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Gary J. Taylor
Vice President
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September 19, 1995
RC-95-0247

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Gentlemen:

Subject: VIRGIL C. SUMMER NUCLEAR STATION
DOCKET NO. 50/395
OPERATING LICENSE NO. NPF-12
AMENDMENT 95-02 TO UPDATED
FIRE PROTECTION EVALUATION REPORT (FPER)

In accordance with 10CFR50.71(e), South Carolina Electric & Gas Company (SCE&G), acting for itself and as agent for South Carolina Public Service Authority, submits eleven (11) sets of Amendment 95-02 to the Fire Protection Evaluation Report (FPER) for the Virgil C. Summer Nuclear Station.

This FPER Amendment is updated as of August 1995, and constitutes the second update to the FPER for 1995, including the required information in accordance with 10CFR50.71(e).

I declare that the statements and matters set forth herein are true and correct to the best of my knowledge, information, and belief.

If there are any questions, please contact Ms. Janis Berley at (803) 345-4248.

Very truly yours,

Gary J. Taylor

JLB:jlb
Enclosure

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NSRC
RTS (REM 9000-94-02)
Central File System
File (810.26-5)

A006
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NUCLEAR EXCELLENCE - A SUMMER TRADITION!

STATE OF SOUTH CAROLINA :

: **TO WIT** :

COUNTY OF FAIRFIELD :

I hereby certify that on the 18th day of September 1995, before me, the subscriber, a Notary Public of the State of South Carolina, personally appeared Gary J. Taylor, being duly sworn, and states that he is Vice President, Nuclear Operations of the South Carolina Electric & Gas Company, a corporation of the State of South Carolina, that he provides the foregoing response for the purposes therein set forth, that the statements made are true and correct to the best of his knowledge, information, and belief, and that he was authorized to provide the response on behalf of said Corporation.

WITNESS my Hand and Notarial Seal

Michael J. Barrone
Notary Public

My Commission Expires

July 13, 2005
Date

VIRGIL C. SUMMER NUCLEAR STATION
FIRE PROTECTION EVALUATION REPORT - AMENDMENT 95-02
INSTRUCTION SHEET

This Instruction Sheet functions as a guide and checklist for inserting Amendment 95-02 into the Virgil C. Summer Nuclear Station Fire Protection Evaluation Report (FPER).

The attached pages of the FPER are to be removed and replaced as indicated below.

REMOVE (Front/Back)	INSERT (Front/Back)
Page xxi/xxii	Page xxi/xxii
Page xxv/xxvi	Page xxv/xxvi
Page xxvii	Page xxvii
Page 4.7-1/4.7-2	Page 4.7-1/4.7-2
Page 5.0-1/5.0-2	Page 5.0-1/5.0-2
Page 5.0-3/5.0-4	Page 5.0-3/5.0-4
Page 5.0-5/5.0-6	Page 5.0-5/5.0-6
Page 5.0-9/5.0-10	Page 5.0-9/5.0-10
Page 5.0-11/5.0-12	Page 5.0-11/5.0-12
Page 5.0-61/5.0-62	Page 5.0-61/5.0-62

LIST OF EFFECTIVE PAGES

The following list delineates the pages of the Table of Contents, List of Effective Pages, and Chapters 1 through 5 of the Virgil C. Summer Nuclear Station Fire Protection Evaluation Report which are currently in effect. Changes to pages, figures, and drawings are indicated below by the number in the Amendment column along with the date of the Amendment for each page, figure, and drawing included in the Fire Protection Evaluation Report.

Page/Figure/ Drawing No.	Amend. No.	Date
Page i	5	June 1991
Page ii	5	June 1991
Page iii	5	June 1991
Page iv	5	June 1991
Page v	3	June 1989
Page vi	3	June 1989
Page vii	3	June 1989
Page viii	3	June 1989
Page ix	4	June 1990
Page x	3	June 1989
Page xi	3	June 1989
Page xii	3	June 1989
Page xiii	3	June 1989
Page xiv	3	June 1989
Page xv	3	June 1989
Page xvi	3	June 1989
Page xvii	3	June 1989
Page xviii	3	June 1989
Page xix	5	June 1991
Page xx	3	June 1989
Page xxi	95-02	Aug. 1995
Page xxii	95-01	May 1995
Page xxiii	94-02	Sep. 1994
Page xxiv	92-01	Feb. 1992
Page xxv	95-02	Aug. 1995
Page xxvi	95-02	Aug. 1995
Page xxvii	95-02	Aug. 1995
Page 1.1-1	0	June 1986
Page 1.2-1	0	June 1986
Page 1.3-1	0	June 1986
Page 2.1-1	0	June 1986
Page 2.1-2	0	June 1986
Page 2.2-1	0	June 1986
Page 2.2-2	4	June 1990
Page 2.2-3	4	June 1990
Page 2.2-3a	4	June 1990
Page 2.2-4	0	June 1986
Page 2.2-5	0	June 1986
Page 2.2-6	0	June 1986
Page 2.2-7	0	June 1986
Page 2.2-8	0	June 1986
Page 2.3-1	3	June 1989
Page 2.3-2	3	June 1989
Page 2.3-3	0	June 1986
Page 2.3-4	0	June 1986
Page 2.3-5	0	June 1986
Page 3.1-1	0	June 1986
Page 3.1-2	0	June 1986
Page 3.1-3	3	June 1989
Page 3.1-4	3	June 1989
Page 3.1-5	5 (Corr)	June 1991
Page 3.1-6	3	June 1989
Page 3.2-1	0	June 1986
Page 3.2-2	0	June 1986
Page 3.2-3	5 (Corr)	June 1991
Page 3.2-4	5	June 1991
Page 3.2-5	0	June 1986
Page 3.2-6	3	June 1989
Page 3.2-7	0	June 1986
Page 3.2-8	0	June 1986
Page 3.2-9	0	June 1986
Page 3.2-10	3	June 1989
Page 3.2-11	3	June 1989
Page 3.2-12	0	June 1986
Page 3.2-13	0	June 1986
Page 3.2-14	0	June 1986
Page 3.2-15	0	June 1986
Page 3.2-16	0	June 1986
Page 3.2-17	0	June 1986
Page 3.2-18	0	June 1986
Page 3.2-19	0	June 1986
Page 3.2-20	0	June 1986
Page 3.2-21	0	June 1986
Page 3.2-22	0	June 1986
Fig. 3.2-1	3	June 1989
Page 3.3-1	0	June 1986
Page 3.3-2	0	June 1986
Page 3.3-3	0	June 1986

