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APPENDIX F

FIRE PROTECTION SAFE SHUTDOWN ANALYSIS
CLINTON POWER STATION UNIT 1

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* Note: Copies of these figures can be found in Appendix E.

FIRE PROTECTION SAFE SHUTDOWN ANALYSIS
CLINTON POWER STATION UNIT 1

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Number	Title
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9	General Arrangement - Control and Diesel-Generator Building Grade Floor Plan - Elevation 737'-0"
10	General Arrangement - Control and Diesel-Generator Building Mezzanine Floor Plan - Elevation 762'-0"
11	General Arrangement - Control Building Floor Plan Elevation 781'-0"
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13	General Arrangement - Control Building Ventilation Room Floor Plan - Elevation 825'-0"
14	General Arrangement - Radwaste Building Basement Plan Elevation 702'-0"
15	General Arrangement - Radwaste Building Intermediate Floor Plan - Elevation 720'-6"
16	General Arrangement - Radwaste Building Grade Floor Plan Elevation 737'-0"

* Note: Copies of these figures can be found in Appendix E.

LIST OF FIGURES: CABLE TRAY DRAWINGS* (Continued)

* Note: Copies of these figures can be found in Appendix E.

LIST OF FIGURES: FIRE PROTECTION DEVIATION DRAWINGS

LIST OF FIGURES: FIRE PROTECTION DEVIATION DRAWINGS (Continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

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5. System status monitoring provided

B. Cold Shutdown

1. Decay heat removal established for extended cooling of the reactor

2. System status monitoring provided

Once the reactor is placed in a hot shutdown condition, within 72 hours, station personnel are able to provide equipment lineups, connections, and/or temporary repairs as needed to achieve and maintain a cold shutdown condition.

1.8 SYSTEMS OPERATION AND EVALUATION METHOD

1.8.1 System Operation

Table 1.8-1 and Figures 1.8-1 through 1.8-7 show those systems necessary for safe shutdown and operation sequence by each method. Table 1.8-2 lists equipment and instruments required for safe shutdown. Table 1.8-1a provides the operating ranges of the safe shutdown systems and methods. Operation of the safe shutdown systems to meet the performance goals of Section 1.7 for hot and cold shutdown is described as follows:

- Method 1

  Cooldown and depressurization of the reactor pressure vessel is accomplished using safety relief valve (SRV) operation; reactor core isolation cooling (RCIC) (see Figure 1.8-1) will provide reactor pressure vessel makeup. RHR Loop A would be used for suppression pool cooling (see Figure 1.8-1) as needed. When pressure has decreased to approximately 96.5 psig in the reactor pressure vessel, the RHR system will be placed in shutdown cooling (see Figure 1.8-3) or alternate shutdown cooling (see Figure 1.8-4) using the RHR-loop A pump, SRV valves, and heat exchanger as necessary. The reactor can then be cooled to cold shutdown.

- Method 2

  Cooldown and depressurization of the reactor pressure vessel is accomplished by activating the automatic depressurization system (ADS) to open seven SRVs. When the reactor pressure vessel pressure is reduced sufficiently to allow low-pressure core injection (LPCI) flow, RHR pumps B and C can be used to provide reactor makeup (see Figure 1.8-5). When necessary, RHR Loop B can be diverted to provide suppression pool cooling (see Figure 1.8-5). At a pressure of approximately 96.5 psig in the reactor pressure vessel, the RHR Loop B pump and heat exchanger will be placed in shutdown cooling (see Figure 1.8-6) or alternate shutdown cooling (see Figure 1.8-7) using the RHR loop B pump, SRV valves, and heat exchanger as necessary. The reactor can then be cooled to cold shutdown.

- Method 3

Cooldown and depressurization of the reactor pressure vessel is accomplished using SRV operation; the high-pressure core spray (HPCS) system (see Figure 1.8-2) will provide reactor pressure vessel makeup. RHR Loop A would be used for suppression pool cooling (see Figure 1.8-2) as needed. When reactor pressure vessel pressure has decreased to approximately 96.5 psig, the RHR system will be placed in shutdown cooling (see Figure 1.8-3) or alternate shutdown cooling (see Figure 1.8-4) using the RHR Loop A pump, SRV valves, and heat exchanger. The reactor can then be cooled to cold shutdown.

o Method R

After taking immediate actions to scram the reactor and trip equipment/close valves from the MCR prior to evacuation, control of the plant will be established at the Remote Shutdown Panel (RSP). Cooldown and depressurization of the reactor pressure vessel is accomplished using safety relief valve (SRV) operation; reactor core isolation cooling (RCIC) (see Figure 1.8-1) will provide reactor pressure vessel makeup. RHR Loop A would be used for suppression pool cooling (see Figure 1.8-1) as needed. When pressure has decreased to approximately 96.5 psig in the reactor pressure vessel, the RHR system will be placed in shutdown cooling (see Figure 1.8-3) or alternate shutdown cooling (see Figure 1.8-4) using the RHR-loop A pump, SRV valves, and heat exchanger as necessary. The reactor can then be cooled to cold shutdown.

It should be noted that the alternate shutdown cooling methods of RHR operation described in the Methods above are not "alternative or dedicated shutdown capability" installed for 10 CFR 50 Appendix R compliance. These modes of RHR operation were part of the original plant design and serve to enhance the overall flexibility of RHR system operation.

Each of the shutdown methods described relies on its own supporting systems in order to effect a safe shutdown of the plant. Each shutdown method requires the following systems/equipment:

1. The shutdown service water system is used to transfer heat to the lake.

2. Class 1E switchgear, motor control centers, distribution panels, and batteries supply electrical power to various systems.

3. Diesel generators supply electrical power to the Class 1E switchgear in the event of a loss of offsite power.

4. Ventilation systems maintain the environmental conditions of various spaces where safe shutdown equipment is located.

5. Monitoring instruments indicate plant parameters to the operators.

Power and control cables are separated into three independent electrical divisions 1, 2, and 3 each serving separate safety-related systems. Division 4 has instrument cables only and is not identified as a safe shutdown system. However, some have been identified as associate circuits.

In this analysis the interrelations among Division 1, 2, and 3 power, control, and instrument cables were reviewed for fire damage, and evaluations were made for safe shutdown capability of the reactor. Tables 1.8-2 lists the safe shutdown equipment and instrumentation in each fire area. The operability of Method 1, 2, 3 or R safe shutdown equipment is ensured by fire protection measures designed to prevent a single fire from disabling all three methods of safe shutdown components. The use of IEEE-383 qualified cable in conjunction with the separation criteria utilized during the routing of safe shutdown cables and sealing all cable tray risers, with a 3-hour fire rated seal, at each floor/sealing penetration regardless of its rating provide sufficient protection against disabling redundant safe shutdown equipment by an internally generated cable fire. To protect against the effects of an exposure fire, each area of the plant with safe shutdown equipment was analyzed. Fire protection measures, in addition to separation, were provided where necessary to ensure the availability of safe shutdown equipment.

After analyzing all fire areas, it was determined that a fire in Fire Area CB-3 or CB-6 or in Fire Zone CB-1i or CB-5c could require that shutdown operations be conducted from the remote shutdown location.

o Remote Shutdown

The remote shutdown panel (RSP) is located in the auxiliary building at the 781-foot 0-inch elevation in Fire Zone A-2. Method 1 safe shutdown components will safely shut down the plant. Operation from the RSP is completely remote from the control room. After analyzing all fire areas, it was determined that a fire in the following fire area or zones could require operation from the RSP: CB-3, CB-6a, CB-6d, CB-5c, and the west side of CB-1i. Remote Shutdown is supplemented by transfer and control switches at MCC 1A2 for operation of Feedwater Shutoff valves 1B21-F065A and 1B21-F065B completely remote from control room. Remote Shutdown is also supplemented by transfer and control switches at MCC 1A3:

- closing of valve 1B21-F019 (Main Steam Line Outboard Drain Isolation Valve)
- closing of valve 1G33-F004 (RWCU Pump Suction Outboard Isolation Valve) and
- control of valve 1IA012A (Compressed Gas Header Outboard Isolation Valve) completely remote from control room.

Essential mechanical, ventilation, instrumentation, and electrical components needed for all the safe shutdown methods are listed in Table 1.8-2. Detailed descriptions of the contents of each fire area are provided in the Fire Protection Evaluation Report. Figures FP-2 through FP-36 ("a" series) provide the outline of all fire areas and fire zones.

1.8.2 Evaluation Method

A Safe Shutdown Equipment List (SSEL), Table 1.8-2, was developed through a review of safe shutdown methods, systems, and components, including all valves and instruments required for safe shutdown or whose spurious operation could adversely impact safe shutdown (including automatic ECCS initiation and the impact of IN 87-50).

Based on the SSEL, circuit analyses were performed for each safe shutdown system and component. These circuit analyses identified the associated cables for the required safe shutdown state during normal operation, and established that a loss of motive or control power would not result in a change of position or status detrimental to Safe Shutdown. The results of the circuit analysis becomes the data used to assure safe shutdown cables required for a particular fire area are available.

For electrical cables routed through an area, the safe shutdown method and associated division, system, and/or component served by the cables were identified. A determination was then made of the effects of the fire on the safe shutdown systems. The acceptance criteria for the analysis of each fire area are as follows:

1. The cables are not required for safe shutdown.

2. The cables are part of only one safe shutdown division or method.

3. A fault in the cable would not prevent a system from performing its intended function.

Cables not meeting any of the above three criteria were identified as not acceptable, and necessary modifications were made to provide an adequate level of protection commensurate with 10 CFR 50 Appendix R. Deviations are discussed in Section 4.2, including the safe shutdown cables as noted on the figures referenced therein.

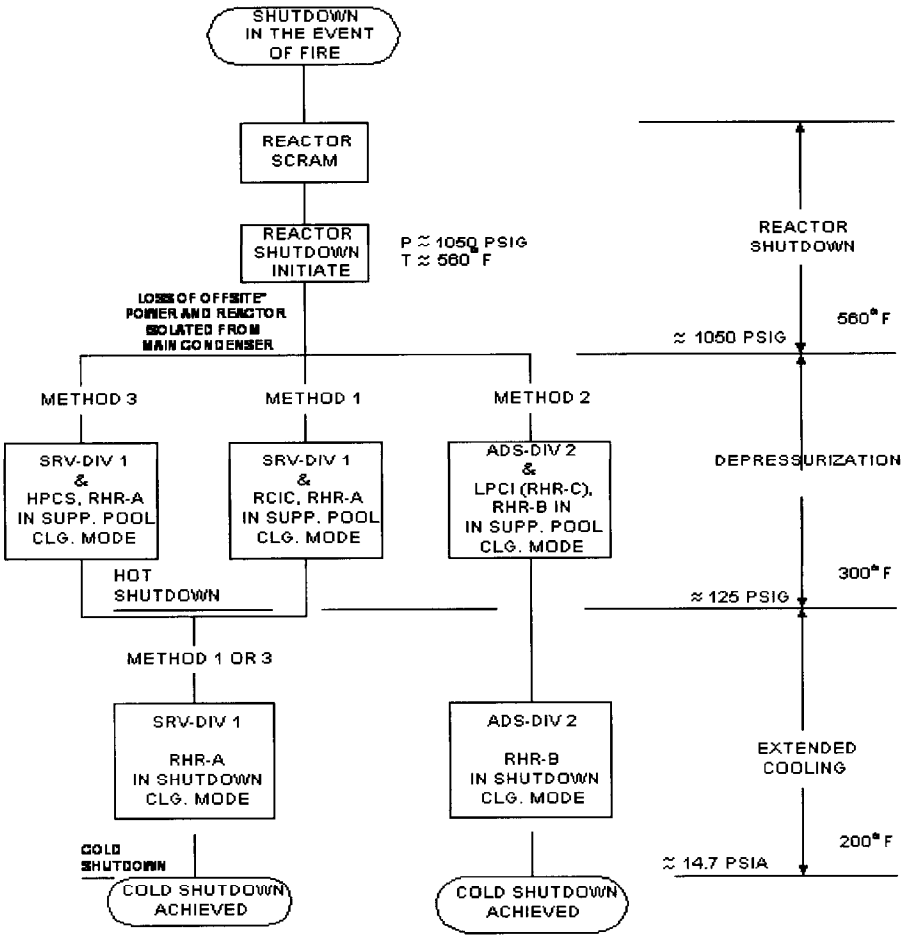
The results of the analyses of the fire areas are described in Section 3.0 of this report.

TABLE 1.8-1
PRIMARY SYSTEMS FOR SAFE SHUTDOWN OF THE REACTOR

Function Purpose	Safe Shutdown Method 1	Safe Shutdown Method 2	Safe Shutdown Method 3
A. Hot Shutdown			
Reactor Scram	Manual Scram	Manual Scram	Manual Scram
Decay Heat Removal and Reactor Water Makeup	SRV Division 1 RCIC	ADS Division 2 RHR Loop C (LPCI)	SRV Division 1 HPCS
Suppression Pool Cooling	RHR Loop A	RHR Loop B	RHR Loop A
B. Cold Shutdown			
Decay Heat Removal	RHR Loop A	RHR Loop B	RHR Loop A
SUPPORT SYSTEMS FOR SAFE SHUTDOWN			
HVAC			
Main Control Room HVAC	Division 1*	Division 2	Division 1
ECCS Equipment Room HVAC	Division 1	Division 2	Division 1 and 3
Shutdown Service Water Pump Room HVAC	Division 1	Division 2	Division 1 and 3
Diesel Room HVAC	Division 1	Division 2	Division 1 and 3
Essential Switchgear Heat Removal Including Refrigeration	Division 1	Division 2	Division 1 and 3
Service Water System			
Shutdown Service Water	Division 1	Division 2	Division 1 and 3
Electrical			
Diesel Generator	Division 1	Division 2	Division 1 and 3
Diesel Fuel Oil	Division 1	Division 2	Division 1 and 3
AC Power System	Division 1	Division 2	Division 1 and 3
DC Power System	Division 1	Division 2	Division 1 and 3

* Unless Shutdown is being performed from the Remote Shutdown Panel (Method R).

TABLE 1.8-1A
SAFE SHUTDOWN SEQUENCE DURING A FIRE



* Offsite Power is assumed not available, except for areas where both of the following have been demonstrated:
(1) Analysis has shown that the fire will not cause a loss of offsite power, and
(2) Dedicated or alternate shutdown capability (per 10CFR50 Appendix R, section III.G.3 and III.L) is not required for safe shutdown.

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
RHR-A PUMP MINIMUM FLOW TRANSMITTER	1E12-N052A	1	1, 3	707' 6"	121/Z	A-2B
RHR A PUMP DISCH PRESSURE TRANSMITTER	1E12-N055A	1	1, 2, 3, R	707' 6"	121/Z	A-2B
RHR A PUMP DISCH PRESSURE TRANSMITTER	1E12-N056A	1	1, 2, 3, R	707' 6"	121/Z	A-2B
RHR EQUIP AREA 1 TEMPERATURE ELEMENT	1E31-N018A	1	1, 2, 3	720’ 0”	114/V	A-2B
RHR EQUIP AREA 1 TEMPERATURE ELEMENT	1E31-N018B	2	1, 2, 3	718’ 0”	117/V	A-2B
RHR EQUIP AREA 1 INLET TEMPERATURE ELEMENT	1E31-N027A	1	1, 2, 3	709’ 0”	117/X	A-2B
RHR EQUIP AREA 1 INLET TEMPERATURE ELEMENT	1E31-N027B	2	1, 2, 3	709’ 0”	117/X	A-2B
RHR EQUIP AREA 1 OUTLET TEMPERATURE ELEMENT	1E31-N028A	1	1, 2, 3	709’ 0”	117/X	A-2B
RHR EQUIP AREA 1 OUTLET TEMPERATURE ELEMENT	1E31-N028B	2	1, 2, 3	709’ 0”	117/X	A-2B
RCIC PP MIN FLOW RECIRC SUPP POOL VLV	1E51-F019	1	1, R	739' 0"	114-117/Z	A-2B
RCIC PP 1ST TEST VALV TO COND STG TANK	1E51-F022	1	1, R	763' 9"	114-117/X-Z	A-2B
RCIC PP 2ND TEST VALV TO COND STG TANK	1E51-F059	1	1, R	763' 9"	117/X-Z	A-2B
RCIC EXH VACUUM BRKR ISO INBOARD VALVE	1E51-F078	2	1, R	737' 0"	114-117/X-Z	A-2B
RHR HX A COIL CABINET OUTLET VALVE	1SX023A	1	1, 3, R	707" 0"	117/X	A-2B
RHR PP RM 1A COIL CAB SSW OUTLET VALVE	1SX027A	1	1, 3, R	707' 0"	117-119/V	A-2B
RHR PP 1A SEAL CLR SSW OUTLET VALVE	1SX029A	1	1, 3, R	708' 0"	121/V	A-2B
RHR HX 1A DEMIN WATER SUPPLY CHECK VALVE	1SX083A	N/A	1, 3, R	730’ 0”	117/V	A-2B
RHR HX SSW BYPASS VALVE	1SX173A	N/A (NOTE 8)	1, 3, R	707' 0"	117/U6	A-2B
RHR HT EXCH RM "A" SUPPLY FAN RTD	1TE-VY003	1	1, 3, R	712' 0"	117/Y	A-2B
ECCS RHR PUMP ROOM A CLG COIL A	1VY02AA	N/A	1, 3, R	707' 6"	117-119/X-V	A-2B
ECCS RHR PUMP ROOM A CLG COIL B	1VY02AB	N/A	1, 3, R	707' 6"	117-119/X-V	A-2B
ECCS RHR PUMP ROOM A SUPPLY FAN	1VY02C	1	1, 3, R	707' 6"	117-119/X-V	A-2B
ECCS RHR PUMP ROOM A COIL CABINET	1VY02S	N/A	1, 3, R	707' 6"	117-119/X-V	A-2B
ECCS RHR HX A ROOM CLG COIL A	1VY03AA	N/A	1, 3, R	707' 6"	114-117/X	A-2B
ECCS RHR HX A ROOM CLG COIL B	1VY03AB	N/A	1, 3, R	707' 6"	114-117/X	A-2B
ECCS RHR HX A ROOM SUPPLY FAN	1VY03C	1	1, 3, R	707' 6"	114-117/X	A-2B
ECCS RHR HX A ROOM COIL CABINET	1VY03S	N/A	1, 3, R	707' 6"	114-117/X	A-2B
RHR TEST VALVE TO SUPP POOL	1E12-F024A	1	1, 3, R	713' 0"	123-124/AB-AC	A-2C
LPCS PUMP	1E21-C001	1	1, 3	707’ 6”	112/V	A-2C
LPCS PUMP SUCTION VALVE	1E21-F001	1	1, 3	726’ 0”	122/AB	A-2C
LPCS FLUSH AND DRAIN VALVE	1E21-F008	N/A	1, 3	716’ 0”	123/AB	A-2C
LPCS PUMP MINIMUM FLOW VALVE	1E21-F011	1	1, 3	707’ 6”	124/Z	A-2C
LPCS PUMP TEST VALVE	1E21-F012	1	1, 3	712’ 0”	124/AC	A-2C
LPCS WATER LEG PUMP DISCHARGE CHECK VALVE	1E21-F033	N/A	1,3	707’	123/V	A-2C

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
RHR PISTON CHECK VALVE	1E12-F495A	N/A	1, 2, 3, R	763' 0"	112/X	A-2F
RHR PISTON CHECK VALVE	1E12-F495B	N/A	1, 2, 3, R	763' 0"	112/X	A-2F
RHR PISTON CHECK VALVE	1E12-F499A	N/A	1, 2, 3, R	763' 0"	112/X	A-2F
RHR PISTON CHECK VALVE	1E12-F499B	N/A	1, 2, 3, R	763' 0"	112/X	A-2F
STEAM TUNNEL OUTLET TEMPERATURE ELEMENT	1E31-N030B	2	1	779' 0"	114/U	A-2F
STEAM TUNNEL TEMPERATURE ELEMENT	1E31-N031A	1	1	775' 0"	114/X	A-2F
STEAM TUNNEL TEMPERATURE ELEMENT	1E31-N031B	2	1	775' 0"	110/X	A-2F
MSIVLCS INBOARD BLEED VALVE	1E32-F001A	1	1, 2, 3	758' 0"	112/X	A-2F
MSIVLCS INBOARD BLEED VALVE	1E32-F001E	1	1, 2, 3	758' 0"	112/X	A-2F
MSIVLCS INBOARD BLEED VALVE	1E32-F001J	1	1, 2, 3	757' 0"	112/X	A-2F
MSIVLCS INBOARD BLEED VALVE	1E32-F001N	1	1, 2, 3	758' 0"	112/X	A-2F
MSIVLCS INBOARD BLEED VALVE	1E32-F002A	1	1, 2, 3	756' 0"	112/X	A-2F
MSIVLCS INBOARD BLEED VALVE	1E32-F002E	1	1, 2, 3	757' 0"	112/X	A-2F
MSIVLCS INBOARD BLEED VALVE	1E32-F002J	1	1, 2, 3	757' 0"	112/X	A-2F
MSIVLCS INBOARD BLEED VALVE	1E32-F002N	1	1, 2, 3	757' 0"	112/X	A-2F
RCIC INJECTION SHUTOFF VALVE	1E51-F013	1	1, R	756' 6"	112/X	A-2F
RCIC STEAM SUP LINE OUTBD ISO VALVE	1E51-F064	1	1, 2, 3, R	758' 0"	110-112/X	A-2F
RWCU DRAIN FLOW INBOARD ISOL VALVE	1G33-F004	1	1, 3, R	758' 0"	114/X	A-2F
RWCU TO RHR-A CHECK VALVE	1G33-F052A	N/A	1, 3, R	755' 0"	114/Y	A-2F
RWCU TO RHR-B CHECK VALVE	1G33-F052B	N/A	2	755' 0"	112/Y	A-2F
SWGR HEAT REMVL MODULATION DAMPER	1VX04YA(1 FZ-VX004)	1	1, 3, R	772' 0"	124/AC	A-2K
RHR LPCI INJECTION SHUTOFF VALVE	1E12-F027A	1	1, 3, R	764' 3"	121-123/AB-AC	A-2M
SRV BACKUP AIR SUPPLY ISO VALVE	1IA012A	1	1, 3, R	762' 0"	121/AB	A-2M
4.16 KV SWGR 1-A-1	1AP07E	1	1, 3, R	781' 0"	122/U-V	A-2N
DIESEL GENERATOR 1-A 4.16 KV FEED BREAKER	1AP07EC	1	1, 3, R	781' 0"	122/U-V	A-2N
4.16 KV SWGR 1-A-1 RESERVE FEED BREAKER	1AP07EH	1	1, 3, R	781' 0"	122/U-V	A-2N
4.16 KV FEED BREAKER	1AP07EJ	1	1, 3, R	781' 0"	122/U-V	A-2N
4.16 KV SWGR 1-A-1 MAIN FEED BREAKER	1AP07EK	1	1, 3, R	781' 0"	122/U-V	A-2N
480V SUBSTATION 1-A	1AP11E	1	1, 3, R	781' 0"	117-119/X-Z	A-2N
480 VAC AUX TRANSFORMER 1A	1AP11E2	1	1, 3, R	781' 0"	117-119/X-Z	A-2N
AUX BLDG MCC 1-A-1	1AP72E	1	1, 3, R	781' 0"	119-122/X	A-2N
120 VAC POWER DISTRIBUTION PANEL	1AP72E9B	1	1, 3, R	781' 0"	119-122/X	A-2N
120 VAC DISTRIBUTION TRANSFORMER	1AP72E9C	1	1, 3, R	781' 0"	119-122/X	A-2N
AUX BLDG MCC 1-A-2	1AP73E	1	1, 3, R	781' 0"	119-121/X-U	A-2N
AUX BLDG MCC 1-A-3	1AP74E	1	1, 3, R	781' 0"	119X-U	A-2N
AUX BLDG MCC 1-A-4	1AP93E	1	1, 3, R	781' 0"	121/X-U	A-2N

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
RCIC TURB. SPEED CONTROL SQ RT CONVERTER	1C61-K001	1	R	781' 0"	121/V-U	A-2N
RHR A FLOW TRANSMITTER	1C61-N001	1	R	707' 6"	117-121/Z-AA	A-2N
REMOTE SHUTDOWN PANEL	1C61-P001	1	R	781' 0"	121/V-U	A-2N
RCIC TURB. SPEED CONTROL FLOW CONTROLLER	1C61-R001	1	R	781' 0"	121/V-U	A-2N
RCIC TURB. SPEED CONTROL FLOW INDICATOR	1C61-R001-1	1	R	781' 0"	121/V-U	A-2N
RCIC TURB. SPEED IND	1C61-R003	1	R	781' 0"	121/V-U	A-2N
RHR A FLOW INDICATOR	1C61-R005	1	R	781' 0"	121/V-U	A-2N
RPV LEVEL INDICATOR	1C61-R010	1	R	781' 0"	121/V-U	A-2N
RPV PRESSURE INDICATOR	1C61-R011	1	R	781' 0"	121/V-U	A-2N
SSW PUMP 1A DISCH PRESSURE INDICATOR	1C61-R503	1	R	781' 0"	121/V-U	A-2N
SUPP POOL LEVEL INDICATOR	1C61-R504	1	R	781' 0"	121/V-U	A-2N
RCIC STORAGE TANK LEVEL INDICATOR	1C61-R505	1	R	781' 0"	121/V-U	A-2N
SUPP POOL TEMPERATURE INDICATOR	1C61-R506	1	R	781' 0"	121/V-U	A-2N
SUPP POOL TEMPERATURE INDICATOR	1C61-R507	1	R	781' 0"	121/V-U	A-2N
SUPP POOL TEMPERATURE INDICATOR	1C61-R508	1	R	781' 0"	121/V-U	A-2N
SUPP POOL LEVEL INDICATOR	1C61-R511	2	2	781' 0"	121/V-U	A-2N
SUPP POOL TEMPERATURE IND	1C61-R512	2	R	781' 0"	121/V-U	A-2N
SUPP POOL TEMPERATURE IND	1C61-R513	2	R	781' 0"	121/V-U	A-2N
SUPP POOL TEMPERATURE IND	1C61-R514	2	R	781' 0"	121/V-U	A-2N
125 VDC BATTERY CHARGER 1-A	1DC06E	1	1, 3, R	781' 0"	121/V-X	A-2N
125 VDC MCC 1-A	1DC13E	1	1, 3, R	781' 0"	117-119/V	A-2N
125 VDC POWER DISTRIBUTION PANEL 1A	1DC13E11A	1	1, 3, R	781' 0"	117-119/V	A-2N
COND UNIT 1VX06CA PRESSURE CONTROLLER	1PC-VX112	1	1, 3, R	786' 0"	124/Z	A-2N
SWGR HEAT REMOVAL SUPPLY FAN PRESS DIFF SWITCH	1PDS-VX016	1	1, 3, R	781' 0"	124/AC	A-2N
COND UNIT 1VX06CA PRESS SWITCH	1PS-VX112A	1	1, 3, R	781' 0"	124/AB	A-2N
COND UNIT 1VX06CA PRESS SWITCH	1PS-VX112B	1	1, 3, R	781' 0"	124/AB	A-2N
COND UNIT 1VX06CA PRESS SWITCH	1PS-VX112C	1	1, 3, R	781' 0"	124/AB	A-2N
COND UNIT 1VX06CA PRESSURE TRANSMITTER	1PT-VX112	1	1, 3, R	786' 0"	124/Z	A-2N
VX COOLING COIL REFRIG INLET VALVE	1RG06MA	1	1, 3, R	781'0"	124/AB	A-2N
VX COOLING COIL REFRIG INLET VALVE	1RG06MB	1	1, 3, R	781' 0"	124/AB	A-2N
VX COOLING COIL REFRIG INLET VALVE	1RG06ME	1	1, 3, R	781' 0"	124/AB	A-2N
VX COOLING COIL REFRIG INLET VALVE	1RG06MF	1	1, 3, R	781' 0"	124/AB	A-2N
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MA	N/A	3	781' 0"	124/AB	A-2N
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MB	N/A	3	781' 0"	124/AB	A-2N
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07ME	N/A	3	781' 0"	124/AB	A-2N
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MF	N/A	3	781' 0"	124/AB	A-2N
VX COOLING COIL REFRIG BYPASS VALVE	1RG12MA	1	1, 3, R	781' 0"	124/AA	A-2N

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
SSW SUPPLY TO RHR ISOLATION VALVE	1E12-F096	2	2	707' 6	107/V	A-3A
RHR B HX INLET TEMPERATURE ELEMENT	1E12-N004B	N/A	2	781' 0"	101/V	A-3A
SSWS B FLOW TRANSMITTER	1E12-N007B	2	2	707' 6"	105-107/V-Z	A-3A
RHR B FLOW TRANSMITTER	1E12-N015B	2	2	707' 6"	105-104/V-Z	A-3A
RHR-B PUMP MINIMUM FLOW TRANSMITTER	1E12-N052B	2	2	707' 6"	107/X	A-3A
RHR B PUMP DISCH PRESSURE TRANSMITTER	1E12-N055B	2	1, 2, 3, R	707' 6"	107/X	A-3A
RHR B PUMP DISCH PRESSURE TRANSMITTER	1E12-N056B	2	1, 2, 3, R	707' 6"	107/X	A-3A
RHR EQUIP AREA 2 TEMPERATURE ELEMENT	1E31-N001A	1	1, 2, 3	720' 0"	107/V	A-3A
RHR EQUIP AREA 2 TEMPERATURE ELEMENT	1E31-N001B	2	1, 2, 3	718' 0"	110/V	A-3A
RHR EQUIP AREA 2 INLET TEMPERATURE ELEMENT	1E31-N002A	1	1, 2, 3	709' 0"	110/X	A-3A
RHR EQUIP AREA 2 INLET TEMPERATURE ELEMENT	1E31-N002B	2	1, 2, 3	715' 0"	110/X	A-3A
RHR EQUIP AREA 2 OUTLET TEMPERATURE ELEMENT	1E31-N003A	1	1, 2, 3	709' 0"	110/X	A-3A
RHR EQUIP AREA 2 OUTLET TEMPERATURE ELEMENT	1E31-N003B	2	1, 2, 3	715' 0"	110/X	A-3A
RCIC STEAM SUPPLY PRESSURE TRANSMITTER	1E31-N083B	2	1	707' 6"	107/X	A-3A
RCIC EXHAUST RUPTURE DIAPHRAGM PRESSURE TRANSMITTER	1E51-N055B	2	1	707' 6"	107/X	A-3A
RCIC EXHAUST RUPTURE DIAPHRAGM PRESSURE TRANSMITTER	1E51-N055F	2	1	707' 6"	107/X	A-3A
RHR HX B COIL CABINET OUTLET VALVE	1SX023B	2	2	707' 0"	110/V	A-3A
RHR PP RM 1B COIL CAB SSW OUTLET VALVE	1SX027B	2	2	707' 0"	106/V	A-3A
RHR PP 1B SEAL CLR SSW OUTLET VALVE	1SX029B	2	2	707' 0"	105/V	A-3A
RHR HX 1B DEMIN WATER SUPPLY CHECK VALVE	1SX083B	N/A	2	727' 0"	108/V.6	A-3A
RHR HX SSW BYPASS VALVE	1SX173B	N/A (NOTE 8)	2	707' 0"	107/U	A-3A
RHR HT EXCH RM "B" SUPPLY FAN RTD	1TE-VY005	2	2	712' 0"	110/V	A-3A
ECCS RHR HX ROOM 1-B COOL COIL A	1VY05AA	N/A	2	707' 6"	107-110/X	A-3A
ECCS RHR HX ROOM 1-B COOL COIL B	1VY05AB	N/A	2	707' 6"	107-110/X	A-3A
ECCS RHR HX B ROOM SUPPLY FAN	1VY05C	2	2	707' 6"	107/110/X	A-3A
ECCS RHR HX ROOM 1-B COIL CABINET	1VY05S	N/A	2	707' 6"	107-110/X	A-3A
ECCS RHR B PUMP ROOM CLG COIL A	1VY06AA	N/A	2	707' 6"	106-107/X-V	A-3A
ECCS RHR B PUMP ROOM CLG COIL B	1VY06AB	N/A	2	707' 6"	106-107/X-V	A-3A
ECCS RHR PUMP ROOM B SUPPLY FAN	1VY06C	2	2	707' 6"	106-107/X-V	A-3A
ECCS RHR B PUMP ROOM COIL CAB	1VY06S	N/A	2	707' 6"	106-107/X-V	A-3A
ECCS RHR C PUMP ROOM COIL CABINET	1VY07S	N/A	2	707' 6"	102-104/X-Z	A-3A
RHR PUMP 1-C	1E12-C002C	2	2	707' 6"	102-105/V-X	A-3B
RHR-C FLUSHING WATER SUPPLY ISOL VALVE	1E12-F063C	N/A	2	737' 0"	103/AC	A-3B

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
RHR PUMP MINIMUM FLOW VALVE	1E12-F064C	2	2	707' 6"	105/X	A-3B
RHR-A/B TO RHR-C CROSS TIE ISOLATION VALVE	1E12-F067	N/A	1, 2, 3, R	707’ 6”	104/Z	A-3B
RHR-C PUMP DISCHARGE SAMPLE ISOL VALVE	1E12-F072C	N/A	2	712’ 0”	103/V	A-3B
RHR-C WATER LEG PUMP SUPPLY CHECK VLV	1E12-F084C	N/A	2	712’ 0”	103/V	A-3B
SX SUPPLY TO RHR-B CHECK VALVE	1E12-F098	N/A	2	707’ 6”	107/V	A-3B
RHR PUMP C SUCTION VALVE	1E12-F105	2	2	720' 0"	105/AB	A-3B
RHR C FLOW TRANSMITTER	1E12-N015C	2	2	707' 6"	102-105/V-Z	A-3B
RHR-C PUMP MINIMUM FLOW TRANSMITTER	1E12-N052C	2	2	707' 6"	102/V	A-3B
RHR C PUMP DISCH PRESSURE TRANSMITTER	1E12-N055C	2	1, 2, 3, R	707' 6"	102/V.5	A-3B
RHR C PUMP DISCH PRESSURE TRANSMITTER	1E12-N056C	2	1, 2, 3, R	707' 6"	102/V.5	A-3B
RHR PP RM 1C COIL CAB SSW OUTLET VALVE	1SX027C	2	2	712’ 0”	102/V	A-3B
RHR PP 1C SEAL CLR SSW OUTLET VALVE	1SX029C	2	2	708' 0"	105-106/V	A-3B
ECCS RHR C PUMP ROOM COOLING COIL A	1VY07AA	N/A	2	707' 6"	102-104/X-Z	A-3B
ECCS RHR C PUMP ROOM COOLING COIL B	1VY07AB	N/A	2	707' 6"	102-104/X-Z	A-3B
ECCS RHR C PUMP ROOM SUPPLY FAN	1VY07C	2	2	707' 6"	102-104/X-Z	A-3B
RHR PUMP C TEST VALVE TO SUPP POOL	1E12-F021	2	2	724' 6"	102-103/AC-AD	A-3C
MDFW PUMP BREAKER	1AP05EF	N/A	1, 2, 3, R	762’ 0”	106/U	A-3D
SWGR HEAT REMVL MODULATION DAMPER	1VX04YB (1FZ-VX005)	2	2	772’ 0”	102/AC	A-3D
RHR-B HX FIRST VENT TO SUPP POOL VALVE	1E12-F074B	NOTE 2	2	762’ 0”	105/AB	A-3E
4.16 KV SWGR 1-B-1	1AP09E	2	2	781' 0"	102/AC	A-3F
4.16 KV SWGR 1-B-1 MAIN FEED BREAKER	1AP09EA	2	2	781' 0"	102/AC	A-3F
4.16 KV FEED BREAKER	1AP09EB	2	2	781' 0"	102/AC	A-3F
4.16 KV SWGR 1-B-1 RESERVE FEED BREAKER	1AP09EC	2	2	781' 0"	102/AC	A-3F
DIESEL GENERATOR 1-B 4.16 KV FEED BREAKER	1AP09EH	2	2	781' 0"	102/AC	A-3F
480V SUBSTATION 1-B	1AP12E	2	2	781' 0"	104/U-V	A-3F
480 VAC AUX TRANSFORMER 1B	1AP12E2	2	2	781' 0"	102/AC	A-3F
AUX BLDG MCC 1-B-1	1AP75E	2	2	781' 0"	106-107/X-Z	A-3F
120 VAC POWER DISTRIBUTION PANEL	1AP75E7B	2	2	781' 0"	106/U-V	A-3F
120 VAC DISTRIBUTION TRANSFORMER	1AP75E7C	2	2	781' 0"	106-107/X-Z	A-3F
AUX BLDG MCC 1-B-2	1AP76E	2	2	781' 0"	106/U-V	A-3F
AUX BLDG MCC 1-B-3	1AP77E	2	2	781' 0"	105-106/U-V	A-3F
AUX BLDG MCC 1-B-4	1AP94E	2	2	781' 0"	104-106/X-Z	A-3F
125 VDC BATTERY CHARGER 1-B	1DC07E	2	2	781' 0"	105/V-X	A-3F
125 VDC MCC 1-B	1DC14E	2	2	781' 0"	106-107/U-V	A-3F
125 VDC POWER DISTRIBUTION PANEL 1B	1DC14E4A	2	2	781' 0"	106-107/U-V	A-3F
COND UNIT 1VX06CB PRESSURE CONTROLLER	1PC-VX114	2	2	786’ 0”	102/Z	A-3F

