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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.

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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.

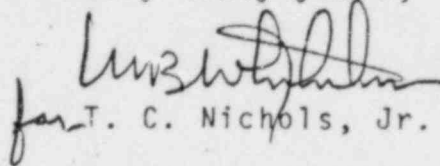
We consider that, excluding item 3 above, the areas of difference regarding SER section 9.5.1 discussed in the meeting of July 7 have been resolved as recorded in this letter and we request that the SER be promptly amended accordingly. Sufficient information has been provided for

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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
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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 IB 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 Loading 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).