



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

Report No.: 50-395/88-04

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

Docket No.: 50-395

License No.: NPF-12

Facility Name: Summer

Inspection Conducted: February 1-5, 1988

Inspector: J. R. Harris

2/29/88  
Date Signed

Approved by: T. E. Conlon  
T. E. Conlon, Chief  
Plant Systems Section  
Division of Reactor Safety

2/29/88  
Date Signed

SUMMARY

Scope: This routine, unannounced inspection was in the areas of the Seismic Monitoring Program and the Fire Protection/Prevention Program.

Results: In the areas inspected, violations or deviations were not identified.

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*K. E. Beale, Manager Nuclear Protection Service
- \*C. Bowinan, Manager of Scheduling and Modifications
- \*O. S. Bradham, Director Nuclear Plant Operations
- \*H. I. Donnelly, Senior Licensing Engineer
- \*D. R. Moore, General Manager Engineering Services
- \*H. Plemmons, Senior Fire Protection Technician
- \*J. R. Proper, Associate Manager of Quality Assurance
- \*W. L. Safley, Fire Protection Supervisor
- \*J. L. Skolds, General Manager Station Operations
- R. B. Whorton, Senior Engineer

Other licensee employees contacted included construction craftsmen, engineers, technicians, operators, mechanics, and office personnel.

#### NRC Resident Inspectors

- \*R. Prevatte, Senior Resident Inspector
- \*P. Hopkins, Resident Inspector

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on February 5, 1988, with those persons indicated in paragraph 1. The inspector described the areas inspected and discussed in detail the inspection finding listed below. Dissenting comments were not received from the licensee.

Proprietary information is not contained in this report

### 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 (92706)

The inspector discussed the seismic monitoring program with responsible engineers, examined seismic monitoring equipment, reviewed procedures for the seismic monitoring program and reviewed the most recent surveillances on seismic monitoring equipment. Procedures reviewed were:

- STP-391.001, Seismic Monitoring System Triaxial Time History Accelerographs
- STP-391.003, Seismic Monitoring System Triaxial Peak Accelerographs Calibration
- STP-391.004, Seismic Monitoring System Triaxial Seismic Switch Calibration
- STP-319.005, Seismic Monitoring System Triaxial Response-Spectrum-Recorders Calibration
- STP-391.006, Seismic Monitoring System Triaxial Response-Spectrum-Recorder Annunciator Switch Calibration
- STP-391.007, Triaxial History Accelerograph Operation Test
- STP-391.008, Reactor Building Foundation Mat Triaxial Seismic Switch Operational Test
- STP-391.009, Reactor Building Foundation Mat Triaxial Response Spectrum Recorder Operational Test
- ICP-391.007, Digital Strong Motion Accelerograph Calibration
- ICP-391.008, Strong Motion Accelerograph Calibration

Surveillance records reviewed for the above equipment were those conducted in March, April, June, August, and September 1987 and in January 1988. The inspector also observed ongoing tests being performed on the seismic instrumentation on the Reactor Building Foundation.

Seismic instrumentation examined by the inspector included the seismic instrumentation on the Reactor Building Foundation Elevation 408, Auxiliary Building Foundation Elevation 374, the instrumentation panel in the relay room of the control building and the seismic annunciator in the control room. The V. C. Summer plant is designed for three type of earthquakes. These are a Level 1 earthquake that is observed but does not activate the annunciator alarms in the control room, a Level 2 earthquake that is observed and activates annunciator alarms in the control room indicating motion less than the Operating Base Earthquake (OBE), and a Level 3 earthquake that activates annunciation alarms in the control room indicating motions greater than or equal to the OBE.

The OBE used in the design of a nuclear facility is based on the largest historical earthquake. This is the 1886 Charleston earthquake. At V. C. Summer, the OBE is represented by a Peak Ground Accelerations of 0.10g for structures founded on rock and 0.15g for structures founded on soil. The safe shutdown earthquake (SSE) is an earthquake based on the largest tectonic earthquake recurring near the nuclear facility, V. C. Summer, which was the 1913 Union County earthquake. At V. C. Summer, the SSE is represented by a Peak Ground Acceleration of 0.15g for structures founded on rock and 0.25g for structures founded on soil.