Page/Figure/ Drawing No.	Amend. No.	Date
Page 3.3-4	0	June 1986
Page 3.3-5	3	June 1989
Page 3.3-6	0	June 1986
Page 3.4-1	3	June 1989
Page 3.4-2	3	June 1989
Page 3.4-3	3	June 1989
Page 3.4-4	3	June 1989
Page 3.4-5	3	June 1989
Page 3.4-6	3	June 1989
Page 3.4-7	3	June 1989
Page 3.5-1	3	June 1989
Page 3.5-2	0	June 1986
Page 3.5-3	0	June 1986
Page 3.5-4	0	June 1986
Page 3.5-5	0	June 1986
Page 3.5-6	0	June 1986
Page 3.5-7	0	June 1986
Page 3.5-8	0	June 1986
Page 3.5-9	0	June 1986
Page 3.6-1	95-01	May 1995
Page 3.6-2	95-01	May 1995
Page 4.1-1	0	June 1986
Page 4.1-2	3	June 1989
Page 4.1-3	0	June 1986
Page 4.1-4	4	June 1990
Page 4.1-5	94-02	Sep. 1994
Page 4.1-6	94-02	Sep. 1994
Page 4.1-7	4	June 1990
Page 4.1-8	4	June 1990
Page 4.1-9	4	June 1990
Page 4.1-9a	4	June 1990
Page 4.1-10	3	June 1989
Page 4.1-11	3	June 1989
Page 4.1-12	0	June 1986
Page 4.1-13	0	June 1986
Page 4.1-14	3	June 1989
Page 4.1-15	3	June 1989
Page 4.1-16	3	June 1989
Page 4.1-17	3	June 1989
Page 4.1-18	0	June 1986
Page 4.1-19	3	June 1989
Page 4.1-20	3	June 1989
Page 4.1-21	3	June 1989
Page 4.1-22	4	June 1990
Page 4.1-23	3	June 1989
Page 4.1-24	3	June 1989
Page 4.1-25	3	June 1989
Page 4.1-26	3	June 1989

Page/Figure/ Drawing No.	Amend. No.	Date
Page 4.2-1	0	June 1986
Page 4.2-2	0	June 1986
Page 4.2-3	0	June 1986
Page 4.2-4	0	June 1986
Page 4.2-5	3	June 1989
Page 4.2-6	3	June 1989
Page 4.2-7	3	June 1989
Page 4.2-8	4	June 1990
Page 4.2-9	4	June 1990
Page 4.2-10	4	June 1990
Page 4.2-11	4	June 1990
Page 4.2-12	4	June 1990
Page 4.2-13	4	June 1990
Page 4.2-14	4	June 1990
Page 4.2-15	4	June 1990
Page 4.2-16	4	June 1990
Page 4.2-17	4	June 1990
Page 4.2-18	4	June 1990
Page 4.2-19	4	June 1990
Page 4.2-20	4	June 1990
Page 4.2-21	4	June 1990
Page 4.2-22	4	June 1990
Page 4.2-23	4	June 1990
Page 4.2-24	4	June 1990
Page 4.2-25	4	June 1990
Page 4.2-26	4	June 1990
Page 4.2-27	4	June 1990
Page 4.2-28	4	June 1990
Page 4.2-29	4	June 1990
Page 4.2-30	4	June 1990
Page 4.2-31	4	June 1990
Page 4.2-32	4	June 1990
Page 4.2-33	4	June 1990
Page 4.2-33a	4	June 1990
Page 4.2-34	3	June 1989
Page 4.2-35	3	June 1989
Page 4.2-36	3	June 1989
Page 4.2-37	3	June 1989
Page 4.2-38	3	June 1989
Page 4.2-39	3	June 1989
Page 4.2-40	0	June 1986
Page 4.2-41	2	June 1988
Page 4.2-42	4	June 1990
Page 4.2-43	3	June 1989
Page 4.2-44	3	June 1989
Page 4.2-45	3	June 1989
Page 4.2-46	3	June 1989
Page 4.2-47	3	June 1989