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
SWGR HEAT REMOVAL SUPPLY FAN PRESS DIFF SWITCH	1PDS-VX017	2	2	781' 0"	103/AB	A-3F
COND UNIT 1VX06CB PRESS SWITCH	1PS-VX114A	2	2	781' 0"	102/AB	A-3F
COND UNIT 1VX06CB PRESS SWITCH	1PS-VX114B	2	2	781' 0"	102/AB	A-3F
COND UNIT 1VX06CB PRESS SWITCH	1PS-VX114C	2	2	781' 0"	102/AB	A-3F
COND UNIT 1VX06CB PRESSURE TRANSMITTER	1PT-VX114	2	2	786' 0"	102/Z	A-3F
VX COOLING COIL REFRIG INLET VALVE	1RG06MC	2	2	781' 0	102/AB-AC	A-3F
VX COOLING COIL REFRIG INLET VALVE	1RG06MD	2	2	781' 0"	102/AB-AC	A-3F
VX COOLING COIL REFRIG INLET VALVE	1RG06MG	2	2	781' 0	102/AB-AC	A-3F
VX COOLING COIL REFRIG INLET VALVE	1RG06MH	2	2	781' 0"	102/AB-AC	A-3F
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MC	N/A	2	781' 0"	102/AB-AC	A-3F
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MD	N/A	2	781' 0"	102/AB-AC	A-3F
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MG	N/A	2	781' 0"	102/AB-AC	A-3F
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MH	N/A	2	781' 0"	102/AB-AC	A-3F
VX COOLING COIL REFRIG BYPASS VALVE	1RG12MB	2	2	781' 0"	102/AB-Z	A-3F
DIV 2 SWGR HT REM COND SSW OUTLET VALVE	1SX025B	2	2	781' 0"	102/AB-Z	A-3F
SWGR HEAT REMOVAL SUPPLY FAN RTD	1TE-VX002	2	2	786' 0"	105/V	A-3F
COND UNIT 1VX06CB TEMP SWITCH	1TS-VX601B	2	2	781' 0"	102/AB	A-3F
COND UNIT 1VX06CB TEMP SWITCH	1TS-VX603B	2	2	781' 0"	102/AB	A-3F
COND UNIT 1VX06CB TEMP SWITCH	1TS-VX604B	2	2	781' 0"	102/AB	A-3F
SWITCHGEAR HEAT REMOVAL COIL CAB B	1VX02SB	N/A	2	781' 0"	102/AB-Z	A-3F
SWITCHGEAR HEAR REMOVAL FAN	1VX03CB	2	2	781' 0"	102/AC	A-3F
SWITCHGEAR HEAT REMVL MOD DAMPER	1VX03YB (1FZ-VX002)	2	2	781' 0"	102/AC-AD	A-3F
SWITCHGEAR HEAT REMOVAL COND UNIT	1VX06CB	2	2	781' 0"	102/AC-AD	A-3F
SWITCHGEAR HEAT REMOVAL COOLING COIL	1VX08AB	N/A	2	781' 0"	102/AB-Z	A-3F
SWITCHGEAR HT REM PKG FILTER	1VX09FB	N/A	2	781' 0"	102/AC	A-3F
125 VDC BATTERY 1-A	1DC01E	1	1, 3, R	781' 0"	114-117/S-U	A-4
125 VDC BATTERY 1-B	1DC02E	2	2	781' 0"	107-110/S-U	A-5
FEEDWATER SUPPLY CHECK VALVE	1B21-F010A	N/A	1, 2, 3, R	764' 0"	112/AZ10	C-1
FEEDWATER SUPPLY CHECK VALVE	1B21-F010B	N/A	1, 2, 3, R	764' 0"	112/AZ345	C-1
MS INBOARD DRAIN ISOLATION VALVE	1B21-F016	2	2	755' 0"	112/AZ345	C-1
INBOARD MSIV A	1B21-F022A	1, 2	1, 2, 3, R	764' 0"	112/AZ0	C-1
INBOARD MSIV B	1B21-F022B	1, 2	1, 2, 3, R	771' 0"	112/AZ344	C-1
INBOARD MSIV C	1B21-F022C	1, 2	1, 2, 3, R	771' 0"	112/AZ15	C-1
INBOARD MSIV D	1B21-F022D	1, 2	1, 2, 3, R	767' 0"	112/AZ354	C-1
SAFETY RELIEF VALVE	1B21-F041A	1, 2	1, 2, 3, R	774' 3"	112/AZ52	C-1
SAFETY RELIEF VALVE (ADS)	1B21-F041B	2, 1	1, 2, 3, R	774' 5"	112/AZ278	C-1

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
SAFETY RELIEF VALVE (ADS)	1B21-F041C	2, 1	1, 2, 3, R	774' 5"	112/AZ88	C-1
SAFETY RELIEF VALVE (ADS)	1B21-F041D	2, 1	1, 2, 3, R	774' 3"	112/AZ309	C-1
SAFETY RELIEF VALVE (ADS)	1B21-F041F	2, 1	1, 2, 3, R	774' 3"	112/AZ296	C-1
SAFETY RELIEF VALVE	1B21-F041G	1, 2	1, 2, 3, R	774' 4"	112/AZ77	C-1
SAFETY RELIEF VALVE	1B21-F041L	1, 2	1, 2, 3, R	774' 3"	112/AZ65	C-1
SAFETY RELIEF VALVE (ADS)	1B21-F047A	2, 1	1, 2, 3, R	774' 3"	112/AZ35	C-1
SAFETY RELIEF VALVE	1B21-F047B	1, 2	1, 2, 3, R	774' 5"	112/AZ270	C-1
SAFETY RELIEF VALVE (ADS)	1B21-F047C	2, 1	1, 2, 3, R	774' 4"	112/AZ70	C-1
SAFETY RELIEF VALVE	1B21-F047D	1, 2	1, 2, 3, R	774' 3"	112/AZ316	C-1
SAFETY RELIEF VALVE	1B21-F047F	1, 2	1, 2, 3, R	774' 3"	112/AZ302	C-1
SAFETY RELIEF VALVE	1B21-F051B	1, 2	1, 2, 3, R	774' 4"	112/AZ282	C-1
SAFETY RELIEF VALVE	1B21-F051C	1, 2	1, 2, 3, R	774' 5"	112/AZ83	C-1
SAFETY RELIEF VALVE	1B21-F051D	1, 2	1, 2, 3, R	774' 3"	112/AZ325	C-1
SAFETY RELIEF VALVE (ADS)	1B21-F051G	2, 1	1, 2, 3, R	774' 3"	112/AZ59	C-1
SLCS LOCKED MANUAL VALVE	1C41-F008	N/A	1, 2, 3, R	762' 0"	112/AZ185	C-1
SLCS INJECTION CHECK VALVE	1C41-F336	N/A	1, 2, 3, R	746' 0"	112/AZ220	C-1
S/D CLG INBD SUCTION ISO VALVE	1E12-F009	2	1, 2, 3, R	747' 9"	112/AZ0	C-1
RHR A INJECTION CHECK VALVE	1E12-F041A	N/A	1, 2, 3, R	760' 0"	112/AZ45	C-1
RHR B INJECTION CHECK VALVE	1E12-F041B	N/A	1, 2, 3, R	760' 0"	112/AZ215	C-1
RHR C INJECTION CHECK VALVE	1E12-F041C	N/A	1, 2, 3, R	767' 0"	112/AZ140	C-1
RHR A INJECTION CHECK VALVE BYPASS VALVE	1E12-F301A	NOTE 6	1, 2, 3, R	760' 0"	112/AZ45	C-1
RHR B INJECTION CHECK VALVE BYPASS VALVE	1E12-F301B	NOTE 6	1, 2, 3, R	760' 0"	112/AZ215	C-1
RHR C INJECTION CHECK VALVE BYPASS VALVE	1E12-F301C	NOTE 6	1, 2, 3, R	760' 0"	112/AZ140	C-1
LPCS INJECTION CHECK VALVE	1E21-F006	N/A	1, 2, 3, R	769' 0"	112/AZ120	C-1
LPCS INJECTION CHECK VALVE BYPASS VALVE	1E21-F340	NOTE 7	1, 2, 3, R	769' 0"	112/AZ120	C-1
HPCS INJECTION CHECK VALVE	1E22-F005	N/A	1, 2, 3, R	769' 0"	112/AZ255	C-1
HPCS INJECTION CHECK VALVE BYPASS VALVE	1E22-F304	NOTE 7	1, 2, 3, R	769' 0"	112/AZ255	C-1
RCIC STEAM SUP LINE INBD ISO VALVE	1E51-F063	2	1, 2, 3, R	761' 2"	112/AZ0	C-1
RCIC INJECTION CHECK VALVE	1E51-F066	N/A	1, 2, 3, R	803' 0"	112/AZ0	C-1
RCIC STEAM LINE WARM-UP LINE ISO VALVE	1E51-F076	2	2, 3	759' 10"	112/AZ0	C-1
RWCU DRAIN FLOW INBOARD ISOL VALVE	1G33-F001	2	2	761' 0"	112/AZ18	C-1
ADS BACKUP AIR BOTTLE CHECK VALVE	1IA041	N/A	1, 2, 3, R	779' 0"	112/AZ61	C-1
RPV HEAD VENT DRAIN ISOLATION VALVE	1B21-F001	NOTE 4	1, 2, 3, R	770' 0"	112/AZ130	C-2
RPV HEAD VENT DRAIN ISOLATION VALVE	1B21-F002	NOTE 4	1, 2, 3, R	763' 0"	112/AZ125	C-2
DRYWELL PRESSURE TRANSMITTER	1B21-N067C	3	1, 2, 3, R	755' 0"	112/AZ148	C-2
DRYWELL PRESSURE TRANSMITTER	1B21-N067D	3	1, 2, 3, R	755' 0"	112/AZ288	C-2

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
DRYWELL PRESSURE TRANSMITTER	1B21-N067G	3	1, 2, 3, R	755' 0"	112/AZ148	C-2
DRYWELL PRESSURE TRANSMITTER	1B21-N067H	3	1, 2, 3, R	755' 0"	112/AZ288	C-2
REACTOR PRESSURE	1B21-N068A	1	1, 2, 3, R	755' 0"	112/AZ73	C-2
REACTOR PRESSURE	1B21-N068B	2	1, 2, 3, R	755' 0"	112/AZ260	C-2
REACTOR PRESSURE	1B21-N068E	1	1, 2, 3, R	755' 0"	112/AZ73	C-2
REACTOR PRESSURE	1B21-N068F	2	1, 2, 3, R	755' 0"	112/AZ260	C-2
REACTOR WATER LEVEL TRANSMITTER	1B21-N073C	3	1, 2, 3, R	755' 0"	112/AZ148	C-2
REACTOR WATER LEVEL TRANSMITTER	1B21-N073D	3	1, 2, 3, R	755' 0"	112/AZ288	C-2
REACTOR WATER LEVEL TRANSMITTER	1B21-N073G	3	1, 2, 3, R	755' 0"	112/AZ148	C-2
REACTOR WATER LEVEL TRANSMITTER	1B21-N073H	3	1, 2, 3, R	755' 0"	112/AZ288	C-2
RPV PRESSURE TRANSMITTER	1B21-N078A	1	1, 2, 3	755' 0"	112/AZ73	C-2
RPV PRESSURE TRANSMITTER	1B21-N078B	2	1, 2, 3	755' 0"	112/AZ260	C-2
RPV PRESSURE TRANSMITTER	1B21-N078C	3	1, 2, 3	755' 0"	112/AZ148	C-2
RPV PRESSURE TRANSMITTER	1B21-N078D	4	1, 2, 3	755' 0"	112/AZ288	C-2
RPV LEVEL TRANSMITTER	1B21-N080A	1	1, 2, 3	755' 0"	112/AZ73	C-2
RPV LEVEL TRANSMITTER	1B21-N080B	2	1, 2, 3	755' 0"	112/AZ260	C-2
RPV LEVEL TRANSMITTER	1B21-N080C	3	1, 2, 3	755' 0"	112/AZ148	C-2
RPV LEVEL TRANSMITTER	1B21-N080D	4	1, 2, 3	755' 0"	112/AZ288	C-2
RPV LEVEL TRANSMITTER	1B21-N081A	1	1, 3	755' 0"	112/AZ73	C-2
RPV LEVEL TRANSMITTER	1B21-N081B	2	2	755' 0"	112/AZ260	C-2
REACTOR WATER LEVEL TRANSMITTER	1B21-N091A	1	1, 2, 3, R	755' 0"	112/AZ73	C-2
REACTOR WATER LEVEL TRANSMITTER	1B21-N091B	2	1, 2, 3, R	755' 0"	112/AZ260	C-2
REACTOR WATER LEVEL TRANSMITTER	1B21-N091E	1	1, 2, 3, R	755' 0"	112/AZ73	C-2
REACTOR WATER LEVEL TRANSMITTER	1B21-N091F	2	1, 2, 3, R	755' 0"	112/AZ260	C-2
DRYWELL PRESSURE TRANSMITTER	1B21-N094A	1	1, 2, 3, R	755' 0"	112/AZ73	C-2
DRYWELL PRESSURE TRANSMITTER	1B21-N094B	2	1, 2, 3, R	755' 0"	112/AZ260	C-2
DRYWELL PRESSURE TRANSMITTER	1B21-N094E	1	1, 2, 3, R	755' 0"	112/AZ73	C-2
DRYWELL PRESSURE TRANSMITTER	1B21-N094F	2	1, 2, 3, R	755' 0"	112/AZ260	C-2
REACTOR WATER LEVEL	1B21-N095A	1	1, 2, 3, R	755' 0"	112/AZ73	C-2
REACTOR WATER LEVEL	1B21-N095B	2	1, 2, 3, R	755' 0"	112/AZ260	C-2
RPV PRESSURE TRANSMITTER	1B21-N097A	1	1, 3	755' 0"	112/AZ73	C-2
RPV PRESSURE TRANSMITTER	1B21-N097B	2	2	755' 0"	112/AZ260	C-2
SDV VENT VALVE	1C11-F010	1, 2	1, 2, 3, R	778' 0"	112/AZ125	C-2
SDV DRAIN VALVE	1C11-F011	1, 2	1, 2, 3, R	755' 0"	112/AZ125	C-2
EQUIPMENT DRAIN MANUAL ISOLATION VALVE	1C11-F062	N/A	1, 2, 3, R	755' 0"	112/AZ189	C-2
DRIVE WATER SUPPLY CHECK VALVE	1C11-F122	N/A	1, 2, 3, R	755' 0"	112/AZ189	C-2
SDV VENT VALVE	1C11-F180	1, 2	1, 2, 3, R	778' 0"	112/AZ125	C-2
SDV DRAIN VALVE	1C11-F181	1, 2	1, 2, 3, R	755' 0"	112/AZ115	C-2
RPV PRESSURE TRANSMITTER	1C61-N006	1	R	755' 0"	112/AZ73	C-2

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
RPV LEVEL TRANSMITTER	1C61-N010	1	R	755' 0"	112/AZ73	C-2
RHR CONTAINMENT SPRAY VALVE	1E12-F028A	1	1, 3, R	833' 6"	112/AZ148	C-2
RHR CONTAINMENT SPRAY VALVE	1E12-F028B	2	2	833' 6"	112/AZ337	C-2
RHR TO UPPER POOL CLG SHUTOFF VALVE	1E12-F037A	1	1, 3, R	805' 0"	112/AZ65	C-2
RHR TO UPPER POOL CLG SHUTOFF VALVE	1E12-F037B	2	2	805' 0"	112/AZ300	C-2
RHR LPCI CONTAINMENT SPRAY VALVE	1E12-F042A	1	1, 3, R	761' 3.5"	112/AZ45	C-2
RHR LPCI CONTAINMENT SPRAY VALVE	1E12-F042B	2	2	765' 0"	112/AZ247	C-2
RHR-A FLUSH WATER SUPPLY ISOL VALVE	1E12-F044A	N/A	1, 3, R	803’ 0”	112/AZ65	C-2
RHR-B FLUSH WATER SUPPLY ISOL VALVE	1E12-F044B	N/A	2	803’ 0”	112/AZ300	C-2
CONTAINMENT PRESSURE TRANSMITTER	1E12-N062A	1	1, 2, 3, R	755’ 0”	112/AZ73	C-2
CONTAINMENT PRESSURE TRANSMITTER	1E12-N062B	2	1, 2, 3, R	755’ 0”	112/AZ260	C-2
CONTAINMENT PRESSURE TRANSMITTER	1E12-N062C	1	1, 2, 3, R	755’ 0”	112/AZ73	C-2
CONTAINMENT PRESSURE TRANSMITTER	1E12-N062D	2	1, 2, 3, R	755’ 0”	112/AZ260	C-2
RCIC STEAM SUP DIFF PRESSURE TRANSMITTER	1E31-N084A	1	1	755’ 0”	112/AZ73	C-2
RCIC STEAM SUP DIFF PRESSURE TRANSMITTER	1E31-N084B	2	1	755’ 0”	112/AZ40	C-2
RCIC STEAM SUPPLY PRESSURE	1E31-N085A	1	1	755’ 0”	112/AZ73	C-2
RCIC STEAM SUPPLY PRESSURE	1E31-N085B	2	1	755’ 0”	112/AZ40	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM001	1	1, 3, R	736' 0"	112/AZ0	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM002	2	2	736' 0"	112/AZ26	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM003	1	1, 3, R	736' 0"	112/AZ47	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM004	2	2	736' 0"	112/AZ68	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM005	1	1, 3	736' 0"	112/AZ90	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM006	2	2	736' 0"	112/AZ111	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM007	1	1,3,R	736' 0"	112/AZ132	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM008	2	2	736' 0"	112/AZ153	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM009	1	1, 3	736’ 0”	112/AZ174	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM010	2	2	736’ 0”	112/AZ195	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM013	1	1, 3	736’ 0”	112/AZ280	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM014	2	2	736’ 0”	112/AZ291	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM015	1	1, 3	736’ 0”	112/AZ312	C-2
SUPP POOL TEMPERATURE ELEMENT	1TE-CM016	2	2	736' 0"	112/AZ333	C-2
CONTROL BLDG MCC G	0AP56E	1	1, 3	719’ 0”	135/AC	CB-1C
120 VAC DISTRIBUTION PANEL	0AP56E5B	1	1, 3	719’ 0”	135/AC	CB-1C
120 VAC DISTRIBUTION TRANSFORMER	0AP56E5C	1	1, 3	719’ 0”	135/AC	CB-1C
CONTROL BLDG MCC H	0AP57E	2	2	719' 0"	128/AC	CB-1C
SBGT CHARCOAL BED 1A SX DELUGE VALVE	1SX073A	1	1, 3, R	719’ 0”	128/AC	CB-1C
SBGT CHARCOAL BED 1B SX DELUGE VALVE	1SX073B	2	2	719’ 0”	129/AD	CB-1C
DIV 1 DAMPER MCC A	0AP24E	1	1, 3	737' 0"	128-129/AA-AC	CB-1E

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
SERVICE AIR SYSTEM VALVE	0VC001B	2	2	838' 0"	130/Y	CB-1I
CHILLED WATER COIL WATER DRAIN VALVE	0VC002A	1	1, 3	825' 0"	132/V	CB-1I
CHILLED WATER COIL WATER DRAIN VALVE	0VC002B	2	2	825' 0"	129/Y	CB-1I
CHILLED WATER COIL MAKE UP VALVE	0VC003A	1	1, 3	825' 0"	132/AC	CB-1I
CHILLED WATER COIL MAKE UP VALVE	0VC003B	2	2	825' 0"	130/AC	CB-1I
SSW MAKE UP TO MCR HVAC COMP TANK	0VC016A	N/A	1, 3	825' 0"	130/AC	CB-1I
SSW MAKE UP TO MCR HVAC COMP TANK	0VC016B	N/A	2	825' 0"	130/AC	CB-1I
MCR CWS MAKE UP CHECK VALVE (CVP)	0VC020A	N/A	1, 3	825' 0"	130/AC	CB-1I
MC MAKE UP CHECK (CVP)	0VC020B	N/A	1, 3	825' 0"	130/AC	CB-1I
CONTROL ROOM HVAC SUPPLY FAN A	0VC03CA	1	1, 3	825' 0"	130-132/V	CB-1I
CONTROL ROOM HVAC SUPPLY FAN B	0VC03CB	2	2	825' 0"	129-130/V	CB-1I
CONTROL ROOM HVAC RETURN FAN A	0VC04CA	1	1, 3	825' 0"	132/T	CB-1I
CONTROL ROOM HVAC RETURN FAN B	0VC04CB	2	2	825' 0"	132/V	CB-1I
CONTROL ROOM RETURN AIR DAMPER	0VC04YA (0FZ-VC024)	1	1, 3	835' 3"	130/S	CB-1I
CONTROL ROOM ISOLATION DAMPER	0VC04YB (0FZ-VC124)	2	2	835'	130/S	CB-1I
CHARCOAL FILTER TR A DRAIN SOL VALVE	0VC056A	1	1, 2, 3, R	825' 0"	132/Y	CB-1I
CHARCOAL FILTER TR B DRAIN SOL VALVE	0VC056B	2	1, 2, 3, R	825' 0"	129/Y	CB-1I
CHARCOAL FILTER TR A DRAIN SOL VALVE	0VC057A	1	1, 2, 3, R	825' 0"	132/Y	CB-1I
CHARCOAL FILTER TR B DRAIN SOL VALVE	0VC057B	2	1, 2, 3, R	825' 0"	129/Y	CB-1I
CHARCOAL FILTER TR A DRAIN SOL VALVE	0VC058A	1	1, 2, 3, R	825' 0"	132/V	CB-1I
CHARCOAL FILTER TR B DRAIN SOL VALVE	0VC058B	2	1, 2, 3, R	825' 0"	129/V	CB-1I
CHARCOAL FILTER TR A DRAIN SOL VALVE	0VC059A	1	1, 2, 3, R	825' 0"	132/V	CB-1I
CHARCOAL FILTER TR B DRAIN SOL VALVE	0VC059B	2	1, 2, 3, R	825' 0"	129/V	CB-1I
CONTROL ROOM ISOLATION DAMPER	0VC05YA (0FZ-VC022)	1	1, 3	832' 2"	130/V	CB-1I
COOLING COIL	0VC06AA	N/A	1, 3	825'	131/V	CB-1I
COOLING COIL	0VC06AB	N/A	2	825'	129.5/V	CB-1I
CTRL ROOM HVAC CHILLED WATER PUMP A	0VC08PA	1	1, 3	825' 0"	130/AC	CB-1I
CTRL ROOM HVAC CHILLED WATER PUMP B	0VC08PB	2	2	825' 0"	130/AC	CB-1I
CONTROL RM RETURN FAN INLET DAMPER	0VC08YA (0FZ-VC011)	1	1, 3	839' 2"	132/T	CB-1I
CONTROL ROOM ISOLATION DAMPER	0VC08YB (0FZ-VC111)	2	2	839' 8"	129/T	CB-1I
CONTROL ROOM ISOLATION DAMPER	0VC10YA (0FZ-VC017)	1	1, 3	825'	132/S	CB-1I
CONTROL ROOM ISOLATION DAMPER	0VC10YB (0FZ-VC117)	2	2	825'	129/S	CB-1I
CTRL RM HVAC SYSTEM WATER CHILLER A	0VC13CA	1	1, 3	825' 0"	132/AC	CB-1I
CTRL RM HVAC SYSTEM WATER CHILLER B	0VC13CB	2	2	825' 0"	132/AC	CB-1I

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
CONTROL PANEL AREA MODULATING DAMPER	0VC13YA (0TZ-VC034)	1	1, 3	825' 0"	130-132/Y	CB-1I
CONTROL PANEL AREA MODULATING DAMPER	0VC13YB (0TZ-VC134)	2	2	825' 0"	129-130/Y	CB-1I
CONTROL ROOM HVAC COMPRESSION TANK	0VC14TA	N/A	1, 3	833’ 0”	130/AC	CB-1I
CONTROL ROOM HVAC COMPRESSION TANK	0VC14TB	N/A	2	838’ 0”	130/AC	CB-1I
MAIN CONTROL ROOM MODULATING DAMPER	0VC14YA (0TZ-VC035)	1	1, 3	825' 0"	130-132/Y	CB-1I
MAIN CONTROL ROOM MODULATING DAMPER	0VC14YB (0TZ-VC135)	2	2	825' 0"	129-130/Y	CB-1I
MCR HVAC EQUIPMENT ROOM COOLING COIL	0VC18AA	N/A	1, 3	825’ 0”	132/T	CB-1I
MCR HVAC EQUIPMENT ROOM COOLING COIL	0VC18AB	N/A	2	825’ 0”	129/T	CB-1I
MCR HVAC EQUIPMENT ROOM FAN	0VC18CA	1	1, 3	825’ 0”	132/V	CB-1I
MCR HVAC EQUIPMENT ROOM FAN	0VC18CB	2	2	825’ 0”	129/V	CB-1I
CONTROL PANEL AREA ISOLATION DAMPER	0VC24YA (0FZ-VC003B)	1	1, 3	825' 0"	130-132/AA-Y	CB-1I
CONTROL PANEL AREA ISOLATION DAMPER	0VC24YB (0FZ-VC103B)	2	2	825' 0"	129-130/AA-Y	CB-1I
MAIN CONTROL ROOM ISOLATION DAMPER	0VC27YA (0FZ-VC003C)	1	1, 3	825' 0"	130-132/AA-Y	CB-1I
MAIN CONTROL ROOM ISOLATION DAMPER	0VC27YB (0FZ-VC103C)	2	2	825' 0"	129-130/AA-Y	CB-1I
CNTRL RM TRAIN A MASTER OS DAMPER	0VC48YB (0FZ-VC125)	2	2	835'	130/T	CB-1I
CONTROL ROOM ISOLATION DAMPER	0VC49YA (0FZ-VC026)	1	1, 3	842' 5"	130/Z	CB-1I
LOCKER ROOM EXHAUST ISOLATION DAMPER	0VC69Y (0FZ-VC068)	1	1, 3	842’ 0”	132/Z.8	CB-1I
LOCKER ROOM EXHAUST ISOLATION DAMPER	0VC70Y (0FZ-VC168)	2	2	829’ 0”	130/X.2	CB-1I
CONTROL ROOM ISOLATION DAMPER	0VC81YB (0FZ-VC123)	2	2	839' 8"	129/V	CB-1I
CTRL RM HVAC UNIT I A HEX INLET VALVE	1SX017A	1	1, 3	825' 0"	130-132/AA-Y	CB-1I
CTRL RM HVAC UNIT I B HEX INLET VALVE	1SX017B	2	2	825' 0"	129-130/AA-Y	CB-1I
CTRL RM HVAC CHILLER SSW FLOW CNTRL VLV	1SX019A	1	1, 3	825' 0"	132/AC	CB-1I
CTRL RM HVAC CHILLER SSW FLOW CNTRL VLV	1SX019B	2	2	825' 0"	129/AC	CB-1I
MCR HVAC 1A FIRE PROTECTION SUPPLY DELUGE VALVE	1SX074A	1	1, 3	825’ 0”	132/T	CB-1I
MCR HVAC 1B FIRE PROTECTION SUPPLY DELUGE VALVE	1SX074B	2	2	825’ 0”	129/S	CB-1I

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
4.16 KV SWGR 1-C-1 MAIN FEED BREAKER	1E22-S004-101	3	3	781' 0"	128/AA	CB-5A
DIESEL GENERATOR 1-C 4.16 KV FEED BREAKER	1E22-S004-103	3	3	781' 0"	128/AA	CB-5A
4.16 KV FEED BREAKER	1E22-S004-105	3	3	781' 0"	128/AA	CB-5A
4.16 KV SWGR 1-C-1 RESERVE FEED BREAKER	1E22-S004-106	3	3	781' 0"	128/AA	CB-5A
DIV 3 NEUTRAL GROUNDING RESISTOR	1E22-S005	3	3	781' 0"	128/AC	CB-5A
CLASS 1E REG TRANSFORMER	1IP78E	3	3	781' 0"	126/S	CB-5A
COND UNIT 1VX06CC PRESSURE CONTROLLER	1PC-VX116	3	3	781' 0"	128/AC	CB-5A
SWGR HEAT REMOVAL SUPPLY FAN PRESS DIFF SWITCH	1PDS-VX018	3	3	781' 0"	130/AC	CB-5A
COND UNIT 1VX06CC PRESS SWITCH	1PS-VX116A	3	3	781' 0"	128/AC	CB-5A
COND UNIT 1VX06CC PRESS SWITCH	1PS-VX116B	3	3	781' 0"	128/AC	CB-5A
COND UNIT 1VX06CC PRESS SWITCH	1PS-VX116C	3	3	781' 0"	128/AC	CB-5A
COND UNIT 1VX06CC PRESS TRANS	1PT-VX116	3	3	781' 0"	128/AC	CB-5A
VX COOLING COIL REFRIG INLET VALVE	1RG06MJ	3	3	781' 0"	130/AB	CB-5A
VX COOLING COIL REFRIG INLET VALVE	1RG06MK	3	3	781' 0"	130/AB	CB-5A
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MJ	N/A	3	781' 0"	130/AB	CB-5A
VX COOLING COIL THERMOSTATIC EXP VALVE	1RG07MK	N/A	3	781' 0"	130/AB	CB-5A
VX COOLING COIL REFRIG BYPASS VALVE	1RG12MC	3	3	781' 0"	128/AB	CB-5A
DIV 3 SWGR HT REM COND SSW OUTLET VALVE	1SX025C	3	3	781' 0"	128/AC	CB-5A
SWGR HEAT REMOVAL SUPPLY FAN RTD	1TE-VX003	3	3	786' 0"	128/AA	CB-5A
COND UNIT 1VX06CC TEMP SWITCH	1TS-VX601C	3	3	781' 0"	128/AC	CB-5A
COND UNIT 1VX06CC TEMP SWITCH	1TS-VX603C	3	3	781' 0"	128/AC	CB-5A
COND UNIT 1VX06CC TEMP SWITCH	1TS-VX604C	3	3	781' 0"	128/AC	CB-5A
SWITCHGEAR HEAT REMOVAL COIL CAB C	1VX02SC	N/A	3	781' 0"	129/AB	CB-5A
SWITCHGEAR HEAT REMOVAL FAN	1VX03CC	3	3	781' 0"	129/AB	CB-5A
SWITCHGEAR HEAT REMVL MOD DAMPER	1VX03YC (1FZ-VX003)	3	3	781' 0"	129/AB	CB-5A
SWGR HEAT REMVL MODULATION DAMPER	1VX04YC (1FZ-VX006)	3	3	781' 0"	129/AA	CB-5A
SWITCHGEAR HEAT REMOVAL COND UNIT	1VX06CC	3	3	781' 0"	128/AB	CB-5A
SWITCHGEAR HEAT REMOVAL COOLING COIL	1VX08AC	N/A	3	781' 0"	128/AB	CB-5A
SWITCHGEAR HT REM PKG FILTER	1VX09FC	N/A	3	781' 0"	129/AB	CB-5A
DIV 3 BATTERY	1E22-S001D	3	3	718' 0"	129-130/AA-AC	CB-5B
CONTROL PANEL AREA DAMPER 0VC13YA RTD	0TE-VC034	1	1, 3	815' 0"	125/AA	CB-6A
MAIN CONTROL ROOM DAMPER 0VC14YA RTD	0TE-VC035	1	1, 3	816' 0"	129/AA	CB-6A
CONTROL PANEL AREA DAMPER 0VC13YB RTD	0TE-VC134	2	2	815' 0"	125/V	CB-6A
MAIN CONTROL ROOM DAMPER 0VC14YB RTD	0TE-VC135	2	2	816' 0"	129/AA	CB-6A
RPV PRESSURE RECORDER	1B21-R623A	1	1, 3	800’ 0”	129/Y	CB-6A
RPV PRESSURE RECORDER	1B21-R623B	2	2	800’ 0”	129/Y	CB-6A
SSWS A FLOW INDICATOR	1E12-R602A	1	1, 3	800’ 0”	129/Y	CB-6A

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
DIESEL GENERATOR AIR START CHECK VALVE	1DG169	N/A	1, 3, R	737' 0"	128/AF	D-5A
DIESEL GENERATOR EXPANSION TANK	1DG17TA	N/A	1, 3, R	737' 0"	128-129/AD-AF	D-5A
DIESEL GENERATOR EXPANSION TANK	1DG18TA	N/A	1, 3, R	737' 0"	128-129/AD-AF	D-5A
DIESEL GENERATOR COOL WATER PUMP	1DG19PA	N/A	1, 3, R	737' 0"	128-129/AD-AF	D-5A
DIESEL GENERATOR COOL WATER PUMP	1DG19PB	N/A	1, 3, R	737' 0"	128-129/AD-AF	D-5A
DIESEL GENERATOR COOL WATER PUMP	1DG20PA	N/A	1, 3, R	737' 0"	128-129/AD-AF	D-5A
DIESEL GENERATOR COOL WATER PUMP	1DG20PB	N/A	1, 3, R	737' 0"	128-129/AD-AF	D-5A
DIESEL GEN COOL WATER OUTLET VALVE	1SX063A	1	1, 3, R	741' 0"	129/AF-AG	D-5A
DG RM 1A SUPP AIR TEMP CTRL RTD	1TE-VD001	1	1, 3, R	753' 0"	128/AG	D-5A
DIESEL GEN FUEL OIL DAY TANK	1DG01TA	N/A	1, 3, R	737' 0"	126-128/AG-AJ	D-5B
DSL/GEN FUEL OIL DAY TANK LEVEL INDICATOR	1LI-DO020	N/A	1, R	737' 0"	128/AG-AJ	D-5B
DSL GEN VENT OIL ROOM EXH FAN 1-A	1VD02CA	1	1, 3, R	737' 0"	126-128/AG-AJ	D-5B
DIESEL GENERATOR AIR START VALVE	1DG008E (1DG646E)	2	2	737' 0"	130/AF	D-6A
DIESEL GENERATOR AIR START VALVE	1DG008F (1DG646F)	2	2	737' 0"	130/AD	D-6A
DIESEL GENERATOR AIR START VALVE	1DG008G (1DG646G)	2	2	737' 0"	130/AF	D-6A
DIESEL GENERATOR AIR START VALVE	1DG008H (1DG646H)	2	2	737' 0"	130/AD	D-6A
DIESEL GENERATOR 1-B	1DG01KB	2	2	737' 0"	129-130/AD-AF	D-6A
DG STARTING AIR RECEIVER TANK	1DG05TA	N/A	2	737' 0"	129/AF-AG	D-6A
DG STARTING AIR RECEIVER TANK	1DG05TB	N/A	2	737' 0"	129/AF-AG	D-6A
DIESEL GEN 1-B HEAT EXCHANGER	1DG11AB	N/A	2	737' 0"	129-130/AD-AF	D-6A
DIESEL GEN 1-B HEAT EXCHANGER	1DG12AB	N/A	2	737' 0"	129-130/AD-AF	D-6A
DIESEL GENERATOR OIL COOLER	1DG14AB	N/A	2	737' 0"	129-130/AD-AF	D-6A
DIESEL GENERATOR OIL COOLER	1DG15AB	N/A	2	737' 0"	129-130/AD-AF	D-6A
DIESEL GENERATOR AIR START CHECK VALVE	1DG170	N/A	2	737' 0"	129/AF	D-6A
DIESEL GENERATOR AIR START CHECK VALVE	1DG171	N/A	2	737' 0"	129/AF	D-6A
DIESEL GENERATOR EXPANSION TANK	1DG17TB	N/A	2	737' 0"	129-130/AD-AF	D-6A
DIESEL GENERATOR EXPANSION TANK	1DG18TB	N/A	2	737' 0"	129-130/AD-AF	D-6A
DIESEL GENERATOR COOL WATER PUMP	1DG19PC	N/A	2	737' 0"	129-130/AF	D-6A
DIESEL GENERATOR COOL WATER PUMP	1DG19PD	N/A	2	737' 0"	129-130/AF	D-6A
DIESEL GENERATOR COOL WATER PUMP	1DG20PC	N/A	2	737' 0"	129-130/AF	D-6A
DIESEL GENERATOR COOL WATER PUMP	1DG20PD	N/A	2	737' 0"	129-130/AF	D-6A
DIESEL GEN COOL WATER OUTLET VALVE	1SX063B	2	2	737' 0"	130/AF-AG	D-6A
DIESEL GEN FUEL OIL DAY TANK	1DG01TB	N/A	2	737' 0"	129-130/AG-AJ	D-6B
DSL GEN VENT OIL ROOM EXH FAN 1-B	1VD02CB	2	2	737' 0"	129-130/AG-AJ	D-6B
DIESEL GENERATOR VENT FAN 1-C	1VD01CC	3	3	762' 0"	126/AG	D-7
DG ROOM MODULATION DAMPER	1VD01YC (1TZ-VD003A)	3	3	762' 0"	124/AG	D-7

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

COMPONENT	Number	1E DIV	Method	ELEV	Col/Row	Fire Zone
FUEL POOL HX OUTLET VALVE	1SX062A	1	1, 3, R	739' 3"	112/AM	F-1M
FUEL POOL HX OUTLET VALVE	1SX062B	2	2	739' 3"	106-109/AM	F-1M
LPCS INJECTION SHUTOFF VALVE	1E21-F005	1	1, 3	756’ 0”	123/AE	F-1P
LPCS FLUSH WATER SUPPLY VALVE	1E21-F025	N/A	1, 3	756’ 0”	123/AE	F-1P
HPCS INJECTION FLUSH WATER ISOL VALVE	1E22-F003	N/A	3	758’ 0”	103/AD	F-1P
HPCS INJECTION SHUTOFF VALVE	1E22-F004	3	3	755' 0"	103/AD	F-1P
SRV BACKUP AIR SUPPLY ISO VALVE	1IA013A	2	2, R	781' 0"	103/AE	F-1P
SHUTDOWN SERVICE WATER MCC 1A	1AP29E	1	1, 3, R	699' 0"	1-2/C	M-1
120 VAC POWER DISTRIBUTION PANEL	1AP29E4C	1	1, 3, R	699' 0"	1-2/C	M-1
120 VAC DISTRIBUTION TRANSFORMER	1AP29E4D	1	1, 3, R	699' 0"	1-2/C	M-1
SSW PUMP 1A DISCH PRESSURE TRANSMITTER	1C61-N503	1	R	703' 0"	2-1/C	M-1
SSW STRAINER 1A PRESSURE DIFF SWITCH	1PDS-SX022	1	1, 3,R	699' 0"	2-1/C	M-1
SSW PUMP 1A DISCH PRESSURE TRANSMITTER	1PT-SX028	1	1, 3	703' 0"	2-1/C	M-1
SSW STRAINER A INLET VALVE	1SX003A	1	1, 3, R	699' 0"	1/C	M-1
SSW STRAINER A OUTLET VALVE	1SX004A	1	1, 3, R	699' 0"	1/C	M-1
SSW STRAINER A BYPASS VALVE	1SX008A	1	1, 3, R	699' 0"	1/C	M-1
SSW PP RM 1A COIL CAB SSW OUTLET VLV	1SX010A	1	1, 3, R	707' 0"	1/C	M-1
SSW STRAINER 1A FLUSH VALVE	1SX013D	1	1, 3, R	703’ 0”	1/C	M-1
PLANT SER WATER SSWS INTERCON VALVE	1SX014A	1	1, 3, R	699' 0"	1/C	M-1
SSW STRAINER 1A	1SX01FA	1	1, 3, R	699’ 0”	1/C	M-1
SHUTDOWN SERVICE WATER PUMP 1-A	1SX01PA	1	1, 3, R	699' 0"	1/C	M-1
SSW PUMP ROOM A CLG COILS	1VH01AA	N/A	1, 3, R	699' 0"	1/C	M-1
SSW PUMP ROOM A CLG COILS	1VH01AB	N/A	1, 3, R	699' 0"	1/C	M-1
SSW PUMP ROOM A SUPPLY FAN	1VH01CA	1	1, 3, R	699' 0"	1/C	M-1
SSW PUMP ROOM 1A COIL CABINET	1VH07SA	N/A	1, 3, R	699' 0"	1/C	M-1
SHUTDOWN SERVICE WATER MCC 1-C	1AP31E	3	3	781' 0"	2/C	M-2A
HPCS 120 VAC DIST PANEL	1AP31E4C	3	3	781' 0"	2/C	M-2A
HPCS 120 VAC TRANSFORMER	1AP31E4D	3	3	781' 0"	2/C	M-2A
SSW STRAINER 1C PRESSURE DIFF SWITCH	1PDS-SX026	3	3	699' 0"	2/C	M-2A
SSW PUMP 1C DISCH PRESSURE TRANSMITTER	1PT-SX032	3	3	703' 0"	1/C	M-2A
SSW STRAINER C INLET VALVE	1SX003C	3	3	699' 0"	1-2/C	M-2A
SSW STRAINER C OUTLET VALVE	1SX004C	3	3	699' 0"	1-2/C	M-2A
SSW STRAINER C BYPASS VALVE	1SX008C	3	3	699' 0"	1-2/C	M-2A
SSW PP RM 1C COIL CAB SSW OUTLET VLV	1SX010C	3	3	699' 0"	1-2/B-C	M-2A
SSW STRAINER 1C FLUSH VALVE	1SX013F	3	3	703’ 0”	1/C	M-2A
PLANT SER WATER SSWS INTERCON VALVE	1SX014C	3	3	699' 0"	1-2/C	M-2A
SHUTDOWN SERVICE WATER PUMP 1-C	1SX01PC	3	3	699' 0"	1-2/C	M-2A
SSW PUMP ROOM C SUPPLY FAN	1VH01CC	3	3	699' 0"	2/C	M-2A

TABLE 1.8-2
SAFE SHUTDOWN EQUIPMENT LIST BY FIRE ZONE (continued)

Security - Related Information Figure Withheld Under 10 CFR 2.390

2.0 AREA DESIGNATION

Based on the guidance provided in NRC IE Information Notice No. 84-09 dated February 13, 1984, various buildings in the Clinton Power Station were redefined from fire zones to fire areas. In defining these fire areas, the fire zones described in the Safe Shutdown Analysis previously submitted to the NRC were reviewed and combined to form a minimum number of fire areas as indicated below. These fire areas are further divided into zones using natural divisions for the purpose of describing plant construction features, equipment fire hazards, and protection. A detailed description of each fire area is provided in the Fire Protection Evaluation Report. Figure FP-1 is a legend. Figures FP-2 through FP-36 ("a" series) show the location of fire areas and zones. Figures FP-2 "through FP-36 ("b" series) show rated barriers, area detection, suppression systems, and major plant equipment. Cable Tray Figure 1 is a legend. Safety-related cable trays are shown on Cable Tray Figures 2 through 22.

