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

Report No.: 50-395/85-08

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

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

Facility Name: V. C. Summer

Inspection Conducted: February 1 - March 1, 1985

Inspector: W. H. Ruland for 3/21/85
C. W. Hehl Date Signed

Approved by: F. S. Cantrell 3/22/85
F. S. Cantrell, Section Chief Date Signed
Division of Reactor Projects

SUMMARY

Scope: This routine, unannounced inspection entailed 106 inspector-hours onsite in the areas of plant tours; operational safety verifications; monthly surveillance observations; monthly maintenance observations; independent inspection effort; followup on written reports of non-routine events and operating reactor events; and in-office review.

Results: One new violation was identified with two examples - failure to follow procedures: one example is identified in paragraph 6, regarding the issuance of an inappropriate torque conversion chart; the second example is identified in paragraph 8, regarding failure to promptly report a degraded fire barrier. A second example of a previously identified violation is identified in paragraph 5. One new unresolved item-failure to test valves XVG 9503A and B in accordance with the ASME Section XI program, is identified in paragraph 9.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

O. Bradham, Director, Nuclear Plant Operations
*J. Connelly, Deputy Director, Operations and Maintenance
*K. Woodward, Manager, Operations
*M. Quinton, Manager, Maintenance
M. Browne, Manager, Technical Support
*B. Croley, Group Manager, Technical and Support Services
*F. Zander, Manager, Training
*G. Putt, Manager, Scheduling and Materials
*A. Koon, Associate Manager, Regulatory Compliance
*S. Hunt, Associate Manager, QA Surveillance Systems
*H. Sufick, Associate Manager, Station Security
*J. Parks, Regulatory Support Supervisor
*R. Fowlkes, Regulatory Compliance Engineer
*M. Irwin, Nuclear Licensing Specialist
*C. McKinney, Regulatory Compliance

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

Other NRC Inspectors

*P. Burnett, Region II
*M. Runyan, Region II
*L. Moore, Region II

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on March 8, 1985, with those persons indicated in paragraph 1 above. The licensee acknowledged the inspection findings. With regard to the item of noncompliance identified in paragraph 5, the licensee committed to treat this item as a second example of violation 395/85-04-02, contained in the Notice of Violation sent to the licensee on February 26, 1985. As such, the licensee will address corrective action for this second example in their response to violation 395/85-04-02. Additionally, licensee management reiterated their intentions regarding the unresolved item identified in paragraph 9. The licensee does not intend to modify their IST program to include valves such as XVG 9503A. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspector during this inspection.

3. Licensee Action on Previous Enforcement Items

This subject was not addressed in the inspection.

4. Unresolved Items

One new unresolved item was identified during this inspection (paragraph 9) regarding the requirement to test certain types of valves under the ASME Section XI program.

5. Operational Safety Verification (71707, 71710)

The inspector observed control room operations, reviewed applicable logs and conducted discussions with control room operators during the report period. The inspector verified the operability of selected emergency systems, reviewed removal and restoration logs, and tagout records, and verified proper return to service of affected components. Tours of the control, auxiliary, intermediate, diesel generation, service water and turbine buildings were conducted to observe plant equipment conditions including potential fire hazards, fluid leaks, and excessive vibrations, and to verify that maintenance requests had been initiated for equipment in need of maintenance. The inspector, by observation and direct interview, verified that the physical security plan was being implemented.

During inspector review of the Operations Key Logs maintained in the Shift Supervisor's office, the inspector determined that on several occasions the logs were utilized for key issues, but the key custodian had failed to sign the log entries (indicating authorization for key issue) for the issuance of non-security keys used for controlling access to the safeguards cabinets. Examples of this type occurrence are found in the Operations Key Logs entries dated February 9, 12, 15, 17, 24 and 28, 1985, documenting the issuance of keys to safeguards train A and/or train B cabinets.

Technical Specification 6.8.1 requires that written procedures be implemented covering the applicable procedures recommended in Appendix A to Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, recommends procedures for equipment control (locking).

Station Administrative Procedure (SAP) 140, Plant Key Control, defines the Non-Security Key System which is used to eliminate unauthorized entry especially to High Radiation Areas and Radioactive Materials Storage Areas and to safeguard records, materials and equipment. SAP 140 requires that key logs be utilized to issue all non-security keys.

SAP 204, Operating Logs and Records, implements the Non-Security Key System within the Operations Group and requires that the Operations Key Control Log Books be maintained in accordance with SAP 140. The above noted failures to properly document the issuance of non-security keys is a violation. Since

this violation is similar to a violation identified in the Notice of Violation sent to the licensee on February 26, 1985, the anticipated corrective action for the violation identified in the Notice should adequately preclude recurrence of this violation, and the licensee has committed to addressing this violation in their response to that Notice, this violation is considered a second example of violation 85-04-02.