Within the areas examined, it appeared that FSAR and Technical Specifications for seismic monitoring were being met.

6. Fire Protection/Prevention Program (64703)

a. Fire prevention/Administrative Control Procedures

The inspector reviewed the following Fire Prevention/Administrative Procedures:

FPP-001, Firefighting Equipment, Revision 7, March 18, 1987

FPP-002, Fire Report, Revision 4, November 12, 1987

FPP-003, Control of Transient Combustibles, Revision 6, August 8, 1986

FPP-004, Duties of Fire watch, Revision 5, August 28, 1987

FPP-005, Burn Permit, Revision 7, January 12, 1987

FPP-006, Handling of Flammable Liquids and Gases, Revision 4, January 12, 1987

FPP-009, Periodic Fire Inspection, Revision 3, March 23, 1986

FPP-010, Fire Barrier Removal, Revision 3, February 24, 1986

FPP-014, Cleaning and Replacement of Failed Smoke Detector Heads, Revision 2, October 2, 1985

FPP-007, Preparation and Distribution of Fire Protection Procedures, Revision 3, February 11, 1986

SAP-131, Fire Protection Program, Revision 3, December 30, 1987

Based on this review, it appears that the above procedures meet the NRC guidelines of the document entitled, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls and Quality Assurance," dated June 1977.

## b. Fire Protection Surveillance Procedures

The inspector reviewed the following Fire Protection System Surveillance Procedures:

- STP 128.001, Surveillance Test Procedure, Electric Fire Pump Weekly Test, Revision 8, November 9, 1987.
- STP-128.004, Diesel Fire Pump Test, Weekly, Revision 8, December 15, 1987
- STP-128.002, Fire Protection Monthly Valve Lineup Verification, Revision 12, March 13, 1987
- STP 128.003, Fire System Annual Valve Test, Revision 2, June 26, 1987
- STP-128.011, Yard Fire Hydrant Hose House Inspection, Revision 5, August 28, 1987
- STP-128.012, Yard Fire Hydrant Hose House Inspection, Revision 4, March 5, 1987
- STP-128.013, Fire Valve Operability Test, Revision 4, March 5, 1987
- STP-128.019, Semi Annual Fire Door Inspection, Revision 3, November 4, 1985
- STP-128.021, Fire Service Annual Flow Test, Revision 4, March 6, 1987
- STP-128.023, Three Year Air Flow Deluge Sprinkler Test, Revision 5, January 17, 1986
- STP-128.009, Monthly Fire Hose Inspection, Revision 6, August 7, 1987
- STP-128.303, Auxiliary Building Pre-action Sprinkler Test, Revision 10, January 30, 1986
- STP-128.010, Fire Hose Station Refueling Inspection, Revision 5, March 30, 1987
- STP-128.015, Fire Hose Station Three-year Inspection, Revision 5, March 20, 1987
- STP-128.007, CO<sub>2</sub> System Valve Lineup Verification, Revision 4, November 15, 1987
- STP-128.027, Diesel Generator Building Fire Barrier Inspection, Revision 5, April 20, 1987

- STP-128.019, Semi-Annual Fire Door Inspection, Revision 3, November 4, 1985
- STP-128.048, Intermediate Building Elevation 436, Fire Barrier Inspection, Revision 0, January 17, 1986
- STP-128.050, Intermediate Building Elevation 412, Fire Barrier Inspection, Revision 2, March 3, 1987
- STP-128.060, Ventilation Fire Damper, Inspection Units XAH-24A, XAH-24B, XAH-31, XAH-29A, XAH-29B, XAH-17, Revision 4, August 28, 1987
- STP-128.062, Ventilation Fire Damper, Inspection Units -20, XAH-9B, XAH-11B, XFN-125, XFN-124; Revision 4, August 28, 1987
- STP-128-065, Ventilation Fire Damper, Inspection Units XAH-11A, XAH-33, XAA-15A, XAH-7B, XAA-6, XFN-80B, XFN-80A, XAH-18, XFN-93 Revision 5, November 24, 1987.

