

SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE 764

COLUMBIA, SOUTH CAROLINA 29218

O. W. DIXON, JR.
VICE PRESIDENT
NUCLEAR OPERATIONS

December 1, 1982

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, DC 20555

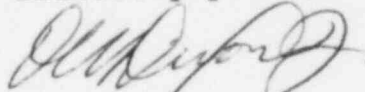
Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Operating License No. 50/395
Fire Protection

Dear Mr. Denton:

In our October 8, 1982 letter, South Carolina Electric & Gas Company (SCE&G) requested an amendment to the Operating License and Technical Specifications. Details were provided in attachments to that letter. Attachment II provided requested changes regarding fire protection. It has been discovered that one of the changes we proposed to make was mistakenly left out of that attachment. That information is provided as an attachment to this letter. Please add it to Attachment II of the October 8, 1982 letter.

If you have any questions, please let us know.

Sincerely yours,



O. W. Dixon, Jr.

RBC:OWD/fjc
Attachments:

cc: V. C. Summer
G. H. Fischer
H. N. Cyrus
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FIRE PROTECTION

The Virgil C. Summer Nuclear Station Fire Protection program was initially established on the basis of the requirement of Appendix A to NRC Branch Technical Position APCS 9.5.1. In accordance with these requirements, a fire hazards analysis was prepared and a point by point comparison was made between Appendix A requirements and SCE&G commitments. This was submitted to the NRC as the Fire Protection Evaluation Report (FPER). A period of question and answer followed during which SCE&G came to agreement with the NRC on all points and revisions were made to the FPER as required.

Subsequently, 10CFR50 Appendix R was issued and after review and evaluation, the NRC issued the Virgil C. Summer Nuclear Station Safety Evaluation Report (SER) showing certain additional fire suppression systems that would result from implementation of Appendix R. As published, Appendix R did not apply to the Virgil C. Summer Nuclear Station because it was not "operating prior to January 1, 1979". The NRC asked SCE&G to commit to meet Appendix R, section I, G, J and O only. SCE&G did so in our letter to Mr. Denton dated April 20, 1981, (attached) with deviations therefrom to be resolved in a manner acceptable to the NRC Staff.

In our letter of June 1, 1981 (attached) addressed to Mr. Denton, SCE&G requested exemption from certain requirements of Appendix R based upon alternative actions taken in accordance with agreements which had previously been reached with the NRC. On July 7, 1981, representatives of SCE&G met with the NRC Staff to discuss these exemptions and other issues pertaining to fire protection. Confirmation of agreements reached during this meeting, along with additional information pertaining to the Appendix R exemptions, were provided in letters to Mr. Denton dated July 16 and August 21, 1981 (attached). Subsequently, the NRC issued Supplement 3 to the SER which included a final list of all the areas agreed upon, where fire suppression systems would be required. The plant is currently in full compliance with the commitments contained in Supplement 3.

Due to the choice of words found in supplement No. 4 to the SER and in the licensing conditions, the status of this issue is unclear. Specifically, the words in question in the licensing conditions are "... SCE&G shall maintain the fire protection program set forth in Appendix R to 10CFR Part 50, except for the following:

.....

(iii) No automatic fire suppression systems are required in the areas listed in Supplement No. 4 to the SER

....."

Supplement No. 4 to the SER lists those areas with deviations from Appendix R which had been included in the SER and then deleted in Supplement No. 3. However, this list does not include all areas affected by the Appendix R requirement.

This ambiguity has been discussed with the Project Manager and the following proposed revision to item (18)a(iii) of the licensing conditions is provided to resolve this issue:

"No automatic fire suppression is provided in the areas shown on the attached table."

DATE November 30, 1982

Page 1 of 9

BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
AB 374'	74-01	(B) CS Piping	00-01E	Yes	7200	
"	74-05	SP Line from RWST	63-03	No	"	
"	74-07	SP Line from RWST	Same Area	Yes	"	
"	74-08	A&B Tray and CND		Yes		
"	74-09	* A VU Piping A&B Ducts from RHR rm Vent A&B CC Lines		Yes		
"	74-16	"B" RHR Pump, B Tray & CND		74-17		Yes
"	74-17	"A" RHR Pump, A Tray & CND	74-16	Yes	"	
AB 385'	85-01	A VU Piping, A CND A XAH-4A-VL	85-02	Yes	"	Exempt SER 4
"	85-02	B VU Piping, B CND B XAH-4B-VL	85-01	Yes	"	
AB 388'	88-05	SP Line to RWST,	Same Area	Yes	11,900	
"	88-13	A CND & Tray,				
"	88-13N	B CND & Tray,				
"	88-13S	C CND				
"	88-13NE					
"	88-16					
"	00-01					
"	00-01W					

BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
AB 388'	88-23	B Charge Pump, B CND	88-24 & 25	Yes	11,900	
"	88-24	C Charging Pump, C CND	88-23 & 25	Yes	"	
"	88-25	A Charging Pump, A CND	88-24 & 23	Yes	"	Exempt SER 4
AB 397'	97-01	"A" Tray	97-02N	Yes	2,100	
"	97-02	A&B RHR & SI	Same Area	Yes	"	Room 97-02
"	97-02N	Lines, A&B Trays,				Exempt SER 4
"	97-02S	A&B MD Valves, A&B VU&CC Piping				
AB 400'	00-01E	A, B, & C CS Piping, A SI Piping	Same Room	Yes	"	
"	00-02E	B-CS piping A&B VU Piping, XAH-1A, 1B, 2-VL, A, B, C CND, B Tray	Same Room	Yes	"	Room 00-02 Exempt SER 4
AB 412'	12-02	SP-Pipe	74-07, 74-08	Yes	29,200	
"	12-03A	A&D CND	Same Room	Yes	"	
"	12-04	A&D CND, LT-990, RWST	Same Room	No	"	

BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
AB 412'	12-05	B Tray, B-CC & RH Piping, B-RHR Heat Exch., A-CC Piping, B-MO Valve	Same Area,	Yes	29,200	
AB 429'-3"	293-01					
AB 412'	12-06	B-RH Piping A-CND A-CC & RH Piping A-RH Heat Exch. A-MO Valve	Same Area	Yes	"	
AB 426'-6"	266-01					
AB 412'	12-09	E-CND	Same Area	Yes	"	RM 12-11N Exempt SER 4
"	12-11	A-Tray (SP)				
"	12-11N	B-SW Piping				
"	12-18	B-VU Piping				
"	12-31	A&B CC-Piping A-MO Valve-CC B-MO Valve-CC B-Boron Inj. Piping				
"	12-13	CS-Pump Suction	00-01E	No	"	
"	12-22	B-Boron Inj. Line	52-02	No	"	
"	12-23	B-Boron Inj. Line	52-02	No	"	
"	12-26	B-Boron Inj. Pipe	52-02	No	"	

BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
AB 412'	12-27	A-Tray, E-CND A&C CND	Same Room	Yes	29,200	
"	12-28	A-VU Piping,	Same Area	Yes	"	
AB 426'	26-01	A-XAH-32-VL, A&B-RH Piping A-Tray & A CND				
AB 412'	12-30	B-CC Piping, A-VU Piping	Same Room	Yes	"	
AB 445'	45-01	A-CND D-CND	Same Room	Yes	"	
AB 436'	36-01	B Tray,	Same General	Yes	31,500	No safe shutdown equip. is located in room 36-08.
"	36-03	A Boric Acid Pump	Area	except 36-08		
"	36-08	& Pipe,				
"	36-31	B Boric Acid Pump				
"	36-33	& Pipe,				
AB 446'	46-01	CC Piping				
AB 448'	48-01	MO Valve 9503A-CC,				
AB 452'	52-01	SW Pipe				
AB 436'	36-10	A Boric Acid Pump Suction Pipe	Adj. Room	No	31,500	
"	36-11	A&B Boric Acid Pump Suction Pipe	Same Room	No	"	
"	36-12	B Boric Acid Pump Suction Pipe	Adj. Room	No	"	
"	36-13	MO Valve CS Piping	None	No	31,500	

DATE November 30, 1982

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BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
AB 436'	36-18	PT-474, 475 & 2000A A-Tray, C-CND	Same Room	Yes	31,500	Exempt SER 4
"	36-30	A-CC Piping	Same Area	No	"	
AB 452'-6"	526-20	Filter XFL-39CS	Adj. Room	No	"	
"	526-21	A Filter XFL 8A-CS, B Filter XFL 8B-CS	Same Room	No	"	
AB 463'	63-02	B Switchgear & Trays	63-16	Yes	40,240	
"	63-04	A Tray	In Same Fire	Yes	"	
"	63-07	B Tray	Area	Except		
"	63-09	VU Pipe		RM 63-07		
"	63-14	XAH-33-VL				
"	63-16	Vent Unit				
"	63-19					
AB 474'	74-001					

BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
AB-463'	63-06	A, D&E Conduit A&B Boric Acid Tank LT-106, 108, 161, 163, 161A, 163A	Same Room	Yes	40,240	
EPAA-412'	12-02	A,B,C, Cable, PT-485, -484, -494, -495, -2010A, -2020A	Same Room	Yes	5,200	
EPAA-436'	36-02	IPV2020 B&D Conduit	Same Room	Yes	Negligible	Exempt SEP 4
WPAA-412'	12-01	B, E Cable, FCV-122, -8152	Same Room	Yes	69,200	
WPAA-436'	36-01	A, B Cable IPV-2000	Same Room	Yes	34,700	
WPAA-463'	63-01 63-03	A,B, Cable in Conduit, A, D, Cable in Tray	Same Room	Yes	24,400	
SWPH 425'	25-01	B Conduit, B SW Pipe	Room 25-03	No	Negligible	
"	25-02	C Conduit C SW Pipe	25-03 and 01	No	Negligible	
"	25-03	C Conduit, A CND & Tray, A SW Pipe	Room 25-01	Yes	5,500	
SWPH 441'	41-01A	A&B Duct	In same area 41-01A	Yes	Negligible	

BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
FH 436'	36-01W	B SW Pipe & Boron Injection Piping, A Limit Switch on Valve 8945A & 8942 B Limit Switch on Valve 8945B, A Conduit	Same Area	Yes	13,000	
FH 463'	63-01S	A Conduit B Conduit B Cable Tray	Same Area	Yes	11,400	
CB 482'	82-02 82-03	A Tray & CND A&B Chilled Water Piping A Fans & Ducts	Same Room & 82-01/04	Yes	35,000	
IB 412'	12-07	A & B Cable in Conduit, Battery Chg. & Transfer Switch	Same Room	Yes	8,600	
"	12-09	B Cable in Tray	12-02	Yes	8,600	
"	12-13A	B HVAC Equip. Water Chiller Pump, B CND	12-13B, 12-13C	Yes	163	
"	12-13B	C HVAC Equip. Water Chiller Pump, B&C CND	12-13A, 12-13C	Yes	163	
"	12-13C	A HVAC Equip. Water Chiller Pump, A&C CND	12-13A, 12-13B	Yes	163	
IB 423'	23-01	B Bat. Rm. Supply and Exhaust Plenums, B CND	23-02	Yes	40,600	

BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
IB 423'	23-02	A Bat. Rm. Supply & Exhaust Plenums, A,B, Cable	23-01 and same room	Yes	40,600	Exempt SER 4
IB 426'	26-01	B Serv. Water Booster Pump Area Cooling Unit, A, B Solenoids, Piping, A, B, C Cable	Same Area, also 26-02	Yes	28,600	Exempt SER 4
"	26-02	A Serv. Water Booster Pump Area Cooling Unit, A, B, Solenoids, Piping, A, B, C Cable	Same Area, also 26-01	Yes	5,700	Exempt SER 4
IB 436'	36-02	A,B,C,D Cable in Conduit, A Cable in tray, B IPV-2010,A,B,C MS safety valves, solenoids & piping, A&B VU&CC valves & piping, PT-484, 485, 2010A PT-494, 495, 2020A	Same Room	Yes	20,600	Automatic sprinklers are provided in the SW corner of room 36-02 as shown on the Fire Protection Evaluation Report Dwg. No.E-023-010.
"	36-03B	Reactor Protection Under Freq. & Vol. Relay & Trans. Panel.	None	Yes	35,700	Exempt SER 4
"	36-04	A,B, VU Piping, A Cable in tray, A Comp. Cool. Speed Switch	36-05 & 06 & Same Room	Yes	10,500	
"	36-06	C Cable in Conduit, B Comp. Cool. Speed Switch	36-04 & 06	No	10,000	

BLDG. & ELEV.	ROOM	SAFE SHUTDOWN SYSTEMS PRESENT	LOCATION OF REDUNDANT SAFE SHUTDOWN SYS.	DETECTION INSTALLED	AREA OR ZONE FIRE LOADING BTU/FT ² **	REMARKS
IB 451'	51-01	A,B Cable in conduit, A VU Piping, XAH6-VL, ESF SWG Rm. Cool Unit A	51-02 & Same Rm	Yes	14,000	Exempt SER 4
"	51-02	J,K,L,M, C Cable in conduit, B VU Piping, XAH-8-VL, ESF SWG Rm. Cool. Unit B	51-01 & Same Rm	Yes	14,000	Exempt SER 4
"	51-03	A,B,J,K,L,M Cable in CND, B VU Piping, XAH-19B-VL, B Cooling Unit for Speed Switch Room	51-04 & Same Rm	Yes	3,700	Exempt SER 4
"	51-04	A Cable in conduit, A, B, VU Piping, A XAH-9A-VL, A Cooling Unit for Speed Switch Room	51-03 & Same Rm	Yes	3,700	
DG 400'	00-01	A tray A-SW piping A&B piping from Condensate Tank	00-02 & Same Rm	Yes	5,200	

* [] Indicates corridors and/or rooms with open passages into corridors and groups of equipment located in these spaces.

** Fire loading is for entire fire area or fire zone.

SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE BOX 764

COLUMBIA, SOUTH CAROLINA 29218

T. C. NICHOLS, JR.
VICE PRESIDENT AND GROUP EXECUTIVE
NUCLEAR OPERATIONS

April 20, 1981

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

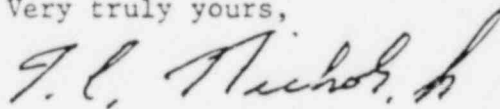
Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Fire Protection, Appendix R

Dear Mr. Denton:

South Carolina Electric & Gas Company acting for itself and as agent for the South Carolina Public Service Authority hereby commits to compliance with 10 CFR Part 50 Appendix R, parts G, J and O. Any deviations therefrom will be resolved in a manner acceptable to the NRC staff.

If you have any questions, please let us know.

Very truly yours,



T. C. Nichols, Jr.

NEC:TCN:rh

cc: V. C. Summer
G. H. Fischer
T. C. Nichols, Jr.
C. A. Price
D. A. Nauman
W. A. Williams, Jr.
R. B. Clary
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SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE BOX 764

COLUMBIA, SOUTH CAROLINA 29218

June 1, 1981

T. C. NICHOLS, JR.
VICE PRESIDENT AND GROUP EXECUTIVE
NUCLEAR OPERATIONS

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: V. C. Summer Nuclear Station
Docket No. 50/395
Fire Protection Review
SER Open Item 1.6.10

Dear Mr. Denton:

The fire hazard evaluation for Virgil C. Summer Nuclear Station was completed in accordance with Appendix A to Branch Technical Position APCS 9.5-1 to provide a fire safe plant. In a meeting with the NRC Staff in November, 1979, SCE&G agreed to provide all the requirements that were requested at that time by the Staff. The NRC Staff indicated that if this were done, the fire system would be acceptable. Measures to meet these requirements have been, or are being, implemented.

Subsequent to the events outlined above, Appendix R to 10 CFR Part 50 was issued. In our letter to Mr. Denton on January 30, 1981 we reported that an initial review indicated general compliance with minor exceptions which were listed. In our letter to Mr. Denton dated April 20, 1981, commitment was made to comply with Parts G, J and O of Appendix R, with deviations therefrom to be resolved in a manner acceptable to the NRC Staff. The requirements of Appendix R, Section G.2, are discussed below in relation to fire protection provided for the V. C. Summer Nuclear Station and Application for Exemption is made for differences identified.

Requirements:

- "2. Except as provided for paragraph G.3 of this section, where cables or equipment, including associated non-safety circuits that could prevent operation or cause maloperation due to hot shorts, open circuits, or shorts to ground, or redundant trains of systems necessary to achieve and maintain hot shutdown conditions are located within the same fire area outside of primary containment, one of the following means of ensuring that one of the redundant trains is free of fire damage shall be provided:
 - a. Separation of cables and equipment and associated non-safety circuits of redundant trains by a fire barrier having a 3-hour rating. Structural steel forming a part of or supporting such fire barriers shall be protected to provide fire resistance equivalent

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to that required of the barrier;

- b. Separation of cables and equipment and associated non-safety circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibile or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or
- c. Enclosure of cable and equipment and associated non-safety circuits of one redundant train in a fire barrier having a 1-hour rating. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area;"

Exemption Requested:

Application is made for exemption to the above requirements in the specific cases and to the extent described below:

- 1. Component cooling water pumps B & C do not meet the above separation requirements.
- 2. HVAC equipment water chiller pumps do not meet the above separation requirements.
- 3. Automatic fire suppression systems are provided for the Auxiliary Building and the Intermediate Building only in those areas identified in item 1 below.
- 4. Fire detection systems are provided for the Auxiliary Building and the Intermediate Building only in those areas identified in item 4 below.

