



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

Report Nos. 50-280/82-04 and 50-281/82-04

Licensee: Virginia Electric & Power Company
Richmond, VA 23261

Facility Name: Surry Units 1 and 2

Docket Nos. 50-280 and 50-281

License Nos. DPR-32 and DPR-37

Inspection at Surry site near Surry, Virginia

Inspectors: H.C. Dance / for
D. J. Burke

4/8/82
Date Signed

H.C. Dance / for
M. J. Davis

4/8/82
Date Signed

Approved by: H.C. Dance
H. C. Dance, Section Chief, Division of
Project and Resident Programs

4/8/82
Date Signed

SUMMARY

Inspection on January 25 - February 26, 1982

Areas Inspected

This inspection involved 260 resident inspector-hours on site in the areas of plant operations and procedures, plant maintenance, calibration, testing, NUREG 0737 item followup, and plant security.

Results

Of the six areas inspected, no violations or deviations were identified in five areas; one violation was identified in the areas of plant operations and procedures (failure to maintain operability of steam flow instrumentation as required by TS 3.7 and to follow the QA manual and procedures for documenting the inoperable steam flow instrumentation - Paragraph 5.e.).

DETAILS

1. Persons Contacted

Licensee Employees

- *J. L. Wilson, Station Manager
- *R. F. Saunders, Assistant Station Manager
- *G. E. Kane, Operations Superintendent
- *D. A. Christian, Superintendent of Technical Services
- D. Rickeard, Supervisor, Safety Engineering Staff
- S. Sarver, Health Physics Supervisor

Other licensee employees contacted included control room operators, shift supervisors, WC, HP, plant maintenance, security, engineering, chemistry, administrative, records and contractor personnel.

*Attended exit interview

2. Management Interviews

The inspection scope and findings were summarized on a biweekly basis with those persons indicated in Paragraph 1 above.

3. Licensee Action on Previous Inspection Findings

Not inspected.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Unit 1 Operations

Unit 1 operations were inspected and reviewed during the inspection period. During this time, the inspectors routinely toured the Unit 1 control rooms and other plant areas to verify that the plant operations, testing and maintenance were being conducted in accordance with the facility Technical Specifications and procedures. Specific areas of inspection and review included the following:

- a. Review of annunciated alarms in the control room and inspection of safety-related valve and pump alignments on the consoles and in the plant.
- b. On January 26, 1982, at 2331 hours, Unit 1 experienced a dropped rod which caused a turbine runback from 100% to 70% power. Rod B-6 in control bank 'A' was dropped due to a fault in the power supply cable. Attempts to retrieve the rod were unsuccessful. All high flux rod stops were reset from 103% to 78% and, all high flux trip setpoints

were reset from 107% to 82% in accordance with Technical Specification 3.12 to compensate for the 12% flux tilt. On January 28, electricians found a broken wire in the power supply cable to rod B-6. The break was in the electrical penetration area inside containment. Following repairs to the cable, retrieval of the rod began at 0037 on January 29. The retrieval rate was 15 steps per hour to minimize potential flux problems. By 1537, rod B-6 was fully withdrawn. An incore flux map was completed indicating high flux rod stop and high flux trip setpoints could be increased to 94% and 98% respectively. The setpoint changes were completed and a power increase at 3% per hour commenced at 2300 on January 29. On January 30, an incore flux map indicated the high flux rod stop and trip setpoints could be increased to their normal values. The unit reached 100% power at 1300 on January 30.

- c. On February 8, 1982, at 1900, Unit 1 began reducing power in preparation for a two week maintenance outage. A reactor trip and safety injection occurred at 2027 after erratic turbine control resulted in a high differential pressure between the main steam line and header. Safeguards systems functioned properly. EHC control circuitry was repaired and tested during the outage.
- d. Following the maintenance outage Unit 1 was taken critical at 2335 on February 21, 1982. During the subsequent power increase the unit experienced two reactor trips. The first occurred at 0405 on February 22 when a turbine trip/reactor trip resulted from a high-high level condition on 'B' steam generator. While operating in bypass feed flow control, the main feed line isolation valve MOV-154B was leaking by to the steam generator. The torque switch for MOV-154B was found to be set at less than the minimum normal setting. The switch was reset to the maximum setting to ensure the valve would close off against the feed delta pressure across it.

The second trip occurred at 1342 on February 21 from 27% power and was caused by a low level condition in 'B' steam generator in coincidence with steam flow exceeding feed flow. Channel III steam flow detector for 'B' steam generator had previously been placed in trip due to an instrument malfunction. Primary average temperature drifted high causing the 'B' steam generator safety relief valve to lift causing the SG low level condition.

