



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

Report No.: 50-395/84-36

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

Docket No.: 50-395

License No.: NPF-12

Facility Name: Summer

Inspection Conducted: November 27-30, 1984

Inspector: T. D. Gibbons 12-27-84
T. D. Gibbons Date Signed

Approved by: T. E. Conlon 12-27-84
T. E. Conlon, Section Chief Date Signed
Engineering Branch
Division of Reactor Safety

SUMMARY

Scope: This routine, unannounced inspection entailed 45 inspector-hours on site in the areas of Independent Inspection effort on the electrical maintenance program.

Results: No violations or deviations were identified.

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REPORT DETAILS

1. Licensee Employees Contacted

- *O. W. Dixon, Vice President, Nuclear Operations
- *O. S. Bradham, Director, Nuclear Plant Operations
- *J. W. Derrick, Associate Manager, Maintenance Engineering
- *J. G. Connally, Deputy Director, Operations and Maintenance
- G. G. Soult, Associate Manager, Maintenance
- J. J. Nesbitt, Electrical Supervisor

Other licensee employees contacted included four mechanics and three foremen.

NRC Resident Inspector: C. W. Hehl, Senior Resident Inspector

*Attended exit interview

2. Exit Interview

The inspection scope and findings were summarized on November 30, 1984, with those persons indicated in paragraph 1 above.

3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

4. Unresolved Items

Unresolved items were not identified during this inspection.

5. Independent Inspection Effort (92706B)

The inspector reviewed the procedures used to perform preventive and corrective maintenance on the electrical systems at the plant. The Station Administrative Procedures (SAP) cover the administrative controls for the station and the Electrical Maintenance Procedures (EMP) detail specific electrical maintenance activities. The following procedures were examined by the inspector.

Station Administrative Procedures

Procedure	Title	Revision	Issued
SAP 120	Plant Safety Review Committee	1	December 28, 1983
SAP 131	Fire Protection Program Plan	1	April 11, 1984
SAP 133	Design Control/Implementation	2	January 20, 1984

SAP 134	Control of Station Surveillance Test Activities	2	July 23, 1984
SAP 137	Procurement	2A	October 8, 1984
SAP 141	Control and Calibration of Measuring and Test Equipment	2B	November 9, 1984
SAP 143	Lubrication and Preventive Maintenance Program	2A	November 9, 1984
SAP 142	Station Housekeeping Control	3	July 16, 1984
SAP 146	Nonconformance Control Program	1	March 21, 1984
SAP 148	Temporary Bypass, Jumper and Lifted Load Control	3	October 19, 1984
SAP 201	Danger Tagging	2	August 9, 1984
SAP 300	Conduct of Maintenance Activities	1	January 19, 1983
SAP 301	Implementation of Maintenance Work Requests, Preventive Maintenance and Surveillance Test Task Sheets and Shop Work Orders	1	January 19, 1984
SAP 601	Application, Scheduling and Handling of Maintenance Activities	0	August 21, 1984

Electrical Maintenance Procedures

EMP-Number	Title	Revision	Date Issued
115.001	Preventive Maintenance Procedure (STATIONARY BATTERIES)	3	April 7, 1983
115.002	PM and Servicing SCI Battery Chargers	4A	February 16, 1984
115.003	Individual Cell Charging Procedure	2	December 11, 1981
115.005	Removal and Reinstallation of Battery Cells and Straps	2	March 28, 1983
115.006	Calibration Check of Battery Hydrometers	2	May 10, 1984

115.007	SCI Static Inverters Preventive Maintenance and Testing	2	April 19, 1983
115.008	Westinghouse Inverter Maintenance and Testing	7	June 15, 1984
115.09	DC Ground Isolation	2	March 5, 1984
115.011	Battery Inspection	3	August 3, 1983
115.014	Battery Output Breaker Maintenance	1	August 3, 1983
120.001	Heat Tracing	0-A	December 6, 1983
135.001	Westinghouse Circuit Breaker Maintenance	2B	July 20, 1984
135.003	Reactor Trip Breaker Testing	0	May 12, 1983
165.002	Fuel Building Crane Preventive Maintenance	0	March 1, 1982
190.001	Test Procedure for ITE 59D Relays	2	October 25, 1983
190.002	Test Procedure for GE Type 1AC51 Relays	1	October 11, 1983
190.003	Test Procedure for GE Type 1AC53 Relays	1	October 7, 1983
190.004	Test Procedure for GE Type 1AC57 Relays	7	October 11, 1983
190.005	Test Procedure for GE Type 1AC66 Relays	1	October 27, 1983
190.006	Test Procedure for GE Type PJC Relays	1	January 3, 1984
190.007	Test Procedure for Agastat Series 7000 Timing Relays	1A	August 6, 1984
190.008	Test Procedure for GE NGV Relays	1	March 21, 1984
190.009	Test Procedure for ITE Type 27D Undervoltage Relays	1	September 7, 1983
190.010	Test Procedure for GE Type STD Relays	1A	March 12, 1984