Page/Figure/ Drawing No.	Amend. No.	Date
Page 4.5-52	3	June 1989
Page 4.5-53	4	June 1990
Page 4.5-54	3	June 1989
Page 4.5-55	4	June 1990
Page 4.5-56	4	June 1990
Page 4.5-57	3	June 1989
Page 4.5-58	4	June 1990
Page 4.5-59	4	June 1990
Page 4.5-60	3	June 1989
Page 4.5-61	3	June 1989
Page 4.5-62	3	June 1989
Page 4.5-63	3	June 1989
Page 4.5-64	3	June 1989
Page 4.5-65	4	June 1990
Page 4.5-66	4	June 1990
Page 4.5-67	4	June 1990
Page 4.5-68	4	June 1990
Page 4.5-69	4	June 1990
Page 4.5-70	4	June 1990
Page 4.5-71	3	June 1989
Page 4.5-72	3	June 1989
Page 4.5-73	3	June 1989
Page 4.5-74	3	June 1989
Page 4.5-75	3	June 1989
Page 4.5-76	3	June 1989
Page 4.5-77	4	June 1990
Page 4.5-78	4	June 1990
Page 4.5-79	4	June 1990
Page 4.5-80	4	June 1990
Page 4.5-81	4	June 1990
Page 4.5-82	4	June 1990
Page 4.5-83	4	June 1990
Page 4.5-84	4	June 1990
Page 4.5-85	4	June 1990
Page 4.5-86	3	June 1989
Page 4.5-87	4	June 1990
Page 4.5-88	4	June 1990
Page 4.5-89	4	June 1990
Page 4.5-90	4	June 1990
Page 4.5-91	3	June 1989
Page 4.5-92	3	June 1989
Page 4.5-93	3	June 1989
Page 4.5-94	3	June 1989
Page 4.5-95	3	June 1989
Page 4.5-96	3	June 1989
Page 4.5-97	3	June 1989
Page 4.5-98	3	June 1989
Page 4.5-99	3	June 1989
Page 4.5-100	3	June 1989
Page 4.5-101	3	June 1989
Page 4.5-102	3	June 1989
Page 4.5-103	3	June 1989
Page 4.5-104	3	June 1989
Page 4.6-1	0	June 1986
Page 4.6-2	0	June 1986
Page 4.6-3	4	June 1990
Page 4.6-4	4	June 1990
Page 4.6-5	4	June 1990
Page 4.6-6	3	June 1989
Page 4.6-7	4	June 1990
Page 4.6-8	4	June 1990
Page 4.6-9	4	June 1990
Page 4.6-10	3	June 1989
Page 4.7-1	95-02	Aug. 1995
Page 4.7-2	2	June 1988
Page 4.7-3	4	June 1990
Page 4.7-4	4	June 1990
Page 4.7-5	4	June 1990
Page 4.7-6	4	June 1990
Page 4.7-7	3	June 1989
Page 4.7-8	4	June 1990
Page 4.7-9	4	June 1990
Page 4.7-10	3	June 1989
Page 4.7-11	3	June 1989
Page 4.7-12	4	June 1990
Page 4.7-13	3	June 1989
Page 4.7-14	3	June 1989
Page 4.7-15	4	June 1990
Page 4.7-16	4	June 1990
Page 4.7-17	3	June 1989
Page 4.7-18	4	June 1990
Page 4.7-19	3	June 1989
Page 4.7-20	3	June 1989
Page 4.7-21	4	June 1990
Page 4.7-22	3	June 1989
Page 4.8-1	0	June 1986
Page 4.8-2	4	June 1990
Page 4.8-3	4	June 1990
Page 4.8-4	3	June 1989
Page 4.9-1	0	June 1986
Page 4.9-2	4	June 1990
Page 4.9-3	3	June 1989
Page 4.9-4	3	June 1989
Page 4.9-5	3	June 1989
Page 4.9-6	3	June 1989
Page 4.9-7	3	June 1989

