



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

Report Nos. 50-280/82-24 and 50-281/82-24

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:	<u>K. O. Landis for</u>	<u>9/28/82</u>
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SUMMARY

Inspection on August 2 - September 3, 1982

Areas Inspected

This inspection involved 300 resident inspector-hours on site in the areas of plant operations and operating records, plant maintenance, calibration, testing, followup on events and LER's, shipment of radioactive waste, and plant security.

Results

In the eight areas inspected, no violations were identified in seven areas; one violation was identified in the area of plant operations (Failure to promptly identify and take corrective actions on conditions adverse to quality - paragraph 6.d).

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
- *R. Driscoll, Director QA, Nuclear Operations
- *F. Rentz, Station Quality Assurance Engineer

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 room and other plant areas to verify that the 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 and pump alignments on the consoles and in the plant.

- b. Unit 1 experienced a reactor trip and safety injection at 1315 on August 24, 1982. A spurious steam header to line delta pressure signal resulted from vibrations caused by mechanics using an air powered impact wrench to remove a bolt from an extraction steam elbow flange. The flange was resting on an I-beam that supported two steam pressure transmitters, PT-464 and PT-466. Vibration of the I-beam resulted in a spike on the steam header pressure instruments (2 out of 3) and caused the SI signal. All safety systems responded normally during the transient, except control room air supply ventilation fan VS-F-15. The fan did not de-energize as required, however, the ventilation dampers did close as required. A deviation report was written on the fan malfunction. Following the trip and SI, the inspector observed that the ventilation vent stack gaseous activity radiation monitor RI-VG-104 had annunciated an "alert" condition. The alert setpoint had recently been reduced to $2.5E+3$ cpm or $6.4E-5$ uci/ml to assure proper procedural response when the Technical Specifications limits are approached in the ventilation systems. The alarm setpoint is $6.4E+3$ cpm or $1.6E-4$ uci/ml. After RI-VG-104 alert cleared, RI-VG-103, the vent stack particulate activity radiation monitor went into the alert condition, and also cleared after a few minutes. The licensed Reactor Operator (RO) assigned to the radiation monitoring and waste treatment panels was assisting the Unit 1 RO as required, following the SI, and thus was not aware of the initial alarm of the alert condition on RI-VG-104. The RO did respond to the subsequent alert on RI-VG-103. Since the Category I fans and HEPA and charcoal banks were automatically made operable by the SI, the immediate operator actions in AP 5.2 were fulfilled. However, the inspector was concerned that the annunciated alert conditions were not documented in any of the five official logbooks or the annunciator alarm books in the control room. In addition, the plant procedures do not clearly prescribe a back-up individual for the third RO in the control room when he leaves the radiation monitoring and waste treatment panels. The licensee is taking action to correct the above weaknesses (Open Item 280/82-24-01).
- c. Following the Unit 1 reactor trip and SI, the dose equivalent Iodine-131 increased from some 0.1 uci/ml to slightly over 10.5 uci/ml. The primary system temperature was reduced to less than 500 degrees F within six hours of detection of high activity in accordance with Technical Specifications 3.1.D.3. Unit 1 was restarted at 2:00 a.m. on August 25, 1982. During power ascension, the inspectors verified that the requirements of TS 3.12.B were not exceeded when the delta flux deviated from the target band and accumulated penalty time below 50 percent power.
- d. On August 12, 1982, the A steam generator (SG) blowdown trip valve TV-BD-100A inside the Unit 1 containment failed closed and was declared inoperable. Since the closed valve prevented SG A blowdown and sampling, the licensee decreased Unit 1 power from 100% to 35% while repairs were being made on the solenoid and diaphragm operator on TV-BD-100A. Following repairs and retesting (PT 14.3), Unit 1 was increased to full power at 3%/hr. The dose equivalent Iodine-131

activity in the primary system had previously peaked at some 0.5 uci/ml, and the maximum secondary chemistry sodium concentration in the A SG samples indicated 145 ppb. The sodium concentration decreased to some 33 ppb following restoration of SG blowdown. No violations were identified in the areas inspected.