Fire areas in buildings that contain safe shutdown equipment are as follows:

		Building Designation	Number of Fire Areas
1.	Auxiliary Building	A	6
2.	Containment Building	C	2
3.	Control Building	CB	7
4.	Diesel-Generator Building	D	10
5.	Fuel Building	F	1
6.	Circulating Water Screen House	M	4
7.	Radwaste Building	R	1
8.	Turbine Building	T	1

Zones are lettered from a to z, the letter l was not used in this report.

The service building is represented by the building designation S. This building does not contain any safe shutdown cables or equipment.

3.0 SHUTDOWN ANALYSIS

3.1 AUXILIARY BUILDING

3.1.1 Fire Area A-1 (Fire Zones A-1a through A-1e)

3.1.1.1 Description

This fire area consists of five fire zones (A-1a through A-1e) located in the auxiliary building at various elevations (see Figures FP-2 and FP-3). The description and location of each fire zone are listed in the Clinton Fire Protection Evaluation Report (FPER) and in Table 3.1-1 of this report.

3.1.1.2 Shutdown Analysis

Safe shutdown cables belonging to Divisions 2, and some belonging to Division 1, are routed through Fire Area A-1 (see Cable Tray Figures 2 and 3). Cables and equipment associated with Method 2 of safe shutdown, and some belonging to Method 1, are located in zone A-1a.

Method 3 cables are also located in Fire 2 zone A-1a. Method 3 safe shutdown is selected because fire induced failure of the Method 3 cables cannot prevent safe shutdown. Therefore, shutdown can be achieved using Method 3, in case of a fire in this fire zone. It should be noted that Thermo-Lag 330-1 cable fire wrap was installed in Fire Zone A-1a prior to the creation of Fire Area A-6. This cable fire wrap is abandoned in place.

The performance goals for the safe shutdown functions in Fire Zone A-1a are assured by Method 3, and this Analysis Area, Fire Zone A-1a, is in compliance with Section III.G.1 of 10CFR50 Appendix R.

Routed in conduit and trays through the west portion (Column Lines 102 and 107) of Fire Zone A-1b are safe-shutdown electrical cables belonging to both Methods 1 and 2. Routed in conduit and trays through the east portion (Column Lines 112 and 124) of Fire Zone A-1b are safe-shutdown electrical cables belonging to both Methods 1 and 3. The two sections are connected by an access corridor at the north end of the auxiliary building. In the corridor between the east and west sides of Zone A-1b are several balance-of-plant (BOP) cable trays, but the area does not contain any safe shutdown equipment or cables. Also, there are stair and hatch openings in the floor at the east side of the corridor, Fire Zones A-1a and A-1b.

In the event of a fire in Zone A-1b at least one division of safe shutdown equipment will remain operable since the Division 1 and 2 cable trays containing safe-shutdown-related cables are routed no closer than 136 feet and the conduits no closer than 72 feet (see Figure 4.2.4.4-2). Each zone has hose stations in the zone or in an adjacent zone for a backup manual response. Portable extinguishers are also located in the zones, or in an adjacent zone. Zones A-1a and A-1b have fire detectors and suppression systems.

To prevent a fire from disabling both divisions in Fire Zone A-1b or communicating from A-1b to A-1a, the features listed in Subsection 3.1.1.3 are provided.

Subsection 4.2 provides engineering justification for a deviation from the requirements of 10 CFR 50 Appendix R concerning full area suppression, detection, and barriers for this area.

Fire Zone A-1e contains a Division 2 safe shutdown valve and cable. The cable for valve 1E12-F042C is from Fire Zone A.1b. The safe shutdown provisions for Fire Zone A-1b apply to Fire Zone A-1e.

Fire Zones A-1c and A-1d contain no safe shutdown cables, equipment, or instrumentation.

Based on the features described in Subsection 3.1.1.3, if a fire occurs in Area A-1, at least one division of safe shutdown equipment will be available to shut down the reactor.

Therefore, the performance goals for the safe shutdown functions for the west portion are assured by Method 3, and the east portion by Method 2. The separation area safe shutdown functions are assured by either Method 2 of 3. This analysis area, Fire Zone A-1b through A-1e, is in compliance with Section III.G.2.b of 10CFR50 Appendix R.

3.1.1.3 Features of the Fire Area

- The entire corridor in Fire Zone A-1a is protected by an ionization fire detection system and an automatic wet-pipe sprinkler system.

- An ionization fire detection system and an automatic wet-pipe sprinkler system from column 114 to column 124 providing for partial zone coverage is installed in the corridor in Fire Zone A-1b.

3.1.1.4 Deviations

Engineering justification for the following deviations is found in Section 4.2 of this report.

3.1.1.4.1 Fire Barrier

- There is a nonrated opening in the floor and ceiling slabs between Fire Areas A-1 and A-3 where the slabs meet at the containment wall (see Subsection 4.2.2.1).

- There are watertight doors between Fire Areas A-1, A-2, and A-3 (see Subsection 4.2.2.4).

- There is a nonrated metal air lock between Fire Zones A-1b and A-2d (see Subsection 4.2.2.3).

- Ventilation piping that penetrates 3-hour fire rated walls and floors does not have fire dampers (see Subsection 4.2.2.9).

- Bus duct penetrations through fire-rated barriers have not been tested or labeled as 3-hour fire rated penetrations (see Subsection 4.2.2.15).

3.1.1.4.2 Fire Detection

- Complete area fire detection is not provided in Fire Area A-1 (see Subsection 4.2.3.1.1).

Security - Related Information Figure Withheld Under 10 CFR 2.390

Security - Related Information Figure Withheld Under 10 CFR 2.390

- o If the Operating VC Chiller trips, locally start the standby system.

- o Terminate/prevent inadvertant HPCS System operation due to fire induced cable damage to the HPCS auto initiation logic as specified by the System Operating Procedure.

- o Terminate/prevent the Division 1 ADS auto initiation signal which may result from fire induced cable damage by placing the Div 1 ADS Inhibit Switch in the INHIBIT position.

- o Terminate/prevent inadvertent RCIC System operation due to fire induced cable damage to the RCIC auto initiation logic by depressing the RCIC TURBINE REMOTE TRIP push-button.

- o Prevent the Division 1 high RPV pressure automatic SRV initiation signal which may result from fire induced cable damage by placing the Division 1 SRV handswitches in the OFF position.

- o Remove fuses for the "B" solenoids at 1H13-P662, for the following SRVs (refer to list below for locations). This action prevents spurious actuation of SRVs from RSP.

	+125 V Supply			+125 V Return		
Valve	Bay	Fuse	Device	Bay	Fuse	Device
1B21-F051C	C-A146	XF5	B21C-F41B	C-A146	XF13	B21C-F42B
1B21-F051D	C-A145	XF10	B21C-F23B	C-A147	XF10	B21C-F24B
1B21-F051G	C-A145	XF6	B21C-F13B	C-A147	XF06	B21C-F14B

- o Terminate/prevent the Division 1 LPCI/LPCS auto initiation signal which may result from fire induced cable damage as specified in the System Operating Procedure.

- o Terminate/prevent the Division 1 Containment Spray auto initiation signal which may result from fire induced cable damage as specified in the System Operating Procedure.

3.1.3 Fire Area A-3 (Fire Zones A-3a through A-3g)

3.1.3.1 Description

This fire area consists of seven fire zones (A-3a through A-3g) located in the auxiliary building at various elevations (see Figures FP-2 through FP-5). The description and location of each fire zone are listed in Appendix E (Clinton FPER) and in Table 3.1-3 of this Appendix.

3.1.3.2 Shutdown Analysis

There are Division 1 cables associated with safe shutdown components in this area. There are also Division 2 cables that control valves required for the proper operation of Method 1 safe shutdown systems. These cables control valves 1E12-F006B, 1E12-F009, and 1E51-Fxxx. Valve 1E12-F006B is normally closed and remains closed during the entire Method 1 shutdown

procedure. The concern here is that a short could open this valve. Valve 1E12-F006B must be closed while proceeding from hot to cold shutdown utilizing Division 1 Shutdown Cooling. To prevent opening of 1E12-F006B, the valve will be closed and power removed when not needed for plant operations.

Valve 1E12-F009 must be opened to achieve cold shutdown using RHR in the shutdown cooling mode. If a fire destroys the cables that serve this valve (1RH17A, B, E, F, and G), an alternate method of shutdown cooling will be used (see Figure 1.8-2). Valves associated with RCIC operation 1E51-Fxxx could be affected by a fire in this area. High-pressure core spray (HPCS) has been analyzed to be acceptable for providing high pressure reactor coolant system makeup water (Method 3).

Based on the analysis of this area, in the event of a fire, hot and cold shutdown can be achieved and maintained using Method 3 safe shutdown system.

The performance goals for safe shutdown functions are assured by Method 3. This area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.1.3.3 Features of the Fire Area

Fire Zones A-3a, 3b, 3d, 3e, 3f, and 3g have fire detectors. Zone A-3f has a suppression system. All zones have fire extinguishers and/or hose stations in the zone or in adjacent zones.

3.1.3.4 Deviations

Engineering justification for the following deviations is found in Section 4.2 of this report.

3.1.3.4.1 Barriers

- There is a nonrated opening in the floor and ceiling slabs between Fire Areas A-1 and A-3 where the slabs meet the containment wall (see Subsection 4.2.2.1).
- There are watertight doors in the fire barrier between Fire Zones A-3c and F-1b and between Fire Areas A-3 and A-1 (see Subsection 4.2.2.4).
- Ventilation piping that penetrates 3-hour fire rated walls and floors does not have fire dampers (see Subsection 4.2.2.9).
- Bus duct penetrations through fire-rated barriers have not been tested or labeled as 3-hour fire rated penetrations (see Subsection 4.2.2.15).
- The penetration seal in the wall separating the east portion of Fire Zone A-3f from Fire Area CB-2 has a fire rating less than that of the fire wall (see Subsection 4.2.2.22).

3.1.3.4.2 Detection

- Complete area fire detection is not provided in this fire area (see Subsection 4.2.3.1.3).

Security - Related Information Figure Withheld Under 10 CFR 2.390

The performance goals for the safe shutdown functions are assured by Method 2. This area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.1.4.3 Features of the Fire Area

Fire Area A-4 has an ionization fire detection system. Portable fire extinguishers are provided outside the zone access door for manual firefighting.

3.1.4.4 Deviations

None.

3.1.4.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.1.5 Fire Area A-5

3.1.5.1 Description

This fire area is comprised of the Division 2 125-Vdc battery room (B) located along the north wall of the auxiliary building at elevation 781 feet 0 inch (see Figure FP-5).

3.1.5.2 Shutdown Analysis

Loss of the Division 2 DC power system will have no impact on the shutdown capabilities of the reactor. Because there are no Division 1 cables or equipment necessary for safe shutdown in this fire area, both Method 1 and Method 3 systems will be available to shut down the reactor.

The performance goals for the safe shutdown functions are assured by either Method 1 or Method 3. This area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.1.5.3 Features of the Fire Area

Fire Area A-5 has an ionization fire detection system. Portable fire extinguishers are provided in an adjacent fire zone for manual firefighting.

3.1.5.4 Deviations

None.

3.1.5.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- o Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.

- o If the Operating VC Chiller trips, locally start the standby system.

3.1.6 Fire Area A-6

3.1.6.1 Description

This fire area is comprised of the east section of the north general access area of the Auxiliary Building basement at elevation 707 feet 6 inches (see Figure FP-2a).

3.1.6.2 Shutdown Analysis

Method 1, 2, and 3 cables are routed the entire length of this Analysis Area. Method 2 safe shutdown is selected because fire-induced failure of the Method 2 cables located in this fire area cannot prevent safe shutdown. Therefore, shutdown can be achieved using Method 2, in case of a fire in this area.

The performance goals for the safe shutdown functions are assured by Method 2. This Analysis Area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.1.6.3 Features of the Fire area

There is an ionization smoke detection system and an automatic wet pipe sprinkler system in this area. However, it should be noted that due to the installation of the 3-hour rated fire wall between fire areas A-6 and A-1a, the sprinkler system is not required as per 10 CFR 50, Appendix R, Section III.G.2.a, and credit for the sprinkler system is not taken. Portable fire extinguishers and hose stations are provided for manual fire fighting.

3.1.6.4 Deviations

None.

3.1.6.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- o Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation System Chill Water Pump.

- o If the Operating VC Chiller trips, locally start the standby system.

TABLE 3.1-1
FIRE AREA A-1 DESCRIPTION

Fire Zone	Description/Location
A-1a	General access north area at elevations 707'-6" and 712'-0"
A-1b	General access north area at elevation 737'-0"
A-1c	Health Physics Instrument Storage Room at elevation 737'-0"
A-1d	Anticontamination Clothing Storage Room at elevation 737'-0"
A-1e	General access area at elevation 737'-0"

TABLE 3.1-2
FIRE AREA A-2 DESCRIPTION

Fire Zone	Description/Location
A-2a	Reactor core isolation cooling pump room at elevations 707'-6"
A-2b	Residual heat removal A pump and heat exchanger rooms at elevations 707'-6" through 737'-0"
A-2c	Low pressure core spray pump room at elevations 707'-6"
A-2d	General hallway and the containment building personnel hatch at elevation 737'-0"
A-2e	MSIV Leakage Control System rooms at elevation 737'-0"
A-2f	Main Steam and Pipe tunnels at elevations 727'-0" to 755'-0"
A-2g	Reactor Water Cleanup Pump A Room at elevation 737'-0"
A-2h	Reactor Water Cleanup Pump B Room at elevation 737'-0"
A-2i	Reactor Water Cleanup Pump C Room at elevation 737'-0"
A-2j	Radwaste pipe tunnel at elevation 750'-6"
A-2k	Non-safety-related switchgear area at elevation 762'-0"
A-2m	Containment electrical penetrations area at elevation 762'-0"
A-2n	Division 1 switchgear area at elevation 781'-0"
A-2o	Containment electrical penetration area at elevation 781'-0"

TABLE 3.1-3
FIRE AREA A-3 DESCRIPTION

Fire Zone	Description/Location
A-3a	Residual heat removal pump B and heat exchanger rooms at elevations 707'-6" through 788'-6"
A-3b	Residual heat removal pump C room at elevations 707'-6"
A-3c	General hallway and floor drain pump rooms at elevations 707'-6"
A-3d	Non-safety-related switchgear area at elevation 762'-0"
A-3e	Containment electrical penetration area at elevation 762'-0"
A-3f	Division 2 switchgear area at elevation 781'-0"
A-3g	Containment electrical penetration area at elevation 781'-0"

3.2 CONTAINMENT BUILDING

3.2.1 Fire Area C-1

3.2.1.1 Description

This fire area consists of the drywell volume of the containment building (see Figures FP-2 through FP-7).

3.2.1.2 Shutdown Analysis

There are Division 1 and 2 safe shutdown cables and equipment in this fire area belonging to both methods of safe shutdown systems. Cables associated with each method of safe shutdown have been evaluated. The RHR safe shutdown cables (1RH17C and 1RH17D) serve valve 1E12-F009. This valve must be opened to proceed from hot to cold shutdown using RHR in the shutdown cooling mode. The alternate shutdown cooling method shown on Figures 1.8-4 or 1.8-7 can be used if this valve cannot be operated. Division 2 RWCU cables (1RT05B and 1RT05D) serve valve 1G33-F001 which must close for method 2 shutdown. Division 2 Main Steam cables (1NB05C and 1NB05D) serve valve 1B21-F016 which must close for method 2 shutdown. Both divisions of nuclear boiler system cables (1NB35D, E, F, G, H, and K and 1NB37C, D, F, H, K, M, P, and R) serve the ADS valves and SRVs 1B21-F051C and D. Horizontal separation between divisional conduits is greater than 20 feet except at elevation 764, where cables for the dual-power SRVs cross over and run within one foot of each other. Applying DC control power to a fire-damaged cable (e.g., on manual SRV actuation or manual ADS initiation) could result in spurious actuation of one or more SRVs. Conversely, due to the potential for multiple hig-impedance faults, applying DC control power to an affected Division 1 (2) cable could result in interruption of all control power to the Division 1 (2) pilot solenoids. With a disabling of any horizontal 20-foot segment of the drywell, manual control of a sufficient number of SRVs will be available to safely shut down the plant. In addition, an exposure fire is not credible for the following reasons.

The only significant fire hazard in this fire area is the lubricating oil for the two reactor recirculation pump motors. Each motor utilizes self-lubricated bearings with lubricating oil cooled by cooling coils installed within the reservoirs; therefore, a pressurized oil system is not utilized. This design minimizes piping connections to the oil reservoirs, which are integral to the pump motors. Each motor has approximately 46 gallons of oil contained within the upper bearing reservoir, approximately 8 gallons of oil contained within the lower bearing reservoir, and approximately 1 gallon of oil in the optional automatic oiler connected externally to the motor at the oil fill line. The heavy construction, seismic qualification, and the nonpressurized design of this lubricating system minimizes susceptibility to leakage. Also, if leakage were to occur, an ignition enhancing spray would be unlikely due to the nonpressurized design. Therefore, an exposure fire due to ignition of the recirculation pump lubricating oil is not credible, and additional fire protection measures for the recirculation pumps are not required.

Although most cables in the noninerted drywell are contained in conduit, there is a limited amount of exposed cable insulation from "free-air" instrument cables carrying very low voltages. The majority of these "free-air" cables are associated with the Control Rod Drive and Neutron Monitoring systems, and are located entirely beneath the reactor vessel. These cables are safety-related but are not required for safe shutdown. An exposure fire involving these cables would be contained within the vessel pedestal and would not propagate to any safety-related equipment; therefore, safe shutdown ability is not affected.

The remainder of the exposed cables are small diameter instrumentation cables. These non safety-related cables carry extremely low voltage signals for the Reactor Recirculation Vibration.

Monitoring system. Approximately 600 feet of vendor-supplied coaxial cable with Tefzel jacketing is exposed in the lower elevation of the drywell. The coaxial cables have not been tested to IEEE-383, and are routed "free-air" from the vibration sensors on each recirculation pump to two junction boxes, one mounted near each pump. Approximately 2700 feet of IEEE-383 qualified cable with Tefzel insulation and jacketing is routed "free-air" from these junction boxes at elevation 737' to a single junction box at elevation 785'.

None of these exposed instrumentation cables represent a significant exposure fire hazard because of the burn characteristics of Tefzel. As documented in GE NEDO-10466A, Revision 1, Tefzel is a thermoplastic material with flash-ignition and auto-ignition temperatures higher than its melting temperature, substantiated by numerous fire tests conducted by General Electric and verified by the Tefzel manufacturer, DuPont. This characteristic of melting before burning ensures that burning can only occur on the cable surface as a liquid, and will prevent a fire from propagating along the exposed Tefzel cable. There are no safe-shutdown cables or equipment below these exposed cables that can be affected by liquefied Tefzel. The limited use of exposed Tefzel insulation does not represent a significant fire hazard, therefore, and is not considered an intervening combustible for any of the safe shutdown cables or equipment in the drywell.

The drywell is inaccessible during operation, and when opened, stringent administrative controls are implemented to monitor personnel and equipment ingress and egress. Therefore, an exposure fire from transient combustibles is not credible.

The area adjacent to each reactor recirculation motor is provided with an infrared fire detection system. Once detected, the fire could be extinguished by the fire brigade using the fire hose stations available in the drywell.

The performance goals for the safe shutdown functions are assured by the availability of Methods 1, 2, or 3 safe shutdown systems, except as described below:

For a fire on the west side of the drywell at elevation 764, only manual control of Division 1 pilot solenoids for SRVs located in the northeast quadrant of the drywell remains available for RPV pressure control.

For a fire on the northeast quadrant of the drywell at elevation 764, only manual control of Division 2 pilot solenoids for SRVs located in the northwest quadrant of the drywell remains available for RPV pressure control.

This area is in compliance with Section III.G.2.d of 10CFR50, Appendix R with approved deviations.

3.2.1.3 Features of the Fire Area

Fire Area C-1 has an infrared fire detection system adjacent to the reactor recirculation motors at elevation 723. A hose station is provided at elevation 737 for manual firefighting.

3.2.1.4 Deviations

Engineering justification for the following deviations is found in Section 4.2 of this report.

3.2.1.4.1 Separation

- The noninerted drywell has intervening combustibles between redundant divisions (see Subsection 4.2.2.8)

3.2.1.4.2 Detection

- This area has safe shutdown equipment but does not have area fire detectors (see Subsection 4.2.3.1.4).

3.2.1.4.3 Suppression

- The drywell does not have an automatic suppression system (see Subsection 4.2.4.1).

3.2.1.4.4 Other Requirements

- The motor recirculation pumps do not have an oil collection system (see Subsystem 4.2.5.1).

3.2.1.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trip, locally start the standby system.

For a fire in the west side of Fire Area C-1, an additional manual action is required as follows:

- Open breaker #23 at MCC 1DC14E to de-energize the Division 2 pilot solenoid valve to prevent spurious SRV operation.

For a fire in the Northeast quadrant of Fire Area C-1, an additional manual action is required as follows:

- Open breaker #23 at MCC 1DC13E to de-energize the Division 1 pilot solenoid valve to prevent spurious SRV operation.

3.2.2 Fire Area C-2

3.2.2.1 Description

This fire area consists of the containment building (see Figures FP-2 through FP-7).

3.2.2.2 Shutdown Analysis

The safe shutdown cables and equipment located in this fire area belong to all methods of safe shutdown systems. Cables associated with each method of safe shutdown have been evaluated. The remote shutdown system cables are important only when shutdown is controlled from the remote shutdown panel. In the event of a fire inside the containment building, shutdown operations will be controlled from the main control room.

The Division 1 and 2 RHR cables serve safe shutdown valves 1E12-F042A, 1E12-F042B, 1E12-F037A, 1E12-F037B, 1E12-F027A, 1E12-F027B, 1E12-F028A, 1E12-F028B, and 1E12-F009.

Division 1 and 2 nuclear boiler cables designated safe shutdown serve ADS valves 1B21-F041B, C, D, and F, 1B21-F047A and C, and 1B21-F051G; SRV valves 1B21-F051C and D; and instruments 1B21N081A and B and 1B21N078A and B. Division 2 cables serve RWCU valve 1G33-F001. Division 2 cables serve Main Steam valve 1B21-F016. Although Division 1 and 2 shutdown cables and equipment occupy the same fire area, the divisional safe shutdown cables are separated by a distance of at least 60 feet, and with the exception of the south end at elevation 803 feet, there are no intervening combustibles between the Division 1 and 2 systems.

In regard to intervening combustibles, above floor elevation 803 feet, Division 2 cable trays are routed within 6 feet of Division 1 trays. The Division 1 trays contain Division 1 safe shutdown cables 1RH61C and 1RH61D. At that point, however, there are no Division 2 safe shutdown cables in Division 2 cable trays. Division 2 safe shutdown cables enter the Division 2 trays at a point where the separation from the Division 1 trays is 80 feet. The concern here is a fire in the Division 1 trays on the east side of Fire Area C-2 spreading to the Division 2 trays and then propagating down the tray and damaging Division 2 safe shutdown cables on the west side of Fire Area C-2. This is prevented by placing a fire break in the Division 2 trays (see Subsection 3.2.2.3).

Division 2 cables serving containment monitoring temperature elements are routed at elevation 737 feet. These cables feed indicators in the main control room are required for safe shutdown. These cables are routed within 20 feet of the redundant Division 1 cables. A fire would not disable these cables since they are routed in conduit only 2 feet above the normal suppression pool level (elevation 731 feet 0 inches) and below the lowest floor, which is at elevation 737 feet 0 inch. At higher elevations in Fire Area C-2, the redundant cables are routed in the Division 1 and 2 cable trays with appropriate separation maintained.

Even though the Division 1 and 2 cables are separated, operation of some Division 2 valves (1E12-F009 and 1E51-F063) is required by Division 1 shutdown systems. Valve 1E12-F009 must be opened to proceed from hot to cold shutdown using RHR in the shutdown cooling mode, or an alternate method can be used (see Figure 1.8-4 or 1.8-7). Valve 1E51-F063 is the RCIC steam supply line isolation inboard valve and thus is required to remain open until the cold shutdown systems are brought into operation. The valve is normally open; therefore damage to power cable 1R102C will not prevent shutdown. Cable 1R102D is connected to a limit switch. A hot short of a limit switch will not close the valve since the control switch contacts are open.

Method 3 is also available for safe shutdown. The cables associated with HPCS will not prevent manual control room operations to provide high-pressure reactor coolant makeup. Therefore, as HPCS has less potential for fire damage than RCIC, Method 3 is the preferred safe shutdown method for the west side of Fire Area C-2.

Security - Related Information Figure Withheld Under 10 CFR 2.390

- Terminate/prevent inadvertent RCIC System operation due to a fire induced cable damage to the RCIC auto initiation logic by depressing the RCIC TURBINE REMOTE TRIP push-button.
- Terminate/prevent the Division 2 high RPV pressure automatic SRV initiation signal which may result from fire induced cable damage by placing the Division 2 SRV handswitches in the OFF position.
- Open Breaker #23 at MCC 1DC14E to de-energize the Division 2 pilot solenoid valve to prevent spurious SRV operation.
- Terminate/prevent inadvertent HPCS System operation due to a fire induced cable damage to the HPCS auto initiation logic as specified in the System Operating Procedure.
- Terminate/prevent the Division 2 LPCI auto initiation signal which may result from fire induced cable damage as specified in the System Operating Procedure.
- Terminate/prevent the Division 2 Containment Spray auto initiation signal which may result rom fire induced cable damage as specified in the System Operating Procedure.

For a fire in the Northeast quadrant of Fire Area C-2, additional manual actions are required as follows:

- Terminate/prevent the Division 1 ADS auto initiation signal which may result from fire induced cable damage by placing the Div 1 ADS Inhibit Switch in the INHIBIT position.
- Terminate/prevent inadvertent RCIC System operation due to a fire induced cable damage to the RCIC auto initiation logic by depressing the RCIC TURBINE REMOTE TRIP push-button.
- Terminate/prevent the Division 1 high RPV pressure automatic SRV initiation signal which may result rom fire induced cable damage by placing the Division 1 SRV handswitches in the OFF position.
- Open Breaker #23 at MCC 1DC13E to de-energize the Division 1 pilot solenoid valve to prevent spurious SRV operation.
- Terminate/prevent inadvertent HPCS System operation due to a fire induced cable damage to the Division 3 HPCS auto initiation logic as specified in the System Operating Procedure.
- Terminate/prevent the Division 1 LPCI auto initiation signal which may result from fire induced cable damage as specified in the System Operating Procedure.
- Terminate/prevent the Division 1 Containment Spray auto initiation signal which may result from fire induced cable damage as specified in the System Operating Procedure.

- Terminate/prevent inadvertent LPCS System operation due to fire induced cable damage to the LPCS auto initiation logic as specified in the System Operating Procedure.

3.3 CONTROL BUILDING

3.3.1 Fire Area CB-1 (Fire Zones CB-1a through CB-1i)

3.3.1.1 Description

This fire area consists of nine fire zones (CB-1a through CB-1i) and is located in the control building at various elevations (see Figures FP-8 through FP-15). The description and location of the individual zones are listed in the Clinton FPER and in Table 3.3-1 of this report.

3.3.1.2 Shutdown Analysis

In this area, Fire Zones CB-1a, CB-1b and CB-1h contain no safe shutdown cables or equipment (see Cable Tray Figures 7 through 13). Therefore, the performance goals for safe shutdown functions for these fire zones are assured by Methods 1, 2, or 3; and these zones are in compliance with Section III.G.1 of 10CFR50 Appendix R.

Fire Zone CB-1c contains equipment and cables used in all three Methods of safe shutdown. Cables associated with each method of safe shutdown have been evaluated. These cables and equipment are part of the shutdown service water, auxiliary power, safety parameter display, and the diesel fuel oil systems.

Disabling the Division 2 safe shutdown equipment and cables in Fire Zone CB-1c will not prevent achieving a safe shutdown condition using Method 3 from the Control Room.

In order to limit the potential damage of a fire spreading to Division 1 cables on the elevations above (i.e., to Zone CB-1e) from Zone CB-1c, Zone CB-1c contains the features described in Subsection 3.3.1.3.1.

In Fire Zone CB-1d, elevation 737 feet 0 inch, Division 2 cable tray risers pass through the zone on the north wall. The nearest Method 3 safe shutdown cables or equipment (in Fire Zone CB-1e) are located over 50 feet from the Division 2 safe shutdown cable, and the Division 1 cables are protected by a ceiling automatic wet-pipe sprinkler system. A fire in Zone CB-1d will not disable Method 3 safe shutdown systems.

Therefore, the performance goals for safe shutdown functions for Fire Zones CB-1c and CB-1d are assured by Method 3, and the zones are incompliance with Section III.G.1 of 10CFR50 Appendix R.

In Fire Zone CB-1e, elevation 737 feet 0 inch (see Figure FP-10a) and above the intermediate roof at elevation 751 feet 0 inch (see Figure FP-11a), Division 1 and 2 electrical cables that belong to the diesel generator, diesel generator HVAC, auxiliary power, shutdown service water, control room HVAC, and the diesel generator fuel oil systems are routed in cable trays within a distance of less than 20 feet (see Cable Tray Figure 9). Also, located in this fire zone are diesel generator building MCCs 1A and 1B. In order to ensure that one shutdown method will be available in the portion of this fire zone generally defined by column lines 128 and 130 and rows AA and AC, the Division 1 and 2 cable trays are protected as described in Subsection 3.3.1.3.2. Division 1 cables are not routed in the north portion of this fire zone, and Division 2 cables are not routed in the west portion of the fire zone. Therefore, Method 3 is credited for safe shutdown in the west portion, which is defined as that part of the zone west of column line 128. Method 2 is credited for safe shutdown in the north portion, which is defined as that part of the

zone east of column line 130, plus that part of the zone north of row Y and east of column line 128. Fire Zone CB-1e is in compliance with Section III.G.2.c of 10CFR50 Appendix R.

In Fire Zone CB-1f, elevation 762 feet 0 inch (see Cable Tray Figure 10), Division 1 cable trays are located on the southwest side of the zone. Division 2 cable trays are routed along the north wall 39 feet from the Division 1 trays, and Division 2 cable risers are found along the south wall 19 feet from the Division 1 trays. All of these trays contain safe shutdown cables. Division 1 cable trays are protected by an automatic wet pipe sprinkler system. Division 2 cable trays are protected with a 1-hour fire-rated material (see Subsection 3.3.1.3.3). An automatic wet pipe sprinkler system is provided to protect the Division 2 cables along the south wall from a fire in the Division 1 cable trays, and also to prevent hot gases from propagating between Fire Zones CB-1e and CB-1f (see Subsection 3.3.1.3.2) and from the west side of Fire Zone CB-1f to CB-1i (see Subsection 3.3.1.3.3). The loss or malfunction of the Division 1 safe shutdown equipment will not prevent safe shutdown from being achieved using Method 2 from the control room.

The performance goals for safe shutdown functions are assured by Method 2 in fire Zone CB-1f. Fire Zone CB-1f is in compliance with Section III.G.2.c of 10CFR50 Appendix R.

A fire in Zone CB-1g at elevation 781 feet 0 inch (see Figure FP-13 and Cable Tray Figure 11) would only disable cables belonging to the Division 1 safe shutdown system. Safe shutdown can be accomplished from the control room with Method 2.

Therefore, the performance goals for safe shutdown functions for Fire Zone CB-1g are assured by Method 2, and the zone is in compliance with Section III.G.2.a of 10CFR50 Appendix R.

Fire Zone CB-1i located at elevation 825 feet 0 inch (see Figure FP-15 and Cable Tray Figure 13) contains cables and equipment belonging to both methods of safe shutdown. In order to ensure a safe plant shutdown, the features described in Subsection 3.3.1.3.5 adequately separate the two methods of safe shutdown cable and equipment. Since Division 1 and 2 control room ventilation system could be affected by a fire in the west side of column line 130 in Fire Zone CB-1i safe shutdown has been assured from the remote shutdown panel, Method R. Since Division 2 cables are not routed east of the fire-rated wall at column line 130, safe shutdown is assured for the east side of the zone by Method 2. This zone is in compliance with Section III.G.1 of 10CFR50 Appendix R for the east side of the zone, and Section III.G.3 for the west side of the zone.

In order to limit the potential damage of hot gases spreading to Division 2 cables on elevation 825 feet, west side, from the enclosed pipe hatches on elevations 781 feet and 800 feet (Fire Zones CB-1f to CB-1i), Fire Zone CB-1f contains the features described in Subsection 3.3.1.3.3.

3.3.1.3 Features of Fire Area

Portable fire extinguishers and hose stations are provided for manual firefighting in all zones.

3.3.1.3.1 Zone CB-1c

- Area detection is provided in this fire zone.
- An automatic wet-pipe sprinkler system is provided around the west pipe hatch to prevent hot gases from propagating to elevation 737 feet 0 inch (Zone CB-1e).

3.3.1.3.2 Zone CB-1e

- o There is an ionization fire detection system provided in this zone at eleveation 751.
- o Division 2 safe shutdown cable trays and risers are protected by a 1-hour fire-rated material that extends 20 feet beyond the closest Division 1 safe shutdown cable tray and riser.
- o In the corridor outside the diesel generator rooms an automatic wet pipe sprinkler system is provided (see Figures FP-10b and FP-11b and Cable Tray Figure 9). This system protects the west portion of the zone at elevations 737 and elevation 751 over Zone CB-1d where the Division 1 cable trays are routed. It also protects the Division 2 cable trays routed within 20 feet of Division 1 cable trays, the Division 1 and 2 Diesel Generator Building MCCs, and the west pipe hatch at column-row 125-AC at ceiling level.
- o An automatic wet-pipe sprinkler system is provided at the ceiling to protect the equipment hatch located at column-row 132-133, AA-AC.

3.3.1.3.3 Zone CB-1f

- o In order to preclude the possibility of a fire destroying both Division 1 and 2 cables that serve safe shutdown equipment, the Division 2 cable trays and risers are protected with a 1-hour fire-rated material.
- o There is an ionization fire detection system provided in this zone. An automatic wet-pipe sprinkler system protects the Division 1 and 2 cables that serve safe shutdown equipment. An automatic wet-pipe sprinkler system is also protecting the west pipe hatch to prevent hot gases from propagating to elevation 825 feet 0 inch (Fire Zone CB-1i). Portable fire extinguishers and hose stations are provided for manual fire fighting.