Page/Figure/ Drawing No.	Amend. No.	Date
Page 4.9-8	3	June 1989
Page 4.9-9	3	June 1989
Page 4.9-10	3	June 1989
Page 4.10-1	0	June 1986
Page 4.10-2	0	June 1986
Page 4.11-1	95-01	May 1995
Page 4.11-2	0	June 1986
Page 4.11-3	93-02	June 1993
Page 4.11-4	0	June 1986
Page 4.11-5	0	June 1986
Page 4.11-6	0	June 1986
Page 4.11-7	0	June 1986
Page 4.11-8	0	June 1986
Dwg. E-023-001	5	June 1991
Dwg. E-023-002	4	June 1990
Dwg. E-023-003	4	June 1990
Dwg. E-023-004	4	June 1990
Dwg. E-023-005	4	June 1990
Dwg. E-023-006	4	June 1990
Dwg. E-023-007	4	June 1990
Dwg. E-023-008	4	June 1990
Dwg. E-023-009	4	June 1990
Dwg. E-023-010	4	June 1990
Dwg. E-023-011	93-01	Feb. 1993
Dwg. E-023-012	0	June 1986
Dwg. E-023-013	4	June 1990
Dwg. E-023-014	4	June 1990
Dwg. E-023-015	4	June 1990
Dwg. E-023-016	4	June 1990
Dwg. E-023-017	4	June 1990
Dwg. E-023-018	95-01	May 1995
Dwg. E-023-019	4	June 1990
Dwg. E-023-020	0	June 1986
Dwg. E-023-021	4	June 1990
Dwg. E-023-022	0	June 1986
Dwg. E-023-023	4	June 1990
Page 5.0-1	0	June 1986
Page 5.0-2	95-02	Aug. 1995
Page 5.0-3	95-02	Aug. 1995
Page 5.0-4	95-02	Aug. 1995
Page 5.0-5	3	June 1989
Page 5.0-6	95-02	Aug. 1995
Page 5.0-7	3	June 1989
Page 5.0-8	94-01	Aug. 1994
Page 5.0-9	95-02	Aug. 1995
Page 5.0-10	3	June 1989
Page 5.0-11	3	June 1989
Page 5.0-12	95-02	Aug. 1995
Page 5.0-13	3	June 1989
Page 5.0-14	3	June 1989
Page 5.0-15	3	June 1989
Page 5.0-16	3	June 1989
Page 5.0-16a	3	June 1989
Page 5.0-17	0	June 1986
Page 5.0-18	0	June 1986
Page 5.0-19	0	June 1986
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Page 5.0-21	0	June 1986
Page 5.0-22	0	June 1986
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Page 5.0-25	0	June 1986
Page 5.0-26	0	June 1986
Page 5.0-27	0	June 1986
Page 5.0-28	0	June 1986
Page 5.0-29	0	June 1986
Page 5.0-30	3	June 1989
Page 5.0-31	0	June 1986
Page 5.0-32	0	June 1986
Page 5.0-33	0	June 1986
Page 5.0-34	0	June 1986
Page 5.0-35	3	June 1989
Page 5.0-36	0	June 1986
Page 5.0-37	0	June 1986
Page 5.0-38	0	June 1986
Page 5.0-39	0	June 1986
Page 5.0-40	0	June 1986
Page 5.0-41	3	June 1989
Page 5.0-42	3	June 1989
Page 5.0-43	0	June 1986
Page 5.0-44	3	June 1989
Page 5.0-45	0	June 1986
Page 5.0-46	0	June 1986
Page 5.0-47	0	June 1986
Page 5.0-48	0	June 1986
Page 5.0-49	3	June 1989
Page 5.0-50	0	June 1986
Page 5.0-51	0	June 1986
Page 5.0-52	0	June 1986
Page 5.0-53	0	June 1986
Page 5.0-54	0	June 1986
Page 5.0-55	0	June 1986
Page 5.0-56	1	June 1987
Page 5.0-57	0	June 1986
Page 5.0-58	0	June 1986
Page 5.0-59	0	June 1986

Page/Figure/ Drawing No.	Amend. No.	Date
Page 5.0-60	0	June 1986
Page 5.0-61	0	June 1986
Page 5.0-62	95-02	Aug. 1995
Page 5.0-63	3	June 1989

4.7 SERVICE WATER PUMPHOUSE

The service water pumphouse is essentially a two story structure constructed of reinforced concrete. The lower story on the service water pond side (northeast) of the structure includes the pump chamber (elevations 390'-0" to 436'-0") and a piping pit (elevations 425'-0" to 436'-0"). The upper story on the northeast side of the structure houses the operating floor (elevations 436'-0" to 459'-0"). On the land side (southwest) of the structure, the lower story (elevations 425'-0" to 441'-0") houses two electrical equipment rooms. The upper story on the southwest side (elevations 441'-0" to 459'-0") includes a third electrical equipment room and two ventilation equipment rooms.

The service water pumphouse is located on the eastern edge of the plant area near the southwest shore of the service water pond. No other buildings are located close to the service water pumphouse. The closest building housing safety related equipment is the diesel generator building, approximately 430 feet to the west.

The service water pumphouse houses the service water pumps, trash racks, traveling screens, screen wash systems, ventilation fans and electric power, and control equipment. The redundant service water pumps provide cooling water from the service water pond to the emergency diesel generators, component cooling heat exchangers and heating, ventilating and air conditioning (HVAC) mechanical water chillers and, under certain conditions, to the reactor building cooling units.

The service water pumphouse ventilation system consists of two 100 percent capacity supply fans. Either of the two supply fans operates continuously during normal operating periods. Ventilation air is distributed through ductwork to the various areas of the building. Outside and return air damper positions are automatically controlled by a discharge temperature controller or may be manually controlled from the control room. Additional ventilation system details are presented in FSAR Section 9.4.

For purposes of this fire hazards analysis, the service water pumphouse is divided into five fire areas, two of which are subdivided into fire zones, as follows:

a. Fire Area SWPH-1, electrical equipment room A, elevation 425'-0".

b. Fire Area SWPH-2, electrical equipment room C, elevation 425'-0" (except southeast corner).

c. Fire Area SWPH-3, electrical equipment room B, elevation 441'-0".

d. Fire Area SWPH-4, ventilation equipment room and ventilation duct room, elevation 441'-0"

   (1) Zone SWPH-4.1

   (2) Zone SWPH-4.2

e. Fire Area SWPH-5

(1) Zone SWPH-5.1, valve pit rooms, elevation 425'-0".

