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

Report Nos.: 50-280/89-31 and 50-281/89-31

Licensee: Virginia Electric and Power Company
5000 Dominion Boulevard
Glen Allen, VA 23060

Docket Nos.: 50-280 and 50-281 License Nos.: DPR-32 and DPR-37

Facility Name: Surry 1 and 2

Inspection Conducted: October 1 - 28, 1989

Inspectors: Scott M. Shaffer FOR 11/28/89
W. E. Holland, Senior Resident Inspector Date Signed

Scott M. Shaffer FOR 11/28/89
J. W. York, Resident Inspector Date Signed

Scott M. Shaffer FOR 11/28/89
L. E. Nicholson, Resident Inspector Date Signed

Approved by: [signature] 11/28/89
P. E. Fredrickson, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope:

This routine resident inspection was conducted on site in the areas of plant operations, plant maintenance, plant surveillance, information meetings with local officials, and licensee event report review.

Certain tours were conducted on backshifts or weekends. Backshift or weekend tours were conducted on October 9, 11, 12, 19, 21, 22, and 25.

Results:

During this inspection period, one violation with two examples was identified regarding licensed operators failure to follow procedures and/or instructions (paragraph 3.a). One unresolved item was identified regarding followup on material problems associated with safety-related check valve maintenance (paragraph 4.c). In addition, seven non-cited violations were identified during closeout of licensee event reports (paragraph 7). These violations involved personnel errors, procedural inadequacies and failure to perform required samples.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

*W. Benthall, Supervisor, Licensing
*R. Bilyeu, Licensing Engineer
R. Blount, Superintendent of Technical Services
D. Christian, Assistant Station Manager
D. Erickson, Superintendent of Health Physics
*E. Grecheck, Assistant Station Manager
M. Kansler, Station Manager
T. Kendzia, Supervisor, Safety Engineering
*J. McCarthy, Superintendent of Operations
G. Miller, Licensing Coordinator, Surry
J. Ogren, Superintendent of Maintenance
*T. Sowers, Superintendent of Engineering
*E. Smith, Site Quality Assurance Manager

*Attended exit interview.

Other licensee employees contacted included control room operators, shift technical advisors, shift supervisors and other plant personnel.

Acronyms and initialisms used throughout this report are listed in the last paragraph.

2. Plant Status

Unit 1 began the reporting period at power. The unit operated at power for the duration of the inspection period.

Unit 2 began the reporting period with the unit increasing power after turbine balancing evolutions had been completed. The unit reached full power on October 8, 1989, and operated at power until October 12, 1989, when identification of leakage past a pressurizer safety valve required that the unit be shut down for repairs. The unit was subcritical at 1116 hours on October 12, and reached the cold shutdown condition on October 13. The unit remained in cold shutdown for the duration of the inspection period.

3. Operational Safety Verification (71707 & 42700)

a. Daily Inspections

Inspections were conducted daily in the following areas: control room staffing, access, and operator behavior; operator adherence to approved procedures, TS, and LCOs; examination of panels containing

instrumentation and other RPS elements to determine that required channels are operable; and review of control room operator logs, operating orders, plant deviation reports, tagout logs, jumper logs, and tags on components to verify compliance with approved procedures.

(1) During this inspection period, the inspectors reviewed an operational event associated with the incorrect system alignment of a Unit 2 AFW pump during performance of the monthly TS operability test. The event sequence was as follows:

On October 8, 1989, a licensed operator on the midnight shift was directed to conduct the monthly surveillance tests for the Unit 1 and 2 B train AFW pumps in accordance with procedures 1-PT-15.1B and 2-PT-15.1B, respectively. The operator obtained copies of each approved test procedure, other support equipment, and went to the Unit 1 safeguards area to conduct the test on the Unit 1 B pump (1-FW-P-3B) in accordance with 1-PT-15.1B. After conducting all necessary prestart alignments, the operator requested the Unit 1 CRO to start the B pump as required by procedure. At this time the shift supervisor (a licensed SRO) reported to the pump location and conducted a material condition check of 1-FW-P-3B prior to pump start. The PT for the Unit 1 pump was completed satisfactorily and the system was returned to its normal operational lineup. The procedure required independent verification for returning the system to normal lineup. The operator then preceded to the Unit 2 safeguards area to conduct the same test on the Unit 2 B pump (2-FW-P-3B) in accordance with 2-PT-15.1B. However, the operator performed the required alignments on the Unit 2 A pump instead of the Unit 2 B pump as required by procedure. These alignments include shutting of the discharge isolation valves for the pump to be tested. After completion of the alignments and a similar verification of the material condition of the pump by the shift supervisor, the Unit 2 CRO started the B pump as required by procedure and noted flow to the steam generators (this condition was not expected). The CRO immediately secured the B AFW pump and the operator and shift supervisor at the pump location determined that the wrong pump had been aligned for testing (i.e. the A pump discharge valves had been closed instead of the B pump discharge valves). The operator immediately opened the A pump discharge valves after the mistake was realized. The B pump was then aligned for testing in accordance with 2-PT-15.1B and the test was satisfactorily completed.