3.3.1.3.4 Zone CB-1g

- o Area detection is provided in this zone.

3.3.1.3.5 Zone CB-1i

- o The wall at column 130 from the missile wall (north) to row AC (south) is a 3-hour fire barrier.
- o Partial fire detection is provided in the vicinity of the west pipe hatch (see Subsection 4.2.4.5).

3.3.1.3.6 Zone CB-1d

- o The vertical cable chase along the S wall between columns 128.5 and 132 is enclosed by a minimum 1.9-hour fire rated barrier (see Figure FP-10b).

- o An ionization detection system is provided for the radiation-chemistry lab and office and cold lab.

3.3.1.3.7 Zone CB-1h

- o There is an ionization fire detection system located in the zone at elevation 800 feet 0 inch.

3.3.1.4 Deviations

3.3.1.4.1 Barriers

Engineering justification for the following deviation requests is found in Section 4.2 of this report.

- o Fire Area CB-1 is separated from Fire Areas CB-2, CB-4, CB-5, and CB-7 by 8-inch hollow-block walls that are rated at less than 3 hours (see Subsection 4.2.2.6).

- o Non-fire-rated reinforced concrete floors of the control building separate redundant safe shutdown electrical divisions of components. (See Subsection 4.2.2.10)

- o Ventilation piping that penetrates 3-hour fire rated walls and floors does not have fire dampers (see Subsection 4.2.2.9).

- o Bus duct penetrations through fire-rated barriers have not been tested or labeled as 3-hour fire rated penetrations (see Subsection 4.2.2.15).

3.3.1.4.2 Detection

- o Complete area fire detection is not provided in this fire area (see Subsection 4.2.3.1.5).

3.3.1.4.3 Suppression

- o An automatic fire suppression system is not provided throughout the fire area (see Subsection 4.2.4.5).

3.3.1.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area (except for a fire in the west side of CB-1i which requires an evacuation of the MCR) consist of the following:

- o Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.

- o If the Operating VC Chiller trips, locally start the standby system.

For a fire in Fire Zone CB-1e, the following additional manual action is required:

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Security - Related Information Figure Withheld Under 10 CFR 2.390

3.3.3 Fire Area CB-3 (Fire Zones CB-3a through CB-3g)

3.3.3.1 Description

The fire area consists of seven zones (CB-3a through CB-3g) located at elevation 781 feet 0 inch of the control building (see Figure FP-13). The description and location of each fire zone are shown in the Clinton FPER and in Table 3.3-2 of this report.

3.3.3.2 Shutdown Analysis

The only equipment or cable in this area that is required for safe shutdown belongs to the Division 1 and 2 NSPS power supplies; NSPS support systems, and the inverter rooms (Zones CB-3b, CB-3e and CB-3f). Fire Zones CB-3c, and CB-3g contain no cables necessary for safe shutdown. A fire in Area CB-3 could disable the NSPS power supplies. If NSPS power supplies are lost, plant shutdown can still be performed from the remote shutdown panel. The cable for tripping MDFW pump 1FW01PC breaker 1AP05EF to provide reactor pressure vessel isolation of the FW system is in CB-3a. For a fire in this area, MOVs 1B21-F065A and 1B21F065B can be closed at MCC 1A2 to achieve isolation. For a description of features in the fire area, see Subsection 3.3.3.3.

In the event of a fire in this fire area, the reactor can be brought to a safe shutdown from the Remote Shutdown Panel using Method R.

The performance goals for the safe shutdown functions are assured by Method R. This fire area is in compliance with Section III.G.3 of 10CFR50 Appendix R.

3.3.3.3 Features of the Fire Area

- o There is an ionization fire detection system located in each zone. Zone CB-3a is protected by a ceiling-level automatic preaction sprinkler system. Portable fire extinguishers and/or hose stations are provided in the zone or in an adjacent fire zone for manual firefighting.

3.3.3.4 Deviations

Engineering justification for the following deviation is found in Section 4.2 of this report.

3.3.3.4.1 Barriers

- o The 8-inch hollow-block walls separating this fire area from Fire Areas CB-2 and CB-4 are rated at less than 3 hours of fire resistance (see Subsection 4.2.2.6).

3.3.3.5 Manual Actions

There are no required Manual Actions in Fire Area CB-3.

3.3.4 Fire Area CB-4

3.3.4.1 Description

This fire area consists of the Division 1 cable spreading room located at elevation 781 feet 0 inch in the control building (see Figure FP-13).

3.3.4.2 Shutdown Analysis

A fire in this area would disable the Division 1 safe shutdown systems (see Cable Tray Figure 11).

Routed through this area are Division 1 cables that control valves required for the proper operation of Method 2 safe shutdown systems. These cables control valves 1E12-F008 and 1E12-F006A. Valve 1E12-F006A must remain closed to achieve normal shutdown cooling using Method 2. Valve 1E12-F008 must be opened for normal shutdown cooling. These valves can be manually repositioned or the alternate shutdown cooling flow path can be established (see Figure 1.8-7).

Routed through this area are Division 1 cables that control valves 1B21-F065A and 1B21-F065B from the control room. These valves are to be closed to provide reactor pressure vessel isolation for safe shutdown. If control room evacuation is not required, an operator can be dispatched to assume control of 1B21-F065A and 1B21-F065B at MCC 1A2 in accordance with the Remote Shutdown Procedure.

Division 1 cables that control valves 1B21-F065A and 1B21-F065B from the main control room are routed through this area. These valves are to be closed to provide reactor pressure vessel isolation for safe shutdown. If control room evacuation is not required, an operator can be dispatched to assume control of 1B21-F065A and 1B21-F065B at MCC 1A2 in accordance with the appropriate CPS Procedure. The MDRFP (1FW01PC) is required to be shutdown using Method 2 as prescribed for this area. It may require manual operator action to stop it by opening breaker 1AP05EF in accordance with the appropriate CPS Procedure.

A safe shutdown of the reactor can be achieved using Method 2 safe shutdown systems.

The performance goals for the safe shutdown functions are assured by Method 2. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.3.4.3 Features of the Fire Area

- o There is an ionization fire detection system in this area. This area is protected by an automatic wet pipe sprinkler system. Portable fire extinguishers and hose stations are provided for manual firefighting.

3.3.4.4 Deviations

Engineering justification for the following deviation is found in Section 4.2 of this report.

3.3.4.4.1 Barriers

- o The 8-inch hollow-block walls separating this fire area from Fire Areas CB-2, CB-3, CB-5, CB-7, and CB-1 are rated at less than 3 hours of fire resistance (see Subsection 4.2.2.6).

3.3.4.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

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Fire Zone CB-5b contains the Division 3 battery room. Loss of Division 3 battery room will not prevent safe shutdown. Therefore, in the event of a fire in this zone, a safe shutdown can be achieved using Method 2 shutdown systems.

Fire Zones CB-5a and CB-5b are in compliance with Section III.G.1 of 10CFR50 Appendix R.

Routed through Fire Zone CB-5c are essentially the same safe shutdown cables that are routed through Zone CB-6d. Both Division 1 and 2 control room HVAC cables and other cables required for safe shutdown are routed through Zone CB-5c. Features are provided to satisfy the requirement of 10 CFR 50 Appendix R, III L (see Subsection 3.3.5.3.2). Shutdown operations can be controlled from the remote shutdown panel, Method R. This fire area is in compliance with Section III.G.3 of 10CFR50 Appendix R.

3.3.5.3 Features of the Fire Area

3.3.5.3.1 Zone CB-5a

- o There is an ionization fire detection system in the zone. Portable fire extinguishers and hose stations are provided for manual firefighting.

3.3.5.3.2 Zone CB-5c

- o An automatic wet-pipe sprinkler system is provided in this fire zone.
- o Area detection is provided in this zone.
- o Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual firefighting.

3.3.5.3.3 Zone CB-5b

- o There is an ionization fire detection system in the zone. Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual firefighting.

3.3.5.4 Deviations

Engineering justification for the following deviations is found in Section 4.2 of this report.

3.3.5.4.1 Barriers

- o The 8-inch hollow-block walls separating this fire area from Fire Areas CB-4, CB-7, and CB-1 are rated at less than 3 hours of fire resistance. (see Subsection 4.2.2.6).
- o Bus duct penetrations through fire-rated barriers have not been tested or labeled as 3-hour fire rated penetrations (see Subsection 4.2.2.15).

3.3.5.4.2 Detection

- o None.

3.3.5.4.3 Suppression

- o An automatic fire suppression system is not provided for the entire fire area (see Subsection 4.2.4.6).

3.3.5.5 Manual Actions

For a fire in Fire Zone CB-5c, no specific actions are taken; safe shutdown is accomplished from the Remote Shutdown Panel (RSP) in accordance with remote shutdown procedures. Manual actions to be performed to assure safe shutdown due to a fire in Fire Zones CB-5a and CB-5b consist of the following:

- o Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.

- o If the Operating VC Chiller trips, locally start the standby system.

For a fire in Fire Zone CB-5a, the following additional manual action is required:

- o Terminate/prevent inadvertant HPCS System operation due to fire induced cable damage to the Division 3 HPCS auto initiation logic as specified in the system Operating Procedure.

3.3.6 Fire Area CB-6 (Fire Zones CB-6a through CB-6d)

3.3.6.1 Description

This fire area consists of four fire zones (CB-6a through CB-6d) located in the control building at elevation 800 feet 0 inch (see Figure FP-14). The description and location of the individual zones are provided in the Clinton FPER and are listed in Table 3.3-4 of this report.

3.3.6.2 Shutdown Analysis

In the event of a fire in this fire area the reactor can be brought to a safe shutdown from the remote shutdown location (Remote Shutdown panel and applicable local MCC), Method R, in the Division 1 switchgear room of the auxiliary building at elevation 781 feet 0 inch utilizing Division 1 safe shutdown systems. Features to ensure power to the RSP is provided as described in Subsection 4.1.3.5.

The performance goals for the safe shutdown functions are assured by Method R. This fire area is in compliance with Section III.G.3 of 10CFR50 Appendix R.

3.3.6.3 Features of the Fire Area

Portable fire extinguishers and/or hose stations are provided in the zone or in an adjacent zone for manual firefighting in all zones.

3.3.6.3.1 Zone CB-6b

- o Area detection is provided in Fire Zone CB-6b.

- o An automatic wet-pipe sprinkler system is provided as shown on Figure FP-14b.

3.3.6.3.2 Zone CB-6d

- In order to increase accessibility for manual fire fighting, the wall just north of the south cable tray riser in Fire Zone CB-6d does not extend up to elevation 825 feet 0 inch.
- Division 1 safe shutdown cables 1AP28Q, 1AP34X, and 1AP28B in the west side of the south Division 1 cable riser have been abandoned-in-place and replaced by cables 1AP28U, 1AP34I, and 1AP28T, which are routed through conduits on the east side of Zone CB-6d. They are protected by a 3-hour fire-rated material.
- There is an ionization fire detection system in the zone.

3.3.6.3.3 Zone CB-6a

- The peripheral rooms of the control room are 1.9-hour fire rated barriers.
- There is an ionization fire detection system in the zone.
- The automatic Halon fire suppression system actuated by thermal detectors is also provided as part of the Power Generation Control Complex (PGCC).

3.3.6.3.4 Zone CB-6c

- There is an ionization fire detection system in the zone.

3.3.6.4 Deviations

Engineering justification for the following deviations are found in Section 4.2 of this report.

3.3.6.4.1 Barriers

- There are two security air lock doors in the 3-hour fire walls separating Fire Zone CB-6d from Fire Zone CB-7 and one security air lock door in the 3-hour fire wall separating Fire Zone CB-6d from Fire Zone CB-1h, which are not 3-hour fire rated (see Subsection 4.2.2.5).

3.3.6.4.2 Suppression

- This area does not have a complete automatic fire suppression system (see Subsection 4.2.4.2).

3.3.6.5 Manual Actions

Safe shutdown is accomplished from the Remote Shutdown Panel (RSP) in accordance with remote shutdown procedures. No specific actions are taken for this fire area.

3.3.7 Fire Area CB-7

3.3.7.1 Description

This fire area consists of the stairwell tower from elevation 702 feet 0 inch to 828 feet 3 inch and the west corridor, exterior to the control room, at elevation 801 feet 9 inch (see Figures FP-8 through FP-15).

3.3.7.2 Shutdown Analysis

This fire area contains cables that belong to Division 3/Method 3 systems that are required for safe shutdown. The performance goals for the safe shutdown functions are assured by either Method 1 or Method 2. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.3.7.3 Features of in the Fire Area

There is an ionization detection system located in the stairwell at elevations 781 and 800, and in the corridor at elevation 801 feet. Portable fire extinguishers and hose stations are provided at elevations 781, 800, and 801 for manual firefighting.

3.3.7.4 Deviations

Engineering justification for the following deviation is found in Section 4.2 of this report.

3.3.7.4.1 Barriers

- The 8-inch hollow-block walls, which have exposed steel on the interior wall separating this fire area from Fire Zones CB-1, CB-4, and CB-5, are rated at less than 3 hours of fire resistance (see Subsections 4.2.2.6 and 4.2.2.11).

- Bus duct penetrations through fire-rated barriers have not been tested or labeled as 3-hour fire rated penetrations (see Subsection 4.2.2.15).

3.3.7.4.2 Detection

- Complete area fire detection is not provided in Fire Area CB-7 (see Subsection 4.2.3.1.9).

3.3.7.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.

- If the Operating VC Chiller trips, locally start the standby system.

- Terminate/prevent inadvertent HPCS System operation due to fire induced cable damage to the Division 3 HPCS auto initiation logic as specified in the system Operating Procedure

TABLE 3.3-1
FIRE AREA CB-1 DESCRIPTION

Fire Zone	Description/Location
CB-1a	General access area and Unit 2 diesel generator floor area at elevations 712'-0", 719'-0", and 737'-0"
CB-1b	General access area, hydrogen recombiner room, and drywell purge filter units at elevation 702'-0"
CB-1c	General access area, standby gas treatment, and HVAC equipment area at elevation 719'-0"
CB-1d	Rad-chem laboratory area at elevation 737'-0"
CB-1e	General access area at elevation 737'-0" and 751'-0"
CB-1f	General access and equipment area at elevation 762'-0" and two pipe chases to elevation 825'-0"
CB-1g	General access for cable spreading rooms at elevation 781'-0"
CB-1h	Stairwell at elevations 702'-0" to 825'-0"
CB-1i	General access, 480-V switchgear, and HVAC equipment area at elevation 825'-0"

TABLE 3.3-2
FIRE AREA CB-3 DESCRIPTION

Fire Zone	Description/Location
CB-3a	Auxiliary electric equipment room at elevation 781'-0" and 790’-0”
CB-3b	Division 4 NSPS inverter room at elevation 781'-0"
CB-3c	Non-safety-related battery room at elevation 781'-0"
CB-3d	Division 4 battery room at elevation 781'-0"
CB-3e	Division 2 NSPS inverter room at elevation 781'-0"
CB-3f	Division 1 NSPS inverter room at elevation 781'-0"
CB-3g	Non-safety-related battery room at elevation 781'-0"

TABLE 3.3-3
FIRE AREA CB-5 DESCRIPTION

Fire Zone	Description/Location
CB-5a	Division 3 switchgear room at elevation 781'-0"
CB-5b	Division 3 battery room at elevation 781'-0"
CB-5c	Division 1 and 2 vertical cable risers at elevation 781'-0"

TABLE 3.3-4
FIRE AREA CB-6 DESCRIPTIONS

Security - Related Information Figure Withheld Under 10 CFR 2.390

3.4 DIESEL-GENERATOR BUILDING

3.4.1 Fire Area D-1

3.4.1.1 Description

This fire area consists of the Division 3 (HPCS) diesel-generator oil storage tank room located on the southwest corner of the diesel-generator building at elevation 712 feet 0 inch and grating at elevation 719 feet 0 inch (see Figures FP-8 and FP-9).

3.4.1.2 Shutdown Analysis

Loss of the Division 3 diesel-generator will not prevent safe shutdown. Method 1 or 2 safe shutdown systems will be available to achieve a safe shutdown condition.

The performance goals for the safe shutdown functions are assured by Method 1 or 2. This fire area is in compliance with Seciton III.G.1 of 10CFR50 Appendix R.

3.4.1.3 Features of the Fire Area

Area fire detection is provided in this fire area. This area is protected by an automatic wet pipe sprinkler system. Portable fire extinguishers (at elevation 719) and hose stations (at elevation 712) are provided for manual firefighting.

3.4.1.4 Deviations

None.

3.4.1.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.4.2 Fire Area D-2

3.4.2.1 Description

This fire area consists of the Division 1 diesel-generator oil storage tank room located on the southwest corner of the diesel-generator building at elevation 712 feet 0 inch and grating at elevation 719 feet 0 inch (see Figures FP-8 and FP-9).

3.4.2.2 Shutdown Analysis

Loss of the Division 1 diesel-generator will not prevent safe shutdown. No Division 2 cables or equipment are located in this area. Method 2 safe shutdown systems will be available to achieve a safe shutdown condition.

The performance goals for the safe shutdown functions are assured by Method 2. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.4.2.3 Features of the Fire Area

Area fire detection is provided in this fire area. This area is protected by an automatic wet pipe sprinkler system. Portable fire extinguishers (at elevation 719) and hose stations (at elevation 712) are provided for manual firefighting.

3.4.2.4 Deviations

None.

3.4.2.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.4.3 Fire Area D-3

3.4.3.1 Description

This fire area consists of the Division 2 diesel-generator oil storage tank room located on elevation 712 feet 0 inch and grating at elevation 719 feet 0 inch of the diesel-generator building (see Figures FP-8 and FP-9).

3.4.3.2 Shutdown Analysis

Loss of the Division 2 diesel-generator will not prevent safe shutdown. There are no Division 1 safe shutdown cables in this area. Method 1 and Method 3 safe shutdown systems will be available to achieve and maintain a safe shutdown condition.

The performance goals for the safe shutdown functions are assured by Method 1 or Method 3. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.4.3.3 Features of the Fire Area

Area fire detection is provided for this fire area. This area is protected by an automatic wet pipe sprinkler system. Portable fire extinguishers (at elevation 719) and hose stations (at elevation 712) are provided for manual firefighting.

3.4.3.4 Deviations

None.

3.4.3.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.4.4 Fire Area D-4

3.4.4.1 Description

This fire area consists of the Division 3 diesel-generator room (Fire Zone D-4a) and day tank room (Fire Zone D-4b) along the west wall of the diesel-generator and HVAC building at elevation 737 feet 0 inch (see Figure FP-10).

3.4.4.2 Shutdown Analysis

Loss of the Division 3 diesel-generator and Division 3 electrical cables will have no impact on the Method 2 safe shutdown systems. There are no Division 2 safe shutdown cables in this area. Method 2 shutdown systems will be available to achieve and maintain a safe shutdown condition.

The performance goals for the safe shutdown functions are assured by Method 2. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.4.4.3 Features of the Fire Area

Area fire detection is provided in Fire Zones D-4b. Zone D-4b is protected by an automatic wet pipe sprinkler system. Portable fire extinguishers and hose stations are provided in the zone and in an adjacent fire zone for manual firefighting.

3.4.4.4 Deviations

None

3.4.4.4.1 Barriers

- The penetration seal in the floor separating Fire Zone D-4a from Fire Area D-7 has a fire rating less than that of the fire wall (see Subsection 4.2.2.22).

3.4.4.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.4.5 Fire Area D-5

3.4.5.1 Description

This fire area consists of the Division 1 diesel-generator room (Fire Zone D-5a) and day tank room (Fire Zone D-5b) on the southwest corner of the diesel-generator and HVAC building at elevation 737 feet 0 inch (see Figure FP-10).

3.4.5.2 Shutdown Analysis

Loss of Division 1 diesel-generator and Division 1 electrical cables will not prevent Method 2 safe shutdown. There are no Division 2 safe shutdown cables in this area. Method 2 safe shutdown systems will be available to achieve and maintain a safe shutdown condition.

The performance goals for the safe shutdown functions are assured by Method 2. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.4.5.3 Features of the Fire Area

Area fire detection is provided in Fire Zones D-5a and D-5b. Zone 5a is protected by an automatic carbon dioxide fire suppression system actuated by thermal detectors. Zone D-5b is protected by an automatic wet pipe sprinkler system. Portable fire extinguishers and hose stations are provided in the zone or in an adjacent for manual firefighting.

3.4.5.4 Deviations

None.

3.4.5.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.4.6 Fire Area D-6

3.4.6.1 Description

This fire area consists of the Division 2 diesel-generator room (Fire Zone D-6a) and day tank room (Fire Zone D-6b) on the southwest corner of the diesel-generator and HVAC building at elevation 737 feet 0 inch (see Figure FP-10).

3.4.6.2 Shutdown Analysis

Loss of Division 2 diesel-generator and associated electrical cables in this area will not prevent a Method 1 or Method 3 safe shutdown. Method 1 and Method 3 safe shutdown systems will be available to achieve and maintain a safe shutdown condition.

The performance goals for the safe shutdown functions are assured by Method 1 or Method 3. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.4.6.3 Features of the Fire Area

Zone 6a is protected by an automatic carbon dioxide fire suppression system actuated by thermal detectors. Area fire detection is provided in Fire Zone D-6b. Zone D-6b is protected by an automatic wet pipe sprinkler system. Portable fire extinguishers and hose stations are provided in the zone or in an adjacent zone for manual firefighting.

3.4.6.4 Deviations

None.

3.4.6.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.4.7 Fire Area D-7

3.4.7.1 Description

This fire area consists of the Division 3 diesel-generator ventilation fan room and air intake on the southwest corner of the diesel-generator and HVAC building at elevation 762 feet 0 inch (see Figure FP-12).

3.4.7.2 Shutdown Analysis

Loss of the Division 2 electrical cables or Division 3 diesel-generator ventilation fan will not prevent safe shutdown of the reactor. There are no Division 1 safe shutdown cables or equipment in this area. Method 1 safe shutdown systems can be utilized to bring the reactor to a safe shutdown condition.

The performance goals for the safe shutdown functions are assured by Method 1. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.4.7.3 Features of the Fire Area

Portable fire extinguishers and hose stations are provided in an adjacent fire area for manual firefighting.

3.4.7.4 Deviations

Engineering justification for the following deviation is found in Section 4.2 of this report.

3.4.7.4.1 Detection

- o No detection is provided for this area (see Subsection 4.2.3.3).

3.4.7.4.2 Barriers

- o The penetration seal in the floor separating Fire Zone D-7 from Fire Area D-4a has a fire rating less than that of the fire wall (see Subsection 4.2.2.22).

3.4.8 Fire Area D-8

3.4.8.1 Description

This fire area consists of the Division 1 diesel-generator ventilation fan room and air intake located along the south wall of the diesel-generator building at elevation 762 feet 0 inch (see Figure FP-12). Division 2 diesel-generator power output cables are routed through this fire area.

3.4.8.2 Shutdown Analysis

Equipment in fire are D-8 supports operation of the Division 1 diesel generator. The Division 2 diesel generator main power feed cables (1DG31A and 1DG31B) are also routed through the area along the south wall. Consequently, a fire in D-8 could result in the loss of power from both the Division 1 and 2 diesel generators. An evaluation of fire are D-8 has shown that there are no cables routed through the area that could cause a loss of offsite power in the event of a fire in area D-8. Therefore, offsite power will be available to support safe shutdown during a fire in area D-8. The Division 2 power cables are monitored for fire by a thermal detector mounted above the cables. Cables for computer monitoring of the Division 3 diesel generator power output and fire detection for all three diesel generators would be lost.

The performance goals for the safe shutdown functions are assured by Method 2. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.4.8.3 Features of the Fire Area

- o Thermal detectors are provided in the area of diesel-generator cables 1DG31A and 1DG31B.

- o Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual firefighting as shown on the referenced drawings.

3.4.8.4 Deviations

Engineering justification for the following deviation is found in Section 4.2 of this report.

3.4.8.4.1 Detection

- o A complete fire deteciton system is not provided for this area (see Subsection 4.2.2.3)

3.4.8.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- o Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- o If the Operating VC Chiller trips, locally start the standby system.

3.4.9 Fire Area D-9

3.4.9.1 Description

This fire area consists of the Division 2 diesel-generator ventilation fan room and air intake located along the south wall of the diesel-generator building at elevation 762 feet 0 inch (see Figure FP-12).

3.4.9.2 Shutdown Analysis

Loss of Division 2 cables or Division 2 diesel-generator vent fan 1B will not prevent the safe shutdown of the reactor. There are no Division 1 safe shutdown cables or equipment in this area.

Method 1 safe shutdown systems can be utilized to bring the reactor to a safe shutdown condition.

The performance goals for the safe shutdown functions are assured by Method 1. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.4.9.3 Features of the Fire Area

Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual firefighting.

3.4.9.4 Deviations

Engineering justification for the following deviation is found in Section 4.2 of this report.

3.4.9.4.1 Detection

- o No fire detection is provided for this fire area (see Subsection 4.2.3.3).

3.4.9.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- o Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- o If the Operating VC Chiller trips, locally start the standby system.

Security - Related Information Figure Withheld Under 10 CFR 2.390

Security - Related Information Figure Withheld Under 10 CFR 2.390

Security - Related Information Figure Withheld Under 10 CFR 2.390

In the event of a fire in the area, at least one shutdown method will be available. The performance goals for the safe shutdown functions are assured by either Method 1 or 2 at all locations in the Fuel Building except as indicated below:

- o Method 1 Equipment is credited for safe shutdown in the following portions of the Fuel Building:
  - West of column line 106.5 in Fire Zones F-1a (elev. 712), F-1m (elev. 737), or F-1p (elev. 781); or,
  - Between column lines AF and AK in Fire Zone F-1p (elev. 781).
- o Method 2 Equipment is credited for safe shutdown in the following portions of the Fuel Building:
  - In the southeast corner of Fire Zone F-1a (elev. 712);
  - East of column line 121 in Fire Zone F-1m (elev. 737); or,
  - In the northeast corner of Fire Zone F-1p (elev. 781).

This area is in compliance with Section III.G.2.b of 10CFR50 Appendix R with approved deviations. In this Fire Area, large horizontal distances, which have low in-situ fuel loading, separate cables supporting redundant safe shutdown methods as follows:

- In excess of 75 feet between Division 1 conduit and Division 2 cable trays at elevation 712;
- 140 feet between divisional cable trays at elevation 737;
- More than 85 feet between divisional conduits along the south wall at elevation 737; and,
- At least 46 feet between divisional conduits at elevation 781.

3.5.1.3 Features of the Fire Area

Area fire detection is provided in Fire Zones F-1a, F-1b, F-1p, and F-1m. The railroad bay in Zone F-1m is protected by an automatic preaction sprinkler system. Portable fire extinguishers and hose stations are provided in the zone or in an adjacent zone for manual firefighting except for Zone F-1o.

3.5.1.4 Deviations

Engineering justification for the following deviations is found in Section 4.2 of this report.

3.5.1.4.1 Barriers

- o There are two watertight doors between Fire Area F-1 and adjacent Areas A-2 and A-3 (see Subsection 4.2.2.4).
- o Ventilation piping that penetrates 3-hour fire rated walls and floors does not have fire dampers (see Subsection 4.2.2.9).

- The headfitting assembly installed at the Condenser Vacuum System piping penetration through the 3-hour fire rated portion of the Fuel Building east wall (separating fire area F-1 and the Common Station Vent Stack) does not provide a fire-resistance rating at least equal to that of the fire barrier itself (see Substation 4.2.2.18).

3.5.1.4.2 Detection

- Complete area fire detection is not provided in this fire area (see Subsection 4.2.3.1.7).

3.5.1.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.

- If the Operating VC Chiller trips, locally start the standby system.

TABLE 3.5-1
FIRE AREA F-1 DESCRIPTIONS

Security - Related Information Figure Withheld Under 10 CFR 2.390

3.6 CIRCULATING WATER SCREEN HOUSE

3.6.1 Fire Area M-1

3.6.1.1 Description

This fire area consists of a room containing the Division 1 shutdown service water pump, shutdown service water strainer, shutdown service water cooling unit, and the shutdown service water motor control center on the northeast corner of the screen house building at elevation 699 feet 0 inch (see Figure FP-25a).

3.6.1.2 Shutdown Analysis

Loss of the Division 1 equipment contained in this fire area will not prevent a Method 2 safe shutdown. The Division 2 system can be utilized to bring the plant to a safe shutdown condition. The performance goals for the safe shutdown functions are assured by Method 2. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.6.1.3 Features of the Fire Area

There is an ionization fire detection system in the area. Portable fire extinguishers are provided for manual firefighting.

3.6.1.4 Deviations

Engineering justification for the following deviations is found in Section 4.2 of this report.

3.6.1.4.1 Barriers

- There are two watertight doors between Fire Areas M-1 and M-2 (see Subsection 4.2.2.4).
- The floor between Fire Areas M-1 and M-2c have unrated ventilation penetrations (see Subsection 4.2.2.13).

3.6.1.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.6.2 Fire Area M-2 (Fire Zones M-2a through M-2c)

3.6.2.1 Description

This fire area consists of three fire zones (M-2a through M-2c) located at elevation 699 feet 0 inch of the screen house building and below (see Figure FP-25). The description and location of each fire zone is provided in the Clinton FPER and is shown on Table 3.6-1 of this report.

3.6.2.2 Shutdown Analysis

Loss of the Division 2 and 3 shutdown service water pumps, shutdown service water strainers, shutdown service water cooling units, and shutdown service water motor control centers will not prevent a Method 1 safe shutdown. The only Method 1 shutdown service water cable in this zone serve valve 1SX011A. This valve is required for safe shutdown and is normally closed. The cable that serve this valve is a control cable routed in dedicated conduit, and the cable does not contain any energized power conductors. Since the conductors in the cable are segregated from internal and external hot shorts, 1SX011A is not subject to spurious operation and will remain closed to maintain the integrity of the Division 1 SX System flow boundary.

The Method 1 systems can be utilized to bring the plant to safe shutdown. The performance goals for the safe shutdown functions are assured by Method 1. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.6.2.3 Features of the Fire Area

There is an ionization fire detection system in Zones M-2a and 2b. Portable fire extinguishers are provided in all zones and hose stations are provided in the zone or in an adjacent zone for manual firefighting.

3.6.2.4 Deviations

Engineering justification for the following deviation requests is found in Section 4.2 of this report.

3.6.2.4.1 Barriers

- o There are two watertight doors between Fire Areas M-1 and M-2.

3.6.2.4.2 Detection

- o Complete area fire detection is not provided in this fire area (see subsection 4.2.3.1.8).

3.6.2.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- o Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- o If the Operating VC Chiller trips, locally start the standby system.

3.6.3 Fire Area M-3

3.6.3.1 Description

This fire area consists of a room containing the diesel-driven fire pump B, diesel fire pump day tank, and the fire pump control panel along the south wall of the screen house building at elevation 699 feet 0 inch (see Figure FP-25).

3.6.3.2 Shutdown Analysis

There are no cables or equipment in this area necessary for safe shutdown. Loss of the non-safety-related equipment contained in this fire area will not prevent a safe shutdown.

The performance goals for the safe shutdown functions are assured by Method 1, 2 or 3. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.6.3.3 Features of the Fire Area

This area is protected by an automatic wet pipe sprinkler system. Portable fire extinguisher (inside the zone) and hose station (outside the zone door) are provided for manual firefighting.

3.6.3.4 Deviations

None.

3.6.3.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.6.4 Fire Area M-4

3.6.4.1 Description

This fire area consists of a room containing the diesel-driven fire pump A, diesel fire pump day tank, and the fire pump control panel along the north wall of the screen house building at elevation 699 feet 0 inch (see Figure FP-25).

3.6.4.2 Shutdown Analysis

There are no cables or equipment in this area necessary for safe shutdown. Loss of the non-safety-related equipment contained in this fire area will not prevent a safe shutdown.

The performance goals for the safe shutdown functions assured by Method 1, 2 or 3. This fire area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.6.4.3 Features of the Fire Area

This area is protected by an automatic wet pipe sprinkler system. A portable fire extinguisher and hose station are provided in an adjacent zone for manual firefighting.

3.6.4.4 Deviations

None.

3.6.4.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation system Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

TABLE 3.6-1
FIRE AREA M-2 DESCRIPTION

Fire Zone	Description/Location
M-2a	The room containing Division 3 shutdown service water pump, strainer, cooling unit, and motor control center at elevation 699'-0"
M-2b	The room containing Division 2 shutdown service water pump, strainer, cooling units, and motor control center at elevation 699'-0"
M-2c	General access circulating water screen house at elevation 699'-0" and below

3.7 RADWASTE BUILDING

3.7.1 Fire Area R-1 (Fire Zones R-1A through R-1U)

3.7.1.1 Description

This fire area consists of the entire Radwaste Building divided into twenty fire zones, R-1a through R-1u. The description and location of each fire zone are provided in the Clinton FPER.

3.7.1.2 Shutdown Analysis

There are cables, but no equipment, in this area which are necessary for safe shutdown. Loss of equipment or damage to cables contained in this fire area will not prevent a safe shutdown.

This area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.7.1.3 Features of the Fire Area

Portable fire extinguishers and hose stations are provided for manual firefighting in all zones. The fire loads for the zones vary from high to low.

3.7.1.3.1 Zone R-1j

- An automatic preaction sprinkler is provided in the baler room.

3.7.1.3.2 Zone R-1k

- An automatic preaction sprinkler is provided in the clean and dirty oil tank room.

3.7.1.3.3 Zone R-1m

- An automatic preaction sprinkler is provided in the weld shop and storeroom.

3.7.1.3.4 Zone R-1n

- An automatic preaction sprinkler is provided in the paint and oil storage room.

3.7.1.3.5 Zone R-1o

- An ionization fire detection system is provided for this zone.

3.7.1.3.6 Zone R-1r

- An ionization fire detection system is provided above the 480 Volt substations.

3.7.1.4 Deviations

None.

3.7.1.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation System Chill Water Pump.
- If the Operating VC Chiller trips, locally start the standby system.

3.8 TURBINE BUILDING

3.8.1 Fire Area T-1

3.8.1.1 Description

This fire area consists of the entire Turbine Building divided into thirteen fire zones, T-1a through T-1n. The description and location of each fire zone are provided in the Clinton FPER.

3.8.1.2 Shutdown Analysis

There are cables, but no equipment, in this area which are necessary for safe shutdown. Loss of equipment or damage to cables contained in this fire area will not prevent a safe shutdown.

This area is in compliance with Section III.G.1 of 10CFR50 Appendix R.

3.8.1.3 Features of the Fire Area

Portable fire extinguishers and hose stations are provided for manual firefighting in all zones. The fire loads for the zones vary from high to low.

3.8.1.3.1 Zone T-1d

- o A sidewall automatic preaction sprinkler system protects the tube pull pit and associated areas.

3.8.1.3.2 Zone T-1e

- o An automatic wet pipe sprinkler system is installed beneath the turbine generator. An 8-inch concrete curb retains turbine oil spills within the sprinkler coverage area.

3.8.1.3.3 Zone T-1f

- o An automatic preaction sprinkler system is provided for the railroad bay floor at elevation 737 feet, 0 inches.

3.8.1.3.4 Zone T-1g

- o An automatic wet pipe sprinkler system is installed beneath the turbine generator.

3.8.1.3.5 Zone T-1h

- o An automatic deluge system is provided for the hydrogen seal oil unit. 8-inch concrete curbs surround the areas near the hydrogen seal oil unit to isolate turbine oil spills.

- o The oil pipeline for the turbine driven reactor feed pump is protected by a manual preaction sprinkler system.

- o An automatic wet pipe sprinkler system is installed in the motor driven reactor feedwater pump room.

- o the mezzanine areas at 777' and 783' are provided with an automatic wet pipe sprinkler system.

3.8.1.3.6 Zone T-1i

- o An automatic wet pipe sprinkler system protects the turbine oil reservoir tank room.

3.8.1.3.7 Zone T-1j

- o A partial automatic wet pipe sprinkler system is provided.

3.8.1.3.8 Zone T-1m

- o A CO_2 system activated by a thermal detector protects the main generator exciter.

- o An automatic preaction sprinkler system has been installed in the area of the turbine generator bearings and underskirt. The sprinkler system is activated by thermal detectors.

- o Two automatic deluge sprinkler systems are provided for the turbine driven reactor feedwater pump rooms. The systems are activated by thermal detectors.

3.8.1.4 Deviations

The engineering justifications for the following deviation is found in Section 4.2 of this report:

3.8.1.4.1 Detection

- o Complete fire area detection is not provided in Fire Area T-1 (see Subsection 4.2.3.1.11).

3.8.1.5 Manual Actions

Manual actions to be performed to assure safe shutdown due to a fire in this fire area consist of the following:

- o Manually open valve 0VC016A (0VC016B) to provide NPSH to the Operating Control Room Ventilation System Chill Water Pump.

- o If the Operating VC Chiller trips, locally start the standby system.

4.0 MODIFICATIONS AND DEVIATIONS

4.1 MODIFICATIONS

Section 4.1 is deleted.

Security - Related Information Figure Withheld Under 10 CFR 2.390

Security - Related Information Figure Withheld Under 10 CFR 2.390

A-3c

Fire Zone A-1e, A-1b, A-3a -Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-3d, A-3e, A-3a -Elevation 762 feet 0 inch (see Figures FP-4a and 4b and Cable Tray Figure 4).

Fire Zone A-3g, A-3f, A-3a -Elevation 781 feet 0 inch (see Figures FP-5a and 5b and Cable Tray Figure 5).

Description of Safe Shutdown Equipment and Cable

Fire Zone A-3b contains Division 1 and 2/Method 1 and 2 safe shutdown cable equipment and valves.

Fire Zone A-3c contains a Division 2/Method 2 safe shutdown valve 1E12-F021 and auxiliary building floor drain tank and pumps. The Division 2 cable that services valve 1E12-F021 (column/row 102/AC-AD) enters from Fire Zone A-3b in the west corridor.