(2) Zone SWPH-5.2, operating floor, elevation 436'-0".

f. Fire Area SWPH-6, electrical equipment room C, elevation 425'-0".

4.7.1 FIRE AREA SWPH-1

4.7.1.1 Description of Fire Area SWPH-1

Electrical equipment room A is designated as Fire Area SWPH-1. This fire area is located in the southern corner of the service water pumphouse at elevation 425'-0" and is shown on Drawing E-023-023. It is bounded on the northeast by the piping pit, stairwell, and operating floor and on the northwest by electrical equipment room C. The southeast and southwest walls are exterior walls partly below grade.

The safe shutdown equipment located within Fire Area SWPH-1 is:

Tag Number	Equipment Description
DPN-1HA3-ED	"A" train 125v DC panel 1HA3
XES-2003A-SW	Service water pump A speed switch
XMC-1EA1X-ES	"A" train service water motor control center
XPN-5424-SW	"A" train local relay and fuse panel
XSW-1EA-ES	"A" train 7.2kV switchgear, bus 1EA
XSW-1EA1-ES	"A" train 480v/277v switchgear, bus 1EA1

The fire area walls are of reinforced concrete, except for the walls separating this fire area from the electrical equipment room, which is of drywall construction. The walls separating this fire area from adjacent fire areas satisfy requirements for a three hour rated fire barrier. The wall separating this fire area from the stairway is of concrete construction and has a two hour fire resistance rating. The remaining walls are unrated exterior walls. The floor is a reinforced concrete mat. The ceiling is also of reinforced concrete and has a three hour fire resistance rating. The doorway between this fire area and the adjacent fire area is protected by Class A fire doors. The doorway to the stairway enclosure is protected by a Class B fire door. Other wall penetrations are sealed, as are floor and ceiling penetrations.

Ventilation is provided by the service water pumphouse ventilation system. Ventilation ductwork within the fire area is protected by "boxing in" with drywall construction to give a three hour fire resistance rating. Fire dampers are provided where ducts penetrate walls to isolate supply and exhaust ducts.

5.0 POINT-BY-POINT COMPARISON TO APPENDIX A

This section contains a point-by-point comparison to NRC Branch Technical Position APCSB 9.5-1 Appendix A.

Position For Plants Under Construction and Operating Plant	South Carolina Electric and Gas Company Response
Positions	
A. Overall Requirements of Nuclear Plant Fire Protection Program	
1. Personnel	
Responsibility for the overall fire protection program should be assigned to a designated person in the upper level of management. This person should retain ultimate responsibility even though formulation and assurance of program implementation is delegated. Such delegation of authority should be to staff personnel prepared by training and experience in fire protection and nuclear plant safety to provide a balanced approach in directing the fire protection programs for nuclear power plants. The qualification requirements for the fire protection engineer or consultant who will assist in the design and selection of equipment, inspect and test the completed physical aspects of the system, develop the fire protection program, and assist in the fire-fighting training for the operating plant should be stated. Subsequently, the FSAR should discuss the training and the updating provisions such as fire drills provided for maintaining the competence of the station fire-fighting and operating crew, including personnel responsible for maintaining and inspecting the fire protection equipment.	The Vice President, Nuclear Operations, has overall responsibility for fire protection. Responsibility for the design of fire protection facilities is assigned to the Manager, Design Engineering who is assisted by the Design Engineering staff and by the consulting engineers, Gilbert/ Commonwealth, Inc. The fire protection engineers at SCE&G and Gilbert/ Commonwealth, Inc., either hold or are qualified to hold full membership in the Society of Fire Protection Engineers. Responsibility for fire prevention is assigned to the General Manager, Nuclear Plant Operations. The Manager, Technical Services, reports to the General Manager, Nuclear Plant Operations, on items dealing with fire protection and is responsible for the development of plans and policies concerning fire protection. The General Manager, Nuclear Plant Operations, approves these plans and policies. The Manager, Technical Services, is responsible for ensuring training programs concerning fire prevention, administration, and activities are established and conducted. He ensures that members of fire fighting teams are properly trained. He is responsible for the establishment of necessary schedules for periodic inspection of plant fire protection equipment and ensures that these inspections are properly carried out as scheduled.