The above surveillance procedures were reviewed to determine if the various test outlines and inspection instructions adequately implement the surveillance requirements of the Plants Fire Protection Technical Specifications. In addition, these procedures were reviewed to determine if the inspection and test instructions followed general industry fire protection practices, NRC fire protection program guidelines and guidelines of the National Fire Protection Association (NFPA) Fire Codes. Based on this review, it appears that the above procedures are satisfactory.

c. Fire Protection System Surveillance Inspections and Tests

The inspector reviewed the following surveillance inspection and test records for the dates indicated:

- STP-128.003, Fire System Annual Valve Flow Test, January 2, 1986 and January 22, 1987
- STP-128.009, Monthly Fire Hose Station Inspection, October 5, 1987, November 2, 1987, December 1, 1987, and January 4, 1988
- STP-128.007, CO<sub>2</sub> System Valve Lineup Verification 31 Day Surveillance, October 5, 1987, November 2, 1987, December 1, 1987, and January 4, 1988
- STP-128.012, Yard Fire Hydrant Inspection Once Every 6 Months, March 24, 1987, October 5, 1987; Hydrant Numbers 1-19
- STP-128.019, Annual Fire Door Inspection, August 18, 1987

- STP-128.021, Fire Service Annual Flow Test, January 19, 1987
- STP-128.027, Three Year Air Flow Deluge Sprinkler Test, February 11, 1986
- STP-128.027, Diesel Generator Building Fire Barrier Test, Annual, September 12, 1986 and October 27, 1987
- STP-128.303, Auxiliary Building Preaction Sprinkler Operation Test Every 6 Months, February 5, 1987, and August 25, 1987
- STP-128.062, Ventilation Fire Damper Inspection, Every 12 Months; June 16, 1987 and January 27, 1988
- STP-128.050, Intermediate Building Elevation 412 Fire Barrier Inspection, Every 18 Months, June 13, 1987 and October 13, 1987

The surveillance test record data and testing frequency associated with the above fire protection system surveillance test inspections were found to be satisfactory with regard to meeting the requirements of the plants fire protection program.

d. Fire Protection Audits

The most recent QA audit reports and QA surveillances of the V. C. Summer Fire Protection Program were reviewed. These audits and QA Surveillances were:

- Professional Loss Control (PLC) Annual Audit Report, issued August 25, 1987
- QA Surveillance No. 07-AEC-87-1, Fire Barrier Inspection - Purpose of surveillance was to verify fire barriers associated with fire service pump house building met requirements of STP-128.032, July 7, 1987
- QA Surveillance No. 2-LPC-87-J - Purpose of surveillance was to verify preaction sprinkler system and supervisory circuits operate properly and met requirements of STP 128.305, September 16-18, 1987.
- QA Surveillance No. 2 LPC-87-J, Fire Door Inspection - verified removal and restoration form was completed for Fire Door SW-305. Door was opened due to an air line running under the door January 13, 1987
- QA Surveillance 3-ESL-87-0 - Purpose of surveillance was to observe the performance of cleaning inspection and lubrication of fire damper, February 11, 1987

- QA Surveillance 12-HMK-87-J - Purpose of Surveillance was to verify fire barrier inspections were being implemented per STP-128-041, Intermediate Bldg. Elevations 426, 422, and 423; July 9, 1987

These audits identified several fire protection program discrepancies and recommended program improvements. The corrective actions associated with these audit findings have been implemented. The licensee appears to be taking the appropriate corrective actions on these audit findings.

e. Fire Brigade

(1) Organization

The total station fire brigade is composed of approximately 82 employees from the operations and maintenance staffs. The on duty shift fire brigade leader is normally one of the Reactor Operators and the remaining four fire brigade members are composed of Reactor Operators and Maintenance personnel. The inspector reviewed the on duty shifts for the following dates and verified that sufficient qualified fire brigade personnel were on duty to meet the provisions of the plants Technical Specification:

January 1, 1988	January 17, 1988
January 2, 1988	January 18, 1988
January 3, 1988	January 19, 1988
January 4, 1988	January 20, 1988
January 5, 1988	January 21, 1988
January 6, 1988	January 22, 1988
January 7, 1988	January 23, 1988
January 8, 1988	January 24, 1988
January 9, 1988	January 25, 1988
January 10, 1988	January 26, 1988
January 11, 1988	January 27, 1988
January 12, 1988	January 28, 1988
January 13, 1988	January 29, 1988
January 14, 1988	January 30, 1988
January 15, 1988	January 31, 1988
January 16, 1988	February 1, 1988