After learning about the above event, station management reviewed the event with those individuals involved and concluded the following:

- The operator did not strictly follow procedure during performance of the PT. This fact was obvious when the

field copies were reviewed and very few signature blocks were initialed as indicating performance of required steps.

- The relative room location of the Unit 2 pumps are reversed from the Unit 1 location. However, the pumps in the Unit 2 safeguards area were clearly labeled.

Immediate corrective actions were taken by station management to include stern reinstruction of all operating shifts with regards to the requirement for strict procedure adherence and attention to detail. In addition, the operators involved in the event were taken off shift and disciplinary actions were taken.

The inspector was present during the management review with the involved individuals and concluded that the station upper- and mid-level management considered the performance of these operators as unsatisfactory and that procedure adherence was mandatory in the future. The inspector agrees with licensee management's assessment of the event; however, he also considers that the lack of procedure adherence and attention to detail is a lingering weakness which needs continued aggressive reinforcement in order to eliminate the problem. The inspector reviewed the procedure for performance of the test and noted that strict procedure adherence would have prevented this event. Failure to follow procedure 2-PT-15.1B is identified as a violation of TS 6.4 (VIO 280, 281/89-31-01).

(2) A second operational event occurred on October 25 that involved a dilution of the Unit 2 RCS. The unit was in cold shutdown in a reduced inventory condition for repair of leaking SI check valves. Maintenance had completed the valve repair and the operators were filling the RCS when the dilution occurred. Adequate shutdown margin was maintained during the event with no increase in count rate on the source range nuclear instrumentation. Containment integrity was not established during this dilution event. TS 3.8.A.6 requires that a boron dilution shall not be made unless containment intergrity is intact.

The RO initiated filling the RCS from a standpipe level of 13.6 feet at 0120 hours on October 25. Initial RCS boron concentration was listed as 2130 ppm. Samples taken during the initial phase of the fill indicated that the makeup blend was resulting in a slight boration (2300 ppm at 0320 hours). In addition to correcting this blend, the RO also increased the fill rate by placing the boric acid valve controller in manual and opening the acid valve to fully open. This action resulted in the boron flow rate indication available to the RO going offscale high. An adjustment of the pure water valve was also made in an attempt to maintain the same mixture.

The RO secured the filling evolution at 0455 hours to allow transfer of inventory between boric acid tanks. The RCS fill was resumed at 0548 hours. It appears that at this time the RO returned the boric acid valve controller to the automatic mode. This action caused the controller to take control and close the acid valve from the approximately 17 gpm full open flow rate down to the 9.5 gpm that had been previously set on the controller. The reactor operator did not verify that the blend settings were correct when he resumed the RCS fill and did not realize that this action resulted in a dilution of the makeup blend. The RCS fill was completed at 0752 hours with a boron concentration of approximately 2065 ppm.

Although the oncoming dayshift operators recognized that a dilution had occurred and submitted a station deviation, they did not determine the cause of the event. Consequently, at 1052 hours the operators initiated a makeup to the RCS to increase primary pressure without verifying the proper blender setting. This resulted in a second unplanned dilution from approximately 2065 ppm to 1996 ppm at 1340 hours. The operators discovered the error and performed a boration that resulted in an RCS concentration of 2110 ppm at 1505 hours.

Filling of the RCS is specified per operations procedure 2-OP-5.1.1. Step 5.10 requires that boric acid and primary grade water flow rates be in accordance with the blended flow nomograph in the station curve book. In addition, the licensee has considered operation of the blender system as "skill of the craft". This philosophy was defined by the Superintendent of Operations as a task that is so routine that it could be performed by a licensed operator without the use of detailed procedures. The licensee also stated that training and instructions direct that the boric acid and pure water flow rates be verified in accordance with the blended flow nomograph whenever an RCS makeup is initiated.

Contrary to these instructions, the operator initiated an RCS fill after performing a boric acid transfer without verifying the correct flow rates. In addition, the operators on the following shift reinitiated RCS fill without verifying that the flow rates were in accordance with the proper nomograph. The inspectors discussed this event with various licensed operators and noticed an attitude that a dilution to recover from an unplanned boration was not considered significant and did not require the establishment of containment integrity. The licensee management expressed concern over this attitude and was initiating actions to reinstruct all licensed operators as the

inspection period ended. This failure to follow instructions, which also resulted in a violation of TS 3.8.A.6, is a second example of Violation 280, 281/89-31-01.

b. Weekly Inspections

The inspectors conducted weekly inspections in the following areas: verification of operability of selected ESF systems by valve alignment, breaker positions, condition of equipment or component, and operability of instrumentation and support items essential to system actuation or performance. Plant tours were conducted which included observation of general plant/equipment conditions, fire protection and preventative measures, control of activities in progress, radiation protection controls, physical security controls, plant housekeeping conditions/cleanliness, and missile hazards. The inspectors routinely monitored the temperature of the AFW pump discharge piping to ensure increases in temperature were being properly monitored and evaluated by the licensee.