Position For Plants Under Construction and Operating Plant	South Carolina Electric and Gas Company Response
The fire protection staff should be responsible for: (a) coordination of building layout and systems design with fire area requirements, including consideration of potential hazards associated with postulated design basis fires, (b) design and maintenance of fire detection, suppression, and extinguishing systems, (c) fire prevention activities, (d) training and manual fire-fighting activities of plant personnel and the fire brigade. (NOTE: NFPA 6 - Recommendations for Organization of Industrial Fire Loss Prevention, contains useful guidance for organization and operation of the entire fire loss prevention program).	The General Manager, Engineering Services, is usually responsible for projects on site that may involve processes, plant layout, and structures. He ensures notification of the Manager, Technical Services, when a new project is to be undertaken and further fire protection is needed. The Manager, Technical Services, assisted by the Manager, Operations, and the Manager, Maintenance Services, makes sure that the necessary elements of fire prevention are integrated with operating and maintenance instructions as necessary. If any special operation is to be performed, the appropriate supervisor(s) appraises the job and ensures that his personnel have the necessary special instructions. Maintenance of fire fighting equipment is the responsibility of the maintenance group under the direction of the Manager, Maintenance Services. The inspection of fire fighting equipment is the responsibility of the Test Unit Supervisor, under the direction of the Manager, Technical Services. Fire barriers are inspected by the Maintenance Services group, under the cognizance of the Test Unit. The Plant Security Force also functions in the interest of fire prevention by performing roving fire watch duties and generally surveying plant areas while making rounds, under the direction of the Manager, Nuclear Protection Services. Personnel from the operations and maintenance groups comprise fire fighting teams on all shifts. The teams are augmented by available personnel from the health physics group. Plant personnel that are on off-shifts are subject to call out.

Position For Plants Under Construction and Operating Plant	South Carolina Electric and Gas Company Response
	A training program for plant employees that may serve on the fire fighting teams is conducted under the direction of the Manager, Technical Services, and augmented by the Nuclear Training group. This training covers methods and equipment for fighting different types of fires that could occur on the site. Appropriate emphasis is placed on the radiological aspects of fire fighting. This training ensures that each employee who may serve on a fire fighting team knows their duties in the event of a fire emergency and knows how to use available fire fighting equipment. In addition, fire drills and reviews of practical fire fighting techniques are conducted at least annually.
2. Design Bases The overall fire protection program should be based upon evaluation of potential fire hazards throughout the plant and the effect of postulated designing basis fires relative to maintaining ability to perform safety shutdown functions and minimize radioactive releases to the environment.	Section 4.0 of this report (Fire Hazards Analysis) provides this comparison. Likewise, plant emergency procedures are based upon maintaining the plant in a safe condition.
3. Backup Total reliance should not be placed on a single automatic fire suppression system. Appropriate backup fire suppression capability should be provided.	In areas where automatic suppression systems are provided, adequate manual suppression equipment, including fire hose stations and/or portable fire extinguishers, is available.
4. Single Failure Criterion A single failure in the fire suppression system should not impair both the primary and backup fire suppression capability. For example, redundant fire water pumps with independent power supplier and controls should be provided.	The fire suppression systems satisfy the single failure criteria and are described in Position E. The effects of lightning strikes have been considered in the design of the plant and lightning protection has been provided.

Position For Plants Under Construction and Operating Plants	South Carolina Electric and Gas Company Response
Postulated fires or fire protection system failures need not be considered concurrent with other plant accidents or the most severe natural phenomena. The effects of lightning strikes should be included in the overall plant fire protection program.	
5. Fire Suppression Systems	
Failure or inadvertent operation of the fire suppression system should not incapacitate safety related systems or components. Fire suppression systems that are pressurized during normal plant operation should meet the guidelines specified in APCSB Branch Technical Position 3-1, "Protection Against Postulated Piping Failures in Fluid Systems Outside Containment."	Failure or inadvertent operation of any fire suppression system will not incapacitate safety related systems or components.
6. Fuel Storage Areas	
Schedule for implementation of modifications, if any, will be established on a case-by-case basis.	Manual suppression equipment, such as hose stations and portable extinguishers, are installed in the fuel handling building.
7. Fuel Loading	
Schedule for implementation of modifications, if any, will be established on a case-by-case basis.	The plant fire protection program (plans, personnel, and equipment) were operational prior to initial fuel loading.
8. Multiple-Reactor Sites	
On multiple-reactor sites where there are operating reactors and construction of remaining units is being completed, the fire protection program should provide continuing evaluation and include additional fire barriers, fire protection capability, and administrative controls necessary to protect the operating units from construction fire hazards.	Not Applicable

Position For Plants Under Construction and Operating Plant	South Carolina Electric and Gas Company Response
The superintendent of the operating plant should have the lead responsibility for site fire protection.	
9. Simultaneous Fires	
Simultaneous fires in more than one reactor need not be postulated, where separation requirements are met. A fire involving more than one reactor unit need not be postulated except for facilities shared between units.	Not Applicable
B. Administrative Procedures, Controls and Fire Brigade	
1. Administrative procedures consistent with the need for maintaining the performance of the fire protection system and personnel in nuclear power plants should be provided. Guidance is contained in the following publications: NFPA 4 - Organization for Fire Services NFPA 4A - Organization of Fire Department NFPA 6 - Industrial Fire Loss Prevention NFPA 7 - Management of Fire Emergencies NFPA 8 - Management, Responsibility for NFPA 27 - Private Fire Brigades	An organized program with appropriate schedules is established to assure that performance of the fire protection system is maintained and that appropriate personnel are properly trained to perform their functions as members of fire fighting teams. The Manager, Technical Services, is responsible for the establishment of training programs concerning fire protection. Fire protection equipment is inspected/tested by Operations, Test Unit, and Maintenance with the overall responsibility resting with the Test Unit.