6. Unit 2 Operations

Unit 2 operations were inspected and reviewed during the inspection period. During this time, the inspectors routinely toured the Unit 2 control room and other plant areas to verify that plant operations, testing and maintenance were being conducted in accordance with the facility Technical Specifications and procedures. Within the areas inspected, one violation was identified regarding licensee identification of and actions on conditions adverse to quality.

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. Unit 2 operated at power during the reporting period. No reactor trips or shutdowns occurred during the month.
- c. Inspection and review of maintenance and testing during the reporting period.
- d. Following heavy rains on August 10, 1982, the inspector noted water accumulation on the floors of the Unit 2 safeguards (valve pit) building and notified licensee management. On August 11, 1982, during further heavy rains, operations personnel reported that rainwater was running into the Unit 2 safeguards building (valve pit) through the removable roof plugs. Apparently, the roof plugs had been recently removed to transfer equipment such as scaffolding and welding machines from the building, but the plugs were not properly resealed. The water ran into the low head safety injection (LHSI) pump (2-SI-P-1A) motor and LHSI system motor operated valves MOV-2890 A, B, and C. The B LHSI pump was successfully tested before the A pump was meggar checked and successfully tested. A splash shield on the pump motor and internal motor heaters apparently prevented the water from affecting the A pump motor. The MOV's (2890 A, B, and C) were meggar checked and found slightly degraded (0.1 to several megohms), but were considered operable. Heat lamps were positioned near the MOV's to dry the motors. When the MOV's-2890 A, B, and C were subsequently retested (meggared) on the morning of August 12, 1982, the "motors" were found grounded (shorted). During the ensuing inspections and repairs, the electrical brake device mounted on the outboard end of the Limitorque valve motor was found shorted. The electrical motors did not appear wet or degraded. However, the brake coils were electrically in parallel with the motor which rendered it inoperable. The electrical brake housing

is not fully sealed to prevent water entry, as are the motors. In fact, the electrical brakes were identified as a potential failure item during the licensee's environmental qualification review of electrical components, and are scheduled to be replaced during future plant outages. Similar Unit 1 MOV's (1890 A, B, and C) were tested to verify the absence of moisture in the electrical brakes; no problems were identified. During power operation, electrical power to MOV-2890A, B, and C is removed in accordance with Technical Specification 3.3.A.9 and 10. The failure of the licensee to promptly identify and correct the significant rainwater leakage onto safety-related electrical equipment in the Unit 2 safeguards building (valve pit) is contrary to criterion XVI of Appendix B to 10 CFR 50 and Section 16 of the VEPCO NPS QA Manual, as well as Surry Administrative Procedure 86, and is a violation (281/82-24-01). A similar violation occurred on November 24, 1980, when roof leaks led to the electrical shorting of the AC power cables to Unit 2 LHSI pump 2-SI-P-1A motor.

7. Radioactive Waste Shipment

On November 11, 1982, while inspecting the plant outside areas and sub-surface drainage systems, the inspectors observed licensee personnel lifting an empty primary resin shipping cask from its Hittman Corp. flatbed trailer. Since the casks are not usually removed from their trailers at Surry to transport resins offsite, the inspectors discussed the operation with licensee personnel. The flatbed trailer and empty cask were surveyed and smeared prior to admitting the rig onsite, and were found to be contaminated in excess of 10 CFR Part 20.205 limits.

The cask and trailer were decontaminated onsite prior to loading the Surry primary resin and high integrity liner into the cask for shipment. Prior to departure from the site, the inspectors verified that the radiation levels surrounding the LSA shipment and the detectable contamination on the shipment were within applicable requirements.

8. Miscellaneous Items

- a. Containment personnel access hatches (doors) - during routine discussions with licensee employees, the inspectors became aware of employee concerns regarding the operation and proper sealing of the inside and outside containment personnel access hatches. The inspectors reviewed certain recent periodic leakage tests on the access hatches and the emergency escape hatch on the inner door (PT 16.7), and, with the licensee, operated certain doors utilizing the normal and emergency opening systems.

Within the areas inspected, no problems were observed. The licensee posted large, printed operating instruction placards on the doors, and is upgrading and providing additional training on the operation and use of the containment personnel access and emergency hatches (doors). The inspectors had no further questions at this time.

b. Noble gas releases - on August 8 and 26, 1982, the Ventilation Vent gaseous radiation monitor (RI-VG-104) for the plant stack effluent alarmed. Immediate analyses of the conditions determined that on both occasions the instantaneous release rate limit (TS 3.11.B.1) for Xenon-133 had been exceeded and an Unusual Event was declared. Details of the releases and NRC inspections of the events are discussed in Inspection Report 50-280/82-25 and 50-281/82-25.