In addition, the inspector verified that sufficient personnel were assigned to each shift to meet the minimum operating and fire brigade staff requirements of the Technical Specifications. Therefore, it appears, based on the review of the duty rosters associated with the above dates, that there was sufficient manpower on duty to meet the operational and the fire brigade requirements of the plants Technical Specifications.



## (2) Training

The inspector reviewed the training and drill records for all the brigade leaders and brigade members from the first quarter of 1987 through the fourth quarter of 1987.

The records reviewed indicated that these members had attended the required training and participated in the required number of drills. The inspector also verified that a fire brigade drill had been conducted every 92 days for each shift in 1987. The fire brigade training records inspected were found satisfactory.

In addition, the inspector reviewed the licensee's initial fire brigade training program to verify that the following training topics are being covered:

- Indoctrination of the plant fire fighting plan with specific identification of each individual's responsibilities
- Identification location of fire hazards and associated types of fires that could occur in the plant
- The toxic and corrosive characteristic of expected products of combustion
- Identification of the location of fire fighting equipment for each fire area and familiarization with the layout of the plant, including access and egress routes to each level
- The proper use of available fire fighting equipment and the correct method of fighting each type of fire. The types of fires include: fire in energized electrical equipment, fires in cables and cable trays, hydrogen fires, fires involving flammable and combustible liquids or hazardous process chemicals, fires resulting from construction or modification (welding), and record file fires
- The proper use of communication, lighting ventilation and emergency breathing equipment
- The proper method for fighting fires inside buildings and confined spaces
- The direction and coordination of the fire fighting activities (fire brigade leader only)
- Detailed review of fire fighting strategies and procedures
- Review of the latest plant modifications and corresponding changes in fire fighting plans

Based on this review, it appears that the licensee's initial fire brigade training program covers the above required training topics. In addition, it appears that the licensee's fire brigade training program repeats the basic fire fighting skills of the initial program to qualified fire brigade members every two years.

(3) Fire Brigade Fire Fighting Strategies

The inspector reviewed the following plant fire fighting strategies:

FPP-3002, Diesel Generator Building Elevations 436/437, Fire Area/Zone 1.2 and 2.2; Revision 1, May 13, 1985

FPP-2000, Intermediate Building Penetration Area, Elevation 412, Fire Zones 1 to 9, 25.1, 25.2, Revision 0, May 17, 1985

FPP-5005, Auxiliary Building Elevation 412, West Penetration Area, Revision 0, May 29, 1985

FPP-6000, Control Building, Elevation 400, Revision 0, May 16, 1985

FPP-4004, Fuel Handling Building Elevation 436, Fire Zone 1.4, Revision 0, May 1, 1985

FPP-5002, Auxiliary Building Elevation 388, Revision 0, May 29, 1985

FPP-2004, Intermediate Building Elevation 451, Fire Zones 16, 17, 18, 19, 22, 29, Revision 0, May 1, 1985

Based on this review, the inspector determined that the above fire fighting strategies adequately addressed the fire hazards in the areas, the type of fire extinguishants to be utilized, the direction of attack, systems in the room/area to be managed in order to reduce fire damage, heat sensitive equipment in the room/area, and specific fire brigade duties with regard to smoke control and salvage.

(4) Fire Brigade Drill

During this inspection, the inspector witnessed an unannounced fire brigade drill. The drill fire scenario was a fire in the Main Transformer outside the Turbine Building. The probable cause of ignition was an electrical short.

Five fire brigade members responded to the pending fire emergency. The brigade assembled adjacent to the area in full protective fire fighting turnout clothing and self-contained breathing apparatus. An initial size up of the fire condition was made by the brigade leader. A foam cart was hooked up and used to suppress the fire and a 1-1/2" fire hose was used as a backup. The fire was placed under control in 13 minutes.