Position For Plants Under Construction and Operating Plant	South Carolina Electric and Gas Company Response
5. The need for good organization, training, and equipping of fire brigades at nuclear power plant sites requires effective measures be implemented to assure proper discharge of these functions. The guidance in Regulatory Guide 1.101, "Emergency Planning for Nuclear Power Plants", should be followed as applicable.	
(a) Successful fire fighting requires testing and maintenance of the fire protection equipment, emergency lighting and communication, as well as practice as brigades for the people who must utilize the equipment. A test plan that lists the individuals and their responsibilities in connection with routine tests and inspections of the fire detection and protection systems should be developed. The test plan should contain the types, frequency, and detailed procedures for testing. Procedures should also contain instructions on maintaining fire protection during those periods when the fire protection system is impaired or during periods of plant maintenance, e.g., fire watches or temporary hose connections to water systems.	Maintenance of the fire fighting equipment is the responsibility of the Test Unit under the direction of the Manager, Technical Services. Operations, Maintenance and Test Unit schedule and conducts inspections/tests of fire fighting equipment, barriers, emergency communications, and emergency lighting. The schedules include type and frequency of tests. Procedures are also available for use in performing tests in cases where procedures are necessary. The evacuation alarms and fire alarm systems are tested periodically in accordance with written and approved procedures. Since the other emergency communications systems are in daily use, any degradation is readily identified and corrected; therefore no formal testing program is necessary. In the event that conditions require modifications to be made to the fire protection system, such as breaking fire stops or impairment of fire detection and suppression system capability, appropriate levels of management would review the conditions and take appropriate actions to ensure that adequate fire protection is available.
(b) Basic training is a necessary element in effective fire fighting operation. In order for a fire brigade to operate effectively, it must operate as a team. All members must know what their individual duties are. They must be	A training program for plant employees who may serve on the fire fighting teams is conducted under the responsibility of the Manager, Technical Services. This training covers methods and equipment for fighting different types of fires that could occur on the site. Also, plant

Position For Plants Under Construction and Operating Plants	South Carolina Electric and Gas Company Response
familiar with the layout of the plant and equipment location and operation in order to permit effective fire-fighting operations during times when a particular area is filled with smoke or is insufficiently lighted. Such training can only be accomplished by conducting drills several times a year (at least quarterly) so that all members of the fire brigade have had the opportunity to train as a team, testing itself in the major areas of the plant. The drills should include the simulated use of equipment in each area and should be preplanned and post-critiqued to establish the training objective of the drills and determine how well these objectives have been met. These drills should periodically (at least annually) include local fire department participation where possible. Such drills also permit supervising personnel to evaluate the effectiveness of communications within the fire brigade and with the on-scene fire team leader, the reactor operator in the control room, and the offsite command post.	layout and equipment locations are included. Appropriate emphasis is placed on the radiological aspects of fire fighting. This training ensures that each employee who may serve on a fire fighting team knows his duties in the event of a fire emergency and knows how to use available fire fighting equipment. In addition, fire drills are conducted quarterly and practical, live fire fighting techniques are conducted at least annually. Each year, at least one fire drill will involve off site fire departments. Such drills include the simulated and actual use of equipment in a predetermined area and are preplanned and post critiqued to establish the training objectives of the drills and to determine how well these objectives have been met. Courses based upon fire fighting procedures that are generally accepted by the fire protection industry are utilized.
(c) To have proper coverage during all phases of operation, members of each shift crew should be trained in fire protection. Training of the plant fire brigade should be coordinated with the local fire department so that	Members of each operations shift crew and mechanical maintenance personnel are trained in fire protection. Offsite groups, such as local fire departments, that may participate in onsite emergency activity, are given instructions as appropriate to ensure that they are familiar with emergency plans, plant layout, possible hazards involving

Position For Plants Under Construction and Operating Plants	South Carolina Electric and Gas Company Response
responsibilities and duties are delineated in advance. This coordination should be part of training course and implemented into the training of the local fire department staff. Local fire departments should be educated in the operational precautions when fighting fires on nuclear power plant sites. Local fire departments should be made aware of the need for radioactive protection of personnel and the special hazards associated with a nuclear power plant site.	radiation, and their expected response actions in the event of an accident.
(d) NFPA 27, "Private Fire Brigade" should be followed in organization, training, and fire drills. This standard also is applicable for the inspection and maintenance of fire fighting equipment. Among the standards referenced in this document, the following should be utilized: NFPA 194, "Standard for Screw Threads and Gaskets for Fire Hose Couplings," NFPA 196, "Standard for Fire Hose," NFPS 197, "Training Standard on Initial Fire Attacks," NFPA 601, "Recommended Manual of Instructions and Duties for the Plant Watchman on Guard." NFPA booklets and pamphlets listed on page 27-11 of Volume 8, 1971-72 are also applicable for good training references. In addition, courses in fire protection and fire suppression which are recognized and/or sponsored by the fire protection industry should be utilized.	Appropriate NFPA sections are used as guidelines in developing plans for organization and training of fire fighting personnel, fire drills, and inspection and maintenance of fire fighting equipment.

