and Maintenance Activities

During the reporting period, the inspectors reviewed various surveillance and maintenance activities to assure compliance with the appropriate procedures and TS, and verified the operability of major plant systems. Inspection areas included the following:

- a. Walkdown inspections of the subsurface drain system, cable penetration areas, vital batteries, diesel generator air start system and associated systems, breaker alignment in the switchgear and cable rooms, the conditions of outside tanks and valves alignments, containment spray and AFW systems in the steam safeguards building and service water system in the turbine building were conducted.
- b. The inspectors reviewed the control room logs and operations daily and reviewed the RCS leak rates on a daily schedule.

Several LCOs in Section 3 of the TS were also verified on a periodic basis to insure compliance with the requirements. The inspectors also verified that at least two Senior Reactor Operators (SRO) were on duty at all times during reactor operations, and at least one of the SRO's was in the reactor control room at all times.

- c. On June 4 and 5, 1984, the inspectors observed periodic testing on the Unit 2 service water (SW) motor operated valves (SW-MOV-203A-D), due to the recent Unit 1 failure of SW-MOV-103C to open during periodic testing. Although the Unit 2 MOV's opened as required, the inspector observed that certain Limitorque (SMB-000) torque switch settings differed from the "as left" settings previously documented. For example, the SW-MOV-203D torque switch was documented as being set on 5.0 for the open and close settings; however, when the Belleville spring in the operator was relaxed by depressing the manual declutching lever, the torque switch indicated settings of 2.5 (open) and well above 5.0 (close). All eight SW MOV's (103A-D and 203A-D) were inspected with the Belleville spring relaxed to verify and/or reset the

torque switches as required. The MOV's were then satisfactorily stroke tested to verify operability. The inspector determined that the electrical corrective maintenance procedure for safety-related motor operated valve, EMP-C-MOV-50, Torque Switch Adjustment, did not provide adequate instructions for performing corrective maintenance operations such as torque switch adjustments on these Limitorque SMB-000 MOV's. The operator (Belleville spring) must be fully relaxed to properly read or set the torque switch since the torque switch upper strikers, hub, and setscrews rotate when the spring pack is compressed or under tension, while the lower dial plate with the inscribed torque settings (1 to 5) remains stationary. Thus, the torque switch must be read and set with the valve in the mid-travel position or the declutching lever for manual valve operation must be depressed, to ensure that all geartrain and worn shaft forces have been removed from the Belleville spring pack. EMP-C-MOV-50 did not provide instructions to properly position or declutch the SW MOV's prior to verifying or adjusting the torque switch settings. This is a Violation of TS 6.4.A.7. (280, 281/84-20-01). In addition, the licensee is implementing a program to reverify the proper torque switch settings on all safety-related MOV's. (Open Item 280, 281/84-20-02). The MOV's are periodically stroked and timed in accordance with the ASME Section XI codes (IWV) to verify operability.

- d. On June 26, 1984, the inspector observed the Unit 2 'B' reactor trip breaker testing, following the completion of preventive maintenance on the breaker. The undervoltage trip attachment (UVTA) and DB-50 breaker tested satisfactorily (66 msec response time). The inspector noted that the normal instrument leads from the breaker cubicle were not used for the testing due to the installation of the bypass breaker in the main reactor trip breaker cubicle (and vice versa). The licensee stated that the bypass breakers will be returned to the adjacent bypass cubicles or the test leads installed to simplify the monthly periodic testing of the breakers. (Open Item 281/84-20-03).

#### 7. IE Bulletin Review

A supplemental response to IE Bulletin 79-25 was submitted to the NRC on June 28, 1984; all actions and commitments have been completed. IE Bulletin 79-25 is closed.

#### 8. LER Review

The inspectors reviewed the Licensee Event Reports (LERs) listed below to ascertain that NRC reporting requirements were being met and to determine the appropriateness of corrective action taken and planned. Certain LERs were reviewed in greater detail to verify corrective action and determine compliance with TS and other regulatory requirements. The review included examination of logbooks, internal correspondence and records review of SNSOC meeting minutes, and discussions with various staff members. Within the areas inspected, no violations were identified.

(Closed) LER 281/81-74 and 280/81-54 concerned an uncontrolled release attributed to leaks from stripper feed heater 1-BR-E-10A. Leaks from the heater drained into the auxiliary steam drain receiver where pumps, taking suction, discharged contaminants into the makeup water heater which then filled the Unit 2 safeguards heating system drain receiver. The receiver overflowed via the vent into the storm drain system. The heat exchanger was isolated and the leaking tubes plugged. The drain receiver pumps were repaired. An engineering study concerning the problem of contaminated leakage entering the auxiliary steam system was completed and did not recommend any modifications to the heater drain receiver vent in the Unit 2 safeguards building. However, routine HP sampling of the auxiliary steam drain receiver is continuing to provide for detection of activity.

(Closed) LER 280/81-51 concerned an unsatisfactorily charging pump service water subsystem hydrostatic test. Design Change 81-41 "Charging Pump Service Water Pump Relocation" replaced the system piping and performed a satisfactory hydrostatic test.

(Closed) LER 280/81-31 concerned a breaker for a loop isolation valve not locked open when the unit was at full power. The valve breaker was locked open; and OP 1.4 was changed to require a second verification of lock installation on all the loop stop valves.

(Closed) LER 281/82-30 concerned an inadvertent dilution during refilling of a loop due to blended flow problems. Procedures were modified to verify blender performance during fill and vent operations.

#### 9. Plant Physical Protection

The inspectors verified the following by observations:

- a. Gates and doors in protected and vital area barriers were closed and locked when not attended.
- b. Isolation zones described in the physical security plans were not compromised or obstructed.
- c. Personnel were properly identified, searched, authorized, badged and escorted as necessary for plant access control.