Fire zones and fire areas within the Intermediate and Auxiliary Buildings are identified in a list included as Attachment I to this letter. Also listed are the safe shutdown equipment and/or cable and the fire loading within each zone or area.

Rational For The Exemption Request:

The following fire protection is provided in the Auxiliary Building and in the Intermediate Building:

- 1. Automatic Fire Suppression and Detection Systems are provided in:
 - a. Zone 9, hallway, south end of the Auxiliary Building.
 - b. Fire Area IB-9, chilled water pump room in the Intermediate Building.

- c. Zone 5, general floor area in the Intermediate Building, including area in which are located component cooling water pumps B & C.
2. Manual Sprinkler Systems are provided for the following:
 - a. Zone 6, truck bay, and drumming station/compactor area in the Auxiliary Building.
 - b. Charcoal filter plena in the Auxiliary Building for the following HVAC Systems:
 1. Reactor Building purge exhaust
 2. Reactor Building charcoal clean-up
 3. Auxiliary Building charcoal exhaust
 4. Fuel Handling Building charcoal exhaust
 3. The 1½ hour fire rated barriers were provided for one division where redundant safe shutdown circuits or equipment are separated by less than 20 feet and no 3-hour barrier, with very low fire loading or without intervening combustibles, except in the cases noted in items 5 and 6 below.
 4. Ionization detectors were added for equipment areas where redundant, safe shutdown equipment was not separated by 3-hour fire rated barriers.

Ionization detectors are provided in the following areas of the Auxiliary Building:

- a. RHR pump area elevation 374'.
- b. Charging/safety injection pump area elevation 388'.
- c. Cooling units area for charging pump rooms elevation 400'.
- d. Corridor Area and Switchgear room elevation 463'.

Ionization detectors are provided in the following areas of the Intermediate Building:

- a. Elevation 412'.
 1. Room 12-02, General Floor Area
 2. Room 12-10, Turbine Driven Emergency Feedwater Pump Room.
 3. Room 12-12, Chiller A Room.

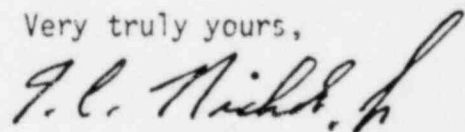
Mr. Harold R. Denton
June 1, 1981
Page Four

4. Room 12-13, Chiller Pump Room
5. Room 12-14, Chiller C Room
6. Room 12-15, Chiller B Room
- b. Elevation 423'6", Room 236-01 Emergency Feedwater Pump Cooling Units.
- c. Elevation 436'
 1. Room 36-01, Switchgear Room
 2. Room 36-03 and Room 36-03A Control Room Evacuation Panel Area.
- d. Elevation 463' Switchgear Room.
5. Radiant shield walls of one-hour construction were provided between component cooling water pumps B & C and HVAC equipment water chiller pumps.
6. A horizontal "M" board fire barrier was provided over service water booster pump "A" in addition to automatic sprinklers and ionization detectors to separate redundant "B" circuits.

In consideration of the separation and protection provided as described above, and the low fire loading in the affected areas, we have concluded that the plant is presently very well protected from a fire protection standpoint, and could be safely shut down with an in situ or exposure fire in any area of the plant. Additionally, the protection provided is in accordance with measures stated to be acceptable by the NRC Staff in the meeting between SCE&G and the Staff in November, 1979.

We request the Staff review the above exemption requests and let us know your conclusion as soon as possible. If you have any questions, please let us know.

Very truly yours,



T. C. Nichols, Jr.

GW:TCN:pj
Attachment

cc: V. C. Summer
C. H. Fischer
H. N. Cyrus
T. C. Nichols, Jr.
D. A. Nauman
W. A. Williams, Jr.
R. B. Clary
O. S. Bradham

A. R. Koon
M. N. Browne
B. A. Bursey
Dr. J. Ruoff
J. L. Skolds
J. B. Knotts, Jr.
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ATTACHMENT I

AUXILIARY BUILDING

<u>Fire Zone/Area</u>	<u>Safe Shutdown Equipment</u>	<u>Safe Shutdown Cable</u>	<u>Fire Load</u>
Zone 1-Sub-Basement 374'-0"	RHR Pumps A & B RHR Cooling Units A & B	Yes	7,200 BTU/ft ²
Zone 2-Sub-Basement 388'0"	Charging Pumps A, B & C	Yes	11,900 BTU/ft ²
Zone 3-Recirculation Valve Room 397'-0"	-	Yes	12,700 BTU/ft ²
Zone 4-Charging Pump Room Cooling Units	Cooling Units A, B & C, Instrumentation	Yes	2,100 BTU/ft ²
Zone 5-Basement 412'-0"	RHR Heat Exchanger A & B MCC, Instrumentation	Yes	29,200 BTU/ft ²
Zone 6-Mezzanine 436'-0"	Boric Acid Pumps A & B Instrumentation	Yes	31,500 BTU/ft ²
Zone 7-Drumming Station 436'-0"	None	None	15,000 BTU/ft ²
Zone 8-Hot Machine Shop 436'-0"	None	None	-
Zone 9-Operating Floor 463'0"	Instrumentation Boric Acid Tanks A & B 480 V. Switchgear, Motor Control Center	Yes	40,240 BTU/ft ²
Zone 10-Ventillation Equipment Level 485'-0"	None	None	24,400 BTU/ft ²