Fire Zone A-3d contains non-divisional MDFW pump 1FW01PC breaker 1AP05EF (column/row 105/V) that can be tripped for reactor pressure vessel isolation for the high pressure FW system for Method 2. The control cable for the breaker is in Fire Zone A-3d and A-3f.

Fire Zone A-1e contains a Division 1 and 2/Method 1 and 2 safe shutdown valve 1E12F042C and cables and is located over the containment equipment maintenance area. Fire Zone A-1b contains only Method 1 and 2 shutdown systems on the west side of the building.

Fire Zone A-3e does not contain any Method 1 or 2 safe shutdown systems.

Safe shutdown cable and equipment for Fire Area A-1 are shown on Figures 4.2.4.4.1 and 2.

Engineering Justification

Fire Zone	Fire Load Classification
A-1a	moderate
A-1b	moderate
A-1c	moderate
A-1d	high
A-1e	low
A-3a	low
A-3b	low
A-3c	low
A-3d	moderate
A-3e	low
A-3f	Moderate
A-3g	low

The 2-inch air gap exists between the 3-hour fire rated floor slabs separating Fire Areas A-1 and A-3 at the containment building wall at elevations 737 feet 0 inch and 762 feet 0 inch. The concern is that a fire propagates from the lower elevation up through the gap to the next elevation. The fire load in the immediate vicinity of the air gap on each level is low.

The floor slabs are a minimum of 14 inches of reinforced concrete and are 3-hour fire rated with the exception of the air gap. All other electrical and mechanical penetrations are sealed with a 3-hour fire rated seal. There is a vertical fire seal along column row 110 separating Fire Areas A-2 and A-3. The seal runs between elevation 707 feet 6 inches through the highest elevation in the auxiliary building.

A fire could not spread from Fire Zone A-1a to Fire Area A-3 (both on elevation 707 feet 6 inches) due to the fire barriers separating the two areas.

Fire Zone A-3a, which contains the RHR pump B and heat exchanger, has a low fire load. An ionization fire detection system by the RHR pump B will alarm and annunciate in the control room. Adjacent Fire Zone A-3b contains the RHR pump C and has a low fire load. This zone has Adjacent Fire Zone A-3c contains the auxiliary building floor drain tank pump and has a low fire load. The fire load in the vicinity of the 2-inch gap in the ceiling of elevation 707 feet 0 inch (elevation 737 feet 0 inch) is low. Hose stations and portable extinguishers are available in the area. The duration of the fire would be short compared to the rating of the fire barriers enclosing the area. The low fire load in the vicinity of the 2-inch gap ensures that any fire in Fire Area A-3 on elevation 707 feet 6 inches would be confined to Fire Area A-3 and would not spread through the gap up to Fire Area A-1 (Fire Zone A-1e) on elevation 737 feet 0 inch.

Fire Area A-1 on elevation 737 feet 0 inch consists of Fire Zones A-1b through A-1e. Fire Area A-1 (Fire Zone A-1e) communicates with Fire Zones A-3a, A-3b, and A-3c at the floor, elevation 737 feet 0 inch, and Fire Zone A-3e at the ceiling, elevation 762 feet 0 inch. The fire load in Fire Zone A-1e is low. The fire hazard between Fire Zones A-3a, A-3b, and A-3c to Fire Zone A-1e was discussed in the previous paragraph. Fire Zone A-3e has containment penetrations. The fire load in this zone is low and the zone is provided with fire detection.

A fire in Fire Zones A-3a, A-3b, and/or A-3c could affect Method 1 and 2 safe shutdown systems as described in Subsection 3.2 of this report.

A fire in Fire Zones A-3a, A-3b, or A-3c would not spread to adjacent Fire Zone A-1e above due to the negligible fire load near the 2-inch gap, which is the only communication between the fire zones. Even assuming such a fire did spread between the west part, these areas house Method 1 and 2 safe shutdown cable and equipment and thus Method 3 systems could be used to safely shut down the plant. Method 1 and 3 safe shutdown equipment is located in the east part of Fire Area A-1 and is separated from Method 2 equipment and Method 1 cable by a sprinkler system between column rows 114 and 124, as well as spatial separation (see Figure 4.2.4.4-2) for safe shutdown cable locations.

Fire Area A-3 on elevation 762 feet 0 inch houses Method 1 and 2 safe shutdown systems and is separated from Fire Area A-2 by a 3-hour fire rated barrier, including the sealed wall at column row 110. Thus, in the event of a fire, Method 3 systems could be used to safely shut down the plant.

Fire Area A-3 is continued up through the next level to elevation 781 feet 0 inch. On this level, Fire Area A-3 again houses only Method 1 and 2 safe shutdown systems. Fire Area A-3 is

separated from adjacent Fire Areas A-2 and A-5 by 3-hour fire rated barriers. Thus, a fire originating in Fire Area A-3 on this elevation or from a fire in Fire Area A-3 below on elevation 762 feet 0 inch would be confined to Fire Area A-3 and Method 3 systems would be used to safely shut down the plant.

In summary, a fire originating in either Fire Area A-1 or A-3 or spreading from one area to the other would result in the loss of Method 1 and 2 safe shutdown systems. Method 3 systems would still be available to safely shut down the plant.

4.2.2.2 Steel Wall (A-2/T-1)

Description of Deviation

The steel wall separating the auxiliary building (Fire Area A-2) and the turbine building (Fire Area T-1) in the main steam tunnel at elevation 755 feet 0 inch is not fire rated.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER, Section 9.5.2.1 references that floors, walls, and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours and penetrations in these fire barriers, including conduits and piping, should be sealed or closed to provide a fire resistance rating at least equal to that of the fire barrier itself.

Fire Areas Involved

Fire Zone A-2f - Elevation 755 feet 0 inch (see Figures FP-3a, 3b, 4a, 4b, 5a, and 5b).

Fire Zone T-1e - Elevation 755 feet 0 inch (see Figures FP-21a, 21b, 22a, 22b, 23a, and 23b).

Description of Safe Shutdown Equipment and Cables

Fire Zone A-2f is the auxiliary building side of the main steam tunnel. The safe shutdown equipment in this zone consists of a shutdown cooling outboard suction isolation valve (1E12-F008), an RCIC injection shutoff valve (1E51-F013), and RCIC steam supply line outboard valve (1E51-F064). All three of these valves are Division 1 operated valves. This fire zone is not accessible during plant operations.

Fire Zone T-1e is the turbine building side of the main steam tunnel. The main steam and feedwater, lines from Fire Zone T-1e pass through Fire Zone A-2f and service equipment in the containment building. Fire Zone T-1e does not contain any safe shutdown equipment or cables; however, Electrical Division 1E cable and equipment are located in this fire zone. This fire zone has a partial automatic wet-pipe sprinkler system (see Figure FP-21b).

Engineering Justification

The steel wall and its associated penetrations are not fire rated. There are no fixed combustibles within 40 feet of the steel wall in Fire Zone A-2f except for the gasketing and ductwork associated with HVAC area coolers. In addition, the presence of transient combustibles is unlikely, since this zone is generally not accessible during normal plant

operation due to high radiation levels. In Fire Zone T-1e, the primary hazard would be a turbine oil fire from oil piping located beneath the turbine. The plant is protected from this hazard by a partial automatic wet-pipe sprinkler system in the entrance to the steam tunnel.

If a fire occurs in Fire Zone A-2f, safe shutdown can be achieved by using the redundant Method 2 shutdown systems.

Based on the partial suppression system, the negligible combustibles in the immediate area, and the plant's ability to safely shut down with a fire in this plant area, the steel wall and its associated penetrations do not need to be fire rated.

4.2.2.3 Steel Wall(A-1/A-2)

Description of Deviation

The steel air lock walls that separate Fire Area A-1 (Fire Zone A-1b) from Fire Area A-2 (Fire Zone A-2d) are not 3-hour fire rated barriers.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853 SER, Section 9.5.2.1 references that floors, walls, and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours and penetrations in these fire barriers, including conduits and piping, should be sealed or closed to provide a fire resistance rating at least equal to that of the fire barrier itself.

Fire Areas Involved

Fire Zone A-1b - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2d - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Description of Safe Shutdown Equipment and Cables

Fire Zone A-1b is a general access area in the auxiliary building. Division 1 safe shutdown cables are located on the east side of the zone from columns 121 to 124 and Division 2 safe shutdown cables are located on the west side of the zone from columns 102 to 104. The fire zone is protected by complete ionization fire detection and a partial wet-pipe sprinkler system between column/row 114-124/S-T.

Fire Zone A-2d is a general hallway and containment building personnel hatch area. Division 1 safe shutdown cables pass through this fire zone from Fire Zone A-1b to the fuel building (see Cable Tray Figure 3).

Engineering Justification

The steel air lock walls that separate Fire Zone A-1b from Fire Zone A-2d are not 3-hour fire rated barriers. A fire in Fire Zone A-2d and A-1b could affect the Division 1 safe shutdown cables that pass through these fire zones. Division 2/Method 2 systems would be available to safely shut down the plant.

The noncombustible steel air lock walls that separate Fire Zone A-1b from Fire Zone A-2d are constructed of uninsulated 20-gauge steel liner panel attached to a steel framework. Two pipes (1SF05A and 1SP01B) and cable trays penetrate these walls. These penetrations are sealed with Sylgard 170 silicone elastomer, which is flame retardant. Sylgard 170 has passed large-scale functional fire testing in accordance with ASTM E-119-73 as a fire-penetration material.

In the event of a fire in Fire Zone A-1b, the same Division 1 safe shutdown cables that are routed through Zone A-2d could be affected. The Division 2 safe shutdown cables located on the opposite side of the fire zone are more than 130 feet away and are separated by an automatic wet-pipe sprinkler system located between column/row 114124/S-T. Thus, there is adequate separation between Division 2/Method 1 and 2 and Division I/Method 3 cables in Fire Zone A-1b, and the plant can be safely shut down by Method 2.

Based on the adequate separation between safe shutdown divisions, partial suppression, and the plant's ability to safely shut down with a fire in the vicinity of the steel wall, the steel air lock walls do not need to be fire rated.

4.2.2.4 Watertight Doors (A-1/A-2/A-3/F-1/M-1/M-2)

Description of Deviation

Watertight doors are not tested or labeled as 3-hour rated fire doors. The doors are part of the plant's fire area boundaries in the auxiliary, fuel and circulating water screenhouse.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER, Section 9.5.2.2 references that door openings should be protected with equivalent rated doors, frames, and hardware that have been tested and approved by a nationally recognized laboratory. Such doors should be normally closed and locked or alarmed with alarm and annunciation in the control room.

Fire Areas Involved

Fire Zone	A-1a	-	Elevation 707 feet 6 inches (see Figures FP-2a and 2b and Cable Tray Figure 2).
Fire Zones	A-2a, A-2b A-2c	-	Elevation 707 feet 6 inches (see Figures FP-2a and FP-2b, and Cable Tray Figure 2).
Fire Zones	A-3a, A-3b, A-3c	-	Elevation 707 feet 6 inches (see Figures FP-2a and FP-2b and Cable Tray Figure 2).
Fire Zones	F-1a, F-1b	-	Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).
Fire Area	M-1	-	Elevation 699 feet 0 inch (see Figures FP-25a and 25b and Cable Tray Figure 22).

Fire Zone M-2b - Elevation 699 feet 0 inch (see Figures FP-25a and 25b and M-2c Cable Tray Figure 22).

Description of Safe Shutdown Equipment and Cables

Fire Zone A-1a is a general access corridor at elevation 707 feet 6 inches. This zone contains Division 1/Method 1 and 3 safe shutdown cables and instrument panels. These cables terminate in or pass through Fire Zones A-2a, A-2b, and A-2c. Fire Zone Ala also contains Division 2/Method 2 safe shutdown cables and instrument panels. These cables terminate in or pass through Fire Zones A-3a and A-3b. There are hose stations and a partial or full ionization fire detection system in Fire Zones A-3a and A-3b, respectively (as noted below).

Fire Zone A-2a is the RCIC pump room and is at elevation 707 feet 6 inches. This zone contains the RCIC pump and supporting equipment, as well as Division 1 and 2 instruments and valves. Fire Zone A-2a also contains Method 1 safe shutdown equipment. An ionization fire detection system and a hose station are located in this zone.

Fire Zone A-2b begins at elevation 707 feet 6 inches. This zone contains RHR pump 1-A and heat exchanger A, as well as Division 1 and 2 instruments and valves. Fire Zone A-2b also contains Method 1 safe shutdown equipment. A partial ionization fire detection system and a hose station are located in this zone.

Fire Zone A-2c is an LPCS pump room and is at elevation 707 feet 6 inches. This zone contains safe shutdown cables in conduit routed to Fire Zone A-2b for valve 1E12-F024A, Method 1 safe shutdown. The equipment located within this zone is not necessary for safe shutdown. There is an ionization fire detection system and a hose station in Fire Zone A-2c.

Fire Zone A-3a begins at elevation 707 feet 6 inches. This zone contains RHR pump 1-B, heat exchanger B, and Division 2 instrument panel and valves. Method 1 and 2 safe shutdown equipment is also located in this fire zone. A partial ionization fire detection system and hose station is located in this zone at elevation 707 feet 6 inches.

Fire Zone A-3b is the RHR pump 1-C room and is at elevation 707 feet 6 inches. RHR pump 1-C and Division 2 valves and instruments are located in the zone. Fire Zone A-3b contains Method 1 and 2 safe shutdown equipment. This fire zone has a full ionization fire detection system and a hose station.

Fire Zone A-3c on elevation 712 feet 0 inch consists of a general hallway and the auxiliary building floor drain pumps and tank. Division 2 safe shutdown cable in conduit to valve 1E12-F021 is located within this zone. Fire Zone A-3c has a portable fire extinguisher.

Fire Zone F-1a (at elevation 712 feet 0 inch) consists of the drywell chillers, drywell water chiller pumps, and the gamma scanner room. No safe shutdown cables or equipment are located within 50 feet of the watertight door. Fire Zone F-1a is equipped with portable fire extinguishers and hose stations. An area ionization detection system is provided in Fire Zone F-1a.

Fire Zone F-1b (at elevation 712 feet 0 inch) contains the HPCS pump and supporting equipment. This equipment is needed in case of a fire in Fire Zone A-3f (elevation 781 feet 0 inch). Division 3 cable trays and Division 2 instrumentation are also located in Zone F-1b. An ionization fire detection system and a portable fire extinguisher are located within this zone.

Fire Area M-1 consists of a room containing Division 1/Method 1 shutdown service water system safe shutdown cable and equipment and is located at elevation 699 feet 0 inch. There is an ionization fire detection system in Fire Area M-1.

Fire Zone M-2b contains Division 2/Method 2 shutdown service water system safe shutdown cables and equipment and is located at elevation 699 feet 0 inch. Fire Zone M-2b has an ionization fire detection system.

Fire Zone M-2c contains only BOP cables and equipment at elevation 699 feet 0 inch, but contains both Division 1/Method 1 and Division 2/Method 2 shutdown service water system safe shutdown cables and valves in the tunnel at elevation 657 feet 0 inch. Portable fire extinguishers and hose stations are provided in the zone.

Engineering Justification

There are seven watertight doors installed in 3-hour fire rated barriers in the auxiliary building and two watertight doors installed in 3-hour fire rated barriers in the circulating water screen house. Doors requiring a deviation are shown on Figures FP-2b and 25b.

The doors have been evaluated by a fire protection engineer to be equivalent to 3-hour rated fire doors based upon the following:

- The acceptance testing of fire doors in accordance with NFPA 252, "Fire Test of Door Assemblies" (ASTM-152), identifies the most important condition of acceptance as the ability of the door to "remain in place during both the fire test and the hose stream test."

- These substantial steel doors are equipped with multiple (4-point) latching. The hinge shaft is 2.75-inch-diameter steel. The latch pins are 1-inch-diameter steel; two are located on each side.

- The hinges and the latches of the watertight doors are significantly stronger than those of a metal fire door and would not allow the door to warp away from the opening in the fire barrier.

Based on the substantial construction of the watertight doors, they are at least equivalent to 3-hour rate fire doors.

4.2.2.5 Security Air Lock (CB-6/CB-7, CB-6/CB-1)

Description of Deviation

The security air lock doors in the 3-hour rated fire barrier around the control room complex are not tested or labeled as 3-hour fire rated doors.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER Section 9.5.2.2 references that door openings should be protected with equivalent rated doors, frames and hardware that have been tested and approved

by a nationally recognized laboratory. Such doors should be normally closed and locked or alarmed with alarm and annunciation in the control room.

Fire Areas Involved

Fire Zone CB-1h - Elevation 800 feet 0 inch (See Figures FP-14a and 14b and Cable Tray Figure 12).

Fire Zone CB-6d - Elevation 800 feet 0 inch (See Figures FP-14a and 14b and Cable Tray Figure 12).

Fire Area CB-7 - Elevation 800 feet 0 inch (See Figures FP-14a and 14b and Cable Tray Figure 12).

Description of Safe Shutdown Equipment and Cables

Fire Zone CB-1h is a stairwell tower that passes through the control building from elevation 702 feet 0 inch through elevation 847 feet 0 inch. At elevation 800 feet 0 inch, Fire Zone CB-1h contains a janitor's closet. No safe shutdown cables are located in the fire zone. Fire Zone CB-1h contains a hose station at this elevation for manual fire fighting.

Fire Zone CB-6d is the entry point to the control room complex and is located at elevation 800 feet 0 inch. This fire zone contains Division 1/Method 1, Division 2/Method 2, and Division 3/HPCS safe shutdown cable and equipment. An ionization detection system is provided in Fire Zone CB-6d as well as portable fire extinguishers and hose stations.

Fire Zone CB-7 is a stairwell tower that passes through the control building from elevation 702 feet 0 inch through elevation 847 feet 0 inch. At elevation 800 feet 0 inch, Zone CB-7 includes a hallway at elevation 801 feet 9 inches that extends over the auxiliary building. This area does not contain any Division 1/Method 1 or Division 2/Method 2 safe shutdown cables or equipment. Division 3/HPCS cables are located in this fire zone. An ionization detection system is located in Fire Zone CB-7 at these elevations. Portable fire extinguishers and hose stations are provided for manual fire fighting.

Engineering Justification

The three security air lock doors in the south corridor (Zone CB-6d), which separate the control room complex from the access stairwells of Zones CB-1h and CB-7 by 3-hour fire barriers, are not fire-rated doors.

The east door separates Fire Zone CB-1h from CB-6d. The nearest fire load in the vicinity of the door is located in the janitor's closet. The air lock contains no in situ combustibles. The exit door of the air lock is a 1.9-hour fire rated fire door in a 3-hour fire rated wall. Based on the substantial construction of the security door, the presence of the air lock barriers, and the absence of combustibles, the door provides adequate fire resistance.

There are two air locks (one security air lock and one emergency exit air lock) that separate Fire Area CB-7 from the control room complex, Fire Area CB-6. The exit doors of the air locks are 3-hour fire rated fire doors in 3-hour fire rated walls. The nearest combustibles to the air lock doors are in the corridor of Fire Area CB-7. The average fire loading in fire zone CB-6d is moderate. The landing of Fire Area CB-7 in front of the doors contains no in situ combustibles.

The air locks contain no in situ combustibles. The exit door of each air lock is a 3-hour rated fire door in a 3-hour rated wall. The floor and ceiling of all air locks have fire ratings of 3 hours. Based on the substantial construction of these security doors, the presence of the air lock barriers, and the minimum 1.9-hour fire resistance of the doors and walls between these doors and adjacent zones, the doors provide adequate fire resistance.

4.2.2.6 Block Walls

Description of Deviation

The 8-inch hollow concrete block walls separating the fire areas listed below are rated with less than a 3-hour fire resistance rating at elevation 781 feet 0 inch.

- o CB-1 to CB-2
- o CB-1 to CB-4
- o CB-1 to CB-5
- o CB-1 to CB-7
- o CB-2 to CB-3
- o CB-2 to CB-4
- o CB-3 to CB-4
- o CB-4 to CB-5
- o CB-4 to CB-7
- o CB-5 to CB-7

The separation criteria of 10CFR50 Appendix R, Section III.G have been met in the design.

References

1. BTP 9.5-1 Appendix A, Sections D.1.1 and F.3.

2. NUREG 0853, SER Sections 9.5.2.1, 9.5.4.2, and 9.5.4.5 reference that floors, walls, and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours.

Fire Areas Involved

Fire Zone CB-1g - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-1h - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Area CB-2 - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-3a - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-3b - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-3c - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-3d - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-3e - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-3f - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-3g - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Area CB-4 - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-5a - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-5b - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-5c - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Area CB-7 - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

As shown on Figure 4.2.4.5-1, divisions of safe shutdown cables are located on this elevation (781 feet 0 inch) of the control building. Electrical cables in all fire zones and areas have been evaluated as stated previously in Section 3.3 of this report.

In each case the protection provided by the fire zones and areas meets the criteria issued by the NRC in 10 CFR 50 Appendix R, Section III.G.2 or 3 for safe shutdown.

Area separation, which is provided by a 3-hour fire barrier, e.g., CB-2 to A-3f or CB-4 to A-2n, are not discussed in this deviation.

Individual safe shutdown cable routing or safety-related cable tray locations are shown on Figure 4.2.4.5-5 or Cable Tray Figure 11, respectively.

Engineering Justification

As can be seen from Figures FP-13b, 35b, and 36b and Table 4.2.2.6-2, all fire zones and areas are enclosed by passive fire barriers of a rating greater than the fire load except for Fire Area CB-2 and Fire Zone CB-5c.

For those fire zones and areas where the fire load is greater than the fire barrier, an automatic wet-pipe sprinkler system has been provided over the fire zone or area.

All fire zones and areas, except for Fire Zones CB-1h, have a fire detection system. Fire Area CB-7 has a partial fire detection system.

All openings in 1.9-hour fire rated walls are protected with 3-hour fire doors, fire dampers, and penetration seals.

Only steel cable trays with solid bottoms are used at the Clinton site. All instrumentation cable trays, in addition to the solid bottom, have solid metal covers over the top. When power, control, and instrument cable trays are stacked and run horizontally, the instrument tray is closest to the floor with the power tray closest to the ceiling. Cable trays routed horizontally have a 6-inch depth, whereas all cable tray risers have a 12-inch depth. The vertical distance between the bottoms of horizontal trays is usually 1 foot 6 inches.

All vertical cable tray risers, where they penetrate a floor and/or ceiling (whether or not it is rated) are sealed with a 3-hour fire rated silicone foam seal.

The majority of the cables used in cable trays are constructed of ethylene-propylene rubber covered with a hypalon jacket. The flame retardant, self-extinguishing characteristics of the EPR/hypalon electrical cable have been demonstrated by a series of fire tests. Tests have proven that a fire will not propagate either horizontally or vertically along cable or between cable trays.

Fire Zones CB-2, CB-3, and CB-4 have good aisle accessibility and at least two remote entrances for use by the fire brigade are provided.

Fire Zone CB-2

The floor, ceiling, and west and north walls of the Division 2 cable spreading room (separating this area from other areas of the plant) are all 3-hour fire rated. The east and south walls, however, are not 3-hour fire rated, but an equivalent level of protection is provided.

A 1.9-hour fire rated wall separates the east wall of the cable spreading room from an adjacent general access area (Fire Zone CB-1g). The fire loading for Fire Zone CB-1g is low. Thus, a fire in Fire Zone CB-1g could not penetrate the 1.9-hour fire wall separating the two areas. Additionally, Fire Zone CB-1g is provided with an ionization fire detection system with alarm and annunciation in the control room so that any fire would be quickly detected. Also, the cable spreading room is protected by a wet-pipe sprinkler system. Thus, the low fire load, combined with the 1.9-hour fire rated wall, along with detection in both areas and suppression system in Fire Area CB-2 provide a level of protection for the east wall equivalent to a 3-hour fire rated barrier.

Fire Zone CB-4

The floor, ceiling, and west wall of the Division 1 cable spreading room are 3-hour fire rated. The east wall, along with the north and south walls, are 1.9-hour fire rated.

The 1.9-hour fire rated east wall, like the Division 2 east wall, is adjacent to Fire Zone CB-1g, which has a low fire loading. As discussed above, the low fire load, combined with the 1.9-hour fire rated wall, along with detection and suppression systems (in Fire Area CB-4), provide a level of protection for the east wall equivalent to a 3-hour fire rated barrier.

A 1.9-hour fire rated wall separates the south wall of the Division 1 cable spreading room from adjacent Fire Zone CB-5a, the Division 3 switchgear room and general access area, and Fire Area CB-7 (stairwell), and Fire Zone CB-5b (Division 3 battery room). The fire loading for Fire Zone CB-5a (the highest of the three adjacent zones) is moderate. Thus, a fire in Fire Zone CB-5a (or Fire Area CB-7 or Fire Zone CB-5b) would not penetrate the 1.9-hour wall separating the two areas. Additionally, Fire Zones CB-5a and CB-5b are provided with an ionization fire detection system with alarm and annunciation in the control room so that any fire would be quickly detected. Also, the cable spreading room is protected by a wet-pipe sprinkler system. Thus, the fire load, combined with the 1.9-hour fire rated wall, along with the detection in both areas and suppression system, provide a level of protection for the south wall equivalent to a 3-hour fire rated barrier.

Walls Separating CB-2 From CB-4

The south boundary of the Division 2 cable spreading room is protected by a 1.9-hour fire rated wall, as is the north boundary of the Division 1 cable spreading room. These two walls are separated by Fire Zone CB-3a, which is the auxiliary electric equipment room. Like the two cable spreading rooms, Fire Zone CB-3a has an ionization fire detection system and an automatic sprinkler system. Thus, the two cable spreading rooms are separated by two 1.9-hour walls and full suppression is provided in each cable spreading room and in Fire Zone CB-3a, which is located between the two cable spreading rooms. Moreover, the fire loading in the intervening fire zone, CB-3a is moderate and is not sufficient to penetrate both the 1.9-hour barriers, thus disabling both cable spreading rooms. Therefore, protection in excess of a 3-hour fire barrier is provided except for a 14-foot section of a 1.9-hour wall that separates the two cable spreading rooms on their extreme east ends.

On the east end, the two cable spreading rooms are separated by a single 1.9-hour fire rated wall. However, there are no safe shutdown cables in close proximity in this area. In the 14-foot section separating the southeast portion of the Division 2 cable spreading room from the northeast portion of the Division 1 cable spreading room, the cables are no closer than 42 feet from each other. BOP cable penetrates the 1.9-hour wall, but is contained in a 3-hour fire rated penetration. Moreover, the area is protected by fire detection and automatic suppression systems. Thus, a fire originating on either side of the 14-foot, 1.9-hour fire rated wall would not be expected to breach the wall and disable both divisions of cable spreading rooms.

In summary, where the cable spreading rooms are not separated from other areas of the plant by 3-hour walls, an equivalent measure of protection is provided.

The existing active and passive fire protection for the remaining zones do not warrant any increase in its fire resistive walls since the fire loading in these zones does not jeopardize the fire resistive integrity of the wall.

4.2.2.7 Control Room Peripheral Walls

Description of Deviation

The control room complex is separated from other plant areas by fire barriers rated at less than 3 hours of fire resistance.

References

1. BTP 9.5-1 Appendix A, Section F.2.

2. NUREG-0853, SER Section 9.5.4.1, references that floors, walls and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours.

Fire Areas Involved

Fire Zone CB-6a - Elevation 800 feet 0 inch (see Figures FP-14a and 14b and Cable Tray Figure 12).

Fire Zone CB-6b - Elevation 800 feet 0 inch (see Figures FP-14a and 14b and Cable Tray Figure 12).

Fire Zone CB-6c - Elevation 800 feet 0 inch (see Figures FP-14a and 14b and Cable Tray Figure 12).

Fire Zone CB-6d - Elevation 800 feet 0 inch (see Figures FP-14a and 14b and Cable Tray Figure 12).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Zone CB-6a contains control cabinets and cables of all divisions.

Fire Zone CB-6b contains the safety-related equipment, including Division 1, 2, and 3 instrument and control cables, terminal cabinets and panels, Division 1 and 2 cable trays, and control room breathing air bottles. The performance goals for the safe shutdown functions are assured by Method 1.

Fire Zone CB-6c contains Division 1 and 2 safety-related and safe shutdown equipment and/or cables. The performance goals for the safe shutdown functions are assured by Method 1.

Fire Zone CB-6d contains the Division 1, 2, and 3 vertical electrical cable risers. The performance goals for the safe shutdown function are assured by Method 1.

Engineering Justification

Fire Zone CB-6a is the main control room. The floor is 23-inch reinforced concrete and has a 3-hour fire rating. The control room is separated from adjacent fire zones by 1.9-hour fire rated walls. The ceiling is 24-inch reinforced concrete on metal decking with fireproofed structural steel and has a 3-hour fire rating. The fire loading for this zone is moderate.

There is an ionization fire detection system is this zone. A Halon fire suppression system (PGCC) is also provided.

Fire Zone CB-6b was intended to be the Unit 2 terminal cabinet and back-panel area of the control room. It includes the TMI panel room and is currently the operations admin area. The floor area is 5631 ft^2.

The floor is 23-inch reinforced concrete and has two 4-inch floor drains. The floor is 3-hour fire rated. The walls are 24-inch reinforced concrete or 7-5/8-inch minimum hollow concrete block. The control room complex is separated from adjacent fire areas by 3-hour fire rated barriers.

Security - Related Information Figure Withheld Under 10 CFR 2.390

Method 1 safe shutdown cables 1AP28Q, 1AP34X, and 1AP28B are routed and labeled as 1AP28U, 1AP34I, and 1AP28T from the west side of the south Division 1 cable riser to the east side of Fire Zone CB-6d. They are protected by a 3-hour fire rated material.

There are Division 1 and 2 safe shutdown cables and instruments in Fire Area CB-6 for the ventilation system in all fire zones. Since the ventilation system is 100% redundant, a fire in any fire zone could affect one or both ventilation systems. The associated ventilation dampers would fail open or closed for that division. The 100% redundant feature would still supply air for the room. If the affected zone or area became uninhabitable, an evacuation of the control room might become necessary. The remote shutdown panel has been provided to ensure a safe shutdown by Method 1.

The control room complex (Fire Zones CB-6a through CB-6d) is separated from other plant areas by fire barriers of at least a 3-hour resistance rating with the following exceptions: Fire Zone CB-6d is separated from Fire Area CB-7 and Fire Zone CB-1h by 3-hour fire rated 12-inch reinforced concrete walls with 3-hour doors (See Subsection 4.2.2.5).

Peripheral rooms included in the control room complex such as the locker room, kitchen, office/computer room and operator staging area (Fire Zone CB-6d) are separated from the control room (Fire Zone CB-6a) by an 8-inch hollow concrete block wall rated at less than 3 hours but with approximately 1.9-hour fire resistance. Doors in these barriers are 3-hour fire rated. The office areas in Fire Zone CB-6a are separated from the control room by 1.9-hour fire rated walls.

Ionization-type smoke detection is provided as outlined in the FPER. The control room equipment is protected as described in the FPER. Alternate shutdown capability is provided independent of the control room and all other zones on this floor elevation from the remote shutdown panel in the auxiliary building Division 1 switchgear area.

Based on the level of passive protection provided and the remote shutdown capability, the existing barriers are adequate.

4.2.2.8 Drywell Separation

Description of Deviation

The noninerted drywell has intervening combustibles between redundant divisions.

References

10 CFR 50 Appendix R, Section III.G.2.d.

Fire Area(s) Involved

Fire Area C-1 - Elevations 723 feet 1-3/4 inch through 778 feet 0 inches (see Figures FP-2a and 2b through FP-5a and 5b and Cable Tray Figures 4 through 6).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

The reactor vessel, reactor assembly, vessel and components, control rod drive, nuclear instrumentation, and Division 1, 2, 3, and 4 valves are located in the area.

There are Division 1 and 2 safe shutdown cables and equipment in this fire area belonging to both methods of safe shutdown systems (see Figures 4.2.4.1-1 through 4.2.4.1-3). Cables associated with each method of safe shutdown have been evaluated. The RHR safe shutdown cables (1RH17C and 1RH17D) serve valve 1E12-F009. This valve must be opened to proceed from hot to cold shutdown using RHR in the shutdown cooling mode. Both divisions of nuclear boiler system cables (1NB35D, E, F, G, H, and K and 1NB37C, D, F, H, K, M, P, and R) serve the ADS valves and SRVs 1B21-F051C and D. Disabling one electrical division of control to those SRV cables will not disable the other division nor cause spurious operation of these valves. The SRVs are dual power valves. With a disabling of any horizontal 20-foot segment of the drywell, a sufficient number of SRVs will be available to safely shut down the plant. The separation distance between the Division 1 and 2 cables is less than 20 feet.

The performance goals for the safe shutdown functions are assured by the availability of both methods of safe shutdown systems.

Engineering Justification

The area consists of the drywell volume of the containment building starting at elevation 723 feet 1-3/4 inches. The floor area at this elevation is 2947 ft^2.

The floor is 12-foot 8-1/4-inch-minimum concrete with five 6-inch and two 4-inch floor drains to a sump located within the area. The floor is not fire rated. The walls are 22-inch-minimum concrete and 1-inch steel liner plates. The drywell wall is 3-hour fire rated; the remaining walls are not fire rated. The ceiling (the drywell head) is 36-inch-minimum concrete and is 3-hour fire rated.

The reactor vessel is located within the area and enclosed by a wall of 68-inch concrete.

The drywell cooling system is non-safety-related and is powered by two independent essential switchgear and standby diesel generators to preclude possible ECCS operation due to cooler shutdown in the event of loss of offsite power. The supplemental drywell cooling system is not powered from divisional sources. The system functions to recirculate and distribute cooling air throughout the drywell.

The only significant combustible materials located in this area are pump lubricants; a minor amount of "free-air" cable is located in this area as well. This results in a low fire loading.

The area adjacent to the reactor recirculation motor is provided with an infrared fire detection system. Once detected, the fire could be extinguished by the fire brigade using portable fire extinguishers accessible to this fire area and the fire hose station available in the drywell.

Separation of safe shutdown conduits is greater than 20 feet except at elevation 764 feet 0 inch where they cross over each other and run parallel within 1 foot of each other. In addition, each SRV is powered by both Division 1 and 2. A sufficient number of SRVs would be available even assuming that all cable and equipment were disabled within any 20-foot horizontal portion of the drywell. It should be noted that the SRVs also have extensive vertical separation from the only significant fire hazard in this fire area, which is the lubricating oil for the two reactor recirculation pump motors.

The fire hazard associated with the reactor recirculation pump motors is discussed in detail in Subsections 3.2.1.2 and 4.2.5.1. An exposure fire due to ignition of the recirculation pump

lubricating oil is not credible. If a fire occurred at the recirculation pump motors, it would be detected by the infrared fire detection system.

Although most cables in the noninerted drywell are contained in conduit, there is a limited amount of exposed cable insulation from "free-air" instrument cables carrying very low voltages. The majority of these "free-air" cables are associated with the Control Rod Drive and Neutron Monitoring systems, and are located entirely beneath the reactor vessel. These cables are safety-related but are not required for safe shutdown. An exposure fire involving these cables would be contained within the vessel pedestal and would not propagate to any safety-related equipment; therefore, safe shutdown ability is not affected.

The remainder of the exposed cables are small diameter instrumentation cables. These non safety-related cables carry extremely low voltage signals for the Reactor Recirculation Vibration Monitoring system. Approximately 600 feet of vendor-supplied coaxial cable with Tefzel jacketing is exposed in the lower elevation of the drywell. The coaxial cables have not been tested to IEEE-383, and are routed "free-air" from the vibration sensors on each recirculation pump to two junction boxes, one mounted near each pump. Approximately 2700 feet of IEEE-383 qualified cable with Tefzel insulation and jacketing is routed "free-air" from these junction boxes at elevation 737' to a single junction box at elevation 785'.

None of these exposed instrumentation cables represent a significant exposure fire hazard because of the burn characteristics of Tefzel. As documented in GE NEDO-10466A, Revision 1, Tefzel is a thermoplastic material with flash-ignition and auto-ignition temperatures higher than its melting temperature, substantiated by numerous fire tests conducted by General Electric and verified by the Tefzel manufacturer, DuPont. This characteristic of melting before burning ensures that burning can only occur on the cable surface as a liquid, and will prevent a fire from propagating along the exposed Tefzel cable. There are no safe-shutdown cables or equipment below these exposed cables that can be affected by liquefied Tefzel. The limited use of exposed Tefzel insulation does not represent a significant fire hazard, therefore, and is not considered an intervening combustible for any of the safe shutdown cables or equipment in the drywell.

The drywell is inaccessible during operation, and when opened, stringent administrative controls are implemented to monitor personnel and equipment ingress and egress. Therefore, an exposure fire from transient combustibles during operation is not credible.

For these reasons, the existing level of protection is adequate to ensure safe shutdown with the existing protection.

4.2.2.9 Ventilation Piping

Description of Deviation

Ventilation piping that penetrate 3-hour fire-rated walls and floors do not have fire dampers.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER Section 9.5.2.1, references that floors, walls, and ceilings enclosing separate fire areas should have a minimum 3-hour fire rating. Penetrations in these

barriers, including conduits and piping, should be sealed or closed to provide a fire resistance rating at least equal to that of the fire barrier itself.

Fire Areas Involved

Fire Zone A-1e - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2a - Elevations 707 feet 6 inches through 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone A-2b - Elevations 707 feet 6 inches through 781 feet 0 inch (see Figures FP-2a and 2b through 5a and 5b and Cable Tray Figures 2 and 3).

Fire Zone A-2c - Elevations 707 feet 6 inches through 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone A-2d - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2g - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2h - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2i - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2j - Elevation 750 feet 6 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2k - Elevation 762 feet 0 inch (see Figures FP-4a and 4b and Cable Tray Figure 4).

Fire Zone A-2n - Elevation 781 feet 0 inch (see Figures FP-5a and 5b and Cable Tray Figure 5).

