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

Report No.: 50-395/92-05

Licensee: South Carolina Electric & Gas Company
Columbia, SC 29218

Docket No.: 50-395 License No.: NPF-12

Facility Name: V. C. Summer Nuclear Station

Inspection Conducted: March 1-31, 1992

Inspectors: _____ 4/15/92
R. C. Haag, Senior Resident Inspector Date Signed

_____ 4/15/92
L. A. Keller, Resident Inspector Date Signed

Approved by: _____ 4/15/92
Floyd S. Cantrell, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope:

This routine inspection was conducted by the resident inspectors onsite in the areas of monthly surveillance observations, monthly maintenance observations, operational safety verification, follow-up review and licensee action on previous inspection items. Selected tours were conducted on backshifts and weekends. Backshift and weekend tours were conducted on twelve occasions.

Results:

No violations or deviations were identified.

Operator responsiveness was viewed as positive in recognizing changing plant parameters prior to exceeding any alarms and taking timely action to prevent a possible plant trip (paragraph 5). A poor work practice, involving signoffs not being made when the work was completed, was observed during a maintenance activity (paragraph 4). A lack of attention and awareness was noted for an

intentionally breached fire barrier. Improvement in the control of fire barriers is warranted (paragraph 5).

REPORT DETAILS

1. Persons Contacted

Licensee Employees

F. Bacon, Acting Manager, Chemistry and Health Physics
K. Beale, Supervisor, Emergency Services
*C. Bowman, Manager, Maintenance Services
*M. Browne, Manager, Design Engineering
*B. Christiansen, Manager, Technical Services
H. Donnell, Senior Engineer, Nuclear Licensing
S. Furstenberg, Associate Manager, Operations
W. Higgins, Supervisor, Regulatory Compliance & Operating Experience
*S. Hunt, Acting General Manager, Nuclear Safety
*A. Koon, Manager, Nuclear Licensing & Operating Experience
K. Nettles, General Manager, Station Support
H. O'Quinn, Manager, Nuclear Protection Services
*M. Quinton, General Manager, Engineering Services
*J. Skolds, Vice President, Nuclear Operations
*G. Taylor, General Manager, Nuclear Plant Operations
*B. Williams, Manager, Operations

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

*Attended exit interview

Other Inspections or Meetings

Caudle Julian, Engineering Branch Chief, DRS, was onsite March 18-20, 1992, to meet with the resident inspectors and review EDSFI activities.

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

2. Plant Status

The plant operated at 100 percent power throughout the inspection period with the exception of a planned power reduction to 45 percent on March 13, 1992, for troubleshooting of the test circuitry for the main turbine intercept valves and other maintenance activities, including replacement of the "C" main feedwater pump seals. Following the successful repair of the main turbine intercept valve test circuitry on March 13, 1992, power was gradually increased over the next several days with the unit returning to 100 percent on March 17, 1992.

An Electrical Distribution System Functional Inspection (EDSFI) was performed March 2 through April 3, 1992. The team was onsite for the weeks of March 2-6, March 16-20 and March 30 through April 3, 1992 (50-395/92-04).

A regional inspection in the area of reactor engineering was performed March 9-13, 1992, by Paul Burnett (50-395/92-07).

A regional inspection in the area of radiation protection was performed March 9-13, 1992, by Elizabeth Pharr (50-395/92-06).

3. Monthly Surveillance Observation (61726)

The inspectors observed surveillance activities of safety related systems and components listed below to ascertain that these activities were conducted in accordance with license requirements. The inspectors verified that required administrative approvals were obtained prior to initiating the test, testing was accomplished by qualified personnel in accordance with an approved test procedure, test instrumentation was calibrated, and limiting conditions for operation were met. Upon completion of the test, the inspectors verified that test results conformed with technical specifications and procedure requirements, any deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel, and the systems were properly returned to service. Specifically the inspectors witnessed/reviewed portions of the following test activities:

* Monthly venting of the ECCS piping to ensure it is full of water (STP 105.006).