ATTACHMENT I

INTERMEDIATE BUILDING

<u>Fire Zone/Area</u>	<u>Safe Shutdown Equipment</u>	<u>Safe Shutdown Cable</u>	<u>Fire Load</u>
IB-1 through IB-6	Redundant Safe Shutdown Equipment is separated by fire barriers.		3-hour
Zone 1 IB-7 through IB-9 Elev. 412'0"	HVAC Water Chillers A, B, & C and HVAC Water Chiller Pumps	Yes	6,600 BTU/ft ² in each Chiller Room and 163 BTU/ft ² in Chiller Pump Rooms (4.2 gallons of oil in each pump motor)
Zone 2 Turbine Driven Emergency Feed- water Pump Room	Turbine Driven Emergency Feedwater Pump and Turbine	Yes	13,100 BTU/ft ²
Zone 3 East Penetration Access Area	None	Yes	5,200 BTU/ft ²
Zone 4 West Penetration Access Area	None	Yes	69,200 BTU/ft ²
Zone 5 General Floor Area 412'0"	Component Cooling Water Heat Exchangers A & B Component Cooling Water Pumps A, B & C Service Water Booster Pumps A & B Motor Driven Emergency Feedwater Pumps A & B	Yes	43,000 BTU/ft ²
Zone 6 Battery Room Ventillation Equipment Fire Area IB-10 Room A & B Elevation 423'0"	Air Handling Unit A in Room A Unit B in Room B	Yes	40,600 BTU/ft ²
Zone 7 Service Water Booster Pump Cooling Equip. Room A & B Elev. 426'0"	Cooling Unit A Cooling Unit B	Yes	5,700 BTU/ft ² -Rm.A 28,600 BTU/ft ² -Rm.B
Zone 8 Switchgear Room B Elev. 436'0"	7200V ESF Switchgear B 480V ESF Switchgear B ESF MCC - B	Yes	15,300 BTU/ft ²

ATTACHMENT I

<u>Fire Zone/Area</u>	<u>Safe Shutdown Equipment</u>	<u>Safe Shutdown Cable</u>	<u>Fire Load</u>
Zone 9 Speed Switch Rooms A, B, C. Elevation 436'0"	Component Cooling Water Pump Speed Switches A, B and C C.C. Water Pump C Transfer Switch in Room C	Yes	Room A 10,500 BTU/ft ² Room B 10,000 BTU/ft ² Room C 15,600 BTU/ft ²
IB-14, IB-15 and IB-15A CREP and Switchgear Rooms, Elevation 436'0"	CREP-A, Reactor Protection Under- frequency and Under Voltage Relay and Transformer Panels, CREP-B	Yes	50,800 BTU/ft ² in Room 36-03A 35,700 BTU/ft ² in Room 36-03B 52,400 BTU/ft ² in Room 36-03
Zone 10 East Penetration Access Area Elevation 436'0"	Main Steam Power Relief Valve and Instrumentation	Yes	Very Low - Cable Insulated in Conduit Not Quantified
Zone 11 West Penetration Access Area Elevation 436'0"	Main Steam Power Relief Valve and Instrumentation	Yes	34,700 BTU/ft ²
Zone 12 General Floor Area 436'-0"	Main Steam Power Relief Valve	Yes	20,600 BTU/ft ²
IB 16 & IB 17 Switchgear Cooling Units Rooms A & B Elevation 451'0"	ESF Switchgear Cooling Units	Yes	Room A 14,000 BTU/ft ² Room B 14,000 BTU/ft ²
IB-18 and IB-19 Speed Switchroom Cooling Units Rooms A & B 451'-0"	Speed Switchroom Cooling Units	Yes	Room A 0 Room B 3,700 BTU/ft ²
IB-20 Switchgear Room A Elev. 463'0"	7200V ESF Switchgear A 480V ESF Switchgear A 480V MCC - A	Yes	95,000 BTU/ft ²
IB-21 CRDM Switchgear Room Elev. 463'0"	Reactor Trip Switchgear	Yes	58,100 BTU/ft ²
Zone 13 West Penetration Access Area 463'0"	None	Yes	24,000 BTU/ft ²

See Virgil C. Summer Nuclear Station Fire Protection Evaluation for further details regarding these fire zones and fire areas.

RBC

SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE BOX 764

COLUMBIA, SOUTH CAROLINA 29218

T. C. NICHOLS, JR.
VICE PRESIDENT AND GROUP EXECUTIVE
NUCLEAR OPERATIONS

July 16, 1981

Mr. Harold R. Denton, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Fire Protection Review
SER Open Item 1.6.10

Dear Mr. Denton:

A meeting was held on July 7, 1981, between South Carolina Electric and Gas Company and members of the NRC staff concerning fire protection for the Virgil C. Summer Nuclear Station. Topics discussed at that meeting are addressed in this letter. The following corresponds to the nine notes relative to SER Section 9.5.1 discussed in the meeting.

1. As requested, isolation valves will be added on laterals for two fire hydrants, XFX-IN-FS and XFX-IM-FS. Other hydrants are sufficiently isolated from interior fire suppression systems by sectionally aligning valves that hydrant maintenance will not impair interior fire protection systems.

2. Water suppression systems are provided in the 463 foot elevation of the Control Building only in the cable chase areas (not in the technical support area, control room, or support areas.) The main floor area is provided with fire detection equipment, hose stations and portable extinguishers as described in the Fire Protection Evaluation. Water suppression systems are not provided in the relay or computer rooms, which are protected by an automatic CO₂ system.

3. Information supplemental to our letter to you dated June 1, 1981, in regard to fire protection, is included as Attachment I to this letter. This information pertains to areas in which the fire protection provided differs from and is an alternative to the protection described in 10CFR50 Appendix R, Section III.G.2. Essentially, these

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areas contain (a) a 1½ hour fire barrier on one train of redundant cable or equipment, or 20 foot separation between redundant trains, and (b) a low fire loading. The fire barrier ratings required by the National Fire Protection Association to protect against various fire loadings are shown in Attachment II. The drawings referenced in Attachment I can be found in the Virgil C. Summer Nuclear Station Fire Protection Evaluation. The fire loadings shown in Attachment I were, for the most part, taken from the Fire Protection Evaluation; these fire loadings are best estimates based on information available.

