



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

Report No.: 50-395/89-13

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

Docket No.: 50-395

License No.: NPF-12

Facility Name: V. C. Summer

Inspection Conducted: July 1 - 31, 1989

Inspectors:	<u><i>F. S. Cantrell</i></u>	<u>8/4/89</u>
	R. L. Prevatte	Date Signed
	<u><i>P. C. Hopkins</i></u>	<u>8/4/89</u>
	P. C. Hopkins	Date Signed
Approved by:	<u><i>F. S. Cantrell</i></u>	<u>8/4/89</u>
	F. 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 observation, operational safety verification, action on previous inspection findings, and other areas. Certain tours were conducted on backshift or weekends. Backshift or weekend tours were conducted on July 11, 12, 13, 18, 19, 23, 24, 25, and 26, 1989.

Results:

The unit began the month at 100 percent power. A trip from 100 percent power occurred on July 11, 1989, as the result of a maintenance technician shorting out a power supply for the generator stator water cooling system. The unit trip and SCE&G grid heavy loading resulted in a loss of offsite power with a transfer of the safety related buses to the emergency diesel generators, paragraph 4.b. The unit was restarted and returned to power on July 13, 1989. It operated at full power for the remainder of the month. The areas of maintenance and surveillance continue to perform satisfactorily. A violation for failure to control the temporary installation of portable demineralizers was identified, paragraph 4.c. The licensee's evaluation of this event determined that although a seismic event could effect the operation of safety equipment, the affected systems would still continue to operate satisfactorily.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- W. Baehr, Manager, Chemistry and Health Physics
- C. Bowman, Manager, Scheduling and Modifications
- *O. Bradham, Vice President, Nuclear Operations
- M. Browne, Manager, Systems Engineering & Performance
- W. Higgins, Supervisor, Regulatory Compliance
- S. Hunt, Manager, Quality Systems
- *A. Koon, Manager, Nuclear Licensing
- G. Moffatt, Manager, Maintenance Services
- D. Moore, General Manager, Engineering Services
- *K. Nettles, General Manager, Nuclear Safety
- C. Price, Manager, Technical Oversight
- M. Quinton, General Manager, Station Support
- J. Shepp, Associate Manager, Operations
- J. Skolds, General Manager, Nuclear Plant Operations
- *G. Sault, General Manager, Operations and Maintenance
- G. Taylor, Manager, Operations
- D. Warner, Manager, Core Engineering and Nuclear Computer Services
- *M. Williams, General Manager, Nuclear Services
- K. Woodward, Manager, Nuclear Operations Education and Training

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

*Attended exit interview

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

2. Monthly Surveillance Observation (61726)

The inspectors observed surveillance activities of safety related systems and components to ascertain that these activities were conducted in accordance with license requirements. The inspectors observed portions of 35 selected surveillance tests including all aspects of Reactor Building Closeout Inspection, STP 109.001. The inspectors verified that required administrative approvals were obtained prior to initiating the test, testing was accomplished by qualified personnel, required test instrumentation was properly calibrated, data met TS requirements, test discrepancies were rectified, and the systems were properly returned to service. The licensee demonstrated good communication between test technicians and control room personnel during performance of test procedures. The materials, parts, components and test equipment used were found to be correct and documented properly. Technicians had procedures available at all times and utilized them properly.

No violations or deviations were identified.

3. Monthly Maintenance Observation (62703)

The inspectors observed maintenance activities of safety related systems and components to ascertain that these activities were conducted in accordance with approved procedures, TS, industry codes and standards. The inspectors determined that the procedures used were adequate to control the activity, and that these activities were accomplished by qualified personnel. The inspectors independently verified that the equipment was properly tested before being returned to service. Additionally, the inspectors reviewed several outstanding job orders to determine that the licensee was giving priority to safety related maintenance and not developing a backlog which might affect a given system's performance. The operational maintenance activities observed by the inspectors during this report were judged to be satisfactory. It appears that with the installation of control room barriers and a new tagging desk in the control room, the traffic in the critical areas of the control room has been reduced. This has also resulted in smoother processing of MWR's, STP's and other maintenance activities through the control room. The following specific maintenance activities were observed:

MWR 87C0022	Replace regulator for demineralizer instrument air supply
MWR 8901080	Repair controller on hydrogen analyzer
MWR 8901211	Calibrate pressurizer control channels 444C & 444D
PMTS 115543	Repair air intake transmitter for SW building
MWR 89G0095	Repair smoke detectors
PMTS 112043	Repair discharge flow transmitter on C FW booster pump
PMTS 116745	Calibrate heater coil temperature controller in auxiliary building supply plenum
PMTS 118844	Calibrate temperature element on SW building pump room
MWR 88E0125	Repair flexible conduit to smoke analyzer
MWR 88E0108	Test and replace smoke analyzer
PMTS 117045	Calibrate temperature alarm on SW booster pump
MWR 8956808	Remove necessary parts and reinstall torque motor
PMTS 122056	Perform inspection on open cycle cooling water booster pump A

PMTS 122063	Rotate turbine on closed cycle cooling water pump A
PMTS 121916	Verify alignment of 480V breakers
PMTS 121917	Electrical adjustment on 7.2kV switchgear breaker
PMTS 119740	Inspection of FW pump turbine
MWR 8901221	Repair position indication circuitry on pressurizer sample header isolation valve
MWR 87G0095	Repair sample detection line
PMTS 122395	Vibration analysis check on RHR pump A
PMTS 121729	Vibration analysis check on EFW pump A
PMTS P122139	Audit misalignment log
PMTS P122104	Inspect 7.2kV switchgear breakers

No violations or deviations were identified.

4. Operational Safety Verification (71707)

- a. The inspectors toured the control room, reviewed plant logs and records and held discussions with plant staff personnel to verify that the plant was being operated safely and in conformance with applicable requirements. Specific items inspected in the control room included: adequacy of staffing and attentiveness of control room personnel, TS and procedural adherence, operability of equipment and indicated control room status, control room logs, tagout books, operating orders, jumper/bypass controls, computer printouts and annunciators. Tours of other plant areas were conducted to verify equipment operability, control of ignition sources and combustible materials, the condition of fire detection and extinguishing equipment, the control of maintenance and surveillance activities in progress, the implementation of radiation protective controls and the physical security plan. Tours were conducted during normal and random off-hour periods.
- b. On July 11, 1989, at 2:35 p.m., the unit tripped from 100 percent power. The trip resulted from an I&C technician shorting a wire while reconnecting a thermocouple inside the stator water cooling control cabinet. The short circuit blew the power supply fuses and resulted in a low flow signal on stator water cooling. The normal protective action would have resulted in a turbine run back. This circuit did not function correctly and resulted in a turbine trip and reactor trip.

At the time of the reactor trip the utility grid was experiencing a high load of approximately 3100 MW's. This loss of the 900 MW's being generated by Summer resulted in a large voltage oscillation which actuated protective relays that also tripped 4 pumped storage units at the Fairfield Pumped Storage Facility (approximately 250MW), 3 units at the Saluda Hydro (approximately 135MW), and both fossil generating units at McMeekin Station (approximately 250MW). These losses resulted in the 230kV offsite power source to Summer dropping to approximately 203kV and the 115kV source dropping to approximately 100kV. This low voltage condition actuated the undervoltage relays which automatically separated the 7200 volt ESF buses from offsite power. This started the emergency diesel generators and placed the safety related buses on the diesel generator. The non-safety service buses remained connected to the degraded offsite power source and continued to operate throughout the event at reduced voltages. An unusual event was declared at 3:10 p.m. due to the loss of both offsite power sources. The system voltage was returned to normal and the safety related buses were reconnected to offsite power at approximately 5:00 p.m. The DG's were secured and the unusual event was terminated at 5:11 p.m.

Further investigation by the licensee revealed that the MVAR loading of Summer, the grid MVAR distribution at the time of the unit trip and lower than normal setpoints on some generator back-up protection relays may have led to this event. The licensee has developed administrative guidelines to provide for improved system MVAR distribution that should reduce the probability of future similar occurrences. After completing all necessary repairs and implementing the above step, the unit was restarted on July 12, 1989, and returned to power operation on July 13, 1989. The licensee is currently preparing a LER on this event. The event will also be discussed during a meeting scheduled for August 1, 1989, at NRC headquarters.

- c. While conducting a routine walkdown of the plant on July 6, 1989, the inspectors discovered two temporary demineralizers on the 412 elevation of the intermediate building. These units are 24 inches in diameter and approximately six feet high and are configured to stand in an upright position. The weight of each of the components is approximately 1750 lbs. The support for these units was a 1/2-inch sisal rope which attached these units to two EFW line supports and a SW line support. A concern with the effects of this installation on the operability of the SW and EFW system and nearby safety-related components during a seismic event was immediately discussed with the operations shift supervisor. The shift supervisor immediately had these units removed from the area and documented this in off-normal occurrence 89-058 and NCN 3386.