* Weekly test of the electric driven and diesel driven fire pumps XPP134A and XPP134B (STP 170.001 and 170.002).

* Component cooling pump "C" and associated valves operability test (STP 122.002). This test is performed at least once every ninety-two days and meets the inservice testing (IST) requirements of TS 4.0.5. All parameters observed were within the acceptance criteria including pump flow, check valve flow and valve stroke times.

* Monthly test of the turbine driven emergency feedwater pump XPP08 (STP 120.002). This test is performed at least once every thirty-one days and demonstrates that the pump is operable per TS surveillance requirements 4.7.1.2.a.2, 4.0.5, and 4.3.2.1. The test was performed in accordance with the procedure and all acceptance criteria were met.

* Quarterly battery surveillance test (STP 501.002). This test demonstrates that each battery bank is operable per TS 4.8.2.1.6. The inspector observed the test for the DC distribution bus 1B battery (XBA1B). Individual cell voltages, electrolyte levels and specific gravities were measured. All parameters were within the acceptance criteria.

* Reactor building personnel airlock local leak rate test (STP 215.001A). This test verifies the operability and integrity of the reactor building personnel airlock in accordance with TS requirements 4.6.1.3, 4.6.1.2.f, and 4.6.1.1.6. All acceptance criteria were met and no discrepancies were noted.

The observed tests were performed in accordance with procedural requirements and demonstrated acceptable results.

4. Monthly Maintenance Observation (62703)

Station maintenance activities for the safety-related systems and components listed below were observed to ascertain that they were conducted in accordance with approved procedures, regulatory guides, and industry codes or standards and in conformance with TS.

The following items were considered during this review: that limiting conditions for operation were met while components or systems were removed from service, approvals were obtained prior to initiating the work, activities were accomplished using approved procedures and were inspected as applicable, functional testing and/or calibrations were performed prior to returning components or systems to service, quality control records were maintained, activities were accomplished by qualified personnel, parts and materials used were properly certified, and radiological and fire prevention controls were implemented. Work requests were reviewed to determine the status of outstanding jobs and to ensure that priority was assigned to safety-related equipment maintenance that may affect system performance. The following maintenance activities were observed:

* Monthly battery inspection (EMP 115.011).

* Molded case circuit breaker test (EMP 280.004). Inspector observed overcurrent testing of the control room radiation monitor supply breaker (XMC1DB2X 03KM). Test results were satisfactory.

* Annual visual inspection of the "B" boric acid tank diaphragm (PMTS P0156064). The diaphragm appeared to be in satisfactory condition.

* Visual inspection and exercising of components within molded case circuit breaker cubicles (EMP 280.006). Inspector observed this procedure for cubicle XMC1DB2Y 07IL; which supplies power to the charging pump suction header isolation valve (XVG8131B-CS) motor operator. The procedure consisted of a visual inspection and exercising the thermal overloads and circuit breaker manually. No discrepancies were noted.

* Troubleshooting of combined intermediate valve (CIV) testing anomalies (MWR 9203194). On February 22, 1992, while performing main turbine valve operability testing (PTP 102.001), the licensee noted that after stroking valve CIV-1, valve CIV-3 closed approximately 10 percent then reopened. This was unexpected and inconsistent with the design of the test circuitry. When later testing CIV-2 the same phenomenon occurred, with CIV-4 closing approximately 10 percent then reopening. The licensee believed that the problem was associated with a test circuit board and reduced power to 45 percent on March 1 , 1992, to replace this circuit card. Replacing the card did not correct the problem, but further troubleshooting revealed that

the problem was with several "plug in" type relays, whose operation had degraded such that the circuit for closing these valves was temporarily energized during testing. Further C.V testing was accomplished which demonstrated that the problem was corrected.