4. Hose stretch tests were performed for the Control Building and Penetration Access Areas. As a result of these tests, one 75 foot hose in the Control Building was replaced by a 100 foot hose. Other hoses were found to be acceptable without extending the length.

5. The Service Water Pump House is provided with a preaction sprinkler system in the main pump room and in the HVAC fan room. The building is also served by a fire hydrant located nearby, as shown in drawing E-023-001 in the Fire Protection Evaluation. Therefore, a standpipe hose station is not required at the Service Water Pump House.

6. Those fire detection systems which are used to actuate water suppression systems will be upgraded to a Class A system as defined in NFPA Standard 72D.

7. Structural steel framing in zone 3 of the Intermediate Building will be provided with a fire barrier rated at one hour or the zone will be provided with a sprinkler system. Fire protection commitments for zone 5 of the Intermediate Building remain as is. The ladder opening between the A train switchgear cooling unit room and the B train switchgear room in the Intermediate Building will be filled-in with grout and an opening will be provided between the A train cooling unit and the A train switchgear room for emergency exit. Floor and ceiling openings in the service water booster pump area cooling equipment room A will remain as is.

8. South Carolina Electric and Gas will submit to the NRC verification from the manufacturer of the three-hour rating of gypsum board construction used at the Virgil C. Summer Nuclear Station.

Mr. H. R. Denton
July 16, 1981
Page 3

9. The control room support areas will be separated from the control room by a one-hour fire rated wall which will extend from the floor slab to the ceiling slab, above the suspended ceiling, or an automatic sprinkler system will be provided in the support areas. The technical support area will be separated from the control room by a 2 hour fire rated wall with 1½ hour rated fire dampers or shutters where required and 1½ hour rated class B doors.

It is our understanding that the above statements represent mutual agreements reached in the July 7 meeting between representatives of South Carolina Electric and Gas and NRC. It was also agreed that reference to HVAC smoke detectors, heat detectors and temperature monitors be deleted from the Fire Protection Evaluation report since area fire detection systems have been provided where required.

Discussion in the meeting of July 7 failed to include the fact that, contrary to a statement on page 9-21 of the SER, curbs are not provided between the chilled water pumps. Fire protection for this area includes:

- a. An automatic sprinkler system,
- b. Radiant shield walls of one-hour construction between pumps to divide the room into three areas.
- c. A fire detection system.
- d. A 1½ hour fire rated barrier for cable from one division which passes through the pump area for another division.

Note: Oil in each pump cubicle amounts to only 4.2 gallons. Placement of curbs between pumps would block drainage from the A and B pump areas

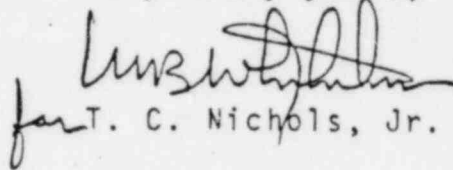
We consider that, excluding item 3 above, the areas of difference regarding SER section 9.5.1 discussed in the meeting of July 7 have been resolved as recorded in this letter and we request that the SER be promptly amended accordingly. Sufficient information has been provided for

Mr. H. R. Denton
July 16, 1981
Page 4

the resolution of item 3 and the SER amendment should also incorporate appropriate changes with respect to that item.

If you have any questions, please let us know.

Very truly yours,


for T. C. Nichols, Jr.

GW:TCN:1kb

Attachments (2)

cc: V. C. Summer
G. H. Fischer
H. N. Cyrus
T. C. Nichols, Jr.
Dr. J. Ruoff
D. A. Nauman
W. A. Williams, Jr.
R. B. Clary
O. S. Bradham
A. R. Koon
M. N. Browne
B. A. Bursey
J. L. Skolds
J. B. Knotts, Jr.
NPCF
File

V. C. Summer Nuclear Station
Supplemental Information to SCE&G Request for
Relief Pertaining to 10CFR50 Appendix R,
Section III.G.2. (See note 3 concerning SER Section 9.5.1)

Attachment 1
July 16, 1981

1. Auxiliary Building, zone 1, area near residual heat removal system/spray pump room cooling unit A, elevation 385'. See drawing E-023-002, room number 85-01.

Zone 1 Fire Loading is 7,200 BTU/ft.².

Total Combustibles in Zone 1 are:

- (a) Lubricating oil, 608,000 BTU and
- (b) Cable insulation, 90,000,000 BTU.

Comments: Fire loading is extremely low in the immediate vicinity of cooling unit A. This loading consists of cable insulation found in three cable trays each approximately three inches wide, and several small lighting cable conduits, all of which are routed above the unit near the ceiling. Several other small cable trays are 10 or 15 feet away and at a higher elevation than the cooling unit. The cooling unit is located on a slab at elevation 385', which is eleven feet above the main floor at elevation 374'.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

2. Auxiliary Building, zone 2, charging pump room A, elevation 388'. See drawing E-023-003, room number 88-25.

Fire Loading of Charging Pump Room A is 12,400 BTU/ft.².

Total Combustibles in Charging Pump Room A are:

- (a) Lubricating oil, 6,840,000 BTU, and
- (b) Cable insulation, 441,000 BTU.

Comments: All cable in this room is contained in conduit which is dispersed throughout the room. There is some B train cable mounted on the north wall, which is about five feet from the north side of the pump.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

3. Auxiliary Building, zone 3, recirculation valve room, elevation 397'. See drawing E-023-003, room number 97-02.

Fire Loading of Zone 3 is 12,700 BTU/ft.²

Total Combustibles in Zone 3 is:
cable insulation 90,000,000 BTU.

Comments: This large room contains mostly piping and valves. About 90% of the cable loading in this area occurs in cable trays in the portion of the room located west of column line 8.8. The remainder of cable is dispersed throughout the area east of column line 8.8, but the majority of this is in conduit.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in the portion of this area containing safe shutdown cable, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

4. Auxiliary Building, zone 4, charging pump room cooling units room, elevation 400'. See drawing E-023-004, room number 00-02.