Position For Plants Under Construction and Operating Plant	South Carolina Electric and Gas Company Response
C. Quality Assurance Program Quality Assurance (QA) programs of applicants and contractors should be developed and implemented to assure that the requirements for design, procurement, installation, and testing and administrative controls for the fire protection program for safety related areas as defined in this Branch Position are satisfied. The program should be under the management control of the QA organization. The QA program criteria that apply to the fire protection program should include the following:	The Quality Assurance Program for the Fire Protection Program is under the management control of the Manager, Materials and Procurement. Audits of the program are the responsibility of the Manager, Quality Services. Specific structures, systems, and components are defined by plant drawings and Technical Requirements Package (TRP)-2. Quality related activities, and indoctrination and training of personnel will be performed in accordance with approved quality related procedures or existing safety related procedures. The QA Program for Fire Protection is further detailed in the Quality Related Plan for Quality Related Systems, Structures and Components, which is used in conjunction with Technical Requirements Package (TRP)-2.
1. Design Control and Procurement Document Control Measures should be established to assure that all design related guidelines of the Branch Technical Position are included in design and procurement documents and that deviations therefrom are controlled.	The same QA controls described in the Operational QA Program apply to the Operational Fire Protection Program. Quality-related procurement documents shall be prepared, maintained, and protected consistent with safety related procurement documents, as outlined in the Operational QA Plan. Technical and quality requirements will be developed for procurements, consistent with approved procurement procedures.
2. Instructions, Procedures, and Drawings Inspections, tests, administrative controls, fire drills, and training that govern the fire protection program should be prescribed by documented instructions, procedures, or drawings and should be accomplished in accordance with these documents.	Fire Protection activities shall be prescribed and accomplished using approved instructions, procedures, and drawings appropriate to the circumstances. Development, review, and control of these documents shall be in accordance with existing plant document control procedures. Procedures for fire protection activities shall be generated, reviewed, and approved in the same manner as safety-related procedures. In most cases, procedures for safety-related activities are already established and may be used for these activities.

Position For Plants Under Construction and Operating Plant	South Carolina Electric and Gas Company Response
15. Decontamination Areas	
The decontamination areas should be protected by automatic sprinklers if flammable liquids are stored. Automatic fire detection should be provided to annunciate and alarm in the control room and alarm locally. The ventilation system should be capable of being isolated. Local hose stations and hand portable extinguishers should be provided as backup to the sprinkler system.	The personnel decontamination area is located in the control building at elevation 412'-0". The equipment decontamination area is located in the auxiliary building at elevation 436'-0". The spent fuel cask decontamination area is in the fuel handling building at elevation 463'-0". The fire hazards analysis outlines the protection for these areas.
16. Safety Related Water Tanks	
Storage tanks that supply water for safe shutdown should be protected from the effects of fire. Local hose stations and portable extinguishers should be provided. Portable extinguishers should be located in nearby hose houses. Combustible materials should not be stored next to outdoor tanks. A minimum of 50 feet of separation should be provided between outdoor tanks and combustible materials where feasible.	Section 4.11.2 of the fire hazards analysis outlines the protection for the condensate storage tank.
17. Cooling Towers	
Cooling towers should be of noncombustible construction or so located that a fire will not adversely affect any safety related systems or equipment. Cooling towers should be of non-combustible construction when the basins are used for the ultimate heat sink or for the fire protection water supply. Cooling towers of combustible construction, so located that a fire in them could adversely affect safety related systems or equipment should be protected	Not applicable.

Position For Plants Under Construction and Operating Plant	South Carolina Electric and Gas Company Response
with an open head deluge system installation with hydrants and hose houses strategically located.	
18. Miscellaneous Areas	
Miscellaneous areas such as records storage areas, shops, warehouses, and auxiliary boiler rooms should be so located that a fire, or effects of a fire, including smoke, will not adversely affect any safety related systems or equipment. Fuel oil tanks for auxiliary boilers should be buried or provided with dikes to contain the entire tank contents.	The permanent records storage area is protected by an automatic halon system. The shops in the service building are protected by automatic sprinklers and are separated from safety related systems or equipment by fire barriers. The auxiliary boiler and warehouses are spatially separated from safety related systems or equipment. Therefore, fire or smoke would not affect safety related systems or equipment. The fuel oil tank for the auxiliary boiler is provided with a dike.
G. Special Protection Guidelines	
1. Welding and Cutting, Acetylene - Oxygen Fuel Gas Systems	
This equipment is used in various areas throughout the plant. Storage locations should be chosen to permit fire protection by automatic sprinkler systems. Local hose stations and portable equipment should be provided as backup (requirements of NFPA 51 and 51B).	As part of the Fire Protection Program, the primary storage location for the welding and cutting, acetylene - oxygen fuel gas systems is outdoors, adjacent to the flammable storage building, which is separated by more than 50 feet from any building containing safe shutdown equipment. Fire hydrants and portable fire extinguishers are provided in the area. Should any welding and cutting, acetylene - oxygen fuel gas systems be located indoors, the storage location(s) will be chosen to permit fire protection by automatic sprinkler system(s). Work involving ignition sources such as welding and flame cutting require a permit, and is procedurally controlled.
2. Storage Areas for Dry Ion Exchange Resins	
Dry ion exchange resins should not be stored near essential safety related systems. Dry	Demineralized resins are stored in the wet condition.