* Disassembly and inspection of service water (SW) screen wash pump suction valve XVG3102C (MWR 91M0044). The inspection was performed due to other gate valves in similar SW applications having failed in service due to corrosion. After reviewing system configuration and flow characteristics, the licensee identified those valves that were susceptible to similar failure. All these valves were in non safety-related applications. The inspectors had previously reviewed the licensee's basis for this selection and were in agreement with the scope of the inspection.

  Similar corrosion of the valve disc was noted on XVG3102A but not to the extent of the valve that had failed. Due to incorrect size of a replacement disc, the original disc was reinstalled. The engineering evaluation accepted this condition on a temporary basis until a replacement disc is procured and installed. The basis for the evaluation was that this condition would not prevent the valve from performing it's function. Based on inspection of the valve disc the inspectors agree with the evaluation.

* Preventive maintenance on the tendon access gallery sump pumps XPP006A and B (PMTS P0153868 and P0153869).

* Replacement of three indicating lights on "A" emergency diesel generator (EDG) local control panel (MWR 92E0023). These lights provide indication for "Emergency Start", "Ready for Auto Start" and "Ready for Load". Previously, the licensee had experienced numerous failures of the bulbs and sockets for these lights. In one occurrence, a failed light bulb caused a 15 ampere fuse in a control circuit to fail. This type failure would have prevented the EDG from tying onto the 7.2 kV safeguards bus. The licensee believes that the indicating light design, which uses a spring in the socket and a threaded bulb, was the main contributor for the numerous failures. The new indicating lights which have a standard "baquet" design also have a resistor in the light socket, which reduces the possibility of a fuse failing due to a blown light bulb.

  While reviewing the work package after the indicating lights were replaced, the inspector noted that signoffs in the "lifted lead" sheet were not completed. Individual signoffs which are required for the reinstallation and second verification of each electrical lifted lead had not been made. The electricians informed the inspector that the signoffs were not completed at the time the work was done because a new lifted lead sheet was going to be filled out when the electricians returned to the shop. All the signoffs would be completed on the new sheet. The electricians wanted a new sheet due to several "line-throughs" that were made on the original sheet.

After reviewing the completed work, the inspector did not identify any problems with the reinstalled leads due to the signoffs not being completed. However, the inspector considers the failure to complete signoffs after completion of the work a poor work practice. Also, a QC inspector that was observing the work did not question this practice.

* Installation of a new orifice in the chill water (VU) return line from air handling unit XAH9A (MWR 22114-0230). The resized orifice was installed in an attempt to throttle VU flow to the correct value such that the VU isolation valve would not be required to throttle flow. However, flow measurements with the new orifice identified that minimum flows could not be obtained. The orifice was removed and the inside diameter was increased to allow additional flow. With the new orifice size, partial throttling with the isolation valve was required. The licensee's current plans are to resize the orifices for those components which require valve throttling. After the orifices are resized, all the isolation valves will be opened to allow measurement of flow for the system and to individual components. The overall goal is for these flows to support system operability without the use of isolation valves for throttling. The inspector will continue to follow-up on the licensee's efforts for the VU system.

With the exception of the signoff not being completed for the lifted lead sheet as the work was completed, all other maintenance activities observed were performed using good work practices and per the required procedures.

5. Operational Safety Verification (71707)

a. Plant Tour and Observations

The inspectors conducted daily inspections in the following areas: control room staffing, access, and operator behavior; operator adherence to approved procedures, TS, and limiting conditions for operations; examination of panels containing instrumentation and other reactor protection system 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.

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(s), and operability of instrumentation and support items essential to system actuation or performance.

Plant tours 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. During a tour of the cable room adjacent to the relay room, the inspector noted that some of the deflectors for the fire protection sprinkler heads were loose and rotated out of position. The deflectors which are attached to the sprinkler piping are normally positioned above the sprinkler head to direct flow downward. After being informed of these deficiencies, the fire protection coordinator initiated corrective action to reposition the deflectors and to inspect other sprinkler locations to determine if similar conditions exist.