c. Biweekly Inspections

The inspectors conducted biweekly inspections in the following areas: verification review and walkdown of safety-related tagouts in effect; review of sampling program (e.g., primary and secondary coolant samples, boric acid tank samples, plant liquid and gaseous samples); observation of control room shift turnover; review of implementation of the plant problem identification system; verification of selected portions of containment isolation lineups; and verification that notices to workers are posted as required by 10 CFR 19.

d. Other Inspection Activities

Inspections included areas in the Units 1 and 2 cable vaults, vital battery rooms, steam safeguards areas, emergency switchgear rooms, diesel generator rooms, control room, auxiliary building, Unit 2 containment, cable penetration areas, independent spent fuel storage facility, low-level intake structure, and the safeguards valve pit and pump pit areas. RCS leak rates were reviewed to ensure that detected or suspected leakage from the system was recorded, investigated, and evaluated; and that appropriate actions were taken, if required. The inspectors routinely independently calculated RCS leak rates using the NRC Independent Measurements Leak Rate Program (RCSLK9). On a regular basis, RWPs were reviewed and specific work activities were monitored to assure they were being conducted per the RWPs. Selected radiation protection instruments were periodically checked, and equipment operability and calibration frequency were verified.

e. Physical Security Program Inspections

In the course of monthly activities, the inspectors included a review of the licensee's physical security program. The performance of various shifts of the security force was observed in the conduct of daily activities to include: protected and vital areas access controls; searching of personnel, packages and vehicles; badge issuance and retrieval; escorting of visitors; and patrols and compensatory posts.

Within the areas inspected, one violation was identified.

4. Maintenance Inspections (62703 & 42700)

During the reporting period, the inspectors reviewed maintenance activities to assure compliance with the appropriate procedures. Inspection areas included the following:

a. Modification to Service Water Piping to MER3

During this inspection period, the licensee continued with modifications to the service water piping which supplies flow to the safety-related components (MCR chillers and charging pump SW pumps) in MER 3 and 4. This modification was being accomplished in accordance with Design Change 87-34-3, Service Water Pipe Replacement /Surry/1 & 2. The inspector noted the periods in which the licensee entered TS LCOs in order to complete required connections to portions of the existing system. In order to accomplish these hookups, the licensee had installed and placed in service a temporary SW supply line, as allowed by TS Amendment No. 134 dated October 5, 1989. This LCO was entered twice in accordance with the modification schedule.

The inspectors reviewed the licensee work package for this modification, frequently visited the jobsite to observe work in progress and specifically reviewed the TS requirements associated with LCO entry. The licensee had prepared special procedures to insure that LCO entry was well coordinated and that all actions required by the TS was implemented as necessary. No discrepancies were noted.

b. Repair of Unit 2 Pressurizer Safety Valve (2-SV-2251B)

On October 11, 1989, at 2230 hours, Surry Unit 2 received a pressurizer safety valve open alarm while operating at 100% power. The CR operators noted that the primary relief tank level and pressure were increasing. The alarm cleared approximately 1-hour later but then came back in several times during the next hour. The licensee commenced an orderly shutdown of the unit at 0355 hours on

October 12. All three pressurizer safety valves were subsequently removed and transported to the Westinghouse Western Service Center for testing and repair.

Surry has three (3) Crosby style 6xK2x6 self-actuated relief valves that are mounted downstream of hot loop seals (water) on top of the pressurizer. A recent design change added mirrored insulation to the loop seals in order to maintain the seals at an elevated temperature. The seals have thermocouples installed that facilitate a local temperature reading of the seal piping. In addition, safety valve tailpipe temperature and acoustic monitors are provided to alert the CR of safety valve problems. A review of the data following the above event indicated that the B safety valve (2-RC-SV-2551B) was leaking. It was also noted that the inlet flange studs on the B valve were discolored blue, indicating an abnormally high pipe temperature.

The as-found test results of the three valves substantiates the conclusion that valve piping temperature effects the safety valve lift setpoint as stated by Westinghouse in their informal memorandum to Virginia Power on October 12, 1989. The licensee has traditionally used steam with no loop seal (water seal) to set and/or verify the valve lift setpoints.

The as-found data supports the conclusion that this technique results in an actual lift setpoint, after installation with a loop seal, somewhat higher than the plus or minus one percent allowed by the TS. The worst case data from the three unit 2 safety valves are given below. The numbers in parenthesis represent the amount the setpoint was above the allowable 2485 psig.

Vave	As-Found/Water Seal	As-Found/Steam
2-RC-2551A	2566 psig (3.25%)	2433 psig
2-RC-2551B	2563.8 psig (3.2%)	2462 psig
2-RC-2551C	2589 psig (4.2%)	2497 psig

The inspectors closely followed the issues concerning safety valve performance both at Surry and industry-wide as they developed. The licensee responded appropriately regarding the generic increased setpoint concern by removing all three valves from Unit 2 and testing the setpoints in an as-installed condition (with loop seal). A conference call on October 19, 1989, between the licensee and the NRC identified that the as-found setpoints were below the 2635 psig maximum pressure (105.4% of nominal) that analysis determined was necessary to maintain the peak RCS pressure below the 110% design overpressure limit. The results did indicate, however, that the actual lift setpoints were above the 2485 plus or minus one percent psig allowed by TS.