6. Surveillance Observation (61726)

During the inspection period, the inspector verified by observation/review that selected surveillances of safety-related systems or components was conducted in accordance with adequate procedures; test instrumentation was calibrated; limiting conditions for operation were met; removal and restoration of the affected components were accomplished; test results met requirements and were reviewed by personnel other than the individual directing the test; and that any test deficiencies identified during the testing were properly reviewed and resolved by appropriate management personnel.

On February 6, 1984, the inspector observed a portion of the performance of Surveillance Test Procedure (STP) 123.003, Service Water System Valve Operability Test, which required an operator to manually stroke service water booster pump check valve XVC 3135A and measure the torque necessary to move the valve disk to the open position. To make this required measurement, the test performer applied torque with a 0-250 ft.lb. torque wrench (MTW-13) and a three inch crowsfoot.

Mechanical Maintenance Procedure (MMP) 285.003 requires that when a torque wrench is used with a crowsfoot, a torque conversion chart be developed to correlate the actual torque output to the input indicated on the torque wrench for the specific wrench/crowsfoot/angle combination. This torque conversion chart is to be provided to the field for use. MMP 285.003 allows for the use of previously developed torque conversion data sheets provided the data sheet reflects the exact combination of calibrated torque wrench, crowsfoot and angles to be employed.

The inspector reviewed the torque conversion chart used by the operator to establish the torque applied to XVC 3135A. The chart was prepared for a 50-300 ft.lb. torque wrench (MTW-110) with a three inch crowsfoot. This data sheet did not meet the criteria for use as identified in MMP 285.003.

Technical Specification 6.8.1 requires that written procedures be established, implemented and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33 recommends a procedure for control of measuring and test equipment. MMP 285.003 implements this requirement for torque wrenches to be used with a crowsfoot or a torque multiplier. The use of the above noted torque conversion chart to establish the torque applied during the February 6, 1984 stroking of XVC 3135A is a violation of this requirement (85-08-01).

It is noted that subsequent testing by the licensee determined that the torque applied by the combination of torque wrench MTW-13 and a three inch crowsfoot correlated within acceptable tolerance with the conversions specified on the conversion chart used in the performance of STP 123.003; therefore, operability of XVC 3135A was unaffected by this deficiency.

7. Maintenance Observation (62703)

Station maintenance activities of selected safety-related systems and components were observed/reviewed to ascertain that they were conducted in accordance with regulatory requirements. The following items were considered in this review: the limiting conditions for operations were met; activities were accomplished using approved procedures; 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 controls were implemented as required. Maintenance Work Requests were reviewed to determine status of outstanding jobs to assure that priority was assigned to safety-related equipment which might affect system performance.

No violations or deviations were identified in this area.

8. On Site Followup of Written Reports of Non-routine Events (92700)

The inspector reviewed the following Licensee Event Reports (LERs) to ascertain whether the licensee's review, corrective action, and report of the identified event and associated conditions were adequate and in conformance with regulatory requirements, Technical Specifications, license conditions, and licensee procedures and controls.

(Closed) LER 84-40, Degraded Fire Barrier. On October 16, 1985, the licensee reported via LER 84-40 that on September 20, 1984 at 2:30 p.m., a fire seal blockout, ELB-2037 Trace 686, located in Control Building Room 36-11 was found with fire protection foam removed. The fire barrier was declared inoperable, the area smoke detectors verified operable, an hourly fire watch patrol established, and a maintenance work request generated to repair the barrier. The barrier was subsequently repaired and declared operable on September 21, 1984.

Inspector review of licensee documentation of this event and discussions with licensee personnel revealed that the sequence of events surrounding the discovery of this degraded barrier and the ensuing corrective action was not clearly stated in LER 84-40. Apparently this fire barrier was identified as degraded by construction personnel on September 19, 1984 at approximately 2:30 p.m., as documented on Station Off Normal Occurrence Report No. 84-230. Then, sometime between discovery at 2:30 p.m. on September 19, 1984, and 1:00 p.m. on September 20, 1984, the Planning and Scheduling Group was

notified of the degraded barrier and generated Maintenance Work Request (MWR) No. 8402113 to effect repairs. The control room was notified and declared the fire barrier inoperable as of 2:30 p.m. on September 20, 1984, as documented on Removal and Restoration (R&R) No. 840827. The Hourly Fire Watch Patrol Log for September 20, 1984 documents that a roving fire watch patrol of this area was established as a result of R&R No. 840827 as of 3:00 p.m. on September 20, 1984.

Technical Specification (TS) 3.7.10 requires all fire barrier assemblies separating safety-related fire areas and sealing devices in fire rated assembly penetrations to be operable at all times. If a fire rated assembly or sealing device is inoperable, the licensee is required to within one hour either establish a continuous fire watch or an hourly fire patrol if the fire detector on at least one side of the barrier is verified operable.