Fire Zone A-3a - Elevations 707 feet 6 inches through 788 feet 6 inch (see Figures FP-2a and 2b through 5a and 5b and Cable Tray Figures 2 and 3).

Fire Zone A-3b - Elevations 707 feet 6 inches (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone A-3c - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone A-3d - Elevation 762 feet 0 inch (see Figures FP-4a and 4b and Cable Tray Figure 4).

Fire Zone A-3f - Elevation 781 feet 0 inch (see Figures FP-5a and 5b and Cable Tray Figure 5).

Fire Zone CB-1c - Elevation 719 feet 0 inch (see Figures FP-9a and 9b and Cable Tray Figure 8).

Fire Zone F-1a - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1b - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1p - Elevations 712 feet 0 inch through 781 feet 0 inch (see Figures FP-2a and 2b through 5a and 5b and Cable Tray Figures 4 and 5).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Zone	Safe Shutdown Equipment and/or Cables
A-1e	Yes
A-2a	Yes
A-2b	Yes
A-2c	Yes
A-2d	Yes
A-2g	No
A-2h	No
A-2i	No
A-2j	No
A-2k	Yes
A-2n	Yes
A-3a	Yes
A-3b	Yes
A-3c	Yes
A-3d	Yes

Fire Zone	Safe Shutdown Equipment and/or Cables
A-3f	Yes
CB-1c	Yes
F-1a	Yes
F-1b	Yes
F-1p	Yes

Engineering Justification

Various 3-hour rated floors and walls are penetrated by the standby gas treatment system ventilation piping (VG). The annular space between the pipe and the barrier is sealed with a 3-hour fire rated penetration seal. The VG system piping exhaust is routed through various fire zones and has exhaust ventilation openings in the fire zones (located away from the fire barrier). The primary concern is that the lack of fire dampers would allow a fire to propagate from one side of the barrier to the other side.

The off-gas treatment ventilation system main header is constructed of 14-inch welded steel pipe that is seismically supported. Two basic piping loops are provided.

Piping Loop No. 1

Piping loop No. 1 is routed through elevation 712 feet of the fuel building and elevations 712 feet and 737 feet of the control building. The VG system provides exhaust via a 6-inch stub into the main loop, from the RHR pump room, HPCS and LPCS sump room, RWCU pump room, and the radwaste pipe tunnel. Exhaust from each pipe opening is between 300 and 400 cfm.

All the fire zones through which piping loop No. 1 is routed contain ionization fire detection that alarm and annunciate in the control room except Fire Zones A-3c, A-2g, A-2h, A-2i, and A-2j. Piping loop No. 1 is routed through fire zones with combustible loadings classified as follows:

Fire Zone	Fire Load Classification
A-2a	low
A-2b	low
A-2c	low
A-2g	low
A-2h	low
A-2i	low
A-2j	low
A-3a	low
A-3b	low
A-3c	low
F-1a	low
F-1b	low

Around the containment building where it would abut the auxiliary building, a 2-inch ventilation and seismic gap is provided (see Deviation 4.2.2.1). Even if a fire did develop on any of the elevations of the auxiliary building, it would not create sufficient pressure to penetrate the VG system pipe, propagate down the pipe, and discharge into another fire area due to the seismic gap.

Piping Loop No. 2

Piping loop No. 2 is routed vertically up the east and west sides of the auxiliary building (elevations 737 feet, 761 feet, and 781 feet) and contains a 6-inch ventilation stub on each elevation. These two risers are cross-connected by a pipe running through the fuel building (Zone F-1p) with a 10-inch ventilation stub.

All the fire zones through which piping loop No. 2 is routed contain ionization fire detection that alarms and annunciates in the control room except Fire Zones A-2d and A-1e.

Safe shutdown Method 1 equipment and cables are located on the east side of the auxiliary building; safe shutdown Method 2 equipment and cables are located on the west side of the auxiliary building. The vertical risers of the VG system that penetrate the various elevations communicate only with the same method of safe shutdown. The opposite method of safe shutdown is separated by 3-hour fire walls except for the piping routed through Zone F-1p that cross connects the two risers. This cross connection is located in a zone that consists of two full elevations of the fuel building with low combustible loading. There is also a 2-inch ventilation and seismic gap where the fuel building wall abuts the south side of the containment building. The distance the piping loop is routed in the zone is approximately 300 feet, with one stub opening. Due to the volume of the zone, it is not credible for a fire to penetrate the VG loop, travel down the cross connection loop, and discharge into opposite shutdown method zones. Therefore, based on the low combustibles, the detection provided, the construction of the penetration, and the presence of the seismic gap, fire dampers are not warranted.

4.2.2.10 Control Building Floors

Description of Deviation

The non-fire-rated reinforced concrete floors of the control building (Fire Area CB-1) separate redundant safe shutdown electrical divisions of cables and components.

Deviations for partial fire detection and suppression in this fire area are found in Subsections 4.2.3.1.5 and 4.2.4.5 of this analysis, respectively.

References

10 CFR 50, Appendix R, Sections III.G.2.b and III.G.3 state: Separation of cables and equipment and associated non-safety-related circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area. . . . Alternative or dedicated shutdown capability and its associated circuits independent of cables, systems, or components in the area, room, or zone under consideration, shall be provided. . . . In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration.

Fire Areas Involved

Fire Zone CB-1a - Elevation 712 feet 0 inch (see Figures FP-8a and 8b).

Fire Zone CB-1b - Elevation 702 feet 0 inch (see Figures FP-8a and 8b and Cable Tray Figure 7).

Fire Zone CB-1c - Elevation 719 feet 0 inch (see Figures FP-9a and 9b and Cable Tray Figure 8).

Fire Zone CB-1d - Elevation 737 feet 0 inch (see Figures FP-10a and 10b and Cable Tray Figure 9).

Fire Zone CB-1e - Elevation 737 feet 0 inch and 751 feet 0 inch (see Figures FP-10a, 10b, 11a, and 11b and Cable Tray Figure 9).

Fire Zone CB-1f - Elevation 762 feet 0 inch (see Figures FP-12a and 12b and Cable Tray Figure 10).

Fire Zone CB-1g - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-1h - Elevations 702 feet 0 inch through 847 feet 0 inch (see Figures FP-8a and 8b through 15a and 15b).

Fire Zone CB-1i - Elevation 825 feet 0 inch (see Figures FP-15a and 15b and Cable Tray Figure 13).

Also see Figures FP-34a and 34b through 36a and 36b for information concerning these fire zones.

Description of Safe Shutdown Equipment and Cables

Safe shutdown cables and equipment in the zones are shown on Figures 4.2.4.5-1 through 4.2.4.5-6.

Fire Zone CB-1h is a stairwell tower enclosed by 1.9-hour and 3-hour fire rated walls and does not contain any safety-related or safe shutdown systems. It is not mentioned in the following discussion.

Engineering Justification

Rated fire floors are not utilized throughout Fire Area CB-1 to separate safe shutdown systems. A combination of partial suppression systems, partial fire detection, and firerated barriers are used to provide an equivalent level of protection to Appendix R requirements. The fire protection provided ensures that a fire cannot propagate horizontally or vertically upward sufficiently to damage redundant safe shutdown trains. This deviation is discussed by starting at the lowest elevation of Fire Area CB-1 and progressing upward. Because it is not likely that a fire will propagate downward since all cable risers are sealed at floor penetrations and there is no other continuity of combustibles, that situation was not analyzed.

Elevation 712 Feet 0 Inch - Fire Zone CB-1a
Elevation 702 Feet 0 Inch - Fire Zone CB-1b

All cable tray risers are sealed at the ceiling with a 3-hour fire rated penetration seal.

The walls of Fire Zone CB-1a are 12-inch-minimum reinforced concrete, or 11-5/8 or 7-5/8-inch hollow concrete block. The west wall and the south corridor wall, common to Fire Areas D-1, D-1, and D-3, are 3-hour fire rated; and the wall common to CB-1h, which is 1.9-hour fire rated. The remaining walls are not fire rated. The ceiling (the floor of elevation 762 feet 0 inch) is 12-inch-minimum reinforced concrete and is 3-hour fire rated. Manual hose stations and portable extinguishers are provided throughout this zone. Fire Zone CB-1a has a low fire loading.

The walls of Fire-Zone CB-1b are at least 12-inch reinforced concrete or 11-5/8-inch solid concrete block or 7-5/8-inch hollow concrete block. The north and west walls are 3-hour fire rated; and the walls common to CB-1h and CB-7 which are 1.9-hour fire rated. The ceiling is at least 12-inch reinforced concrete and is not fire rated. Manual hose stations and portable extinguishers are provided throughout this zone. Fire Zone CB-1b has a low fire loading.

Fire Zones CB-1a and CB-1b contain no safe shutdown cables or equipment. If a fire were to start at elevation 702 feet 0 inch, no safe shutdown equipment would be affected. Because of the low fire loading in Fire Zone CB-1a, it is not credible that a fire started in this zone will propagate. A fire starting in Fire Zone CB-1b would be prevented from spreading upward because of the sealing of the cable risers at the ceiling and the substantial construction of the ceiling.

Elevation 719 Feet 0 Inch - Fire Zone CB-1c

All cable tray risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

This zone is a general access area and a heating, ventilation, and air-conditioning equipment area. Also, the standby gas treatment Systems A and B are located in the zone. The fire load in Fire Zone CB-1c is low.

The floor of Fire Zone CB-1c is 12-inch reinforced concrete. The floor of the west and east radwaste pipe tunnels are 3-hour fire rated, and the remaining floor is not fire rated. The walls of Fire Zone CB-1c are 36-inch reinforced concrete, 15-5/8-inch solid concrete block, or 11-5/8-inch hollow concrete block. The north and west walls, including walls and ceiling of the west radwaste pipe tunnel and interior walls and ceiling of the east radwaste pipe tunnel, are 3-hour fire rated, and the remaining walls are not fire rated. The ceiling is 20-inch reinforced concrete and is 3-hour fire rated from columns/rows AC-AE and 124-130, and under the cable riser area of Zone CB-1d. The remainder of the ceiling is unrated. There are four stairways in this zone: two are open and two are enclosed in 1.9-hour fire rated walls, There are two elevators enclosed in 1.9-hour fire rated wall. Area fire detection and manual hose stations and extinguishers are provided in this zone.

If a fire were to start in Fire Zone CB-1c, Method 1 and 2 safe shutdown systems could be affected (see Figure 4.2.4.5-1). Fire induced damage to Division 1 safe shutdown systems would not prevent safe plant shutdown using Method 3 equipment. As a result of the low fire loading, it is unlikely that a fire will propagate up to elevation 737 feet 0 inch.

Elevation 737 Feet 0 Inch - Fire Zone CB-1d

Elevations 737 Feet 0 Inch and 751 Feet 0 Inch - Fire Zone CB-1e

Cables and equipment are shown on Figures 4.2.4.5-2 and 4.2.4.5-3.

The floor of Fire Zone CB-1d is 20-inch reinforced concrete and is not fire rated, except for the floor of the cable riser area which is 3-hour fire rated. The walls in Fire Zone CB-1d are 7-5/8-inch-minimum solid or hollow concrete block or 18-inch-minimum reinforced concrete. The north and west walls have a 3-hour fire rating. The radwaste pipe tunnels are 3-hour fire rated. The enclosed stairways are 1.9-hour fire rated. The south and west walls of the cable riser rooms are 1.9-hour fire rated. The remaining walls are not fire rated. The ceiling is at least 8-inch reinforced concrete at elevation 751 feet 0 inch and is not fire rated. Portable extinguishers, manual hose stations, and partial fire detection are provided (see Figure FP-10b).

Fire Zone CB-1e is a general access area at elevation 737 feet 0 inch and it includes a mezzanine above Fire Zone CB-1d. The floor of the general access area of Fire Zone CB-1e is 20-inch-minimum reinforced concrete and is not fire rated. The floor of the mezzanine level, which is the intermediate roof of Fire Zone CB-1d, is at least 8-inch reinforced concrete and it is not fire rated. The walls of Fire Zone CB-1e are 18-inch reinforced concrete, 15-5/8- inch solid concrete block, or 7-5/8-inch-minimum hollow concrete block. The portion of the south wall adjacent to the diesel-generator rooms (Fire Zones D-4a, D-5a, and D-6a) and the north wall adjacent to the radwaste building above elevation 751 feet 0 inch and the west wall adjacent to the auxiliary building are 3-hour fire rated. The two enclosed stairways and two enclosed elevators are 1.9-hour fire rated. The remaining walls are not fire rated. The ceiling of Fire Zone CB-1e is 12-inch-minimum reinforced concrete with open pipe and equipment removal hatches. The ceiling is not fire rated.

The fire load in Zone CB-1e is low. Cables are concentrated at the west side of Fire Zone CB-1e. The fire load in Fire Zone CB-1d is moderate. Higher cable tray concentrations are located in the riser sections by row S (see Figure 4.5.4.5-2). These risers are sealed at elevations 737 feet 0 inch, 751 feet 0 inch, and 762 feet 0 inch by 3-hour fire rated seals. The only other fixed fire hazards are the gases stored in the compressed gas storage room. The Division 1 and 2 cables in proximity to this room are shown on Cable Tray Figure 9.

If a fire were to start in Fire Zone CB-1d or CB-1e, either Division 1 or Division 2 safe shutdown systems (but not both) could be affected (see Figures 4.2.4.5-2 and 4.2.4.5-3). Damage to both Division 1 and Division 2 safe shutdown systems from a fire would be prevented by one or more of the following fire protection or mitigating plant features (a wet-pipe sprinkler system (see Figures FP-10b and FP-11b), horizontal separation and/or Division 2 raceway protected with fire barrier material). Also, a wet-pipe sprinkler system was installed to protect the small open pipe hatch at the ceiling of Fire Zone CB-1c (located at column row 125/AC, elevation 737 feet 0 inch, see Figure FP-9b).

The Division 2 safe shutdown systems in Fire Zone CB-1c pass no closer than 14 feet from the hatch, which along with the absence of intervening combustibles, limits the chances of vertical fire propagation. In addition, an automatic suppression system is provided over Division 1 safe shutdown systems at elevation 737 feet 0 inch (see Figures FP-10b and FP-11b and Cable Tray Figure 9), further preventing fire damage to Division 1 safe shutdown systems from exposure fires from all directions. The suppression system would also prevent a fire in Division 1 systems from propagating horizontally or vertically upward.

Any Division 2 safe shutdown systems that pass horizontally within 20 feet of Division 1 safe shutdown systems are also protected by a fire rated material. Automatic detection is installed throughout Fire Zone CB-1e at elevation 751. The possibility of upward fire propagations from Fire Zones CB-1d and CB-1e is prevented by automatic sprinkler protection that is provided at the ceiling of elevation 737 feet 0 inch around the HVAC shaft at column row 125/AC and the equipment hatch at column row 132/AA. Upward propagation through the unrated ceiling is prevented by the sealing of the primary propagation path, the cable riser penetrating the ceiling.

A safe plant shutdown would be achieved by Method 2 or 3 safe shutdown systems.

Elevation 762 Feet 0 Inch - Fire Zone CB-1f

All cable tray risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

The floor is 12-inch reinforced concrete with open areas for piping and equipment removal. The floor is not fire rated, except for the floor over the two radwaste pipe tunnels which are 3-hour fire rated.

The zone walls are 24-inch-minimum concrete and are 3-hour fire rated, except for the east wall, which is not fire rated. The ceiling is 12-inch-minimum reinforced concrete and is 3-hour fire rated between column rows 124-130 and column lines S-AC. Manual hose stations and portable fire extinguishers are provided as shown on Figure FP-12b.

Area fire detection is provided in this fire zone. The fire load in Fire Zone CB-1f is moderate.

If a fire were to start in Fire Zone CB-1f at elevation 762 feet 0 inch, only Division 1 safe shutdown systems could be affected; all Division 2 safe shutdown systems are protected by a fire-rated material (see Figure 4.2.4.5-4). A safe plant shutdown would be achieved by Method 2 safe shutdown systems. The possibility of upward fire propagation from Fire Zone CB-1f is limited by the automatic sprinkler system that is provided at the ceiling of elevation 762 feet 0 inch over the Division 1 cable trays and around the HVAC shaft at column row 125/AC, the 3-hour fire rated ceiling between column rows 124-130 and column line S-AC, and the sealing of cable risers penetrating the ceiling. Upward fire propagation can occur through the open hatch at column row 135/AC, which communicates with elevation 825 feet 0 inch (Fire Zone CB-1i). The concern is discussed later.

In addition sprinkler protection is provided by an automatic wet pipe sprinkler system at the 762' elevation of the Control Building between columns S-AC/124-130. This system will mitigate the exposure of the wrapped Div. II raceways from a fire in this zone.

Elevation 781 Feet 0 Inch - Fire Zone CB-1g

All cable tray risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

This zone is a general access for the cable spreading rooms. This space was originally intended for the Unit 2 cable spreading rooms but is currently the insulators shop. The fire loading in Fire Zone CB-1g is low.

The floor is 12-inch minimum reinforced concrete and is not fire rated. The walls are 24-inch minimum reinforced concrete or 7-5/8-inch hollow concrete block. The north and south walls are 3-hour fire rated, and the west wall and stair/elevator enclosure are 1.9-hour fire rated. The

remaining walls are not fire rated. The ceiling is 23-inch minimum reinforced concrete and is 3-hour fire rated. Portable fire extinguishers and manual hose stations are provided as shown on Figure FP-13b. Area fire detection is also provided throughout this fire zone.

If a fire were to start in Fire Zone CB-1g at elevation 781 feet 0 inch, only Division 1 safe shutdown systems could be affected (see Figures 4.2.4.5-5). A safe plant shutdown would be assured by Method 2 safe shutdown systems. A fire cannot propagate upward from Fire Zone CB-1g since the ceiling is 3-hour fire rated. Thus, for a fire in Fire Zone CB-1g at elevation 781 feet 0 inch, the fire would be contained at this elevation and safe shutdown could be achieved.

Elevation 825 Feet 0 Inch - Fire Zone CB-1i

All cable tray risers have 3-hour fire rated penetration seals installed in the floor. The fire loading in Fire Zone CB-1i is moderate.

This zone contains the air handling equipment for the control room and auxiliary building. The floor is 12-inch-minimum concrete on steel decking and is 3-hour fire rated. The walls are 24-inch reinforced concrete, 11-5/8-inch hollow concrete block, or 7-5/8-inch hollow concrete block. The walls at the stair/elevator enclosures are 1.9-hour fire rated. The walls of the hatch at elevation 781'-0" are 3-hour fire rated. The missile wall and remaining exterior walls are not fire rated. The ceiling is 24-inch concrete on steel decking and is 3-hour fire rated. The dividing wall at column 130 between the missile wall and row AC has a 3-hour fire rating. Portable fire extinguishers and manual hose stations are provided as shown on Figure FP-15b. Fire detection is provided between columns 128 and 133.

Division 1 and 2 cables required for safe shutdown are located in this fire zone and are shown on Figure 4.2.4.5-6.

If a fire were to start in or propagate to Fire Zone CB-1i at elevation 825 feet 0 inch, Division 1 and Division 2 safe shutdown systems could be affected (Figure 4.2.4.5-6).

If a fire were to start on the east side of Fire Zone CB-1i, only Division 1 safe shutdown systems could be affected, and if a fire had propagated up from Fire Zone CB-1f, the same would hold true. A safe plant shutdown would be assured by Method 2 safe shutdown systems. If a fire were to start on the west side of Fire Zone CB-1i, it would be detected by the automatic fire detection system, which would alert the fire brigade, who would promptly extinguish the fire. A fire would not propagate up from Fire Zone CB-1f at elevation 755 feet 0 inch since it has a wet-pipe sprinkler system at the ceiling of the hatch leading to Fire Zone CB-1i (see Figures FP-34a and 34b). Safe shutdown would be provided from the remote shutdown panel by Method 1 safe shutdown systems.

In conclusion, additional fire-rated barriers separating each elevation are not necessary in Fire Area CB-1. In all possibilities of fire ignition and propagation, safe shutdown is assured by a combination of passive fire barriers, detection, and partial automatic suppression systems, providing an equivalent level of protection to the referenced requirements.

4.2.2.11 Unprotected Steel in Stairways

Description of Deviation

Enclosed stairwells are constructed of 1.9-hour hollow concrete blocks with openings protected by fire-rated doors and labeled frames. Steel columns framed into these walls on the stairwell side are not protected.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER Section 9.5.2.1 references that floors, walls, and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours and penetrations in these fire barriers, including conduits and piping, should be sealed or closed to provide a fire resistance rating at least equal to that of the fire barrier itself.

3. 10 CFR 50, Appendix R, Section III.G.2.a requires 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 to that required of the barrier.

Fire Areas Involved

Fire Zone CB-1h - Elevations 702 feet 0 inch through elevation 781 feet 0 inch, and elevations 828 feet 3 inch and 847 feet 0 inch (See Figures FP-8a and 8b through FP15a and 15b and Cable Tray Figures 7 through 13).

Fire Area CB-7 - Elevations 702 feet 0 inch through 847 feet 0 inch (interior walls only at elevations 800 feet 0 inch and 847 feet 0 inch) (see Figures FP-8a and 8b through FP-15a and 15b and Cable Tray Figures 7 through 13).

Description of Safe Shutdown Equipment and Cables

Fire Zone CB-1h does not contain any safe shutdown related cable or equipment. Division 3 and 4 cables associated with HPCS (Method 3) are routed through Fire Area CB-7 at elevation 781 feet 0 inch and 801 feet 9 inch. Both are stairways that communicate from elevation 702 feet through elevation 847 feet.

Engineering Justification

The enclosed stairwells are constructed of 1.9-hour fire rated hollow concrete blocks with all door openings protected as a minimum by 1-1/2-hour Class B labeled fire rated doors. Unprotected steel columns are framed into these walls on the stairway side only. Since the function of the stairway is to minimize smoke infiltration during a fire, as well as to provide quick access to a building's various elevations by the fire brigade, having exposed steel on the inside does not degrade the function of the stairwell.

Since the stairwells are devoid of combustibles, the existing fire barriers provide sufficient protection and are adequate.

Since no safe shutdown equipment or cable listed for the credited safe shutdown Methods will remain unaffected by a fire in these fire areas, safe shutdown of the plant can be achieved.

4.2.2.12 Fuel Building Zone Separations

Description of Deviation

The fuel building is separated from all other buildings by 3-hour fire rated barriers, but the building is not divided into 3-hour fire rated fire areas.

Deviations for partial fire detection and suppression in this fire area are found in Subsections 4.2.3.1.7 and 4.2.4.7 of this analysis, respectively.

Reference

10 CFR 50, Appendix R, Section III.G.2.b states: Separation of cables and equipment and associated non-safety-related circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

Fire Areas Involved

Fire Zone F-1a - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1b - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1 - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1d - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1e - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1f - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1g - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1h - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1i - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1j - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone F-1k - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone F-1m - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone F-1n - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone F-1o - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone F-1p - Elevations 712 feet 0 inch through 781 feet 0 inch (see Figures FP-2a and 2b through 5a and 5b and Cable Tray Figures 2 through 5).

Description of Safe Shutdown Equipment and Cables

Safe shutdown cables and equipment in the zones of interest are shown on Figures 4.2.4.7-1 through 4.2.4.7-4.

Engineering Justification

Rated fire floors are not utilized throughout Fire Area F-1 to separate safe shutdown systems. A combination of partial suppression, partial fire detection, passive barriers, and low fire loads is used to provide adequate fire protection equivalent to Appendix R requirements.

The fire protection provided ensures that a fire cannot propagate horizontally or vertically upward sufficiently to damage redundant safe shutdown trains. This discussion begins at the lowest elevation and progresses upward. As it is not likely that a fire will propagate downward since all cable risers are sealed and there is no other continuity of combustibles between elevations, this situation is not discussed here.

Fire Zone F-1p extends from elevation 712 feet 0 inch through 781 feet 0 inch. Justification for this fire zone is discussed in the writeup for elevation 751 feet 0 inch and 781 feet 0 inch.

Elevation 712 Feet 0 Inch

In Fire Zone F-1a, the Division 1 safe shutdown cables (in conduit) in the southeast corner and the zone are separated from the Division 2 cable trays by a horizontal distance in excess of 75 feet.

Solid bottom BOP cable trays are routed between the Division 1 and 2 cables such that these trays are horizontally separated from the Division 1 and 2 cables by distances in excess of 15 feet and 6 feet, respectively. An exposure fire in the vicinity of the Division 1 conduits would have to ignite the BOP cables located a horizontal distance of approximately 15 feet away, propagate at least 75 feet along the BOP cable trays, and then ignite the Division 2 cables located at a horizontal distance of 6 feet. Such a scenario is highly unlikely due to the ignition resistance of the cable (IEEE 383 qualified) in the BOP trays in conjunction with the low heat release and flame spread rates for these cables.

Fire Zone F-1b, contains only one cable and instrument required for safe shutdown. As shown on Figure 4.2.4.7-1, the spatial separation of this cable and instrument from its redundant counterpart located in Fire Zone F-1a is sufficient to ensure a safe shutdown.

Fire Zones F-1a and F-1b have a 9-foot 8-inch-minimum concrete floor. The floor is not fire rated. The walls are 24-inch-minimum concrete. The walls adjacent to the containment building, service building, auxiliary building, and diesel-generator building are 3-hour fire rated. The remaining walls are not fire rated. The ceiling is 12-inch-minimum concrete and is not fire rated. There are two stair systems on this elevation: one enclosed stair (1.9-hour fire rated) and one open stair, both up to elevation 755 feet 0 inch. All cable tray risers are sealed at the ceiling with a 3 hour fire rated penetration seal. An ionization fire detection system is provided throughout Fire Zones F-1a and F-1b. Portable fire extinguishers and hose stations are provided for manual firefighting as shown on Figure FP-2b.

The remaining fire zones on this elevation are for support for the services of the fuel building. The fire loads for the fire zones are classified as follows:

Fire Zone	Fire Load Classification

F-1a	low
F-1b	low
F-1c	low
F-1d	low
F-1e	low
F-1f	low
F-1g	low
F-1h	low
F-1i	low

Portable fire extinguishers and hose stations are provided for manual firefighting as shown on Figure FP-2b.

Due to the low fire loading of the preceding fire zones, it is not credible that a fire starting on this elevation would propagate upward. Upward propagation would be prevented by the sealing of the cable risers at the ceiling and the substantial construction of the ceiling itself. Because of the inherent fire-retardant nature of the cables, the low fire loading, and the numerous fire zones for this elevation, it is unlikely that a fire would spread horizontally through this elevation. Zones in which both divisions of safe shutdown systems are located or have a potential hazard such as the HPCS pump are provided with ionization fire detection systems.

Safe shutdown would be ensured by Method 1 or 2 safe shutdown systems on this elevation.

Elevation 737 Feet 0 Inch

In Fire Zone F-1m, Division 1 cable trays along the east wall are separated from Division 2 cable risers along the west wall by a distance in excess of 140 feet with no intervening combustibles. The water suppression system provided for the railroad bay (see Figure FP-3b) provides additional protection between the Division 1 and 2 cables. Division 1 cables (in conduit) along the south wall are routed in Fire Zones F-1m (in conduit) (see Figure 4.2.4.7-2) and in excess of 60 feet from the Division 2 cable risers. Based on the cable functions, spatial separation, the railroad bay suppression system, and the absence of intervening combustibles, safe shutdown is ensured.

All cable risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

Fire Zone F-1m has a 12-inch-minimum concrete floor with twenty-eight 4-inch floor drains, removable concrete slabs, and an open stair. The floor is not fire rated. The walls are 15-inch-minimum concrete or 11-5/8-inch minimum solid concrete block. Walls adjacent to the auxiliary building, containment building, diesel-generator building, and service building are 3-hour fire rated. The remaining walls are not fire rated. The ceiling is 12 inch-minimum concrete with areas of removable concrete slabs and steel grating. The ceiling is not fire rated. There are two

stair systems in this zone: one enclosed stair (1.9 hour fire rated) and one open stair both going up to elevation 755 feet 0 inch and down to elevation 712 feet 0 inch.

An ionization fire detection system is provided for this zone. The railroad bay is protected by an automatic preaction sprinkler system for protection of transient combustibles and has its own detection systems. Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone F-1m.

Fire Zone F-1n has a 24-inch-minimum concrete floor that is not fire rated. There is one 4-inch floor drain. The walls are 24-inch-minimum concrete or 23-5/8-inch-minimum solid concrete block. The walls are not fire rated. The ceiling is 24-inch-minimum and is not fire rated.

Fire Zones F-1j, F-1k, and F-1o have a 12 or 24-inch-minimum concrete floor that is not fire rated. The walls are 12 or 24-inch-minimum concrete or 23-5/8- or 11-5/8-inch-minimum solid concrete block. The walls are not fire rated. The ceiling is 12 or 18-inch-minimum concrete and is not fire rated.

The remaining fire zones on this elevation (Fire Zones F-1j, F-1k, and F-1o) are for support for the fuel building. The fire loads for these zones are classified as follows:

Fire Zone	Fire Load Classification
F-1j	low
F-1k	low
F-1m	low
F-1n	low
F-1o	low

The possibility of upward fire propagation is prevented by the automatic preaction sprinkler protection system that is provided for the entire railroad bay area. Upward propagation path (the cable tray risers) by 3-hour penetration seals. All fire zones on this elevation have a low fire loading, reducing the possibility of either vertical or horizontal fire propagation. Detection is provided in Fire Zone F-1m, with alarm and annunciation in the control room, where combustibles are present.

Safe shutdown would be ensured by Method 1 or 2 safe shutdown systems on this elevation.

Elevation 751 Feet 0 Inch Through Elevation 781 Feet 0 Inch

Fire Zone F-1p includes the fuel building at elevations 755 feet 0 inch and 781 feet 0 inch. The floor of this zone at elevation 755 feet 0 inch is 12-inch-minimum concrete with twenty 4-inch floor drains, four 8-inch by 8-inch by 4-inch box drains, removable concrete slabs, open hatches, steel grating, and open stairwell. The floor is not fire rated. The walls are 24-inch-minimum concrete. The walls adjacent to the containment building, auxiliary building, service building, and diesel-generator building are 3-hour fire rated walls. An enclosed stairwell has 1.9-hour fire rated walls. A portion of the ceiling at elevation 781 feet 0 inch is 8-inch concrete

on steel decking. The remainder is the fuel building roof. The combustible loading for elevation 755 feet 0 inch is negligible.

Fire Zone F-1p also extends up to a partial mezzanine on elevation 781 feet 0 inch. The floor of the mezzanine is 8-inch concrete on steel decking and is not fire rated. There are eight 4-inch floor drains. The walls are 36-inch reinforced concrete. The north wall including containment is 3-hour fire rated; the walls adjacent to the containment building, auxiliary building, service building, and diesel-generator building are 3-hour fire rated walls; and the remaining walls are not fire rated. The ceiling is the fuel building roof and is 24-inch-minimum concrete on steel decking and is not fire rated.

Diesel-generator cables (Division 1 and 2) are necessary for safe shutdown. These are the power feeds from the Division 1 and 2 diesel generators to the 4.16-kV switchgear. The Division 1 and 2 cables are at least 50 feet apart (see Figure.4.2.4.7-4). Other safe shutdown cables related to the shutdown service water system (power and control for fans, valves, etc.) are routed through areas on the opposite side of the building. Division 1 and 2 cables are separated by at least 50 feet, except for the Division 2 diesel generator power feed conduits that come within 46 feet of some Division 1 cables. These cables are located on the 737 feet 0 inch elevation (see Figure 4.2.4.7-3).

All cable risers have 3-hour fire rated penetration seals installed at each floor elevation in addition to fire stops at 15 feet above the floor in this fire zone.

There is an ionization fire detection system provided throughout the zone at these elevations. Portable fire extinguishers and hose stations are provided at these elevations for manual firefighting as shown on the referenced drawings for Fire Zone F-1p.

Based on these reasons--that the diesel-generator cables in conduits are at least 50 feet apart, that an open area is accessible for manual fire suppression, that an area fire detection system is provided, and that the fire load is low--adequate separation is provided.

Safe shutdown would be assured by Method 1 or 2 safe shutdown systems on these two elevations.

In conclusion, additional fire-rated barriers separating each elevation are not necessary in Fire Area F-1. In all possibilities of fire ignition and propagation, safe shutdown is assured by a combination of passive fire barriers, detection, and partial automatic suppression systems, providing an equivalent level of protection to the referenced requirements.

4.2.2.13 Circulating Screen House Ventilation Penetration

Description of Deviation

Building ventilation is ducted through Fire Area M-1. The duct has a transition at the ceiling of Fire Area M-1 to a 12-inch pipe and then penetrates the floor to the lower elevation of Fire Zone M-2c. This penetration at elevation 699 feet 0 inch is not provided with a fire damper.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER Section 9.5.2.1, February 1982 references that floors, walls, and ceilings enclosing separate fire areas should have minimum fire rating of 3 hours and penetrations in these fire barriers, including conduits and piping, should be sealed or closed to provide a fire resistance rating at least equal to that of the fire barrier itself.

Fire Areas Involved

Fire Zone M-1 - Elevation 699 feet 0 inch (see Figures FP-25a and 25b and FP-26a and Cable Tray Figure 22).

Fire Zone M-2b - Elevation 699 feet 0 inch (see Figures FP-25a and 25b and Cable Tray Figure 22).

Fire Zone M-2c - Elevation 699 feet 0 inch, elevation 678 feet 0 inch, and elevation 657 feet 6 inches (see Figures FP-25a and 25b and FP-26a and Cable Tray Figure 22).

Description of Safe Shutdown Equipment and Cables

Fire Area M-1 consists of the Division I/Method 1 shutdown service water pump, strainer, cooling unit, and motor control center. Fire Zone M-2b contains the Division 2 shutdown service water pump, strainer, cooling unit, and motor control center. Fire Zone M-2c consists of the circulating water screen house and below grade pipe tunnel at elevation 657 feet 6 inches. Fire Zone M-2c contains the shutdown service water cables that serve valves 1SX011A and 1SX011B.

Engineering Justification

Fire Area M-1 has 3-hour fire rated walls and floors except the north exterior wall, which is not fire rated. The 3-hour fire rated floor between Fire area M-1 and Fire Zone M-2c, located under Fire Area M-1 contains a ventilation penetration without a 3-hour fire damper. See Figures 4.2.2.13-1 and 2.

The ventilation duct penetrates the west 3-hour fire rated wall of Fire Area M-1 at elevation 720 feet 0 inch and is provided with a 3-hour fire damper. The duct is routed to the east end of the room to the southeast corner and then turns down toward the floor. At elevation 718 feet 6 inches the 8-inch x 16-inch rectangular duct is changed into a circular 18-inch welded pipe that is routed straight down through the floor without a fire damper at elevation 699 feet 0 inch into Fire Zone M-2c. The space between the pipe and the floor is sealed with a 3-hour fire rated penetration seal. The pipe continues down to elevation 694 feet 11-1/2 inches, at which point it is changed back into a ventilation duct and is routed 193 feet south before ending.

Air enters through fire damper 1VH07Y and exhausts into Fire Area M-1 via the register at elevation 720 feet 0 inch and then flows down to Fire Zone M-2c.

The concern is the propagation of fire from the underside (Fire Zone M-2c) into Fire Area M-1. Fire Area M-1 contains no cable trays and has a low combustible loading. All other electrical and mechanical penetrations in the floor are sealed to provide a 3-hour fire rating.

The average combustible loading for Fire Zone M-2c is low.

Ionization fire detection is provided throughout Fire Area M-1 and Fire Zone M-2b with alarm and annunciation in the control room. Hose stations and fire extinguishers are also provided in the immediate area.

Based on the protection provided and the low combustible loading, the floor slab provides an adequate barrier without providing a fire damper at penetration 1PH0126.

Safe shutdown would be assured by Method 1 or 2 safe shutdown systems.

4.2.2.14 Containment Penetrations

4.2.2.14.1 Containment Air Locks

Description of Deviation

The air lock doors (hatches) provided in the containment and the drywell boundaries are not tested or labeled as 3-hour fire doors.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER, Section 9.5.2.2 references that door openings should be protected with equipment-rated doors, frames, and hardware that have been tested and approved by a nationally recognized testing laboratory. Such doors should be normally closed and locked or alarmed with alarm and annunciation in the control room.

   Fire Areas Involved

   The following fire areas and zones are involved in this deviation:

Door Location	Fire Areas/Zones Separated
Elevation 737 feet 0 inch SW Quadrant Equipment Hatch	F-1m/C-2/C-1
Elevation 737 feet 0 inch Column/Row-AD East Personnel Hatch	C-2/C-1
Elevation 737 feet 0 inch NE Quadrant Personnel Hatch	A-2d/C-2
Elevation 828 feet 3 inches NE Quadrant Personnel Lock/Walkway	C-2/CB-1i

Description of Safe Shutdown Equipment and Cables

Fire Area C-2 separates the containment from the fuel and auxiliary buildings. The containment walls are not used to separate redundant safe shutdown divisions. Safety related cables/trays are shown on Cable Tray Figures 2 through 5.

Engineering Justification

The air lock doors (hatches) provided in the containment and drywell boundaries are not tested or labeled as 3-hour fire doors. The containment boundary, including penetrations (i.e., doors

and cable penetrations), is designed for worst-case accident parameters as described in CPS-USAR, Subsection 6.2.1.1.3. Each of the air lock-type doors addressed in this deviation is designed to withstand the pressures and temperatures associated with design-basis accidents. Each opening is protected by massive steel hatches with multiple-point latches on both ends of the air lock. Each air lock consists of two doors. The space between the doors is devoid of combustibles.

NFPA 252 "Fire Test of Door Assemblies" (ASTM E-152) identifies the most important condition of acceptance testing as the ability of the door to "remain in place during both the fire test and the hose stream test." The hinges and the latches of the air lock doors are significantly stronger than those on a metal fire door and would not allow the doors to significantly warp away from the openings in the fire barrier in the event of a fire.

There is no temperature restriction (as in penetration seals) to the temperature rise or limitation on the unexposed side of the fire door. Doors usually fail a fire test due to the door being "bowed" into the test furnace in addition to the possible failure of the hardware holding the door in place.