The licensee submitted the safety valve test results for Unit 2 with a Justification for Continued Operation for Unit 1 in a request for Discretionary Enforcement dated October 23, 1989. This letter acknowledged that the potential exists for the Unit 1 valves to exceed the one percent TS tolerance and requested Discretionary Enforcement until December 1, 1989, to allow time for resolution of this generic issue.

A separate issue developed from the generic concern above was the premature leaking that occurred on October 11. The inspectors discussed with the licensee the concern that the temperature of the loop seal can affect the lift setpoint. The drain valve under the B valve loop seal (2-RC-136) was found to have a broken packing flange. The licensee has postulated that the loop seal inventory could have been lost through the broken drain valve and therefore allowed the inlet piping temperature to increase to a point that safety valve leakage occurred. The inspectors reviewed all work involving the above valves. No discrepancies were identified.

c. Safety Injection Check Valve Repair

The inspectors reviewed the repair of SI check valve 2-SI-79 as authorized by work order 3800086812 and in accordance with procedure MCM-0417-1. The six inch Velan check valve exhibited excessive backleakage into the cold leg SI piping. This same valve was disassembled and overhauled during the previous Unit 2 outage.

Inspection of the valve internals indicated severe damage to the body/bonnet gasket which appears to have been caused by an incorrect size gasket and/or improper gasket alignment with respect to the valve body. The bonnet sheared a portion of the "Flexitallic" gasket which caused the spiral ribbon construction of the gasket to unwind. EWR 89-684 was issued detailing the problems and determined that the four to six feet of 304 stainless steel ribbon and the carbon filler material that was removed from the valve had prevented the valve disc from fully seating. The valve was reassembled using the correct gasket and returned to operations. The inspector reviewed the documentation and discussed with the station staff the following conclusions:

- An incorrect size gasket had been installed during the previous valve maintenance.

- Correct replacement parts have not been maintained in spare parts inventory.

- Adherence to an established foreign material exclusion program was evident.

- Adherence to procedure was evident. The procedure had been upgraded to the new format with clear, concise instructions and useful diagrams.

- The licensee adequately evaluated the implications of the above failure on the remaining check valves that had been worked.

The licensee was continuing an investigation of the above failure as the inspection period ended. Plans were being made to open two additional check valves that records indicate may have a gasket material problem. This item is identified as an unresolved item (280, 281/89-31-02) pending final determination of the cause of the check valve material discrepancies.

Within the areas inspected, no violations were identified.

5. Surveillance Inspections (61726 & 42700)

During the reporting period, the inspectors reviewed various surveillance activities to assure compliance with the appropriate procedures as follows:

- Test prerequisites were met.

- Tests were performed in accordance with approved procedures.

- Test procedures appeared to perform their intended function.

- Adequate coordination existed among personnel involved in the test.

- Test data was properly collected and recorded.

Inspection areas included the following:

a. Heat Tracing

On October 11, 1989, selected portions of periodic test 1-PT-27H, Heat Tracing (Panels 2A1, B1, and 5-Thermon and Strip Heaters), were witnessed. The inspector observed the recording of amperage, voltage, and temperature measurements of several channels in panel 2B1. The test procedure was reviewed to ensure that initial conditions and test steps had been performed. No discrepancies were noted.

b. Safety Injection Control Isolation Logic

On October 13, 1989, selected portions of periodic test 1-PT-8.3A, Safety Injection and Feedwater Control Isolation Logic, were witnessed. The inspector observed the pretest briefing, the determination of the condition (energized or not) of certain relays

on both train A and train B, and the activation of certain annunciators in Unit 1 CR when certain test switches were activated in the relay cabinets. The procedure was reviewed and the inspector observed the signing and accomplishment of certain steps during the testing. No discrepancies were noted.

Within the areas inspected, no violations or deviations were identified.

6. Information Meetings with Local Officials (94600)

On October 26 and 27, 1989, the Senior Resident Inspector, accompanied by the Section Chief from the Region II office responsible for the Virginia Power plants, conducted meetings with local officials in the surrounding counties and cities. The counties visited included York, Surry and James City County. The city visited was Newport News. The meetings were held to update the officials on the current NRC organization, provide appropriate business telephone numbers and points of contact, and to discuss the status of Surry Power Station and related community concerns with the local officials. The meetings were held with appropriate people including the local government coordinators, county administrators, and other government officials. The meetings were constructive with no major concerns identified. The inspectors also left a standing invitation for additional meetings with interested parties and/or city/county officials to discuss matters of mutual interest.

7. Licensee Event Report Review (92700)

The inspectors reviewed the LER's listed below to ascertain whether NRC reporting requirements were being met and to determine appropriateness of the corrective actions. The inspector's review also included followup on implementation of corrective action and review of licensee documentation that all required corrective actions were complete.