The unit was subsequently restarted with criticality at 1500 on February 22, 1982.

- e. The inspectors reviewed the circumstances surrounding the Unit 1 main steamline (MSL) flow instrument isolations, which resulted in a violation of Technical Specifications 3.7.B and 6.4.D. On February 14, 1982, the six Unit 1 MSL pressure transmitters (delta P to measure flow) were isolated and the power fuses to the instruments were pulled for Design Change 81-104 to replace the transmitters with qualified units in accordance with IE Bulletin 79-01B. The Design Change was completed on February 18, and testing was initiated to verify

operability of the new instruments. However, only two of the six fuses which were removed were available, so the instrument technicians calibrated two instruments channels at a time, until all six were calibrated. Calibration and testing of the six instrument channels continued on February 19, 20, and 21 on a time available basis until completed. During this time, certain high steam flow alarms were in due to the draining of the MSL flow condensate pots and water filled instrument legs to the transmitters during replacement. To eliminate these alarms which can open the cross-connect valves between Unit 1 and 2 RWST's, three of the six MSL flow instruments were left unfused until unit startup and steaming would refill the condensate pots and instrument (sensing) lines. However, this status was not documented in the procedures, logbooks, or jumper log. Unit 1 heatup commenced on February 20, 1982, and proceeded through 543 degrees F and 200 psig at 4:00 p.m. on February 21, 1982. At 2:45 a.m. on February 22, with the reactor at approximately 4% power, an instrument technician reported to the control room that he had three MSL instrument fuses to install. The fuses were installed in a matter of minutes.

The failure to have either of the two MSL flow instruments (FI-1474 and 1475) operable on the A steam line is a violation of Technical Specifications (TS) 3.7.B and TS Table 3.7.2, which require a minimum of one operable high steam flow channel per main steamline, for actuation of Safety Injection and steamline isolation when the reactor coolant system is above 543 degrees F. This violation resulted from not tagging the removed fuses and not using the jumper log as required when the electrical fuses to the MSL flow instrument channel (FI-1474, 1475, and 1484) were removed prior to Unit 1 startup on February 22, 1982; this is a violation of TS 6.4.D and Section 14 of the Vepco QA Manual (280/82-04-01).

A similar violation involving the six MSL flow instruments on Unit 2 was identified in IE Inspection Report 50-281/80-37. This event occurred in August 1980 and involved removal of fuses from all six MSL high flow transmitters and the isolation of all instrument root valves. The inoperable flow instruments were discovered by the licensee after observing no response during the startup. In addition, Unit 2 LER 281/81-83 discussed a December 31, 1981 event observed during unit startup. At approximately 15% power, two of the six MSL flow instruments were observed not responding properly (still downscale). The root valves for FI-2474 on the A MSL were found closed and an instrument isolation valve for FI-2485 on B MSL was found closed, isolating the instrument. Due to NRC concern over the repetitive nature of the violations and events discussed above, an enforcement conference was held at Surry with Vepco management on March 23, 1982 to discuss the corrective action being taken to prevent recurrence. Inspection Report 50-280/82-07 documents this meeting.

6. Unit 2 Operations

Unit 2 operations were inspected and reviewed during the inspection period. The inspector routinely toured the Unit 2 control room and other plant areas to verify that the plant operations, maintenance and testing 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 of alarms in the control room and inspection of safety-related valve and pump alignments on the consoles and in the plant, during operations.
- b. On February 11, 1982, at 1851 Unit 2 experienced a turbine runback to 70% due to a loss of detector voltage on power range nuclear instrument channel N-41. The cause of the problem is being investigated during the current maintenance outage which commenced February 27.
- c. On February 23 at 1528, Unit 2 experienced a reactor trip on overpower delta temperature (OP T) several minutes after losing a high pressure heater drain pump. Reactor coolant pump A lost power when the 'A' 4160V bus failed to transfer to 'A' Reserve Station Service. The failure of breaker 25A1 to transfer was due to the breaker control power fuses being pulled during previous maintenance. The 'A' reactor coolant pump was restarted 17 minutes following the reactor trip. The failure of electrical maintenance personnel to replace the fuses after breaker maintenance was discussed with licensee management.
- d. On February 24 at 0551, Unit 2 experienced a turbine trip/reactor trip from 70% power due to a high level on 6B feedwater heater while attempting to place the moisture separator reheaters in service. Subsequently the 5B and 6B feedwater heater train was placed in bypass prior to restarting the unit.
- e. During restart from the previous trip, Unit 2 experienced a reactor trip at 1022 on February 24 from 30% power due to a low level condition on 'C' steam generator. Feed control was in manual at the time of the trip.