Inspector review of Hourly Fire Watch Patrol Log entries for the period following initial discovery on September 19, 1984 until 3:00 p.m. on September 20, 1984, when the hourly fire watch patrol noted above was established, determined that an hourly fire watch patrol of this area was in effect for reasons unrelated to this event. Thus, the required compensatory measures for degraded fire barrier ELB2037, Trace 686, were in effect within one hour of time of discovery - satisfying the requirements of TS 3.7.10.

The degraded fire barrier assembly was identified nearly 24 hours prior to the initiation of "within one hour" compensatory actions. This indicates a breakdown in the licensee's program for prompt identification and correction of conditions adverse to quality.

Technical Specification 6.8.1 requires that written procedures be implemented covering the applicable procedures recommended in Appendix A of Regulatory Guide 1.33, Revision 2, February 1978. This requirement to implement the procedures recommended in Regulatory Guide 1.33, without further qualification, indicates the licensee will comply with the requirements of ANSI N18.7-1976. ANSI N18.7-1976 requires procedures for control of items, services or activities which do not conform to requirements.

Station Administrative Procedures (SAP) 146, Nonconformance Control Program, implements this requirement at V. C. Summer. SAP 146 requires that when a nonconformance involves installed equipment not removed from service, the shift supervisor shall be notified immediately. The shift supervisor will then take necessary action to maintain the plant in a safe condition in accordance with Technical Specifications. Therefore, the above apparent failure to promptly notify the Shift Supervisor of the degraded fire barrier assembly penetration seal ELB 2037, a nonconformance, is a violation. This failure to follow procedures is a second example of violation 85-08-01.

9. Independent Inspection (92706)

Following inspector observation of preventative maintenance on the valve operator for motor operated component cooling water valve XVG 9503 B on February 7, 1985, the inspector determined that this valve and a valve of

similar function XVG 9503 A were not included in the licensee's ASME Section XI program for inservice testing (IST) of valves.

AMSE Section XI, Subsection IWV, provides the rules and requirements for inservice testing to verify operational readiness of certain class 1, 2 and 3 valves (and their actuating and position indicating systems) which are required to perform a specific function in shutting down a reactor to the cold shutdown condition or in mitigating the consequences of an accident.

The component cooling water valves XVG 9503 A and B are motor operated shut-off valves which isolate flow from the component cooling water (CCW) system through the residual heat removal (RHR) system heat exchangers. During normal plant operation, only one loop of component cooling water is operated to supply its essential and nonessential loads. The XVG 9503 valve for the operating loop is normally shut to limit flow demand to within the flow capacity of the active CCW pump operating in slow speed. The XVG 9503 valve in the inactive CCW loop is maintained open to provide a flow path for its CCW pump which will start upon receipt of a safety injection signal. Since the RHR heat exchangers provide no safety function during the safety injection (SI) phase of a design basis loss of coolant accident (LOCA), these valves would not be required to change position at that point to accomplish a specific safety function.

The post LOCA safety injection phase is followed by the recirculation phase during which the water collected in the reactor building is recirculated through the RHR heat exchangers and the reactor coolant system by the RHR pumps. During this phase, the CCW system loops must transfer the heat load from the RHR heat exchangers. The normally inactive CCW loop operates during the SI phase with the RHR heat exchanger circuit open (i.e. Valve XVG 9503 open) and therefore no change in the position of XVG 9503 for this loop is necessary when recirculation is initiated. However, in the normally active CCW loop, the RHR heat exchanger circuit is isolated as identified above. Therefore, XVG 9503 for this loop must be opened by operator action to activate the RHR heat exchanger for the recirculation phase. Thus, depending on which loop is active at the time of the LOCA, either valve XVG 9503 A or B would be required to change position to accomplish a specific safety function following the design basis LOCA.

From the above description of the specific safety function performed by valves XVG 9503 A and B, these valves appear to fall within the scope of ASME Section XI requirements for inservice testing.

The inspector discussed this finding with NRR, Mechanical Engineering Branch and NRC Region II on February 12 and 13, 1985. The results of these discussions affirmed the apparent requirement to test valves XVG 9503 A and B under the IST program.

The licensee claims that these valves were not included in the IST program based on discussions which occurred during meetings held on February 24, 25, 1982 between NRC and SCE&G regarding the IST program for pumps and valves.

This meeting was documented in a March 16, 1982 letter to the licensee. The licensee contends that inclusion of the subject valves and other valves of similar function which do not receive an automatic ESF signal represents a departure from a previous NRC interpretation.

Based on these discussions the question as to the applicability of ASME Section XI to the subject valve will be carried as an unresolved item pending further NRC Region II review of this issue (85-08-02).