LERs that identify violations of regulations and that meet the criteria of 10 CFR, Part 2, Appendix C, Section V shall be identified as NCV in the following closeout paragraphs. NCVs are considered first-time occurrence violations which meet the NRC Enforcement Policy for exemption from issuance of a Notice of Violation. These items are identified to allow for proper evaluations of corrective actions in the event that similar events occur in the future.

(Closed) LER 280/89-01, Unplanned Auto Start of No. 3 EDG Due to Failed Diode. The issue involved an automatic start of the subject EDG due to a failed diode in the engine control circuit. Corrective action included replacement of the diode and proper testing of the engine control circuit after repairs were made. This LER is closed.

(Closed) LER 280/89-03, Degraded IRSP Motor Power Feeder Cables and Motor Leads. The issue involved identification of damage to the subject pump

motor cables during reinstallation of one of the pump motors. Corrective actions included shipping the motors to the vendors for corrective actions. This issue was inspected by region based inspectors and was addressed in NRC Inspection Report 280, 281/89-03. This LER is closed.

(Closed) LER 280/89-04, Cable Tray Covers Not Properly Installed for Compliance with 10 CFR 50, Appendix R. The issue involved the identification of a condition where cable tray cover installation was not in compliance with Appendix R commitments. This issue was inspected by region based inspectors and was addressed in NRC Inspection Report 280, 281/89-12. This LER is closed.

(Closed) LER 280/89-05, Auto Start of No. 1 and No. 3 EDGs Upon Loss of F Transfer Bus. The issue involved the subject ESF actuations due to the failure of a 4160 volt breaker to close. Corrective actions included refurbishment of all 4160 volt safety-related circuit breakers prior to unit restart. This issue was closely followed by both region based and resident inspectors and is addressed in NRC Inspection Reports 280, 281/89-06 and 89-12. This LER is closed.

(Closed) LER 280/89-06, Spurious Safety Injection Due to Inadequate Special Test Procedure. The issue involved various ESF actuations which occurred during testing due to an inadequate procedure. Corrective action included changing the test procedure to prevent recurrence and satisfactorily completing the test. This issue was addressed in NRC Inspection Report 280, 281/89-06. This LER is closed.

(Closed) LER 280/89-07, Failure to Initiate Alternate Radiological Sampling of Ventilation Vent Due to Personnel Error. The issue involved a failure to initiate alternate sampling of ventilation flowpath within one-hour after loss of normal sampling as required by TS 3.7-5(b). The alternate sampling was not initiated because operators thought that they could restore normal sampling within the one-hour period. Corrective actions included reinstruction of all operations and health physics personnel. The inspector reviewed the LER and corrective actions. This issue is identified as a NCV 280/89-31-03 for failure to commence alternate sampling in accordance with TS. This LER is closed.

(Closed) LER 280/89-08, A and B Inside Recirculation Spray Pumps Inoperable Due to Replicator Shaft Sleeves. The issue involved identification of replicator parts which had been installed in several safety-related pumps. Corrective actions included purchase order review to identify the scope of the problem and replacement of all identified replicas in safety-related applications. This issue was closely monitored by the resident inspectors and was addressed in NRC Inspection Reports 280, 281/88-51, 89-06, 89-13, and 89-17. This LER is closed.

(Closed) LER 280/89-09, Inadvertent Isolation of Component Cooling Water to Operating RHR Heat Exchanger Due to Inadequate Awareness of System

Configuration. The issue involved improper alignment of the subject heat exchanger due to operator error. This issue was closely monitored by the resident inspectors and was addressed in NRC Inspection Report 280, 281/89-08. This LER is closed.

(Closed) LER 280/89-10, Lockout of No.2 Auto-tie Transformer Due to Failure of Lighting Arrestor and Subsequent De-energization of 1H and 2J Emergency Buses. The issue involved the subject failure and resultant ESF actuations due to undervoltage conditions sensed on emergency buses. The event evaluation was closely monitored by the residents and was addressed in NRC Inspection Report 280, 281/89-13. This LER is closed.

(Closed) LER 280/89-11, TS Required Fire Watch Patrol Not Maintained While Containment Smoke Detectors Were Inoperable. The issue involved a failure to have a continuous firewatch patrol in the Unit 1 containment when smoke detectors were inoperable. The firewatch exited the containment without proper relief. The failure to maintain a required firewatch patrol was attributed to poor communications. The inspector reviewed the LER. This issue is identified as a NCV 280/89-31-04 for failure to maintain required firewatches as required by TS. This LER is closed.

(Closed) LER 280/89-12, Reanalysis of CR Dose Following DBA With Manual Discharge of Air Bottles Results in Exceeding GDC-19 Limits. The issue involved the subject reanalysis and the resulting conclusion that automatic initiation of an air bottle dump was required to meet the new analysis. Corrective action included redesign and installation of an auto air bottle dump signal on SI initiation. The inspectors reviewed the LER and verified that the auto-dump modification was implemented and tested satisfactorily. This LER is closed.