190.012	Test Procedure for GE Type CEH Relays	1	February 21, 1984
190.013	Test Procedure for GE Type INC-77 Relays	1	February 21, 1984
190.014	Test Procedure for GE Type 1JVC Relays	1	February 8, 1984
190.015	Test Procedure for GE Type PJV Relays	1	December 10, 1983
190.016	Test Procedure for GE Type PJC Relays	1	February 8, 1984
190.017	Test Procedure for GE Type ICW51A Relays	1	February 21, 1984
190.018	Test Procedure for ITE-81 Relays	1A	April 9, 1984
190.019	Test Procedure for Westinghouse Type SA-1 Relays	1	February 13, 1984
190.023	GE Type HFA Relay Maintenance	1	February 28, 1984
190.024	Cleaning Procedure for GE Relays With Lubricated Time Dials	0	November 1, 1984
245.006	Diesel Generator Preventive Maintenance	5	November 26, 1984
245.007	Setup and Adjustment of the Diesel Generator Governor	0	February 10, 1983
280.001	Sizing and Testing of Thermal Overloads	3	October 9, 1984
280.003	Disassembly and reassembly of Square D Motor Control Centers	3	September 21, 1984
280.004	Molded Case Circuit Breaker Testing	3	September 27, 1984
280.006	Molded Case Circuit Breaker and Controller Inspection and Preventive Maintenance	1	August 5, 1983
280.007	APN/DPN Preventive Maintenance	0	March 12, 1984
285.001	Panel Mounted Meter Calibration Check	1	August 17, 1983

295.003	Electric Motor Maintenance	3	March 31, 1983
295.004	Inspection and PM of Electric Motors	3	January 5, 1984
300.001	Relay Maintenance	2	December 27, 1983
300.002	Replacement of Electrical Components	3	November 22, 1983
300.003	Installation of Flexible Conduit	4	May 23, 1983
300.005	Cleaning and Inspection of Electrical Equipment	2	March 8, 1983
300.007	General Electrical Maintenance and Troubleshooting	2B	November 19, 1984
300.009	Cable Pulling	1A	October 2, 1984
300.011	Terminal Block Inspection	0	February 23, 1984
300.012	Agastat Relay Replacement	1	October 29, 1984
300.013	Hermetic Connector Maintenance	0	November 16, 1984
300.014	Maintenance of Valcor and Target-Rock Solenoid Valves	0	November 15, 1984
325.001	Pressurizing Electrical Penetration	0	October 25, 1981
325.002	D. G. O'Brien Electrical Penetration	1A	August 7, 1984
325.003	Conax Electrical Penetrations	0A	November 8, 1984
391.001	Removal and Installation of Conduit in Seismic Areas	1A	October 29, 1984
391.002	Removal and Reinstallation of Cable Tray Covers	1	September 25, 1984
391.003	Installation of Electrical Supports	0A	October 17, 1984
405.001	7.2KV Circuit Breaker Annual Maintenance	6	November 19, 1984

405.002	ITE Air Circuit Breaker Maintenance	7B	June 28, 1984
405.004	Termination and Determination of Cable 480 Volts and Below	2	March 16, 1983
405.004	Termination and Determination of 7.2KV Cables	2	March 16, 1983
405.5	Disassembly and Reassembly of ITE Substations for Inspection or Repair	1	September 25, 1980
405.6	ITE 7.2KV Switch Maintenance	0	September 25, 1980
405.008	480V Substation Maintenance	1	August 30, 1983
405.009	DC High Voltage Proof Testing	1	February 13, 1984
405.010	ITE Type 51 IM Relay Testing	3	April 16, 1984
405.011	ITE 7.2KV Switch Preventive Maintenance	2	May 21, 1984
405.012	Guide for Electrical Physical Separation	1	November 9, 1984
405.013	7.2KV Circuit Breaker 5 Year Maintenance	0A	October 18, 1983
405.014	Breaker Testing to Meet Cable Tray Fire Separation	1	April 3, 1984
405.015	Termination of Equipment for Instrument and Controls	0A	September 21, 1984
445.001	Limatorque Preventive Maintenance	3	September 20, 1984
445.002	Limatorque Operator Maintenance	2	August 7, 1984
445.003	Terminating Determinating and Testing of Limatorque Operators	2	September 27, 1984
445.004	ROTORK Maintenance	0	March 15, 1982