9. Surveillance Testing

The surveillance calibration tests detailed below were analyzed by the inspectors to ascertain procedural and performance adequacy. Completed test procedures were analyzed for the necessary test prerequisites, preparations, instructions, acceptance criteria and sufficiency of technical content.

The selected procedures conformed with applicable Technical Specifications, appeared to have received the required administrative review, and were performed within the surveillance frequency prescribed.

Selected tests included recent Technical Specification additions in order to assess the efficiency and accuracy with which the licensee implements the TS requirements. Administrative controls to ensure that Technical Specifications changes affecting surveillance requirements are incorporated into the test programs in a timely manner were also reviewed.

In addition, Section 4 of the Technical Specifications, Surveillance Requirements, was reviewed to ensure that all required surveillances are adequately covered by Periodic Test procedures. Within the areas inspected, no violations were identified.

There are two items in Table 4.1-1 which cannot be performed completely (items 8 and 34). Item 8, 4KV undervoltage and frequency monthly trip test, was previously addressed. Item 34, regarding the monthly periodic test of the steam-driven auxiliary feedwater pump for each unit, cannot be performed without tripping the unit due to the coincidence required in the steam generator low-low level logic or due to the Reactor Coolant Pumps (RCP) undervoltage which would trip the RCP. The logics are verified operable when they occur. This item will remain open until the Technical Specifications are revised or modifications are made to enable testing. (Open item 280/82-24-02). Program review included the following Periodic test (PT) - and calibration (CAL) procedures:

<u>Procedure</u>	<u>Title</u>
PT-2.28	PORV/Safety Valve Monitoring System
PT-2.27A	Core Subcooling Monitor
PT-8.3A	Safety Injection System Logic
PT-8.3B	Safety Injection System Logic (Refuel)
PT-8.4	Consequence Limiting Safeguards
PT-8.2	RPS (Refueling)

PT-8.1	RPS (Normal Operating Conditions)
PT-8.6	Recirculation Mode Transfer Signal Logic
CAL-FW-60	Auxiliary Feedwater Flow (Loop A)
CAL-FW-61	Auxiliary Feedwater Flow (Loop B)
CAL-FW-62	Auxiliary Feedwater Flow (Loop C)
CAL-NI-048	Nuclear Instrumentation Intermediate Range
CAL-VMS-180	Valve Monitoring System Calibration
CAL-RM-189	Containment High Range Monitor Calibration
CAL-RC-136	RCS Wide Range Pressure
CAL-LM-135	Containment Wide Range Pressure
CAL-FW-57	Auxiliary Feedwater Flow
CAL-CN-015	Condensate Storage Tank
CAL-CS-192	RWST Narrow Range Level
CAL-GW-175	Containment Hydrogen Monitor

10. The inspector reviewed the LER's listed below to ascertain that NRC reporting requirements were being met and to determine the appropriateness of corrective action taken and planned. Certain LER's were reviewed in greater detail to verify corrective action and determine compliance with the Technical Specifications and other regulatory requirements. The review included examinations of log books, internal correspondence and records review of SNSOC meeting minutes, and discussions with various staff members. Within the areas inspected, no violations were identified.

LER 280/80-59 concerned the potential for a loss of Auxiliary Feedwater flow following a rupture of a small steamline due to pump runout and the subsequent pump trip on high motor current. The emergency procedure for a loss of secondary coolant was revised to provide instructions to prevent pump runout. Subsequently, flow restricting orifices were installed in each AFW line (D/C 80-75) to provide AFW pump runout protection. This LER is closed.

LER 280/82-65 concerned an inoperable core cooling monitor which failed due to a faulty thermocouple input. The input was replaced with another thermocouple located in the same quadrant. This LER is closed.