The fire brigade utilized proper manual fire fighting methods and reacted to the fire drill scenario in an effective and efficient manner.

f. Plant Tour and Inspection of Fire Protection Equipment

- (1) The inspector performed an inspection of the fire brigade equipment, consisting of fire hoses, nozzles, tools and miscellaneous equipment, stored at the fire brigade equipment response locations on Elevation 436 of the Turbine Building and Elevation 412 of the Containment Building.

A total of 10 sets of turnout gear (coats, boots, helmets, etc.), five sets of self-contained breathing apparatus, and 10 spare air cylinders are stored at the response center in the turbine building, response location and five sets of turnout gear and five sets of self-contained breathing apparatus are stored at the containment building response location.

Based on this inspection, the designated fire brigade equipment appeared to be properly maintained and stored in a ready condition.

- (2) Outside Fire Protection Walkdown

The inspector verified that the two separate fire pump suction intake structures from the lake were in service and met the requirements of the Technical Specifications. The two fire pumps were inspected and found to be in service. The diesel fuel tank for the diesel driven fire pump was full of fuel which met the requirements of the Technical Specifications.

The following sectional control valves in the outside fire protection water supply system were inspected and verified to be properly aligned and locked in position:

XVG-4014-FS, Fire Pump A&B Discharge Isolation Valve  
 XVG-4015-FS, Fire Pump A&B Discharge Isolation Valve  
 XVG-4013-FS, Fire Pump A&B Discharge Isolation Valve  
 XVG-6947-FS, Yard Fire Hydrant INFS Supply Valve  
 XVG-6948-FS, Yard Fire Hydrant INFS Supply Valve  
 XVG-4073-FS, Yard Fire Hydrant INFS Supply Valve

XVG-4001-FS, Yard Fire Hydrant INFS Supply Valve  
 XVG-4020-FS, Yard Fire hydrant INFS Supply Valve

The following fire hydrants and fire hydrant equipment houses were inspected:

Hydrant Hose House-1  
 Hydrant Hose House-2  
 Hydrant Hose House-3

The equipment houses contained the minimum equipment required as specified by NFPA-24 Private Fire Service Mains and Their Appurtenances, and/or the FSAR commitments. The equipment appeared to be adequately maintained.

A tour of the exterior of the plant indicated that sufficient clearance was provided between permanent safety-related buildings and structures and temporary buildings, trailers, and other transient combustible materials. The general housekeeping of the areas adjacent to the permanent plant structures was satisfactory.

(3) Permanent Plant Fire Protection Features.

A plant tour was made by the inspector. During the plant tour, the following safe shutdown related plant areas and their related fire protection features were inspected:

- Intermediate Building; Elevations 412, 423, 426, 436, 451, 463 and 476
- Diesel Generator Building; Elevations 400, 427, 436, 447, and 463
- Auxiliary Building; Elevations 374, 385, 397, 400, 412, 421, 436, 452, 463, 474 and 485
- Fuel Handling Building Elevations 412, 419, 422, 424, 428, 427, 436, 444, and 446
- Control Building; Elevations 400, 412, 425, 436, 448, 463 and 482
- Service Water Pump House; Elevations 425, 436 and 441

The fire/smoke detection systems, manual fire fighting equipment (i.e., portable extinguishers, hose stations, etc.) and the fire area boundary walls, floors, and ceilings associated for the above plant areas were inspected and verified to be in service except for the jockey pump and the Integrated Fire Computer

System (IFCS) which receives an alarm when a fire occurs. A maintenance work request (MWR) was issued to repair the jockey pump and the scheduled date of repair is February 10, 1988. The licensee submitted a Special Report to Dr. J. Nelson Grace on January 28, 1988, stating that the target date for the return to service of the IFCS is April, 1988. A continuous fire watch has been established to cover all safety-related fire protection areas in the plant. During this inspection, the inspector reviewed the fire watch log from January 1 through February 4, 1988.

Based on this inspection except for the items mentioned above, it appeared that the fire protection features associated with the above plant areas are satisfactorily maintained.

The plant tour also verified the licensee's implementation of the fire prevention administrative procedures. The control of combustibles and flammable materials, liquids and gases, and the general housekeeping was found to be very good in the areas inspected.

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