Zone 4 Fire Loading is 2,100 BTU/ft.²

Total Combustibles in Zone 4 are:
cable insulation 4,000,000 BTU.

Comments: About half of the cable in this area is contained in conduit dispersed throughout the room. A cable tray, approximately one foot wide and wrapped in kaowool, runs across the room from east to west below the ceiling, as shown in the referenced drawing. Since the small quantity of cable in this area is either contained in conduit or is wrapped in kaowool, there is practically nothing in this area which could burn.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

5. Auxiliary Building, zone 5, northeast general floor area near open ceiling hatch, elevation 412'. See drawing E-023-005, room number 12-11N.

Fire Loading in Zone 5 is 29,200 BTU/ft².

Combustibles in Zone 5 consist of:
cable insulation, 470,000,000 BTU.

Comments: Fire loading in this corner of zone 5 is low. Two lightly loaded 3 foot wide, ceiling mounted cable trays run north to south on the west side of the equipment hatch. Two small ceiling mounted trays run diagonally on the southeast side of the hatch. About 12 conduits run up and along the wall on the west side of the hatch and enter the area above the 426'6" slab. Several more conduits run up and along the wall on the east side of the hatch.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

6. Auxiliary Building, zone 6, backup heater transformer area; hallway south end, elevation 436'. See drawing E-023-008, room number 36-18.

Zone 6 Fire Loading is 31,500 BTU/ft.²

Total Combustibles in Zone 6 consist of:

- (a) Lubricating oil, 637,500 BTU, and
- (b) Cable insulation 440,000,000 BTU

Comments: Cable is routed in trays and conduit located below the ceiling. This hall is an area of relatively heavy cable loading. The backup heater transformers are not identified as safe shutdown equipment in the Fire Protection Evaluation.

Conclusion: Based on the fact that redundant trains of safe shutdown equipment or cable are not located in this area, it is concluded that no additional fire protection is required.

7. Intermediate Building, fire areas IB-10, battery room ventilation equipment room, elevation 423'. See drawing E-023-007, room number 23-02, Auxiliary Plan A.

Fire Loading in Room 23-02 is 40,600 BTU/ft.².

Total Combustibles in Room 23-02 consist of:
cable insulation, 30,000,000 BTU.

Comments: Fire loading consists of cable in tray and some conduit, fairly well dispersed throughout the area. One tray approximately 12 inches wide runs vertically; the remainder of cable runs are essentially horizontal.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

8. Intermediate Building, zone 7 and fire area IB-11, service water booster pumps area cooling equipment rooms A and B, elevation 426'. See drawing E-023-007, room numbers 26-01 and 26-02, Auxiliary Plan D.

Fire Loadings are:

- (a) Room A (26-02) 5,700 BTU/ft.² and
(b) Room B (26-01) 28,600 BTU/ft.².

Total Combustibles consist of:

- (a) Room A, cable insulation, 4,000,000 BTU.
(b) Room B, cable insulation, 20,000,000 BTU.

Comments: In both rooms, cable is essentially evenly distributed throughout the room, mostly in horizontal runs. About half of the cable is in conduit and half in tray.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

9. Intermediate Building, fire area IB-15A, Reactor Protection Underfrequency and Undervoltage Relay and Transformer Panel, elevation 436'. See drawing E-023-010, room number 36-03B.

Fire Loading in fire area IB-15A is 35,700 BTU/ft².

Total Combustibles consist of:
cable insulation 11,000,000 BTU.

Comments: About 70% of the cable in this room consists of A train cable routed vertically on the east wall approximately 8'6" from the east side of the equipment panels. The remainder of cable is in conduit, most of which is located above the panels, including one small B train conduit.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

10. Intermediate Building, zone 10, east penetration access area, elevation 436'. See drawing E-023-010, room number PA 36-02.

Comments: Fire loading and combustibles in this area are so low that they were not quantified in the Fire Hazards Analysis. The area contains piping. There are a few widely dispersed cables in conduit attached to the ceiling. The fire loading in this area is essentially zero.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

11. Intermediate Building, zone 12, general floor area, areas near redundant cable interaction, elevation 436'. See drawing E-023-010, room number 13 36-02.

Fire Loading is 20,600 BTU/ft.².

Total Combustibles consist of:
cable insulation, 220,000,000 BTU.

Comments: Cable is concentrated in the area immediately to the east and north of the switchgear room in the vicinity of and to the west of column line 7.5. A preaction sprinkler system is provided in the area approximately between column lines 6.8 and 8.3. The area to the east of column line 6.8 has an extremely low fire loading; one cable tray runs east to west from one end of this area to the other as shown in the referenced drawing and a few widely dispersed conduits are to be found.

Conclusion: Based on the fact that a sprinkler system is provided in the portion of this area in which the cable loading is concentrated, it is concluded that no additional fire protection is required.

12. Intermediate Building, fire areas IB-16 and IB-17, switchgear cooling unit rooms, elevation 451'. See drawing E-023-010, room numbers 51-01 and 51-02, Auxiliary Plan A.

Fire Loadings are:

- (a) room A (51-01) 14,000 BTU/ft.²., and
(b) room B (51-02) 14,000 BTU/ft.².

Total Combustibles consist of:

- (a) room A, cable insulation, 10,000,000 BTU, and
(b) room B, cable insulation, 10,000,000 BTU.

Comments: (a) Room A: Fire loading is very light. One lightly loaded cable tray runs north to south against east wall. Another short, lightly loaded tray is located in the northeast corner. The remainder of the cable is in dispersed conduit mounted below the ceiling. There are no vertical trays in this area. (b) Room B: Fire loading is very light. Roughly half of the cable is in conduit and half in trays. There are two vertical sections of cable tray on opposite sides of the room, each containing six cables of about 2 inch diameter. Cable is not concentrated in any part of the room.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no additional fire protection is required.

13. Intermediate Building, fire area IB-19, speed switch room cooling unit room B, elevation 451'. See drawing E-023-010, room 51-03, Auxiliary Plan B.