The inspectors conducted biweekly inspections in the following areas: verification review and walkdown of safety related tagout(s) in effect; observation of control room shift turnover; review of implementation of the plant problem identification system; and verification of selected portions of containment isolation lineup(s).

Selected tours were conducted on backshifts or weekends. Inspections included areas in the cable vaults, vital battery rooms, safeguards areas, emergency switchgear rooms, diesel generator rooms, control room, auxiliary building, cable penetration areas. service water intake structure, and other general plant areas. Reactor coolant system 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. On a regular basis, RWP's were reviewed and specific work activities were monitored to assure they were being conducted per the RWP's.

b. Operator Responsiveness

On March 23, 1992, the inspector observed the control room operators effectively respond to a transient in the feedwater system which had the potential to result in a plant trip. The transient occurred when the Deaerator Storage Tank startup drain control valve (ILV3235FW), which diverts flow from the discharge of the feedwater booster pumps, inadvertently opened. Approximately 16 percent of the flow from the feedwater booster pumps was diverted back to the condenser. This resulted in the feedwater booster pumps operating at near runout conditions, which in turn caused the Deaerator Storage Tank level to rapidly decrease.

The Deaerator Storage Tank level is normally maintained at 67 percent, which provides net positive suction head for the feedwater booster pumps. At a level of 33 percent an annunciator is energized in the control room, and if level continues down below 21 percent an automatic trip of the feedwater booster pumps occurs which would indirectly cause a reactor trip due to a loss of feedwater. At the rate the Deaerator Storage Tank level was decreasing, due to ILV3235FW inadvertently opening, the operators may not have had enough time to prevent a trip if they had relied on the low level annunciator to alert them of this condition. However, the operators were alert and noted the decreasing tank level in a timely manner, enabling them to close ILV3235FW before the level decreased below 42 percent.

Normally, ILV3235FW is closed and functions to provide level control of the Deaerator Storage Tank during startup and to automatically prevent overfilling the tank in the event of a reactor trip or large load rejection. The cause of ILV3235FW inadvertently opening is still being investigated, but it appears that a fault in the balance of plant (BOP) instrumentation rack (XPN6006) power supply may have caused a voltage spike in the control circuit card for ILV3235FW, which resulted in the inadvertent actuation.

c. Control of Fire Barriers

During a tour of the intermediate building on March 13, 1992, the inspector noted that the fire barrier door between the rooms containing "A" and "B" train control room evacuation panals (CREP) was propped open. On March 7, 1992, the door was intentionally opened to provide additional cooling to "A" CREP room. Since "A" train chill water system was not running, the room was not receiving any external cooling. On March 7, the outside temperatures were higher than normal and resulted in the "A" CREP room exceeding the TS limit of 83 degrees Fahrenheit. After opening the door the room temperature decreased below the TS limit. When the door was originally opened a seven day fire barrier removal permit was issued. The compensatory action was a one hour roving fire watch.

Since outside temperatures were below normal on March 13, the inspector questioned the need for additional cooling to "A" CREP room. Following a discussion of this matter with the shift supervisor, the door was closed. The TS high temperature limit was not exceeded after the door was closed. Based on the low outside temperatures for several days before March 13, it appears that the door could have been closed earlier without adversely affecting the TS room temperature limit. While reviewing this issue the inspector noted a lack of involvement by operations personnel on the status of the open door. It appeared that expiration of the seven day fire barrier removal permit would be the mechanism to question the continued need for the open door. Previously, the inspector had identified a lack of attention for a similar situation involving an open door for the turbine driven EFW pump room. Improvements in the control of breached fire barriers are needed.

No violations or deviations were identified.