7. Open Item and IE Bulletin Followup

- a. The inspector reviewed chemical certification records and licensee data regarding the Unit 2 RCS piping decontamination, and the procedures for the process, and had no further questions. The process and chemicals (low halogen) appeared appropriate; open item (281/79-49-01) is closed.
- b. Open item (280/79-31-01) is also closed; more frequent changeout of the boric acid filters has not reduced the radiation levels. Engineering studies on additional shielding and permanent (backflushable) filter installations are in progress.

- c. IE Bulletin 79-23 concerned the potential failure of the Emergency Diesel Generator (EDG) field exciter transformer due to design errors. The design and installation of electrical wiring and connections was reviewed at Surry and no discrepancies were identified. In addition, a 24 hour full load (2750 KW) special test was performed on each EDG; no problems were experienced during the testing. A licensee report of the inspections and testing was submitted to the NRC within 45 days of receipt of the Bulletin; IE Bulletin 79-23 is closed.

8. Inspection of NUREG 0737 Post TMI Requirements

- a. Item II.B.1 concerns installation of a reactor vessel head and pressurizer venting system. The licensee in their December 1981 NUREG 0737 update, requested an extension of the required installation date to July 1, 1982 or first refueling after January 1, 1981, (whichever is later) since installation requires reactor vessel head removal. This item remains open.
- b. Item II.B.2 concerns plant shielding modifications and environmental qualification of equipment for spaces or systems used in postaccident operations. Delivery of qualified radiation monitoring pumps and motors is scheduled for summer 1982 with installation scheduled for the first refueling after summer 1982. Installation of control valves required to automatically adjust service water to the charging pump lube oil cooler was held up due to equipment delivery delays. Valve installation is scheduled for completion by July 1, 1982. Updating radiation zone maps for personnel access is to be accomplished when all post-TMI modifications are complete to ensure the impact of all changes are incorporated. This item remains open.
- c. Item II.B.3 concerns an improved post-accident sampling system. The Sentry Equipment Company Chemical Analysis Panels and Chemical Analysis Monitor Panels, originally scheduled for delivery in December 1980, were reviewed in late October 1981. In their December 1981 NUREG 0737 update, the licensee committed to having the Reactor Coolant Sampling System fully operable by July 1, 1982. This item remains open.
- d. Item II.B.4 concerned training for mitigating core damage. A training program to teach the use of installed equipment and systems to control or mitigate accidents in which the core is severely damaged has been incorporated into licensed operator training and retraining programs. The program for managers and technicians in the instrumentation and control, health physics, and chemistry departments has been implemented in conjunction with Station Emergency Plan training on Emergency Plan Implementing Procedures (EPIP's) specific to each technical area. This item is considered closed. Inspector followup item 280, 281/81-15-17 is also considered closed.
- e. Item II.E.1.1. concerns evaluation of the Auxiliary Feedwater System. The short term system modification have been completed for Surry Units

- 1 and 2. Item II.E.1.1.1 is considered closed. The long term AFW system modifications (Item II E.1.1.2) remains open. The design modifications to provide remote on/off manual control of AFW pumps for manual flow control is complete with the exception of installation of qualified pressure regulators. Non-qualified regulators will remain in service until others are received. The AFW flow control valves have environmental qualification data requiring further corroborating information from the manufacturer before final judgement can be made.
- f. Item II.E.1.2. concerns auxiliary feedwater system initiation and flow instrumentation. The licensee has committed to provide control room bypass indication for the motor driven auxiliary feed pumps to comply with IEEE 279-1971 paragraph 4.13 Indication of Bypasses. The modifications should be completed during the spring 1982 maintenance outage for Unit 2 and the fall 1982 refueling outage for Unit 1. Concerning AFW flow indication environmental qualification, the licensee is participating in a transmitter qualification program in response to IE Bulletin 79-01B, which is scheduled to be complete in the Spring of 1982. Upon successful completion of the test program and receipt of materials, these transmitters will be replaced at the first outage of sufficient duration. This item remains open.
- g. Item II.E.4.2 concerned Containment isolation dependability. In their response to NUREG 0737 the licensee stated that: "...all of the automatic containment isolation valves in non-essential systems except the condenser air ejector vent line receive diverse isolation signals. The condenser air ejector high radiation vent line isolates upon receipt of a high containment pressure signal." The licensee committed to provide a diverse isolation signal to the condenser isolation valve. Design change 80-S-90 made this modification and was completed for Unit 1 on 12-7-80 and for Unit 2 on 12-17-80. Item II-E 4.2 1-4 is considered closed. Subparagraph 5.b. concerned reducing the containment setpoint pressure that initiates containment isolation for non-essential penetrations to the minimum compatible with normal operating conditions. The licensee response to this item stated that the setpoint of 17.7 psia was based on maximum expected containment pressure of 15.5 psia (normal atmospheric pressure = 14.7 psia) plus a total error of 2.2 psia. The licensee response stated: "These are the minimum setpoints compatible with normal operating conditions and are less than the FSAR and Technical Specification Requirements... It would be inappropriate to use a lower setpoint due to potentially severe operational complications without a commensurate improvement in safety. For example, loss of containment vacuum, in the absence of any potential release of radioactivity, would result in containment isolation an orderly shutdown as required by Technical Specifications in such as incident would be complicated and delayed due to system isolations." The inspector agrees with this position. Item II.E.4.2.5.b is closed.
- h. Item II.F.1 concerns additional accident monitoring instrumentation. Attachments 1 and 2 concern installation of extended range noble gas