An exposure fire adjacent to one of these doors would not void the integrity of these doors because of the massive heat sink of the door itself.

Based on the design and construction of the doors, the air lock doors are equivalent to 3-hour fire doors.

4.2.2.14.2 Containment Electrical Penetration Seals

Description of Deviation

Containment and drywell electrical penetration seals have not been tested or labeled as 3-hour fire rated seals.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER, Section 9.5.2.1 references that floors, walls, and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours. Penetrations in these barriers, including conduits and piping, should be sealed or closed to provide a fire-resistance rating at least equal to that of the fire barrier itself.

Fire Areas Involved

Penetration Location	Fire Area
Floor Elevation 762 feet 0 inch Northeast Quadrant	A-2m/C-2
Floor Elevation 762 feet 0 inch Northeast Quadrant	A-2o/C-2
Floor Elevation 762 feet 0 inch Northwest Quadrant	A-3e/C-2
Floor Elevation 781 feet 0 inch Northwest Quadrant	A-3g/C-2

Floor Elevation 737 feet 0 inch Southwest Quadrant C-I/C-2

Description of Safe Shutdown Equipment and Cables

Electrical penetrations at elevations 771 feet 0 inch and 773 feet 0 inch from Fire Area A-2 (Zone A-2m) to Fire Area C-2 contain no safe shutdown cables. Electrical penetrations at elevations 771 feet 0 inch and 773 feet 0 inch from Fire Area A-3 (Zone A-3e) to Fire Area C-2 contain no safe shutdown cables.

Electrical penetrations at elevations 792 feet 0 inch, 794 feet 0 inch, and 796 feet 0 inch from Fire Area A-2 (Zone A-2o) to Fire Area C-2 contain safe shutdown cables associated only with shutdown Method 3 (Division 1). Electrical penetrations at elevations 792 feet 0 inch and 796 feet 0 inch from Fire Area A-3 (Zone A-3g) to Fire Area C-2 contain safe shutdown cables associated only with shutdown Method 1 and 2 (Division 2). These penetration areas are separated by the steam tunnel (3-hour rated barriers) in both auxiliary and containment buildings.

The horizontal (circumferential) distance of open space between the Division 1 and 2 electrical penetration areas is in excess of 250 feet (270° angular separation).

Engineering Justification

The drywell boundary Fire Area C-1 to C-2 contains 14 conduit penetrations that are sealed with silicone foam material that contains a comparable amount of elastomer (base material for fire resistance of the foam) as that of a tested material. It should also be noted that instead of the usual 12-inch depth for a tested foam material, 5 feet is used. Although not tested, an equivalent level of protection is provided.

The containment boundary of Fire Area C-2 to A-2 or A-3, including electrical penetrations, is designed for worst-case accident parameters as described in CPS-USAR, Subsection 6.2.1.1.3. Each of the electrical penetrations outlined in USAR Section 3.8, Table 3.8-5, is designed to withstand the pressures and temperatures associated with design-basis accidents. Although they have not been subjected to the ASTM E-119 fire test, their construction will prevent the propagation of a fire through the containment boundary.

The most significant fire hazards in the vicinity of the electrical penetrations are unprotected cables. The EPR-insulated hypalon jacketed or tefzel insulated/jacketed cables, however, are inherently flame-retardant cables in which vertical or horizontal fire propagation is extremely difficult.

The separation of Division 1 and Division 2 electrical penetrations as shown on Cable Tray Figures 4 and 5) within the containment wall is such that, even in the unlikely event that a penetration seal failed, only one division of safe shutdown cables would be affected. Thus in the event of a fire, safe shutdown is assured.

4.2.2.14.3 Containment Piping Penetrations

Description of Deviation

Piping that penetrates the 3-hour fire-rated wall of the containment is not externally sealed to provide a fire-resistance rating at least equal to that of the containment wall itself.

References

1. BTP 9.5-1 Appendix A, Section D.1.j.

2. NUREG-0853, SER, Section 9.5.2.1 references that floors, walls, and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours. Penetrations in these barriers, including conduits and piping, should be sealed or closed to provide a fire-resistance rating at least equal to that of the fire barrier itself.

Fire Areas Involved

All fire areas adjacent to the containment wall are involved.

Description of Safe Shutdown Equipment and Cables

The description of safe shutdown equipment and cables is given in the appropriate sections of the Clinton FPER and SSA.

Engineering Justification

The containment wall, including the piping penetrations, is designed for worst-case accident parameters as described in CPS-USAR Subsection 6.2.1.1.3. Each of the penetrations listed in USAR Section 3.8, Table 3.8-5, has been designed to withstand the pressures and temperatures associated with design-basis accidents.

All piping that penetrates the containment wall has a penetration headfitting assembly. A typical headfitting assembly is shown on Figure 4.2.2.14.3-1. The headfitting assembly consists of a minimum 0.28-inch-thick steel sleeve embedded in the containment wall that extends beyond the face of the wall on both sides. A minimum 0.375-inch-thick steel headfitting plate is welded to the sleeve and to the pipe passing through the penetration, forming an airtight seal.

The headfitting assemblies have been evaluated by a fire protection engineer as providing protection equivalent to that provided by a fire door or damper.

Based on the substantial construction of the piping penetration headfitting assemblies, the piping penetrations in the containment wall do not need to have a rated external seal.

4.2.2.15 Unsealed Bus Ducts Through Fire Barriers

Description of Deviation

Bus duct penetrations through fire-rated barriers have not been tested or labeled as 3hour fire rated penetration.

References

1. BTP 9.5-1 Appendix A, Section D.1.J.

2. NUREG-0853, SER, Section 9.5.2.1 references that floors, walls and ceilings enclosing separate fire areas should have minimum fire rating of 3 hours. Penetrations in these fire barriers, including conduits and piping, should be sealed or closed to provide a fire resistance rating at least equal to that of the fire barrier itself.

Fire Areas Involved

The fire areas involved in this deviation, along with the location by column-row, are listed on Table 4.2.2.15-1, and the 480-volt bus openings are listed on Table 4.2.2.15-2.

Description of Safe Shutdown Equipment and Cables

All areas in which bus ducts penetrate fire barriers were reviewed for the effects on redundant safe shutdown equipment and/or cables. In no cases are bus ducts located in areas where their failure could affect redundant systems needed for safe shutdown.

The description of safe shutdown equipment and cables is given in the appropriate sections of the Clinton FPER and SSA.

Engineering Justification - 4.16-kV and 6.9-kV Bus Ducts

There are twenty-one 4.16-kV and 6.9-kV bus duct penetrations in 3-hour fire rated barriers. The bus duct penetrations are constructed of 0.125-inch thick steel construction that is bolted to the barrier on each side of the penetration. As evaluated by a fire protection engineer, the construction of the duct assembly, as well as the bolted attachment of the duct to the wall on both sides of the floor/wall, provides protection equivalent to that provided by a fire door or damper.

Engineering Justification - 480-Volt Bus Ducts

There are four 480-volt bus duct penetration in 3-hour fire rated barriers. The bus duct penetrations consist of 0.125-inch thick steel construction and are seismically supported and bolted to the barrier on each side of the penetrations.

The steel enclosure around the bus duct is approximately 6 inches by 8 inches. The gap between the steel enclosure and the 3-hour fire rated barrier is sealed with a 3-hour firerated material. All the fire zones affected by the 480-volt bus duct penetrations have ionization fire detection installed throughout the zone on both sides of the penetration.

As evaluated by a fire protection engineer, the construction of the bus ducts, the 3-hour fire rated seals on the outside of the penetrations, and the local fire detection provide protection equivalent to that provided by a fire door or damper.

Equivalent Design Features of Fire Dampers and Bus Ducts

There is no requirement on the temperature rise on the unexposed side of the penetration opening through a wall or floor protected with a fire damper.

The ventilation duct may allow hot gases and smoke to propagate into the ductwork through ventilation openings before the activation of the fusible link. No opening or ventilation is provided in the bus ducts.

Fire dampers are installed in sleeves of a minimum of 0.054-inch thickness where they penetrate the barrier. The damper actually "Floats" in the barrier. Bus duct penetrations consist of 0.1225-inch-thick steel construction that is substantially bolted to the wall on both sides of the barrier.

Security - Related Information Figure Withheld Under 10 CFR 2.390

Containment. The other three walls of the Common Station Vent Stack are minimum 1-foot 4-inch reinforced concrete for radiation shielding.

The 16" Condenser Vacuum System vacuum pump common discharge pipe which penetrates the Fuel Building wall into the Common Station Vent Stack has a penetration headfitting assembly. The headfitting assembly is shown on Figure 4.2.2.18-1, and consists of a minimum 0.687-inch-thick steel sleeve embedded in the Fuel Building wall that protrudes at least six inches into the Fuel Building. A minimum 2-inch thick steel headfitting plate is welded to the sleeve and to the pipe passing through the penetration, forming an airtight assembly.

The headfitting assembly has been evaluated by a fire protection engineer as providing protection at least equivalent to that provided by a fire door or damper. As described in the FPER, the fireload in fire zone F-1p is classified as low. The maximum operating and design temperatures of the vacuum pump common discharge pipe are 125°F and 135°F, respectively; a fire due to the process effluent is therefore unlikely. Additionally, the height of the penetration (approximately 17 feet above the floor) makes it unlikely that transient combustible material will pose an exposure fire hazard to this penetration.

Based on the substantial construction of the piping penetration headfitting assembly and the relatively low fire hazards on either side of the penetration, the headfitting assembly is acceptable without taking credit for the installed fireproofing. Therefore, the 16" condenser vacuum pipe penetration through the Fuel Building wall into the Common Station Vent Stack does not need to be fire rated.

4.2.2.19 Deleted

4.2.2.20 Deleted

4.2.2.21 Structural Gap Seals

Description of Deviation

Various Structural Gap Seals installed in fire rated walls described in the Fire Hazards Analysis do not provide a fire-resistance rating at least equal to that of the fire barrier itself.

References

1. BTP 9.5-1 Appendix A, Section D.2.j.

2. NUREG-0853, SER, Section 9.5.2.1 references that floors, walls, and ceilings enclosing separate fire areas should have a minimum fire rating of 3 hours.

Fire Zones Involved

This deviation impacts various fire zones and areas of the Auxiliary, Control, Diesel Generator, Radwaste, and Turbine Buildings; and the Circulating Water Screen House.

Description of Safe Shutdown Equipment and Cables

Division 1,2, and/or 3, Safe Shutdown equipment and systems are involved in all areas except the Radwaste and Turbine Buildings.

Engineering Justification

Based on an evaluation of the design and USAR requirements, Structural Gap Seals shall conform to the following requirements:

a) Gap seal configurations have a ceramic fiber blanket sealed with Dymeric or equivalent on one side, and a backing rod with a Dymeric sealant or equivalent on the other side. Ceramic fiber blanket is an acceptable substitute for the backing rod. The acceptable gap size is 2" for masonry (block) and concrete walls.

b) Gap seals configurations may have BISCO SE-Foam as specified on BISCO Drawing No. 143. The acceptable gap size for this configuration is 8" for masonary (block) and concrete walls.

c) Structural Gap Seals that do not meet this criteria have been evaluated as acceptable as follows:

1) Gap seals in fire rated walls separating fire zones within fire areas that do not contain Safe Shutdown equipment or systems. With this arrangement, any breach of a fire barrier due to a non-conforming gap seal will not affect safe shutdown of the plant.

2) Gap seals in fire rate walls separating fire zones in fire areas that contain Safe Shutdown equipment or systems, but that have a common Safe Shutdown Method. If each side of the gap has the same safe shutdown method available in the event of a fire, then if the fire were to spread from one side to the other due to a non-conforming gap seal, the plant could be safely shutdown using the common safe shutdown method.

3) Gap seals in the fire rated walls that are around a removable hatch in an exterior wall. The gaps are offset (smaller on the inside of the wall and larger on the exterior), and have Dymeric sealant and ceramic fiber blanket on the inside wall. The concern is with regard to hose stream impingement. Since the gaps have an offset configuration, there is little chance that a hose stream would blowout the seal. Therefore, the non-conforming gap seal would not affect the ability for safe shutdown.

4) Gap seals in fire rated walls with ceramic fiber blanket and Dymeric seal on one side only. Since the primary fire resistive characteristics are provided by the ceramic fiber blanket, this non-conforming configuration is acceptable if the gap size conforms to requirements, and consideration is to be given to fire detection and suppression, and other fire protection features.

5) Gap seals in fire rated walls with ceramic fiber blanket and Dymeric seal on one side only, with firecoating, a steel beam with or without firecoating, or any other mechanism to protect against hose stream impingement, on the other side. Firecoating, as related to gap seals, is generally found on structural steel that traverses the area adjacent to the gap, and serves to protect the structural steel as well as provide a gap seal for the barrier. Firecoating at any depth on one side of the gap provides an equivalent to a sealant as a hose stream barrier, and with a Dymeric sealant and ceramic fiber blanket on the other side, provides a gap seal equivalent to the required configuration. Similarly, a beam, gap offset, or other mechanism that provides for protection of the fire-resistive material in the gap, and performs the same function as a backing rod and sealant can be considered a gap seal configuration equivalent to the required configuration.

Security - Related Information Figure Withheld Under 10 CFR 2.390

between Fire Area D-7 and Fire Zone D-4a, as described in the Fire Hazards Analysis, do not provide a fire-resistance rating at least equal to that of the fire barrier itself.

References

1. BTP 9.5-1, Section C.5(a)(3)

2. BTP 9.5-1, Appendix A, Section D.3.d

Fire Zones Involved

This deviation impacts Fire Zones A-2k and A-3f of the Auxiliary Building, Fire Zone T-1h of the Turbine Building, Fire Zone D-4a and Fire Area D-7 of the Diesel Generator Building, and Fire Area CB-2 of the Control Building.

Description of Safe Shutdown Equipment and Cables

Division 2 cables are penetrants through the wall between Fire Area CB-2 and Fire Zone A-3f. No safety-related or safe shutdown cables are routed through the wall between Fire Zones T-1h and A-2k. Fire Zone D-4a contains Division 1 and Division 3 safe shutdown equipment and cables. Fire Area D-7 contains Method 3 safe shutdown equipment and cables.

Engineering Justification

CB-2/A-3f Penetration Seal

The wall between the Division 2 Cable Spreading Room, Fire Area CB-2, and a portion of Fire Zone A-3f is a 3-hour fire rated wall containing a large partitioned Penetration Seal for the Division 2 cables. Basaed on an engineering evaluation, the Penetration Seal has a 2-hour fire rating. The penetration seal is 58 1/4” high and 160 1/4” long, and is subdvided into 9 compartments. All but two of the compartments have a 3-hour fire rating as supported by tested configurations. The other two compartments are oversized, and, therefore, their configurations only support a 2-hour fire rating. Therefore, based on engineering judgement, the overall seal has a 2-hour fire rating. However, there is no fire test that supports the 2-hour fire rating of this large partitioned penetration seal.

Fire Zone A-3f consists of the auxiliary building Division 2 switchgear area and general access area and extends above the Division 1 and 2 battery rooms (Areas A-4 and A-5) and above the steam tunnel (Zone A-2f), terminating in the northeast corner of the Auxiliary Building in an open area containing exhaust fans for the battery rooms. The east wall of this open area, containing the penetration seal, interfaces with Fire Area CB-2.

Fire Area CB-2 has a floor that is 18-inch minimum concrete with five 4-inch floor drains and is 3-hour fire rated. All walls except the north and west walls are 7-5/8-inch hollow concrete block, and are 1.9-hour fire rated. The north and west walls are 24-inch reinforced concrete, and are 3-hour fire rated. The west wall contains the 2-hour fire rated penetration seal. The ceiling is 23-inch reinforced concrete and is 3-hour fire rated. There is an ionization fire detection system and automatic wet pipe sprinkler system in the area. Portable fire extinguishers and hose stations are provided for manual firefighting. This area has a high fire load rating.

The east end of Fire Zone A-3f has walls on the north and east that are 24-inch minimum concrete, and walls on the south and west that are 11-5/8-inch hollow concrete block. These walls are 3-hour fire rated. The ceiling is 18-inch minimum concrete and is 3-hour fire rated. The east wall contains the 2-hour fire rated penetration. There is an area-wide ionization fire detection system in Fire Zone A-3f, including the east portion of the zone. In addition, an automatic wet pipe water spray system is installed to protect the high cable concentration area above the Division 1 and 2 battery rooms and the pipe tunnel, but is not installed in the vicinity of the penetration seal. A portable fire extinguisher is provided in the east portion of the zone for manual firefighting. Although Fire Zone A-3f has an overall moderate fire load rating, the east portion of the zone, by itself, has a low fire load.

Fire Zone A-3f and Fire Area CB-2 only contain Division 2 (Method 2) safe shutdown cables. There are Division 1 cables for the Division 1 Battery Room exhaust fan in Fire Zone A-3f, however, the exhaust fan is not required for safe shutdown. The purpose of the battery room exhaust fan is to remove hydrogen generated during battery charging operations. Battery charging operations are not conducted during post-fire safe shutdown, and, therefore, removal of hydrogen is not required to assure safe shutdown. In the event of a fire in either Fire Zone A-3f or Fire Area CB-2, only Method 2 would be lost, and therefore, an alternate safe shutdown method is available for safe shutdown.

Based on fire detection being available on both sides of the wall, suppression on the Fire Area CB-2 side, and the same safe shutdown methods (Method 3) being available on each side of the wall to safely shut down the plant in the event of a fire on either side, the penetration seal is acceptable for the fire hazards to which it is exposed.

T-1h/A-2k Penetration Seal

The wall between the southeast corner of Turbine Building Fire Zone T-1h, and the north end of Fire Zone A-2k is a 3-hour fire rated wall containing a large partitioned Penetration Seal containing motor-driven feedwater pump and lighting cables. Based on an engineering evaluation, the Penetration Seal has a 3-hour fire rating. The penetration seal is 85 1/4” high and 78 1/4” wide, and is subdivided into 9 compartments. All but one of the compartments have a 3-hour fire rating as supported by tested configurations. One compartment is oversized, but the excessive sealant thickness is considered to compensate for the oversize condition. Therefore, based on engineering judgement, the overall seal has a 3-hour fire rating. However, there is no fire test that supports the 3-hour fire rating of this large partitioned penetration seal.

Fire Zone T-1h consists of the turbine auxiliaries hydrogen seal oil unit, motor-driven RX feed pump, and area coolers. No safety-related cable trays are located in this fire zone. The floor is a minimum 12-inch concrete and is not fire rated. The north exterior wall, the south wall adjacent to the Auxiliary Building, the west exterior wall from Column Line J through S, and the walls adjacent to Zone T-1i are 3-hour fire rated. The remaining walls are not fire rated. The ceiling is 12-inch minimum concrete and is not fire rated. The majority of the zone is open up to elevation 800 feet 0 inch. The wall in the southeast corner of the zone interfaces with Fire Zone A-2k of the Auxiliary Building, and contains the penetration seal.

Fire Zone A-2k consists of a non-safety-related switchgear area. The floor is 17-inch minimum concrete, and is 3-hour fire rated over Fire Zone A-1b. The walls are 24-inch minimum concrete or uninsulated metal siding. The walls are 3-hour fire rated except the walls adjacent to Zones A-b and A-f and the uninsulsated metal siding walls adjacent to Zone A-2m which are not fire rated. The ceiling is 14-inch minimum concrete and is 3-hour fire rated adjacent to Fire Zones

A-3f and A-4. The remaining ceiling is not rated. The fire load for the fire zone is low. A hose station is provided for manual firefighting.

In Fire Zone T-1h, the hydrogen seal oil unit is protected by an automatic deluge system activated by thermal detectors. The oil pipeline for the turbine-driven reactor feed pump is protected by a manual preaction sprinkler system. An automatic wet pipe sprinkler system is provided in the motor-driven reactor feedwater pump room. Two 8-inch concrete curbs are provided in the area near the hydrogen seal oil unit to isolate potential turbine oil spills within the area easily accessible for manual fire suppression. An automatic wet pipe sprinkler system is provided in the mezzanine area at elevations 777'-0" and 783'-0". Portable fire extinguishers and hose stations are provided for manual firefighting. The fire load for the fire zone is moderate.

Fire Zone T-1h does not contain any safe shutdown cables. Fire Zone A-2k does contain the Division 1 Switchgear Heat Removal Modulation Damper 1VX04YA, which is a safe shutdown component, but does not affect the safe shutdown method (Method 2) that is credited for a fire in this zone (A-2k). A source range monitor, intermediate range monitor drive control relay panel, electrical penetrations, and Division 1 cable trays are also located in Fire Zone A-2k, however, none of these components are required for safe shutdown. In the event of a fire in Fire Zone A-2k, Safe Shutdown Method 2 would be used. In the event of a fire in Fire Zone T-1h, any Safety Shutdown Method could be used.

Based on the same shutdown methods (Method 2) being available on each side of the wall to safely shutdown the plant in the event of a fire on either side, the penetration seal is acceptable for the fire hazards to which it is exposed.

D-4a/D-7 Penetration Seal

The wall between the Division 3 Diesel Generator Room, Fire Zone D-4a, and the Division 3 Diesel Generator HVAC Room, Fire Area D-7, is a 3-hour fire rated floor containing a large partitioned Penetration Seal for exhaust air from the Diesel Generator Room. Based on an initial engineering evaluation, the Penetration Seal was found to not have a 3-hour fire rating. The penetration seal is 54" wide and 60" long, and is subdivided into four compartments. The boards subdividing the seal abut the 24" exhaust air pipe located in the center of the seal. The major concern was the large empty pipe penetrant. The penetration seal was redesigned to add more sealant depth to compensate for the large penetrant, and to provide a steel support assembly such that subdivision of the seal is not requried and the in-place subdividers could be abandoned. Therefore, the redesigned seal configuration is that of a single penetrant through a homogenous seal, and, based on engineering judgement, the redesigned seal has a 3-hour fire rating. However, there is no fire test that supports the 3-hour fire rating of this large penetration seal.

In Fire Zone D-4a, the floor is 20-inch minimum reinforced concrete, and is 3-hour fire rated. The walls are 12-inch minimum reinforced concrete or 7-5/8-inch minimum hollow concrete block. The walls are 3-hour fire rated except the interior walls around the Day Tank Room, which are 1.9-hour fire rated. The ceiling, which contains the large penetration seal, is 12-inch minimum reinforced concrete and is 3-hour fire rated. The penetration seal is located near one end of the room. This zone is protected by an automatic carbon dioxide fire suppression system actuated by thermal detectors. Portable fire extinguishers and hose stations are provided for manual firefighting. The fire load for the zone is designated as moderate due, primarily to the Diesel Generator. However, the Diesel Generator is over 10' from the penetration seal.

In Fire Area D-7, the floor, which contains the penetration seal, is 12-inch minimum reinforced concrete, and is 3-hour fire rated. The walls are 12-inch minimum reinforced concrete. The walls are 3-hour rated except the south wall which is not fire rated. The ceiling is 24-inch minimum concrete and is not fire rated. The fire load in the area is designated as low.

Fire Zone D-4a contains Division 1 and Division 3 safe shutdown equipment and cables. Fire induced damage to equipment and cables in this area would not prevent a Method 2 safe shutdown as there are no Division 2 safe shutdown cables in this area. Therefore, the safe shutdown performance goals are satisfied using Safe Shutdown Method 2. Fire Area D-7 contains Method 3 safe shutdown equipment and cables. The Division 2 Diesel Generator main power feed cables are also routed through the area along the wall at one end of the room. Therefore, the safe shutdown performance goals are satisfied using Safe Shutdown Method 1. However, were it not for the Division 2 cables, Fire Area D-7 would be designated a Safe Shutdown Method 2 area, the same as designated for Fire Zone D-4a. The penetration seal is isolated in the room by a missile wall on one side, and a partition wall on the other side. The missile wall separates the area in which the Division 2 cables are routed from the rest of the area, including the penetration seal. Although the missile wall is not fire rated, it would mitigate the effects of a fire that could envelope the penetration seal from affecting the Division 2 cables. The partition wall, which is not fire rated, would mitigate the effects of a fire in the main area of the HVAC Room from affecting the penetration seal.

Based on the above, a fire in Fire Zone D-4a that would affect the penetration seal would be mitigated by the automatic carbon dioxide fire suppression system actuated by thermal detectors. A fire in Fire Area D-7 that would affect the penetration seal is mitigated by its location between two interior walls, Therefore, the penetration seal is acceptable for the fire hazards to which it is exposed.

4.2.2.23 Fire-Rated Penetration Seals

Description of Deviation

Some Fire-Rated Penetration Seals installed in fire rated walls, ceilings, and floors are not supported by qualified tests comparable to those used to rate fire barriers.

References

1. BTP 9.5-1, Section C.5(a)(3)

2. Appendix R, Section M

Fire Zones Involved

This deviation impacts specific Fire-Rated Penetration Seals installed in fire rated walls, ceilings, and floors in Fire Zones in all areas of the plant.

Engineering Justification

An inspection of Fire-Rated Penetration Seals indicated that some had configurations that were not bounded by existing qualification tests. This inspection addressed over 30 parameters of each penetration seal. Based on this inspection, engineering evaluations were prepared that considered design deviations such as penetration size; penetrant type, quantity, size (including

cross-sectional area), material, and surface area; limitations for maximum unsupported spans, maximum circumference ratio factor, and minimum space between penetrants; sealant type, depth, mass, and impact of degradation (shrinkage gaps); impact of subdivider boards; and percentage of cable fill in cable trays. These engineering evaluations were then grouped by location (buildings), and the impact of the analysis assessed relative to the hazards involved. The conclusions of the hazards analysis indicated that all seal evaluated were acceptable in their existing (or reworked) configurations for their intended function based on one or more of the following reasons:

a. Excess Sealant Depth: Increasing the depth of a penetration seal is an effective method of providing additional fire resistance. Fire testing shows that unexposed side surface temperatures are reduced as sealant depth is increased. The amount of sealant erosion does not change as a result of increasing sealant depth. Consequently, more sealant depth can remain at the end of the fire test in cases where additional sealant depth was installed. This increased depth decreases bending stress and the increased sealant contact surface area also reduces shear stress. As a result, deviations to design parameters may be compensated for by the presence of additional sealant depth in the penetration seal.

b. Water Filled Penetrant: Large diameter, non-liquid filled pipe pentrants present a severe challenge to penetration seals when exposed to the ASTM E-119 time-temperature fire exposure. However, if these penetrants are water filled, the water provides a significant heat sink which compensates for the penetrant size.

c. Seal Surface Degradation (Seal Shrinkage): Small gap formation may occur as a result of pressure relief upon completion of the installation process and thermal contraction thereafter. Such gaps that are no more than one third of the total depth of the sealant, and do not exceed 3/8” in width, should have no adverse effects on the fire resistant performance of the sealant due to the expansion rate of the sealant resulting from the fire.

d. Location: Location of the penetration seal in the fire barrier, or the conditions on one or both sides of the barrier, may compensate for penetration seal design deviations, as follows:

   - o A seal located near the top of a wall with other defense-in-depth fire protection features on one or both sides may provide sufficient compensation consistent with the hazard.

   - o A seal located on an outside wall with no safe shutdown equipment or systems in the area on the inside of the barrier will not impair the ability to perform a safe shutdown of the plant in the event of a fire that breaches the penetration seal.

   - o A seal in a barrier that has the same safe shutdown method on both sides will not impair the ability to perform a safe shutdown of the plant in the event of a fire that breaches the penetration seal.

Table 4.2.2.6-1
Safe Shutdown Cable/Method
and Protection for Elevation 781 Feet
Control Building

Fire Area or Zone	Division Safe Shutdown Cable	Safe Shutdown Method Affected	Fire Wrap Division and/Rating	Available Safe Shutdown Method	Auto Fire Suppression in Zone/ Area	Auto Fire Detection	Barrier Separation > 1.0 Hour	10 CFR 50 Appendix R Separation Met by Section III.G
CB-1g	1	1	None	2	No	Yes	Yes	Yes
CB-1h	None	None	None	1,2,3,R	No	Yes	Yes	N/A
CB-2	2	1,2	None	3,R	Yes	Yes	Yes	Yes
CB-3a	1,2	1,2	None	3,R	Yes	Yes	Yes	Yes
CB-3b	None	None	None	1,2,3,R	No	Yes	Yes	N/A
CB-3c	None	None	None	1,2,3,R	No*	Yes	Yes	N/A
CB-3d	None	None	None	1,2,3,R	No	Yes	Yes	N/A
CB-3e	2	2	none	1,3,R	No*	Yes	Yes	Yes
CB-3f	1	1,3	None	2,R	No*	Yes	Yes	Yes
CB-3g	None	None	None	1,2,3,R	No*	Yes	Yes	N/A
CB-4	1	1,3	None	2	Yes	Yes	Yes	Yes
CB-5a	1	1,3	None	2	No	Yes	Yes	Yes
CB-5b	3	3	None	1,2	No	Yes	Yes	N/A
CB-5c	1,2	1,2,3	None	R	Yes	Yes	Yes	Yes
CB-7	3	3	None	1,2	No	Yes	Yes	N/A

Acronyms

R = Remote shutdown panel
* = Suppression system over fire zone

TABLE 4.2.2.6-2

Security - Related Information Figure Withheld Under 10 CFR 2.390

Table 4.2.2.15-1
Locations of 4.16-kV and 6.9-kV Bus Ducts

Security - Related Information Figure Withheld Under 10 CFR 2.390

Table 4.2.2.15-2
Locations of 480-Volt Bus Ducts

Fire Zones	Fire Load Classifications	Detection	Automatic Suppression	Zone Elevation (ft)	Location (row/ column)	Safe Shutdown Concern*	Number of Openings	Number of Bus Ducts	High Fire Load in Area
A-3d/A-1b	moderate/moderate	Y/Y	N/N	762 (floor)	S/104	N	1	1	N
A-2k/A-1b	moderate/moderate	Y/Y	N/Y	762 (floor)	S/119	N	1	1	N
A-3f/A-2k	moderate/moderate	Y/Y	N/N	781 (floor)	S/119	N	1	1	N
CB-7/CB-7	moderate/moderate	Y/Y	N/N	800	AB/124	N	1	1	N

* Redundant safe shutdown components or methods of shutdown are not located in the vicinity (less than 20 feet) of the penetration.

4.2.3 Fire Detection Systems

4.2.3.1 Low-Hazard Safety-Related Areas

4.2.3.1.1 Fire Area A-1

Description of Deviation

Complete area fire detection is not provided in Fire Area A-1. Fire detection is not provided in Fire Zones A-1c, A-1d, and A-1e.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Zone A-1c - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-1d - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-1e - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Zones A-1c and A-1d do not contain any safe shutdown or safety-related equipment or cables. Fire Zone A-1e contains safety-related Division 1 and 2 valves. The Division 2 safe shutdown valve, 1E12-F042C (and associated cables), is also located in Fire Zone A-1e.

Engineering Justification

The fire loadings for the zones of interest are classified as follows: Fire Zone A-1c - moderate; Fire Zone A-1d - high, and Fire Zone A-1e - low.

Fire detection is not provided in Fire Zones A-1c, A-1d, and A-1e. Fire Zone A-1c is a health physics instrument storage room and Fire Zone A-1d is an anticontamination clothing storage room. These two very small zones do not contain any safety-related cables or equipment and both zones are surrounded by Fire Zone A-1b, which has a complete ionization detection system. Portable fire extinguishers and hose stations are provided in the vicinity of these zones. In the event of a fire in either of these zones, safe shutdown can be achieved by Method 3. Any potential propagation of a fire from Fire Zone A-1b, west side by Fire Zones A-1c or A-1d, via the BOP cable trays from the west side to the east side would be prevented by a wet-pipe sprinkler system from column-rows 114-124/S-U in the east side (see Figure FP-3b). Method 3 safe shutdown cables would be protected. Thus, fire detection in Fire Zones A-1c and A-1d is not necessary.

Fire Zone A-1e is the contaminated equipment maintenance area. The Division 2 safe shutdown valve, 1E12-F042C, and its associated cables are located over 75 feet away from its redundant safe shutdown cables in Fire Zone A-1b, and a wet-pipe suppression system

separates the redundant cables (for coverage, see Figure FP-3b). Fire Zone A-1b, which abuts Fire Zone A-1e, has a complete ionization detection system. In the event of a fire in this zone, safe shutdown can be achieved by Method 1. Based on this zone's low combustible loading, spatial separation and partial suppression separating redundant cables in Fire Zone A-1b, and the fire detection system in the adjacent fire zone (Fire Zone A-1b) where the redundant cables are located, fire detection for Fire Zone A-1e is not necessary.

4.2.3.1.2 Fire Area A-2

Description of Deviation

Complete area fire detection is not provided in Fire Area A-2. Fire detection is not provided in Fire Zones A-2d, A-2e, A-2f, A-2g, A-2h, A-2i, and A-2j. Partial fire detection is provided for Fire Zone A-2b.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Zone A-2b - Elevation 707 feet 6 inches through 788 feet 6 inch (see Figures FP-2a and 2b through 5a and 5b and Cable Tray Figures 2 through 5).

Fire Zone A-2d - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2e - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2f - Elevation 727 feet 0 inch through 755 feet 0 inch (see Figures FP-3a, 3b, 4a, and 4b and Cable Tray Figures 3 and 4).

Fire Zone A-2g - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2h - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2i - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone A-2j - Elevation 750 feet 6 inches (see Figures FP-3a and 3b and Cable Tray Figure 3).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

The following safety-related equipment or cables are located in the fire zones of interest:

Fire Zone A-2b contains safety-related and Method 1 safe shutdown RHR pump and heat exchanger A, fan-coil cooler, Division 1 and 2 valves and instruments, and support equipment.

Fire Zone A-2d contains safety-related Division 1 cable tray and Division 1 instruments, which support Method 1 safe shutdown systems.

Fire Zone A-2e contains safety-related Division 1 and 2 valves, exhaust blowers B and F, heaters A, E, J, and N, and Division 1 and 2 MSIV inboard and outboard room supply fans, and Method 1 safe shutdown systems.

Fire Zone A-2f contains safety-related Division 1 safe shutdown equipment and cables. The main steam isolation valves, Division 1 and 2 instruments, Division 1 and 2 valves, feedwater check valve accumulator tanks A and B, and the 39-gallon accumulator tank are in this zone.

Fire Zones A-2g, A-2h, A-2i, and A-2j contain safety-related Division 1 and 2 instruments that do not affect either safe shutdown system. In addition, safety-related cables and valves are located in Fire Zone A-2j.

Based on the review of associated Method 2 systems and equipment in this fire area, in the event of a fire, hot and cold shutdown can be achieved using Method 2 shutdown systems.

The performance goals for safe shutdown functions are assured by Method 2.

Engineering Justification

Fire detection is not provided in Fire Zones A-2d, A-2e, A-2f, A-2g, A-2h, A-2i, and A-2j. Fire Zone A-2b, with a fire load classified as low, is the Division 1 RHR pump and heat exchanger room, and has partial fire detection. The fire zone is open, between column/row 114-117/U-containment, from elevation 707 feet 6 inches through 781 feet 0 inch through which the RHR heat exchanger extends. Ionization fire detection is provided in Fire Zone A-2b at elevation 707 feet 6 inches between column/row 117-121/U-containment. Since the majority of the combustibles in this fire zone are located at elevation 707 feet 6 inches, additional detection for the upper elevations will not significantly increase the level of fire protection in the fire zone. Therefore, providing additional fire detection in Fire Zone A-2b is not necessary.

Fire Zone A-2d consists of a general hallway and containment building personnel hatch area and contains a Division 1 safe shutdown cable tray and Division 1 safety-related instruments. Cable insulation is the primary fixed combustible in this fire zone, resulting in a low fire loading. Based on the ignition resistance of these cables (IEEE-383 qualified) and their low concentration in this fire zone, fire detection is not necessary in Fire Zone A-2d.

Fire Zone A-2e consists of the MSIV leakage control system room. The Division 1 and 2 safety-related cables and conduits have been analyzed in the Safe Shutdown Analysis, subsection 3.1.2.2, for a fire. In the event of a fire in this fire zone, failure of these cables will not prevent a safe shutdown by Method 2 safe shutdown systems. Due to negligible combustible loading in this fire zone and the ability to achieve safe shutdown with a loss of all safe shutdown cables, fire detection is not necessary in Fire Zone A-2e.

Fire Zone A-2f is the main steam pipe tunnel, and contains Division 1 and Division 2 safe shutdown cables and equipment. The associated circuits/spurious operation analysis has demonstrated the ability of the MSIVs to close in the event of a fire. The fire loading in this fire

zone is low and in the event of a fire in this fire zone, safe shutdown can be achieved. Based on the ability of the MSIVs to close in the event of a fire and the ability to achieve safe shutdown, fire detection is not necessary in Fire Zone A-2f.

Fire Zone A-2g has a low fire loading. This load is evenly distributed throughout the fire zone, and consists solely of lubricants.

Fire Zone A-2h has a low fire loading. This load is evenly distributed throughout the fire zone and consists solely of lubricants.

Fire Zone A-2i has a low fire loading. This load is evenly distributed throughout the fire zone, and consists of lubricants and HVAC materials.

Fire Zone A-2j has a low fire load.

Fire Zones A-2g, A-2h, A-2i, and A-2j, which contain safety-related instruments, equipment and cables, do not contain any cables or equipment required for safe shutdown. In the event of a fire in any of these fire zones, safe shutdown can be achieved. Based on the ability to achieve safe shutdown in the case of a fire and the lack of safe shutdown cables or equipment in these fire zones, fire detection is not necessary in Fire Zones A-2g, A-2h, A-2i, and A-2j.

4.2.3.1.3 Fire Area A-3

Description of Deviation

Complete area fire detection is not provided in Fire Area A-3. Fire detection is not provided in Fire Zone A-3c. Partial fire detection is provided in Fire Zone A-3a.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Zone A-3a - Elevation 707 feet 6 inches through 788 feet 6 inch (see Figures FP-2a and 2b through 5a and 5b and Cable Tray Figures 2, 3, and 4).

Fire Zone A-3c - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Zone A-3a contains safety-related and Method 2 safe shutdown RHR pump 1B, RHR heat exchanger B, fan-coil cooler, and Division 1 and 2 valves. Fire Zone A-3c contains Division 2 valves.