(Closed) LER 280/89-13, Lockout of 230 KV Bus No.3 Due to Personnel Error and Subsequent De-energization of 1H and 2J Emergency Buses. The issue involved loss of one source of offsite power to personnel error in the switchyard. Corrective actions included restoration of offsite power and the placement of stricter controls on workers in the switchyard. The resident inspectors monitored the licensee evaluation and reviewed the operator actions during the event. This effort was addressed in NRC Inspection Report 280, 281/89-13. This LER is closed.

(Closed) LER 280/89-14, Main Control Room Ventilation Isolation (Unplanned ESF Actuation) Due to a Spurious Chlorine Gas Detector Alarm. The issue involved an ESF actuation due to a spurious signal from a detector which is no longer required. Corrective action included removal of the detector from service. The inspector reviewed the LER and verified that chlorine monitoring was no longer required by TS. This LER is closed.

(Closed) LER 280/89-15, Setpoints Required for Auto Start of Fire Pumps Do Not Correspond to TS Requirements. The issue involved auto start setpoints for fire pumps that were lower than those specified in TS. Corrective action included changing the auto start setpoint to comply with the TS. The inspector reviewed the LER. This LER is closed.

(Closed) LER 280/89-16, Inadvertent Positive Reactivity Addition by Boron Dilution Without Containment Integrity Intact Due to Leaking RCP Standpipe Makeup Valve. The issue involved an inleakage of water into the RCS which slowly decreased boron concentration. Corrective action included identification of the leak point and corrective maintenance to the leaking valve. The inspector reviewed the LER and also the operator actions during the leakage determination timeframe. This LER is closed.

(Closed) LER 280/89-17, Failure to Sample CC Heat Exchangers Within 12 Hours Due to Personnel Error. The issue involved a violation of TS required sampling periodicity due to personnel error. The individual who failed to properly evaluate the samples was reinstructed on TS requirements. The inspector reviewed the LER. This issue is identified as a NCV 280/89-31-05 for failure to sample required systems in accordance with TS. This LER is closed.

(Closed) LER 280/89-18, Failure to Obtain the WGDT Sample Within TS Required 24 Hour Frequency Due to Personnel Error. The issue involved a violation of TS required sampling periodicity due to personnel error. The error occurred due to an operator misreading the log for the time required to take the sample. Corrective actions included additional written guidance to operators to insure that samples are obtained within the required TS times. The inspector reviewed the LER. This issue is identified as NCV 280/89-31-06 for failure to take a TS required sample. This LER is closed.

(Closed) LER 280/89-19, Unplanned ESF Component Actuation (Auxiliary Vent Fans Tripped Due to Test Rig Design). The issue involved an inadvertent ESF actuation due to a test rig that was inadequately designed. Corrective action included removal of the test rig and restarting of required fans. Additional actions included discussions with personnel responsible for preparation and revision of special tests. The inspector reviewed the LER. This LER is closed.

(Closed) LER 280/89-20, Potentially Inoperable Reactor Protection Channel Due to High Leakage Currents in Cable While in Harsh Containment. The issue involved identification of the subject concern during review of a similar problem at the North Anna Station. Corrective actions included replacement of the suspect cables. The resident inspectors monitored the licensee's evaluation and corrective actions for this issue. This LER is closed.

(Closed) LER 280/89-21, Control/Relay Room Chillers Inoperable Due to Inadequate Service Water Flow. The issue involved the tripping of the operable control room chiller due to high condenser discharge pressure. Corrective action included restarting of the chiller. Additional corrective actions are underway to upgrade the capacity of service water flow to the chillers. The inspector reviewed the LER, the licensee's

corrective action, and monitored the Service Water System upgrades that affect this area. This LER is closed.

(Closed) LER 281/88-09, Inoperable Component Cooling Water Heat Exchangers Due to Vacuum Priming Seismic Restraints Not Installed. The issue involved improper supporting of vacuum priming line due to the missing restraints. Corrective action included reinstallation of the supports. This issue was discussed in NRC Inspection Report 280, 281/88-14. This LER is closed.

(Closed) LER 281/88-11, Control/Relay Room Chiller Inoperable Due to Fouled Filter-Dryer Element. The issue involved the removal of the operating chiller from service in order to replace the filter/dryer elements. One of the other chillers was inoperable due to being tagged out for maintenance. Corrective action included replacement of the elements and returning the chiller to service. The inspector reviewed the LER and the licensee's actions. This LER is closed.

(Closed) LER 281/88-13, Reactor Trip Breakers Opened Due to Inadequate Procedure. The issue involved an ESF actuation of reactor trip breakers due to improper control of power supplies to simulated signals for S/G level. No immediate corrective action was required due to the reactor being already shutdown and in a maintenance condition. Additional instruction was provided to personnel with regards to the need for clarity when deviating procedures. The inspector reviewed the LER. This LER is closed.