effluent monitors and sampling and analysis of plant effluent radioactive iodines and particulates. Delays in delivery of Kaman Sciences Increased Range Radiation Monitoring Skids have resulted in a delay in the implementing date. The licensee committed in the December 1981 NUREG 0737 update to complete installation of Increased Range Radiation Monitor Skids by April 1, 1982. In the interim, the short-term Increased Range Radiation Monitors will continue to be utilized. Item II.F.1 parts 1 and 2 remain open.

Attachment 3 to Item II.F.1 concerns installation of containment high-range radiation monitors. Delays in delivery of the Victorean supplied control room panels for the high range radiation system have resulted in a delay in the implementation date. The detectors have been installed with all in-containment terminations made using a temporary termination procedure. Qualified terminations will be made in accordance with the schedule of IE Bulletin 79-01B and NUREG 0588. The licensee has committed to having the system operational not later than July 1, 1982. Item II.F.1 part 3 remains open.

Attachments 4 and 5 concern installation of containment pressure and water level instruments. The qualifications of recently installed transmitters to IEEE-344-1971 and IEEE-323-1971 will be verified as part of the IE Bulletin 79-01B program. Transmitter qualification testing is currently scheduled to be complete by mid 1982. II.F.1 parts 4 and 5 remain open.

Attachment 6 concerns installation of containment hydrogen monitoring instrumentation. Final heat tracing of the sample input lines has not been completed and is dependent on material delivery. The licensee has committed to complete installation of Category I heat tracing by August 1, 1982. The existing redundant hydrogen analyzers will remain operational in the interim. Item II.F.1 part 6 remains open.

- i. Item II.F.2.3.b concerns installation of instrumentation for detection of inadequate core cooling. The licensee requested an extension to July 1982 in their December 1981 update to NUREG 0737. System installation with the exception of filling and venting is complete. Unit 1 is scheduled to be operational after the next refueling outage scheduled for November 1982. Unit 2 is scheduled to be filled and vented during the spring 1982 maintenance outage. Item II.F.2.3.b remains open.

Item II.K.3.5 concerns the automatic trip of reactor coolant pumps during a loss of coolant accident. This item is still under review by the licensee, vendors, and the NRC and remains open.

- j. Item II.K.3.3 concerns reporting of safety and relief valve failures and challenges. Surry Technical Specifications Amendments 72 and 73 for Units 1 and 2, respectively, were issued September 29, 1981. The amendments related to reporting requirements of all challenges to RCS PORV's or safety valves. Limiting Conditions for Operation (LCO) for

the PORV's and block valves were provided requiring failure to be reported under T.S. paragraph 6.6.2.b. There are also LCO's on safety valves whose failures are reported under paragraph 6.6.2.b. Item II.K.3.3 is closed for Surry Units 1 and 2.

- k. Item III.A.1.2.1.b concerns upgrading the Operational Support Center (OSC) emergency response facility. The licensee has established an OSC within the control room pressure envelope, which is supplied with bottled air and a HEPA and charcoal filter ventilation system. The OSC would be habitable during post accident conditions. Additional communications have been installed between the OSC and the TSC, EOF, and control room. Item III.A.1.2.1.b is closed.

9. Plant Physical Protection

The inspector 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.

No violations were identified.