Further investigation into this item revealed that these units had been installed on June 1, 1989, to permit draining of the SG while the plant was in Mode 5. This installation was accomplished without a MWR as required by the Station Housekeeping and Plant Inspection Program Procedure SAP 142, and Conduct of Maintenance Procedure SAP-300. The unit was restarted on June 11, 1989 with the units still in place. This installation had been noted by plant management and directions had been given to remove the units on or around June 20, 1989.

In this instance personnel were deficient in not performing this work under the licensee MWR program. No documentation to require engineering review of this temporary installation was performed as required by SAP 142. The above procedure was also inadequate in that it did not insure that a seismic evaluation of the installation be performed and that time limits were established to insure removal of this hazard prior to plant start-up. This is contrary to the requirement of TS 6.8.1.a which requires that procedures be established, implemented and maintained for activities referenced in Appendix A of Regulatory Guide 1.33, Revision 2, February 1972. This is a violation, "Failure to Control Temporary Installations," 89-13-01.

The licensee has performed an evaluation which determined that a seismic event could have resulted in the portable demineralizer becoming mobile and possibly damaging two FW line supports and shearing off a test connection on a CCW line and a drain line in the SW system. The failure of the EFW supports would not have resulted in the system becoming inoperable and the loss of flow in the SW and CCW system would not have degraded system flow below the worst case analyzed values. The potential flooding from the lines were well within the capacity of space dewatering equipment. This analysis determined that all systems would remain operable.

This event is similar to a licensee identified violation that was documented in inspection report 89-03. In that event temporary scaffolding had been erected for shielding of RHR piping to reduce personnel radiation exposure while the plant was in a refueling outage. Due to procedural deficiencies and personnel errors the scaffolding was not removed prior to plant start-up. That installation had the potential to impact on system operability.

The licensee, in their response to this violation, should address procedural changes made to insure that temporary installations are controlled and that dates or mode restraints are established to insure that temporary installations which are required while the plant is shutdown are removed prior to unit start-up.

Violations or deviations were identified.

5. Action on Previous Inspection Findings (92701, 92702)

(Closed) TI2511/94, Inspection for verification of licensee changes made to comply with PWR moderator dilution requirements, multi-plant action item 13-03. The inspector reviewed inspection requirements specified in this instruction and reviewed the V. C. Summer Safety Evaluation Report and supplements to determine what requirements had been established. This review identified that dilution events and preventive measures were discussed and resolved in section 15 of the SER and in supplements 1 and 3 to the SER. However, multi-plant action item B-03 was not specifically discussed. Discussion with Mr. L. Kopp, the NRR lead contact for this item, indicates that this item is not applicable for V. C. Summer. The SIMS open item list for V. C. Summer also does not list this item. Further discussion with Mr. Kopp revealed that since V.C. Summer was licensed in 1982, this issue would have been resolved in the normal licensing process for V. C. Summer and all other plants licensed after 1979. Based on the above, this item is administratively closed.

6. Other Areas

The inspectors toured the licensee's lead dispatch center in Columbia, SC on July 25, 1989. Computer control and indication systems and procedures that are used to operate and control SCE&G's grid was discussed in detail. This tour was very beneficial and provided the inspectors with a better understanding of this system.

7. Exit Interview (30703)

The inspection scope and findings were summarized on July 31, 1989, with those persons indicated in paragraph 1. The inspectors described the areas inspected and discussed the inspection findings. The plant trip and the resulting offsite power loss event which occurred on July 11, 1989, was discussed in detail. This included the short term corrective measures and the current investigation into root cause and long term corrective action. The violation which resulted from the failure to control the temporary installation of portable demineralizers in the intermediate building was attributed to procedural inadequacies and a failure to follow procedures. It was also noted that the violation was similar to LIV 89-03-01 when the plant was restarted without removing scaffolding that contained temporary shielding. 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.

8. Acronyms and Initialisms

CCW	Component Cooling Water
DG	Diesel Generator
EFW	Emergency Feedwater
FW	Feedwater

I&C	Instrumentation and Control
MW	Megawatt
MWR	Maintenance Work Request
MVAR	Million Volt Amps Reactive
NCN	Non-Conformance Notice
NRC	Nuclear Regulatory Commission
NRR	Nuclear Reactor Regulation
PMTS	Preventive Maintenance Task Sheet
QC	Quality Control
RHR	Residual Heat Removal
SAP	Station Administrative Procedure
SCE&G	South Carolina Electric & Gas Company
SER	Safety Evaluation Report
SG	Steam Generator
SIMS	Safety Issues Management Systems
STP	Surveillance Test Procedures
SW	Service Water
TS	Technical Specifications