(Closed) LER 281/88-14, Lifting of Power Operated Relief Valve Due to Procedural Inadequacy. The issue involved the lifting and reclosing of a PORV when an RCP was started. The PORV lifted due to the failure to identify proper starting pressure when starting an RCP. The inspector reviewed the LER. This issue is identified as NCV 281/89-31-07 for failure to provide adequate procedure when starting RCPs for RCS venting. This LER is closed.

(Closed) LER 281/88-15, Commencement of Shutdown Due to Rod Control Circuitry Failure. The issue involved commencement of a TS required shutdown due to a rod control LCO. After the shutdown was commenced, the rod control problem was corrected and properly tested. Unit 2 then resumed normal operation. The inspector reviewed the LER. This LER is closed.

(Closed) LER 281/88-18, B S/G Steam Flow Channel III Failed High Due To Failed Multiplier/Divider. The issue involved a failure of the subject component requiring that the unit enter TS 3.0.1. Corrective action included placing affected protection bistables in trip and replacing the failed component. After satisfactory testing of the replaced component, the protection circuitry was returned to normal alignment and Unit 2 exited TS 3.0.1. The inspector reviewed the LER. This LER is closed.

(Closed) LER 281/88-19, Unplanned Actuation of ESF Component, Inside Containment Blowdown Trip Valve. The issue involved the closure of the inside containment A S/G blowdown isolation valve for an unknown reason. Corrective action included a containment entry to correct the operability condition. After resetting of the high flow solenoid in containment, proper valve operation was obtained and verified. The inspector reviewed the LER. This LER is closed.

(Closed) LER 281/88-21, B LHSI Pump Not Tested Within Required 8-Hour Interval Due to Inoperable Test Equipment. The issue involved the required testing of the subject pump while the redundant pump was in a maintenance condition. The test was not accomplished in the specified timeframe due to equipment problems. The inspector reviewed the LER. This LER is closed.

(Closed) LER 281/88-22, Reactor Trip by Turbine Trip Due to Inadequate Procedure, Faulty Valve Position Limiter Indication and Response. The issue involved an unplanned reactor trip due to turbine trip. No immediate corrective actions were required other than to stabilize the plant after the trip in accordance with procedure. This issue was closely followed by the resident inspectors and was addressed in NRC Inspection Report 280, 281/88-36. This LER is closed.

(Closed) LER 281/88-23, Inadvertent ESF Component Actuation Due to Personnel Error. The issue involved inadvertent closure of three containment trip valves associated with radiation monitoring and sampling due to an electrician incorrectly lifting leads to support maintenance activities on another trip valve. Corrective action included properly relanding of the lead and appropriate testing of the affected components for operability. The inspector reviewed the LER. This issue is identified as an NCV (281/89-31-08) for failure to provide adequate instructions (proper identification of leads to be lifted) for a maintenance activity which affected operability of safety-related components. This LER is closed.

(Closed) LER 281/89-01, Loss of Containment Integrity During Refueling Operations Due to Loss of Administrative Control. The issue involved the improper installation of a blank flange on one of the "A" SG safety valve openings during refueling operations. When discovered, refueling evolutions were stopped and a proper blank was installed. In addition, the blanks were tagged to prevent unauthorized removal. The inspector reviewed the LER. This issue is identified as an NCV (281/89-31-09) for failure to provide for containment integrity as required by TS during refueling operations. This LER is closed.

(Closed) LER 281/89-02, Unplanned Auto-Start of EDG During Performance of PT-22.6B Due to Previously Unrecognized EDG Control Circuit Logic. The issue involved the subject ESF actuation due to the failure to reset appropriate relays prior to placing the EDG selector switches in AUTO. This issue was discussed in NRC Inspection Report 280, 281/89-17. In that

report, this event and a similar earlier event were identified as a weakness of past corrective action problems. No further enforcement action is required. This LER is closed.

8. Exit Interview

The inspection scope and findings were summarized on October 31, 1989, with those individuals identified by an asterisk in paragraph 1. The following new items were identified by the inspectors during this exit:

One violation with two examples was identified (paragraph 3.a) for failure to follow procedures and/or instructions (281/89-31-01).

One unresolved item was identified (paragraph 4.c) regarding followup on material problems associated with safety-related check valve maintenance (280, 281/89-31-02).

One non-cited violation was identified (paragraph 7) for falure to initiate alternate radiological sampling of ventilation vents as required by TS (280/89-31-03).

One non-cited violation was identified (paragraph 7) for failure to maintain a TS required fire watch patrol while containment smoke detectors were inoperable (280/89-31-04).

One non-cited violation was identified (paragraph 7) for failure to sample the component cooling heat exchangers within 12 hours as required by TS (280/89-31-05).

One non-cited violation was identified (paragraph 7) for failure to take a TS required sample (280/89-31-06).

One non-cited violation was identified (paragraph 7) regarding an inadequate procedure that resulted with the lifting of a power operated relief valve (281/89-31-07).

One non-cited violation was identified (paragraph 7) for failure to provide adequate instructions that resulted in an ESF component actuation (281/89-31-08).