LER 280/82-66 concerned the inadvertent defeating of one train of the automatic start of the steam driven auxiliary feed pump on a station service undervoltage condition. A failed time delay relay coil, which closes the outside S/G blowdown trip valves and opens one of two redundant steam supply valves to the steam driven auxiliary feed pump on a station service undervoltage condition, had performed its intended function when it failed. In order to stop operation of the auxiliary feed pump turbine, an upstream isolation valve was shut under administrative control. In an attempt to bypass the defective relay, contacts were jumped. This allowed closing of the steam supply valve and opening of the blowdown trip valves. The steam isolation valve was reopened. It was later discovered that the jumper had defeated one train of the automatic start of the steam driven auxiliary feed pump on a station service undervoltage condition. The unsuccessful attempt to defeat only the time delay portion of the circuit with the jumper was attributed to misinterpretation of the circuit diagram. The defective relay was repaired and tested and the jumper removed. This LER is closed.

LER 280/82-72 concerned the inadvertent draining of the A SI accumulator below the Technical Specifications limit while the B SI accumulator discharge valve was closed for performance of Periodic Test 18.5. The operator opened the wrong test valve during the test. The draining was secured, the B accumulator discharge valve was opened and the A accumulator was refilled. The operator was reinstructed on the importance of following procedures. This LER is closed.

LER's 280/82-73, 280/82-64, 280/82-60, 280/82-49, 280/82-34, 281/82-28, 281/82-33, 281/82-37 concerned low charging pump service water pump discharge pressure due to insufficient NPSH. Flow through the air conditioner chiller units was throttled and the pump vented to correct the problem. A design change is in progress to upgrade the service water system. In the interim, the licensee has increased surveillance on the system to reduce the chance of recurrence.

LER 280/82-82 concerned high dose equivalent Iodine-131 activity in the RCS following a reactor trip from 100% power. The Iodine spike was caused by known fuel element defects in the core. Post trip conditions enhanced the release of fission products, specifically I-131, which caused an increase of the RCS specific activity level. Activity levels were monitored every four hours until the level returned to less than 1.0 uci/ml. The peak activity was 11.36 uci/ml. Following the trip the unit was cooled to 500°F and maintained less than 500°F until the activity dropped below 10 uci/ml. This LER is closed.

LER 281/82-20 concerned failure of the C Boric Acid Transfer Pump due to a failed pump to motor coupling. This resulted in loss of recirculation flow to the BIT, because the D Boric acid transfer pump was tagged out for preventive maintenance. The D pump was returned to service within 15 minutes and the C pump was subsequently repaired. BIT concentration and recirculation flow was verified to be within TS limits. This LER is closed.

LER 281/82-31 concerned the overfill of the B SI accumulator to 1.7% above the maximum specified in Technical Specifications. The operator who initiated filling was relieved prior to completion of the evolution which led to the high level. Level was reduced and operators were cautioned to take special precaution for the turnover of significant evolutions. This LER is closed.

LER 281/82-42 concerned a main steam line snubber declared inoperable due to no oil in its reservoir. A leaking rod seal had been improperly installed during previous repairs. A spare snubber was installed and proper seal installation procedures were reviewed with Maintenance Department personnel. This LER is closed.

LER 281/82-43 concerned a heat tracing failure in which the heat tracing was replaced and tested within the time span specified by Technical Specifications. This LER is closed.

LER 281/82-44 concerned the Refueling Water Storage tank exceeding 45°F due to a failure of a mechanical refrigeration unit and high ambient temperatures. Contributing factors were the high temperature alarm setpoint had drifted high and inadequate corrective action was taken as surveillance logs revealed temperatures approaching the Tech. Spec. limit. During this time, operators assumed the low channel to be reading correctly based on a recirculation temperature of 38°F, however, this temperature is measured downstream of the refrigeration unit only. The chilled component cooling water system was lined up with one RWST cooler to return the temperature to 45°F and a unit rampdown was initiated. The RWST temperature was returned to 45°F within three hours and the unit returned to 100% power. The refrigeration unit was subsequently repaired and returned to service. Operators were instructed to take corrective action before RWST temperature reaches the limiting condition value. This LER is closed.

LER 281/82-46 concerned a failed steam flow comparator which could not be adjusted into acceptable range. The high steam flow bistable previously placed in trip to perform the periodic test, was maintained in trip. The flow comparator was replaced and the new comparator calibrated. The channel was returned to service. This LER is closed.

11. 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.