6. ESF System Walkdown (71710)

The inspectors verified the operability of an ESF system by performing a walkdown of the accessible portions of the spent fuel cooling and purification system. The inspectors confirmed that the licensee's system line-up procedures matched plant drawings and the as-built configuration. The inspectors looked for equipment conditions and items that might degrade performance (hangers and supports were operable, housekeeping, etc.). The inspectors verified that valves, including instrumentation

isolation valves, were in proper position, power was available, and valves were locked as appropriate. The inspectors compared both local and remote position indications.

During the walkdown inspection several minor deficiencies were identified. After review of these items with the inspectors, the licensee was responsive in initiating appropriate corrective action.

7. Follow-up Review and Action on Previous Inspection Findings (92701 and 92702)

(Closed) NRC Temporary Instruction 2500/14 addressed a potential deficiency with the schematic diagrams for Westinghouse Solid State Protection Systems (SSPS). The deficiency involved a SSPS control schematic drawing at an operating facility which erroneously depicted the manual trip circuit for the reactor trip breakers. The inspector reviewed the licensee's controlled drawing (1MS 42-036-13) and the diagram in the technical manual which depicts the SSPS manual trip circuit. Both drawings were identical. The manual trip circuit input was correctly shown to be downstream of output transistors Q3 and Q4 in the undervoltage ouput card. This Temporary Instruction is closed based on this drawing verification.

(Closed) 10 CFR 21 Report (P21 90-04), from Rosemount, regarding potential degradation of resistors associated with Rosemount model 710 trip/calibrate units and 414 E/F resistance bridges. The licensee does not utilize either of these devices, therefore, this Part 21 is not applicable to V. C. Summer.

(Closed) Violation 395/90-06-01, Example A, Failure to follow procedures resulted in a spill of approximately 25 gallons of contaminated water. The cause of the spill was maintenance work on a filter without tagging, isolating, or draining the system. The inspector verified completion of the corrective action contained in the licensee's response letter dated April 16, 1990. One exception the inspector noted was the statement in the response that maintenance supervisors would verify themselves that the equipment/systems are properly aligned prior to initiating work. However, SAP 300, "Conduct of Maintenance", assigns this responsibility to the personnel performing the maintenance. In the field the inspectors have observed the individual workers ensuring/verifying that operations personnel have properly aligned the component/systems. This practice has been successful in ensuring correct isolation for maintenance work.

(Closed) Violation 395/90-12-02, Failure to follow procedure for reconnection of electrical leads and failure to have adequate procedures for post maintenance and post modification testing. This violation had two examples involving a TS required instrument that was disconnected for an entire cycle and the reversing of the feeder cables for a new battery. The licensee's response to this violation dated June 1, 1990, was reviewed by the inspector. Improvements were noted in the lifted lead and jumper program. Additional guidance has been provided for the

planning and performance of post modification testing. Improvements have been noted in some recent post modification testing reviewed by the inspector. A new post maintenance test procedure (GTP 214) was recently issued. During review of maintenance activities and review of the MWR packages, the inspectors have noted improvements in the documentation and application consistency of testing that is specified on the MWR's.

8. Exit Interview (30703)

The inspection scope and findings were summarized on April 3, 1992, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed the inspection findings.

No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during the inspection.

9. Acronyms and Initialisms

BOP	Balance of Plant
CIV	Combined Intermediate Valve
CREP	Control Room Evacuation Panel
ECCS	Emergency Core Cooling System
EDG	Emergency Diesel Generator
EDSFI	Electrical Distribution System Functional Inspection
EMP	Electrical Maintenance Procedure
ESF	Engineered Safety Feature
GTP	General Test Procedure
ISEG	Independent Safety Evaluation Group
IST	Inservice Testing
LER	Licensee Event Reports
MWR	Maintenance Work Request
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
PMTS	Preventive Maintenance Task Sheet
PTP	Plant Test Procedure
QC	Quality Control
RCS	Reactor Coolant System
RWP	Radiation Work Permits
SPR	Special Reports
SSPS	Solid State Protection System
STP	Surveillance Test Procedures
SW	Service Water
TS	Technical Specifications
VU	Chill Water