Fire Loading is 3,700 BTU/ft.².

Total Combustibles consist of:
cable insulation, 800,000 BTU.

Comments: One cable tray, approximately two feet wide, runs from the south wall to the center of the room at which point the cables penetrate the ceiling. All other cable is in conduit dispersed throughout the room. An A train conduit, wrapped in kaowool, runs about two feet to the east and two feet above the cable tray. Other A train conduit in the room is also wrapped in kaowool.

Conclusion: Based on the low fire loading and the fact that combustibles are not concentrated in this area, it is concluded that the fire protection provided for this area, as described in the Fire Protection Evaluation, is adequate and no further measures are required.

Attachment II
July 16, 1981

REQUIRED BARRIER RATINGS FOR FIRE LOADINGS⁽¹⁾

<u>Fire Loading</u> <u>BTU/ft.²</u>	<u>Required Barrier Rating</u>
40,000	30 minutes
80,000	1 hour
120,000	1½ hours
160,000	2 hours
200,000	2½ hours
240,000	3 hours

NOTES:

- (1) From National Fire Protection Association Handbook, 14th Edition, page 6-81.
- (2) "Combustible" is used to refer to any material or structure that can burn (National Fire Protection Association Handbook, 14th Edition, page A-39).

RBC

SOUTH CAROLINA ELECTRIC & GAS COMPANY

POST OFFICE BOX 764

COLUMBIA, SOUTH CAROLINA 29218

August 21, 1981

T. C. NICHOLS, JR.
VICE PRESIDENT AND GROUP EXECUTIVE
NUCLEAR OPERATIONS

Mr. Harold R. Denton
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Virgil C. Summer Nuclear Station
Docket No. 50/395
Fire Protection
SER Open Item 1.6.10

Dear Mr. Denton:

On July 7, 1981, a meeting was held between South Carolina Electric and Gas Company (SCE&G) and members of the NRC staff to discuss nine (9) items from the Virgil C. Summer Nuclear Station Safety Evaluation Report, Section 9.5.1 relative to the topic of fire protection. Pursuant to that meeting a letter, dated July 16, 1981, was sent providing responses to the items discussed. Subsequently, SCE&G now supplies additional information to fulfill and clarify commitments.

At the request of the NRC staff, SCE&G committed (see item 3 of the above referenced letter) to provide verification from the manufacturer of the three-hour rating of gypsum board construction used at the Virgil C. Summer Nuclear Station. Attached is a letter from U. S. Gypsum supplyin the required verification. Additional design information pertaining to the gypsum assembly is contained in section 2.2.3 of the Fire Protection Evaluation.

In reference to item 7 of the July 16th letter, it was stated that "the ladder opening between the A train switchgear cooling unit room and the B train switchgear room in the Intermediate Building will be filled in with grout and an opening will be provided between the A train cooling unit and the A train switchgear room for emergency exit." Upon more detailed investigation it was found that obstructions exist, preventing construction of an opening as described. Therefore, as an alternative action an enclosure will be constructed over the ladder opening providing a three hour separation between the A train switchgear cooling unit room and the B train switchgear room.

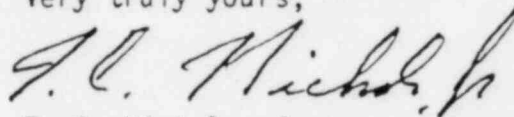
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Mr. H. R. Denton
August 21, 1981
Page Two

The statement "redundant trains of safe shutdown equipment or cable are not located here," referring to the backup heater transformer area on elevation 436' of the Auxiliary Building, is contained in item 6 of Attachment I of the July 16, letter. This area has been reviewed to identify and locate all circuits required for safe shutdown. This process indicated that there are no mutually redundant circuits within the area. Thus, a fire in the area would not cause any loss of function that would impair our ability to achieve safe shutdown and no additional fire protection is required.

If you have any questions, please let us know.

Very truly yours,



T. C. Nichols, Jr.

NEC:TCN:1kb

Attachment

cc: V. C. Summer
G. H. Fischer
T. C. Nichols, Jr.
H. N. Cyrus
J. C. Ruoff
D. A. Nauman
W. A. Williams Jr.
R. B. Clary
O. S. Bradham
A. R. Koon
M. N. Browne
B. A. Bursey
J. L. Skolds
H. E. Yocom
T. McAllister
J. B. Knotts, Jr.
NPCF
File

UNITED STATES GYPSUM COMPANY //

555 White Plains Road / Tarrytown, New York 10591

August 17, 1981

Mr. R.S. Bittle, R.A.
Gilbert Associates, Inc.
PO Box 1498
Reading, PA 19603

Re: Three (3) Hour Non-Load Bearing
Partition (Estimated Fire Rating)

Dear Mr. Bittle:

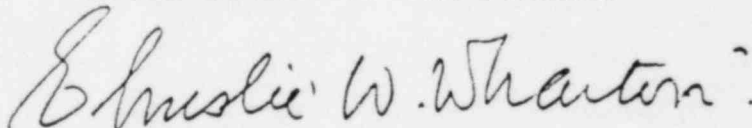
This is in reference to our recent telephone conversation regarding the subject assembly which consists of the following:

U.S.G. 3-1/2" or 5-1/2", 14 ga. steel studs at 12" and 16" o.c., double layers U.S.G. 1/2" Sheetrock Firecode "C" gypsum board each side of studs, DWC furring channels located horizontally at 16" o.c. each side; single finish layer 1/2" Sheetrock Firecode "C" gypsum board each side.

Based upon U.S.G.'s testing experience with fire rated gypsum board partitions including designs similar to the one described, our Research Dept. believes that the above described assembly using Sheetrock Firecode "C" gypsum panels could be expected to provide at least three (3) hours of fire protection.

Very truly yours,

UNITED STATES GYPSUM COMPANY



Elmslie W. Wharton
Technical Representative

EWW/dp