10. On Site Followup Of Events At Operating Reactors (93702)

a. On February 16, 1985, the unit was brought to Mode 3, Hot Standby, from 100% power following unsuccessful attempts to correct a failure in the rod control system.

At approximately 9:00 a.m. on February 16, 1985, while attempting to move control rods for control of axial flux distribution, the control rods failed to respond to the demand signal and a rod control system urgent failure alarm was received in the control room. Logic error urgent failure alarms were occurring on all rod control power cabinets.

Each power cabinet urgent failure monitoring subsystem monitors the cabinet logic circuit. A detected logic circuit problem actuates the cabinet urgent failure alarm circuit that warns the operator and places the control rods in an immediate freeze mode, inhibiting all rod motion.

Attempts to troubleshoot the failure were unsuccessful and in accordance with facility Technical Specifications, at 1:45 p.m. a plant shutdown to Hot Standby was initiated. The plant shutdown was accomplished by normal boration and at 2:48 p.m., with the reactor at approximately 3% power, a manual reactor trip was inserted in accordance with the facility emergency operating procedures. During the reactor trip, the Reactor Protection System and all control rods functioned properly, no automatic Engineered Safety Feature actuation was required.

Subsequent troubleshooting by the licensee with on-site assistance from Westinghouse identified several control rod drive system irregularities which may have contributed to the problem. No clear cause for the failure was identified. The rod drive system irregularities found and corrected included pulse oscillator card output pulse voltage of 8 volts instead of 15 ± 2 volts, one of the rod drive motor generator sets had an output voltage of 249 volts instead of 260 volts, and master pulser period of 6.4 milliseconds instead of specified 6.1 ± 0.05 milliseconds. The above irregularities were corrected, alarms cleared and each control rod bank was exercised with no identifiable deficiencies. All rods moved freely and with proper indication.

At 4:10 p.m. on February 18, 1985, the Plant Safety Review Committee concluded that no nuclear safety concern existed and the unit could be restarted. The unit was restarted and returned to power on February 18, 1985.

b. On February 27, 1985, the unit was again brought to Hot Standby from 100% power due to a failure in the rod control system.

At approximately 1:33 a.m. on February 27, 1985, while attempting to return axial flux difference to the target value, rods would not respond to demand and a rod control urgent failure alarm was received. Attempts to the troubleshoot the rod control system were unsuccessful and, in accordance with Technical Specifications and facility Emergency Operating Procedures, at 6:00 a.m. a plant shutdown by normal boration was initiated. At 7:05 a.m., with reactor power reduced to approximately 10%, a manual reactor trip was inserted to bring the plant to Mode 3, Hot Shutdown.

Unlike the previous event of February 16, 1985, the licensee limited the initial troubleshooting activities in order that the rod control system remained as close to the "as failed" configuration as possible to facilitate failure analysis. Subsequent troubleshooting by the licensee with onsite assistance from Westinghouse isolated the failure to the rod control system logic cabinet supervisory buffer memory card, card no. A112. The supervisory buffer memory card, which passes directional demand signals to the rod control system power cabinets, had not been replaced during previous troubleshooting of the February 16, 1985 problem. The identified card failure was intermittent in nature.

The failed supervisory buffer memory card was replaced, post-maintenance testing successfully performed, and the rod control system returned to an operable status. The reactor was not immediately returned to power following this event due to an inoperable feedwater isolation valve.

c. On February 28, 1985, while restarting the reactor following the February 27 shutdown discussed above, a premature criticality occurred. A power range nuclear instrumentation high positive rate trip terminated the event at 1:35 p.m. Reactor power peaked at approximately 6 percent. The Reactor Protection System (RPS) functioned as required and no automatic engineered safety feature (ESF) actuation was required or occurred. Post trip review determined that the unanticipated criticality resulted from operator error compounded by an error in the estimated critical rod position (ECP). Following discussions between the licensee and NRC Region II concerning this event, the unit was restarted and returned to power on March 1, 1985. Following this event, a special inspection was performed by NRC Region II; the results of that inspection appear in NRC Report 50-395/85-12.

11. In-Office Review

a. The following item was evaluated by the Reactor Safety, and Reactor Projects regional staff. Based on this review and the results of the latest Resident and Region based inspection activities in the affected functional areas, the following item was determined to require no additional specific followup and is closed:

CDR 83-05	Substantial Safety Hazard Main Control Board Separation Criteria

b. IE Bulletin 79-07 (79-BU-07), Seismic Stress Analysis of Safety-Related Piping, is considered closed for the purposes of the Regional Inspection Program. This closure does not affect the status of any NRR evaluations. Related inspection followup will be performed as required by IE Bulletin 79-14, Seismic Analysis for As-Built Safety-Related Piping Systems.