One non-cited violation was identified (paragraph 7) for failure to provide containment integrity as required by TS during refueling operations (281/89-31-09).

The licensee acknowledged the inspection findings with no dissenting comments. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

9. INDEX OF INITIALISMS

AFW	-	AUXILIARY FEEDWATER
ANSI	-	AMERICAN NATIONAL STANDARDS INSTITUTE
AP	-	ABNORMAL OPERATING PROCEDURE
CAD	-	COMPUTER AIDED DESIGN
CAL	-	CONFIRMATION OF ACTION LETTER
CC	-	COMPONENT COOLING
CCW	-	COMPONENT COOLING WATER
CFR	-	CODE OF FEDERAL REGULATIONS
CLS	-	CONSEQUENCE LIMITING SAFEGUARD
CRO	-	CONTROL ROOM OPERATOR
CW	-	CIRCULATING WATER
DBA	-	DESIGN BASES ACCIDENT
DPI	-	DELTA PRESSURE INDICATORS
DR	-	DEVIATION REPORT
EDG	-	EMERGENCY DIESEL GENERATOR
EHC	-	ELECTRO-HYDRAULIC CONTROL
EMP	-	ELECTRICAL MAINTENANCE PROCEDURE
ESF	-	ENGINEERED SAFETY FEATURE
ESW	-	EMERGENCY SERVICE WATER
EWR	-	ENGINEERING WORK REQUEST
GDC	-	GENERAL DESIGN CRITERIA
GPM	-	GALLONS PER MINUTE
HP	-	HEALTH PHYSICS
HX	-	HEAT EXCHANGER
HPSI	-	HIGH PRESSURE SAFETY INJECTION
IA	-	INSTRUMENT AIR
IE	-	INSPECTION AND ENFORCEMENT
IFI	-	INSPECTOR FOLLOWUP ITEM
IRSP	-	INSIDE RECIRCULATION SPRAY PUMP
IOER	-	INDEPENDENT OFFSITE EVALUATION REVIEW
IRPI	-	INDIVIDUAL ROD POSITION INDICATION
ISI	-	INSERVICE INSPECTION
KV	-	KILOVOLT
LER	-	LICENSEE EVENT REPORT
LCO	-	LIMITING CONDITIONS OF OPERATION
LHSI	-	LOW HEAD SAFETY INJECTION
LOCA	-	LOSS OF COOLANT ACCIDENT
LOOP	-	LOSS OF OFFSITE POWER
MER	-	MECHANICAL EQUIPMENT ROOM
MOV	-	MOTOR OPERATED VALVE
MCR	-	MAIN CONTROL ROOM
NCV	-	NON-CITED VIOLATION
NRC	-	NUCLEAR REGULATORY COMMISSION
NRR	-	NUCLEAR REACTOR REGULATION
OP	-	OPERATING PROCEDURE
ORS	-	OUTSIDE RECIRCULATION SPRAY

PCV	-	PNEUMATIC CONTROL VALVE
PI	-	PRESSURE INDICATOR
PM	-	PREVENTATIVE MAINTENANCE
PORV	-	POWER AND OPERATED RELIEF VALVE
PPM	-	PARTS PER MILLION
PSI	-	POUNDS PER SQUARE INCH
PSIG	-	POUNDS PER SQUARE INCH GAUGE
PT	-	PERIODIC TEST
QA	-	QUALITY ASSURANCE
QC	-	QUALITY CONTROL
RAI	-	RESIDENT ACTION ITEM
RCP	-	REACTOR COOLANT PUMP
RCS	-	REACTOR COOLANT SYSTEM
RHR	-	RESIDUAL HEAT REMOVAL
RG	-	REGULATORY GUIDES
RO	-	REACTOR OPERATOR
RPS	-	REACTOR PROTECTION SYSTEM
RSS	-	RECIRCULATION SPRAY SYSTEM
RWP	-	RADIATION WORK PERMIT
RWST	-	REFUELING WATER STORAGE TANK
SCFM	-	STANDARD CUBIC FEET PER MINUTE
SER	-	SAFETY EVALUATION REPORT
SG	-	STEAM GENERATOR
SI	-	SAFETY INJECTION
SNSOC	-	STATION NUCLEAR SAFETY AND OPERATING COMMITTEE
SOV	-	SOLENOID OPERATED VALVE
SPDS	-	SAFETY PARAMETER DISPLAY SYSTEM
SRO	-	SENIOR REACTOR OPERATOR
SW	-	SERVICE WATER
TAVG	-	AVERAGE TEMPERATURE OF RCS
TI	-	TEMPORARY INSTRUCTION
TS	-	TECHNICAL SPECIFICATIONS
TSC	-	TECHNICAL SUPPORT CENTER
UFSAR	-	UPDATED FINAL SAFETY ANALYSIS REPORT
URI	-	UNRESOLVED ITEM
UV	-	UNDER VOLTAGE
VS	-	VENTILATION SYSTEM
WGDT	-	WASTE GAS DECAY TANK