The SAP procedures require Operations to release the system or component for maintenance. All signatures must be complete on the Maintenance Work Order (MWO) prior to returning the equipment to Operations. The MWO identifies the drawings and procedures to be used. The EMP procedures identify the vendor manual as a reference where applicable and when a vendor notifies the site of a specific problem a new EMP is issued detailing the inspections and rework. As an example, EMP 190.023 was specifically written to correct

the HFA relay problem and 190.024 was written to clean the GE relays with lubricated time dials. Each of the above procedures contained detailed steps for accomplishing the work and the related inspections to assure that the work is done properly. MWOs are reviewed to assure that Fire Plan requirements are considered, and that materials, parts, and components to be used are correct, suitable, and meet the environmental qualification as necessary. The planning of an MWO considers the requirements of the Technical Specification and any limiting condition for operation in order to properly schedule the maintenance activity. The EMPs contain provisions for housekeeping, cleaning of safety-related systems and control of special processes such as relay calibration, meggering, high potential testing, crimping tool verification and the requirements for qualified operators for soldering and crimping. Also, each EMP contains acceptance criteria for the work performed and QC hold points as required. All procedures state that if something abnormal is identified, not to proceed without contacting supervision and if the abnormal condition is significant, a nonconformance is issued. When maintenance is completed, the MWO or EMP will require that all jumpers or lifted leads be restored to normal and verified. A retest may be required prior to returning the system to Operations Control.

The inspector observed work associated with the following maintenance activities:

- MWO 84M0481, Steam Generator Isolation Valve XVG-01611a, Reterminate Control Wiring
- Preventive Maintenance (PM) Task Sheet 0045437 Periodic Surveillance on 7.2KV Breaker X5W1DB Unit 15

The MWO and PM task sheets had been issued and approved for the above activities. The components were released and tagged by Operations. The required drawings and procedures were with the work package. QC inspection hold points were identified on the MWO. The PM task sheet did not require any parts nor QC hold points. The inspector verified the test equipment and crimper calibration tags. The inspector examined the lifted lead records for the MWO and found that the record was entered on a procedure data sheet and required QC verification of reinstallation. The box covers were reinstalled after the leads were terminated. The work activities observed by the inspector did have retest steps, but they were not completed during the inspection.

During the initial inspection of the 7.2KV circuit breaker the electricians identified two items which were not normal. The load stab on the A phase had abrasions which were not explainable. They were about an inch wide and covered about 45° on the stab. It did not appear to be detrimental to the stab, but the electrician immediately contacted the electrical supervisor for evaluation. The second item was two small burns on the C phase main

contacts. The two burns were about 1/4 inch long and about a 1/32 wide. It appeared that they could be corrected by burnishing. The electrical supervisor stopped work on the breaker and initiated MWO 84E-0285 to replace the entire breaker with a spare breaker. Evaluation and rework of the breaker will be accomplished on a new MWO. The electricians appeared to be very knowledgeable of the workings of the breaker and conducted the inspection in a professional manner.

MWO 84M0481 required the electrical retermination of two cables. The electrician noted that the lugs on one of the cables appeared damaged. The lugs were replaced using a calibrated crimping tool, and class IE lugs. A QC inspector observed the work and accepted the electrical portion of the MWO.

The NRC inspector examined fifteen completed MWO packages to verify that; the required approvals were obtained prior to starting work; the acceptance criteria were met; the referenced procedures were approved and adequate for the activity; and inspections were made in accordance with procedures. Most of the MWOs reviewed contained functional tests which were completed prior to returning the system to operations. The site employs journeyman electricians who are trained on the job using plant equipment. The licensee has established that all maintenance and modification work activities will be controlled by the maintenance group. If there is a need for contractor support, the licensee's maintenance QA/QC program controls remain in place. When additional craft personnel are required, they are assigned to a maintenance foremen who control their work within the overall maintenance program.

The licensee has established a computer program to assemble, store and retrieve maintenance records for a maintenance history. The program is identified by the acronym "Champs" and is used to control and schedule PMs. This program performs trend analysis on repetitive failures. It is possible to have the program identify all maintenance performed on a specific piece of equipment or identify all MWOs for a particular component. The Champs program has been loaded with the periodic replacement of components imposed by NUREG 0588 and design requirements. It should be noted that no electrical components have been replaced to meet NUREG 0588 as of yet. The specific maintenance work packages examined were 0035, 7753, 50002, 50707, 50716, 50717, 51873, 52174, 52177, 52178, 54184, 54188, 54805, 55909 and 57311. These records were stored on microfilm and accessible by the computer.

Within the areas examined there were no violations or deviations identified.

6. Electrical Maintenance Training

The licensee has established a training program for all maintenance electricians. The licensee has assigned one instructor to this program. The program as it now exists is a review of the electrician apprentice training. There are specific training classes for qualifying electricians in soldering and crimping. The licensee is rewriting the training plan to expand the training available.

Within the areas examined there were no violations or deviations identified.