Cables that affect Method 1 RCIC system are routed in this area.

Based on the safe shutdown analysis of this fire area, in the event of a fire, hot and cold shutdown can be achieved and maintained using Method 3 safe shutdown systems.

The performance goals for safe shutdown functions are assured by Method 3.

Engineering Justification

Fire Zone A-3a, which has a low fire load, is open from elevation 707 feet 6 inches through 788 feet 6 inch and consists of the RHR heat exchanger B room. Ionization fire detection is provided at elevation 707 feet 6 inches by the RHR B pump. Since the majority of the combustibles in this fire zone are located at elevation 707 feet 6 inches, additional detection for the upper elevations will not significantly increase the level of fire protection in the fire zone. Therefore, providing additional fire detection in Fire Zone A-3a is not necessary.

Fire Zone A-3c consists of a general hallway and floor drain pump rooms. The fire loading in this zone is low. This fire loading is a result of lubricants and HVAC materials (duct insulation, gaskets, sealant, silencers, electric damper actuators, mixing boxes, and flexible connections) and is distributed evenly throughout the fire zone. In case of a fire in this fire zone, Division 1/Method 3 systems can be used to safely shut down the plant. Based on the low fire loading in this zone and availability of a redundant safe shutdown train, fire detection is not necessary in Fire Zone A-3c.

4.2.3.1.4 Fire Area C-1

Description of Deviation

A complete fire detection system is not provided in the drywell area, Fire Area C-1. A fire detection system has been provided only for the reactor recirculation pumps/motors.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Area C-1 - Elevation 723 feet 1-3/4 inches (see Figures FP-2a and 2b and Cable Tray Figure 2).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

The reactor vessel, reactor assembly, vessel and components, control rod drive, nuclear instrumentation, and Division 1, 2, 3, and 4 valves are located in Fire Area C-1.

There are Division 1 and 2 safe shutdown cables and equipment in this fire area belonging to both methods of safe shutdown systems. See Figures 4.2.4.1-1 through 3. Cables associated with each method of safe shutdown have been evaluated. The RHR safe shutdown cables (1RH17C and 1RH17D) serve valve 1E12-F009. This valve must be opened to proceed from hot to cold shutdown using RHR in the shutdown cooling mode. An alternate shutdown cooling method can be used if this valve cannot be operated. Both divisions of nuclear boiler system cables (1NB35D, E, F, G, H, and K and 1NB37C, D, F, H, K, M, P, and R) serve the ADS valves and SRVs 1B21-F051C and D. Disabling one electrical division of control to those SRV cables will not disable the other division nor cause spurious operation of these valves. The SRVs are

dual power valves. With a disabling of any horizontal 20-foot segment of the drywell, a sufficient number of SRVs will be available to safely shut down the plant. The separation distance between the Division 1 and 2 cables is less than 20 feet.

Engineering Justification

Fire Area C-1 consists of the drywell volume of the containment building at elevation 723 feet 1-3/4 inches and has a low fire load. The reactor vessel is located within the fire area. The principal potential fire hazard in this fire area is the lubricating oil for the two reactor recirculation pump motors. The fire hazard associated with the reactor recirculation pump motors is discussed in detail in Subsections 3.2.1.2 and 4.2.5.1.

Although most cables in the noninerted drywell are contained in conduit, there is a limited amount of exposed cable insulation from "free-air" instrument cables carrying very low voltages. The majority of these "free-air" cables are associated with the Control Rod Drive and Neutron Monitoring systems, and are located entirely beneath the reactor vessel. These cables are safety-related but are not required for safe shutdown. An exposure fire involving these cables would be contained within the vessel pedestal and would not propagate to any safety-related equipment; therefore, safe shutdown ability is not affected.

The remainder of the exposed cables are small diameter instrumentation cables. These non safety-related cables carry extremely low voltage signals for the Reactor Recirculation Vibration Monitoring system. Approximately 600 feet of vendor-supplied coaxial cable with Tefzel jacketing is exposed in the lower elevation of the drywell. The coaxial cables have not been tested to IEEE-383, and are routed "free-air" from the vibration sensors on each recirculation pump to two junction boxes, one mounted near each pump. Approximately 2700 feet of IEEE-383 qualified cable with Tefzel insulation and jacketing is routed "free-air" from these junction boxes at elevation 737' to a single junction box at elevation 785'.

None of these exposed instrumentation cables represent a significant exposure fire hazard because of the burn characteristics of Tefzel. As documented in GE NEDO-10466A, Revision 1, Tefzel is a thermoplastic material with flash-ignition and auto-ignition temperatures higher than its melting temperature, substantiated by numerous fire tests conducted by General Electric and verified by the Tefzel manufacturer, DuPont. This characteristic of melting before burning ensures that burning can only occur on the cable surface as a liquid, and will prevent a fire from propagating along the exposed Tefzel cable. There are no safe-shutdown cables or equipment below these exposed cables that can be affected by liquefied Tefzel. The limited use of exposed Tefzel insulation does not represent a significant fire hazard, therefore, and is not considered an intervening combustible for any of the safe shutdown cables or equipment in the drywell.

The drywell is inaccessible during operation, and when opened, stringent administrative controls are implemented to monitor personnel and equipment ingress and egress. Therefore, an exposure fire from transient combustibles is not credible.

The performance goals for the safe shutdown functions are assured by the availability of both methods of safe shutdown systems.

An infrared fire detection system has been provided for the reactor recirculation pump motors. Based on the low potential for a fire in this fire area, the fire detection system that is installed is sufficient and additional fire detection coverage is not necessary in Fire Area C-1.

4.2.3.1.5 Fire Area CB-1

Description of Deviation

Complete area fire detection is not provided in Fire Area CB-1. Fire detection is not provided in Fire Zones CB-1a, CB-1b, and partial fire detection is provided in Fire Zones CB-1d, CB-1e, CB-1h, and CB-1i.

Deviations for partial fire barriers and suppression in this fire area are found in Subsections 4.2.2.10 and 4.2.4.5 of this analysis, respectively.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Zone CB-1a - Elevation 712 feet 0 inch through 737 feet 0 inch (see Figures FP-8a and 8b).

Fire Zone CB-1b - Elevation 702 feet 0 inch (see Figures FP-8a and 8b and Cable Tray Figure 7).

Fire Zone CB-1d - Elevation 737 feet 0 inch (see Figures FP-10a and 10b and Cable Tray Figure 9).

Fire Zone CB-1e - Elevations 737 feet 0 inch and 751 feet 0 inch (see Figures FP-10a and 10b and FP-11a and 11b and Cable Tray Figure 9).

Fire Zone CB-1h - Elevations 702 feet 0 inch through 828 feet 3 inch (see Figures FP-8a and 8b through 15a and b and Cable Tray Figures 8 through 11 and 13).

Fire Zone CB-1i - Elevation 825 feet 0 inch (see Figures FP-15a and 15b and Cable Tray Figure 13).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Zone CB-1a does not contain Division 1 and 2 cables. No safe shutdown equipment or cables are located in this fire zone.

Fire Zone CB-1b contains Division 1 and 2 hydrogen recombiners and room fans, which are safety-related. No safe shutdown equipment or cables are located in this fire zone.

In Fire Zone CB-1d, Division 2 cable tray risers pass through the fire zone on the north wall. The nearest Method 1 safe shutdown cables or equipment (in Fire Zone CB-1e) are located over 50 feet from the Division 2 safe shutdown cable, and the Division 1 cables are protected by a ceiling automatic wet-pipe sprinkler system (in Fire Zone CB-1c). An ionization detection system is provided for the radiation-chemistry lab and office and cold lab. A fire in Fire Zone CB-1d will not disable Method 1 safe shutdown systems.

Fire Zone CB-1e contains Division 1 and 2 electrical cables, diesel generator motor control centers, Division 1 and 2 cable trays, and the Division 1 hydrogen recombiner control panel. There is an ionization fire detection system provided in this zone at elevation 751. An automatic wet pipe sprinkler system is provided to protect a portion of the zone at elevations 737 and elevation 751 over Zone CB-1d. This system will also protect the west pipe hatch at column row 125/AC and the equipment hatch at column row 132/AA leading to elevation 762 feet 0 inch. This zone contains Division 1 safe shutdown cables.

Fire Zone CB-1h contains no safe shutdown or safety-related equipment or cables. There is an ionization fire detection system located in the zone at elevation 800 feet 0 inch.

Fire Zone CB-1i contains the Division 1 and 2 control room air handling units, control room chillers, control room air filter packages and fans, Division 1 and 2 electrical cables and trays, unit substations, and motor control centers and panels, which are safety-related. Fire Zone CB-1i contains cables and equipment belonging to both methods of safe shutdown. An ionization detection system is located in this zone west of Column 133. To ensure a safe plant shutdown, a 3-hour fire rated wall at column 130 - extending from the missile wall (north) to row AC (south) - adequately separates the two methods of safe shutdown cable and equipment.

Engineering Justification

Fire Zone CB-1a was originally intended for Unit 2 diesel generators and fuel storage. It includes a general access corridor at elevation 719 feet 0 inch. The fire loading in this fire zone is low. In the event of a fire, the plant can be shut down using Method 1, 2, or 3 safe shutdown equipment. Based on the ability to achieve safe shutdown and the low fire loading in this fire zone, fire detection is not necessary in Fire Zone CB-1a.

Fire Zone CB-1b is the general access area at elevation 702 feet 0 inch of the control building, and it includes the hydrogen recombiner rooms and the drywell purge filter units room. The floor is 9-foot reinforced concrete. The walls are 12-inch minimum reinforced concrete, 11-5/8-inch minimum solid concrete block or 7-5/8-inch hollow concrete block. The north and west walls are 3-hour fire rated. The ceiling is 12-inch minimum reinforced concrete and is not fire rated. The floor area is 25,669 ft^2 with a low fire loading. This fire load is concentrated in the hydrogen recombiner rooms and the drywell purge filter units room.

Each of the three drywell purge filter units is protected by a manual deluge fire suppression system; therefore, fire detection has not been provided for the room. For a fire occurring in Fire Zone CB-1b, hot and cold shutdown can be achieved using Method 1, 2, or 3 safe shutdown equipment.

Fire Zone CB-1d consists of the radiation-chemistry laboratory area. Partial detection is located in offices as shown in Figure FP-10b. The fire loading in this fire zone is moderate. In the event of a fire, the plant can be shut down using Division 1/Method 3 equipment. Full area fire detection is not provided in Fire Zone CB-1d. The fire load in the laundry area on the other side of the cable chase wall (risers 10R30 and 10R31) is low. The walls adjacent to the laundry are 1.9-hour fire rated barriers. Therefore, with the hazard being separated from the safe shutdown cables by a fire barrier with a rating greater than the fire load, and the ability to achieve safe shutdown, fire detection is not necessary in all of Fire Zone CB-1d.

Fire Zone CB-1e consists of a general access area at elevation 737 feet 0 inch and a secondary floor at 751'-0". The fire load for the fire zone is low. There is an ionization fire detection

system provided in this zone at elevation 751. Portable fire extinguishers and hose stations are provided at elevations 737 and 751 for manual firefighting as shown on the referenced drawings. A fire in this fire zone will not prevent a safe plant shutdown. Therefore, fire detection in all of Fire Zone CB-1e is not necessary.

Fire Zone CB-1h is a stairwell tower. The fire zone contains no safety-related cable or equipment. A low fire loading in this fire zone is concentrated at the janitor's closet at elevation 800 feet 0 inch. There is an ionization fire detection system located in the zone at elevation 800 feet 0 inch. Portable fire extinguishers and hose stations are provided starting at elevation 781 feet 0 inch for manual fire fighting. A fire in this fire zone will not prevent a safe plant shutdown. Therefore, fire detection in all of Fire Zone CB-1h is not necessary.

Fire Zone CB-1i has a moderate fire load and contains the air handling equipment for the control room and auxiliary building. The primary combustible sources in this fire zone, the control room air filter packages and portions of the control room air handling units are protected by manual deluge sprinkler systems and a partial ionization detection system as shown on Figure FP-15b. In the event of a fire in this fire zone, safe shutdown can be achieved. Based on the partial detection system provided for the primary combustibles (see Figure FP-15b) in this fire zone and the ability to achieve safe shutdown, additional fire detection in Fire Zone CB1i is not necessary.

4.2.3.1.6 Fire Area CB-5

Deleted

4.2.3.1.7 Fire Area F-1

Description of Deviation

Complete area fire detection is not provided in Fire Area F-1. Fire detection is not provided in Fire Zones F-1c, F-1d, F-1e, F-1f, F-1g, F-1h, F-1i, F-1j, F-1k, F-1n and F-1o.

Deviations for partial fire barriers and suppression in this fire area are found in Subsections 4.2.2.12 and 4.2.4.7 of this analysis, respectively.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Zone F-1c - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1d - Elevation 712 feet 0 inches (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1e - Elevation 712 feet 0 inches (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1f - Elevation 712 feet 0 inches (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1g - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1h - Elevation 712 feet 0 inch (see Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1i - Elevation 712 feet 0 inches (See Figures FP-2a and 2b and Cable Tray Figure 2).

Fire Zone F-1j - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone F-1k - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone F-1n - Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Fire Zone F-1o - Elevation 737 feet 0 inch through 748 feet 0 inches (see Figures FP-3a and 3b and Cable Tray Figure 3).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Zones F-1c, F-1d, F-1e, F-1f, F-1g, F-1j, F-1k, and F-1o do not contain any safe shutdown or safety-related equipment or cables.

Fire Zones F-1h, F-1i, and F-1n contain Division 1 and/or 2 safety-related equipment and cables that support the fuel building functions. No equipment or cables required for safe shutdown are located in these fire zones.

Engineering Justification

Area fire detection is provided in Fire Zones F-1a, F-1b, F-1p, and F-1m.

Fire Zone F-1c consists of the fuel building floor drain pumps. The floor is 9-foot 8-inch minimum concrete and is not fire rated. The walls are 24-inch concrete or 27-5/8-inch solid concrete block. The containment wall is 3-hour fire rated. The remaining walls are not fire rated.

The ceiling is 24-inch minimum concrete and is not fire rated. The floor area is 361 ft^2 with a low fire loading. This fire loading results from HVAC materials and is evenly distributed throughout the fire zone. Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual fire fighting. In the event of a fire in this fire zone, safe shutdown can be achieved as discussed in Subsection 3.5.1 of the Safe Shutdown Analysis.

Fire Zone F-1d consists of the fuel building floor drain pumps. The floor is 9-foot 8-inch minimum concrete and is not fire rated. The walls are 24-inch concrete or 15-5/8-inch solid concrete block. The walls are not fire rated. The ceiling is 24-inch minimum concrete and is not

fire rated. The floor is 194 ft^2 with a low fire loading. The cable trays in this zone are located along the east wall of Fire Zone F-1d. Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual fire fighting. In the event of a fire in this fire zone, safe shutdown can be achieved as discussed in Subsection 3.5.1 of the Safe Shutdown Analysis.

Fire Zone F-1e consists of the fuel building equipment drain tank. The floor is 9-foot 8-inch minimum concrete and is not fire rated. The walls are 24-inch minimum concrete or 27-5/8-inch solid concrete block. The containment wall is a 3-hour fire rated wall. The remaining walls are not fire rated. The ceiling is 24-inch minimum concrete with an open hatch and is not fire rated. The floor area is 295 ft^2 with a low fire loading. This fire loading results from HVAC materials and is evenly distributed throughout the fire zone. Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual fire fighting. In the event of a fire in this fire zone, safe shutdown can be achieved as discussed in Subsection 3.5.1 of the Safe Shutdown Analysis.

Fire Zone F-1f consists of the fuel building equipment drain pumps. The floor is 9-foot 8-inch minimum concrete and is not fire rated. The wall is 24-inch minimum concrete or 27 5/8-inch solid concrete block. The north wall and the containment building wall are 3-hour fire rated. The remaining walls are not fire rated. The ceiling is 24-inch minimum concrete and is not fire rated. The floor area is 168 ft^2 with a low fire loading. The fire loading results from HVAC materials and is evenly distributed throughout the fire zone. Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual fire fighting. In the event of a fire in this fire zone, safe shutdown can be achieved as discussed in Subsection 3.5.1 of the Safe Shutdown Analysis.

Fire Zone F-1g consists of the fuel cask pump area. The floor is 9-foot 8-inch minimum concrete and is not fire rated. The wall is 24-inch minimum concrete or 19-5/8-inch solid concrete block. The walls are not fire rated. The ceiling is 24-inch minimum concrete and is not fire rated. The floor area is 357 ft^2 with a low fire loading. This fire loading results from HVAC materials and is evenly distributed throughout the fire zone. Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual fire fighting. In the event of a fire in this fire zone, safe shutdown can be achieved as discussed in Subsection 3.5.1 of the Safe Shutdown Analysis.

Fire Zone F-1h consists of a valve room that contains a safety-related Division 1 valve. Loss of the Division 1 valve would not prohibit safe shutdown on the plant as the valve is not required for safe shutdown. The low fire load in this zone results from HVAC materials distributed throughout the fire zone. In the event of a fire in Fire Zone F-1h, at least one shutdown method will be available. Based on the ability to achieve safe shutdown, fire detection is not necessary in Fire Zone F-1h.

Fire Zone F-1i consists of the fuel pool cooling and cleanup pump rooms, and contains safety-related Division 1 and Division 2 instruments, Division 1 and Division 2 area coolers, and Division 1 and Division 2 fuel pool cooling and makeup pumps. None of this equipment is necessary for safe shutdown. The low fire loading for this fire zone results from lubricants and HVAC materials. In the event of a fire, safe shutdown can be achieved. Based on the ability to achieve safe shutdown, fire detection is not necessary in Fire Zone F-1i.

Fire Zone F-1j is the personnel change room, and it does not contain any safety-related or safe shutdown cables or components. The floor is 24-inch-minimum concrete and is not fire rated.

The walls are 24-inch-minimum concrete or 23-5/8-inch-minimum concrete and are not fire rated. The low fire load in this fire zone is a result of protective clothing materials, and HVAC materials. In the event of a fire in this fire zone, safe shutdown can be achieved by Method 1 or 2 safe shutdown systems, and fire detection is not necessary.

Fire Zone F-1k consists of a workshop and storage vault, and it does not contain any safety-related or safe shutdown cables or components. The floor is 12-inch-minimum concrete with hatchways. The floor is not fire rated. The walls are 12-inch-minimum concrete or 11-5/8-inch-minimum solid concrete block. The containment wall is equivalent to a 3-hour fire barrier. The remaining walls are not fire rated. The ceiling is 12-inch-minimum concrete and is not fire rated. The fire load in this fire zone is low. In the event of a fire in this fire zone, safe shutdown can be achieved by Method 1 or 2 safe shutdown systems, and fire detection is not necessary.

Fire Zone F-1n consists of the fuel pool heat exchangers A and B. The fire loading in this fire zone is low, and results from HVAC materials, lubricants, and protective clothing materials located throughout the fire zone. In the event of a fire in this fire zone, at least one shutdown method will be available. Based on the low fire loading and the ability to achieve safe shutdown by either safe shutdown method, fire detection is not necessary in Fire Zone F-1n.

Fire Zone F-1o consists of the pipe tunnel. The floor is 12-inch concrete and is not fire rated. There are eight 4-inch floor drains. The walls are 12-inch minimum reinforced concrete. The walls adjacent to the diesel and auxiliary buildings are 3-hour fire rated. The remaining walls are not fire rated. The ceiling is 12-inch minimum concrete and is not fire rated. The floor area is 878 ft^2 with a low fire loading. Portable fire extinguishers and hose stations are provided in an adjacent fire zone for manual firefighting. In the event of a fire in the fire area, either safe shutdown method will be available. The performance goals for the safe shutdown functions are assured by Method 1 or 2.

4.2.3.1.8 Fire Area M-2

Description of Deviation

Fire detection is not provided in Fire Zone M-2c.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Zone M-2c - Elevation 699 feet 0 inch (see Figures FP-25a and 25b and Cable Tray Figure 22).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Safe shutdown cables and valves are located below elevation 699 feet. No safety-related cable trays are located in this fire zone. No safe shutdown cables are located in Fire Zone M-2c above elevation 699 feet 0 inch.

Engineering Justification

Fire Zone M-2c consists of the circulating water screen house and the below-grade pipe tunnel. The fire loading for this fire zone is low and results from HVAC materials, cable insulation, and lubricants. In the event of a loss of power, the Division 1 and 2 service water safe shutdown valves in this fire zone below elevation 699 feet 0 inch are not a concern since the valves are normally closed. A hot short of the valve control cable will not open the valves since the limit switch contacts are open. Therefore, Method 1 systems can be utilized to bring the plant to safe shutdown. Based on the ability to achieve safe shutdown, the absence of combustibles except for HVAC insulation, and separation of Division 1/Method 1 safe shutdown systems from Division 2/Method 2 systems, fire detection is not necessary in Fire Zone M-2c.

4.2.3.1.9 Fire Area CB-7

Description of Deviation

Complete area fire detection is not provided in Fire Area CB-7.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Area CB-7 - Elevation 702 feet 0 inch through 847 feet 0 inch (see Figures FP-8a through 15a and FP-8b through 15b and Cable Tray Figures 11 and 12).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Area CB-7 contains the NSPS solenoid power inverter/bypass switches A and B, Division 3 and 4 cable trays, and control room breathing air bottles. This fire area does not contain any cables or equipment belonging to Method 1 or 2 systems that are required for safe shutdown. The performance goals for the safe shutdown functions are assured by Method 1 or 2.

Engineering Justification

Fire Area CB-7 is a stairwell tower and elevator shaft that is enclosed and partitioned by 1.9-hour fire rated walls, except at elevation 800 feet 0 inch and a corridor at elevation 801 feet 9 inches. The walls surrounding the stairwell/elevator shaft at 800 feet 0 inch and the corridor at elevation 801 feet 9 inches are 3-hour fire rated. An ionization detection system is installed at the landings on elevations 781 feet 0 inch and 800 feet 0 inch and in the corridor at elevation 801 feet 9 inches. This fire zone has a moderate fire loading, resulting from BOP, Division 3 cables and cable insulation at elevation 800 feet 0 inch. None of the safety related equipment in this area is required for Method 1 or 2 safe shutdown. In the event of a fire in this fire area, safe shutdown can be achieved. Based on the ability to achieve safe shutdown, additional fire detection on elevations other than 781 feet 0 inch, 800 feet 0 inch, and 801 feet 9 inches is not necessary in Fire Area CB-7.

4.2.3.1.10 Fire Area C-2

Description of Deviation

Complete area fire detection is not provided in Fire Area C-2.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Area C-2 - Elevations 712 feet 0 inch through 828 feet 3 inches (see Figures FP-2a and 2b through 7a and 7b and Cable Tray Figures 4, 5, and 6).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Area	Safe Shutdown Equipment and/or Cables	Safety-Related Equipment and/or Cables
C-2	Yes	Yes

Engineering Justification

Complete area fire detection is not provided in Fire Area C-2. Linear thermal detectors are provided for all cable trays containing safe shutdown cables. Also, all safety-related cable trays approximately greater than 40% full are provided with linear thermal detectors. Based on the ability to achieve safe shutdown and partial detection, additional detection is not necessary in Fire Area C-2.

The fire loading classifications for Fire Area C-2 by elevation are:

Elevation	Btu/ft^2
712	low
737	low
755	low
778	low
789	low
803	low
816	low
828	low

The safe shutdown cables and equipment located in this fire area belong to both methods of safe shutdown systems as shown on Figures 4.2.3.1.10-1 through 4.2.3.1.10-6. Cables associated with each method of safe shutdown have been evaluated. The remote shutdown system cables are important only when shutdown is controlled from the remote shutdown panel.

In the event of a fire inside the containment building, shutdown operations will be controlled from the main control room.

The Division 1 and 2 RHR cables serve safe shutdown valves 1E12-F042A, 1E12-F042B, 1E12-F037A, 1E12-F037B, 1E12-F027A, 1E12-F027B, 1E12-F028A, 1E12-F028B, and 1E12-F009.

Division 1 and 2 nuclear boiler cables designated safe shutdown serve ADS valves 1B21-F041B, C, D, and F, 1B21-F047A and C, and 1B21-F051G; SRV valves 1B21-F051C and D; and instruments 1B21N081A and B and 1B21N078A and B. Although Division 1 and 2 shutdown cables and equipment occupy the same fire area, the divisions are separated by a distance of at least 60 feet, and with the exception of the south end at elevation 803 feet, there are no intervening combustibles between the Division 1 and 2 systems.

Above floor elevation 803 feet, Division 2 cable trays are routed within 6 feet of Division 1 trays. The Division 1 trays contain Division 1 safe shutdown cables 1RH61C and 1RH61D. At that point, however, there are no Division 2 safe shutdown cables. Division 2 safe shutdown cables enter the Division 2 trays at a point where the separation from the Division 1 trays is 80 feet. The concern here is a fire in the Division 1 trays spreading to the Division 2 trays and then propagating down the tray and damaging Division 2 safe shutdown cable. This is prevented by placing a fire break in the Division 2 trays.

Division 2 cables serving containment monitoring temperature elements are routed at elevation 737 feet. These cables feed indicators in the main control room required for safe shutdown. These cables are routed within 20 feet of the redundant Division 1 cables. A fire would not disable these cables since they are routed in conduit only 2 feet above the normal suppression pool level (elevation 731 feet 5 inches) and below the lowest floor, which is at elevation 737 feet 0 inch.

Even though the Division 1 and 2 cables are separated, operation of some Division 2 valves (1E12-F009, and 1E51-F063) is required by Division 1 shutdown systems. Valve 1E12-F009 must be opened to proceed from hot to cold shutdown using RHR in the shutdown cooling mode, or an alternate method can be used (see Figure 1.8-4 or 1.8-7). Valve 1E51-F063 is the RCIC steam supply line isolation inboard valve and thus is required to remain open until the cold shutdown systems are brought into operation. The valve is normally open; therefore damage to power cable 1RI02C will not prevent shutdown. Cable 1RI02D is connected to a limit switch. A hot short of a limit switch will not close the valve since the control switch contacts are open.

Based on the above discussion and with the fire break, a fire in this area could only damage one division of safe shutdown cables and equipment. A fire would be sensed by the linear thermal detectors in the safe shutdown cable trays, and general cable tray protection from elevations 755 feet to 803 feet is provided with linear thermal detection in most safety-related cable trays. General area detection is not required.

4.2.3.1.11 Fire Area T-1

Description of Deviation

Complete area fire detection is not provided in Fire Area T-1.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area(s) Involved

Fire Zone	T-1a, T-1b	-	Elevation 712 feet 0 inch (see Figures FP-20a and 20b and Cable, Tray Figure 18),
	T-1d		
Fire Zone	T-1c	-	Elevation 709 feet 0 inch (see FP-20a and 20b and Cable Tray Figure 18).
Fire Zone	T-1e	-	Elevations 737 feet 0 inch and 762 feet 0 inch (see Figures FP-21a, 21b, 22a, and 22b and Cable Tray Figures 19 and 20).
Fire Zone	T-1f	-	Elevation 737 feet 0 inch (see Figures FP-21a and 21b and Cable Tray Figure 19).
Fire Zone	T-1g,		Elevation 762 feet 0 inch and 781 feet 0 inch (see Figures FP-22a and 22b and Cable Tray Figure 20).
Fire Zone	T-1h,		Elevation 762 feet 0 inch and 785 feet 0 inch (see Figures FP-22a and 22b and Cable Tray Figure 20).
Fire Zone	T-1i,		Elevation 762 feet 0 inch (see Figures FP-22a and 22b and Cable Tray Figure 20).
Fire Zone	T-1j, T-1k		Elevation 781 feet 0 inch (see Figures FP-23a and 23b and Cable Tray Figure 21).
Fire Zone	T-1m, T-1n		Elevation 800 feet 0 inch (see Figures FP-24a and b)

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Class 1E electrical cables (in conduits) as well as instrumentation devices are located in Fire Area T-1. The turbine building contains safe shutdown cables, but fire damage resulting from a Turbine Building fire will not prevent accomplishing a safe shutdown.

Engineering Justification

Fire Zone T-1a consists of the general access area, floor drain pump and tank rooms, condensate polisher tank rooms, LCLC pumps, LCLC tank, cation and anion regenerator tanks, and acid and caustic reclaim tanks - all at elevation 712 feet 0 inch. The floor area is 33,214 ft^2.

The floor is 96-inch minimum concrete and is not fire rated. The walls are either 19-5/8inch minimum solid concrete block, 24-inch minimum concrete, or 3-1/8-inch removal sound attenuation panel. The south wall adjacent to the auxiliary building and radwaste building is 11-

5/8-inch minimum hollow concrete block and is 3 hour fire rated. There are removable 19-5/8-inch minimum solid concrete blocks in the floor drain pump and tank rooms and also each condensate polisher tank room. The ceilings are 12-inch minimum concrete. There are two open and two 1.9-hour fire rated enclosed stairways and one 1.9-hour fire rated enclosed elevator in this zone. There are a total of seventy-eight 4-inch floor drains in this zone.

Combustible materials located in this zone include lubricants, cable insulation, HVAC materials , and protective clothing materials for an overall low fire loading. This load is evenly distributed throughout Fire Zone T-1a.

Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1a.

Fire Zone T-1b consists of the condensate booster pump room. The floor area is 3633 ft^2.

The floor is 96-inch minimum concrete. The walls are 11-5/8-inch concrete block, and the ceiling is 22-inch minimum concrete. There are eight 4-inch floor drains located in this zone.

This zone contains lubricants, located throughout the zone, resulting in a low fire loading.

The existing fire hazards are not significant enough to present a problem due to the breaching of the radioactive systems and building constraints allowing a release of radioactive material to the environment in excess of 10 CFR 100 limits. Portable fire extinguishers (inside the zone) and hose stations (outside the zone door) are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1b.

Fire Zone T-1c consists of the condensate pump room. The floor area is 2295 ft^2. The floor is 96-inch minimum concrete. The walls are either 40-inch minimum concrete or 19-5/8-inch minimum concrete block. There are three sections of the walls that contain a metal siding type of 3-1/8-inch sound attenuation panels. The ceiling is 48-inch minimum concrete. This zone contains three 4-inch floor drains.

The zone contains lubricants, located throughout the zone, resulting in low fire loading.

Portable fire extinguishers (inside the zone) and hose stations (outside the zone doors) are provided for manual firefighting as shown on the referenced drawings.

Fire Zone T-1d consists of the bottom portion of the condenser unit. The area is 7408 ft^2. There is a low fire loading for this zone.

The floor is 96-inch minimum concrete. The walls are either 40-inch minimum concrete or 43-5/8-inch minimum concrete block. There is no ceiling for this zone as it is open to elevation 737 feet 0 inch. This zone contains five 4-inch floor drains.

The condenser tube pull pit and associated areas are protected by a sidewall automatic preaction sprinkler system. Portable fire extinguishers (in the zone) and hose stations (in an adjacent zone) are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1d.

Fire Zone T-1e consists of the LP heaters, HP heaters, cooler area, and the upper portions of the condenser unit at 737’-0”, and the main steam tunnel at 762’-0”. The fire zone has a total

floor area of 18,163 ft^2, split between the 737' and 762' elevations. At elevation 737'-0", the floor is 20-inch minimum concrete. The walls are either 40-inch minimum concrete or 43-5/8-inch minimum solid concrete block. The walls have 56-inch minimum removable solid concrete blocks. The ceiling of the heater area is 14-inch minimum concrete. The steam tunnel portion of the zone is open to elevation 755 feet 0 inch. This zone has one open stairway and thirty-nine 4-inch floor drains.

This zone contains lubricants and cable insulation, located throughout the zone, for an overall low fire loading.

The area beneath the turbine-generator where oil could spread from a pipe break is protected by an automatic wet pipe sprinkler system. Hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1e.

Fire Zone T-1f consists of the general access area. The floor area is 19,653 ft^2. The floor is 20-inch minimum concrete and is not fire rated. The walls are 24-inch minimum concrete. The north exterior wall, the south wall adjacent to the auxiliary building, and the west exterior wall from column line J to S (adjacent to the transformers) are 3-hour fire rated. The remaining portion of the west wall and all of the east wall adjacent to the Radwaste Building are not fire rated. The ceiling is 12-inch minimum concrete with areas of 1-1/2-inch steel grating and is not fire rated. There are two open and two enclosed 1.9-hour fire rated stairways, one 1.9-hour fire rated enclosed elevator, and fifty-five 4-inch floor drains in this zone.

Combustible materials distributed throughout Fire Zone T-1f consist of lubricants, cable insulation, HVAC materials, and protective clothing materials. This results in an overall moderate fire loading.

The R.R. bay floor area at elevation 737 feet 0 inch is protected by an automatic preaction sprinkler system. Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1f.

Fire Zone T-1g on elevation 762 feet 0 inch consists of the LP heaters and main steam stop and control valves. The floor area is 23,343 ft^2. The floor is 14-inch minimum concrete. The walls are 48-inch minimum concrete, and the ceiling is 14-inch minimum concrete. At elevation 754 feet 0 inch, the ceiling is 1-1/2-inch steel grating. The majority of the zone is open up to elevation 800 feet 0 inch. There are twenty-seven 4-inch floor drains in this zone.

This zone contains lubricants and cable insulation, distributed throughout the zone, for an overall low fire loading.

The area beneath the turbine-generator where oil could spread from a pipe break is protected by an automatic wet pipe sprinkler system. Portable fire extinguishers (in an adjacent zone) and hose stations (in the zone) are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1g.

Fire Zone T-1h consists of the turbine auxiliaries hydrogen seal oil unit, motor-drive RX feed pump, and area coolers. The floor area is 22,774 ft^2. The floor is a minimum 12-inch concrete. The walls are a minimum 24-inch reinforced concrete, 3-5/8-inch minimum hollow concrete block, and 16-inch minimum solid removable concrete block. The north exterior wall, the south wall adjacent to the auxiliary building, the west exterior wall from column line J through S, and the walls adjacent to Zone T-1i are 3-hour fire rated. The remaining walls are not fire rated.

The ceiling is 12-inch minimum concrete. The majority of the zone is open up to elevation 800 feet 0 inch. There are two open and two enclosed stairways in this zone. The stairwell enclosures on the north and east walls and the elevator enclosure on the north wall are 1.9-hour fire rated. There are fifty 4-inch floor drains in the zone.

Combustible materials distributed throughout this zone consist of lubricants , cable insulation, HVAC material, and protective clothing materials. This results in an overall moderate fire loading.

The hydrogen seal oil unit is protected by an automatic deluge system. The oil pipe line for the turbine-driven reactor feed pump is protected by a manual preaction sprinkler system. An automatic wet pipe sprinkler system is provided in the motor-driven reactor feedwater pump room. Two 8-inch concrete curbs are provided in the area near the hydrogen seal oil unit to isolate potential turbine oil spills within the area easily accessible for manual fire suppression. An automatic wet pipe sprinkler system is provided in the mezzanine area at elevations 777' -0" and 783'-0". Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1h.

Fire Zone T-1i consists of the turbine oil reservoir and has a floor area of 855 ft^2. The oil reservoir results in a high fire loading.

The floor is 60-inch concrete at elevation 766 feet 6 inches. The walls are 56-inch concrete and 11-5/8-inch hollow concrete block. All walls are 3-hour fire rated. The ceiling is 16-inch concrete at elevation 800 feet 0 inch. There are two 4-inch floor drains in this area.

The turbine oil reservoir tank room is protected by an automatic wet pipe sprinkler system. A hose station is provided outside the zone door for manual firefighting as shown on the referenced drawings for Fire Zone T-1i.

Fire Zone T-1j consists of the steam jet air ejectors, cooler condensers, catalytic recombiners, regenerator, desiccant dryer, steam seal evaporator and area cooler, and two steam packing exhausters - all at elevation 781 feet 0 inch. The floor area is 6284 ft^2. This zone contains lubricants and HVAC materials, resulting in a low fire loading.

The floor is 14-inch minimum concrete. The walls are either 24-inch minimum concrete, 43-5/8-inch minimum solid concrete block or 11-5/8-inch hollow concrete block. Some walls have removable solid concrete blocks. A partial wall extending to elevation 791 feet 0 inch separates the catalytic recombiner and the cooler condenser. The ceiling is 12-inch minimum concrete. There are twenty 4-inch floor drains in the zone.

A partial automatic wet-pipe sprinkler system is provided. Portable fire extinguishers, and hose stations are provided outside the zone door for manual firefighting as shown on the referenced drawings for Fire Zone T-1j.

Fire Zone T-1k consists of a general access area. The floor area is 4397 ft^2. The floor is 12-inch minimum concrete. The walls are 24-inch minimum concrete, 43-5/8-inch solid concrete block, 11-5/8-inch hollow concrete block, and 64-inch solid removable concrete block. The south walls, the north wall, and the west wall from column line J to S are 3-hour fire rated, and the elevator enclosure walls are 1.9-hour fire rated. The remaining walls are not fire rated. The ceiling at elevation 800 feet 0 inch is 12-inch minimum concrete and 1-1/2-inch steel grating. There are seventeen 4-inch floor drains in this zone. The zone is open to Zone T-1h.

Combustible materials distributed throughout this zone consist of lubricants, cable insulation, HVAC and material. This results in a low fire loading.

Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1k.

Fire Zone T-1m consists of the turbine deck and surrounding operating level, the turbine driven reactor feed pumps, RFPT contract panel, and reactor feed pump instrument panel, all at elevation 800 feet 0 inch. The floor area is 39,792 ft^2.

The floor is 12-inch minimum concrete and 1-1/2-inch steel grating. The walls are either 18-inch minimum concrete, 23-5/8-inch solid concrete block, 11-5/8-inch hollow concrete block, or 3-1/2-inch metal siding. The two stairwell enclosures and the elevator enclosure are 1.9-hour fire rated. The roof is steel decking. There are forty-one 4-inch floor drains. Automatic heat vents are provided on the roof of this zone.

Combustible materials located throughout this zone consist of lubricants, cable insulation, HVAC material, and protective clothing materials. This results in a low fire loading.

Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone T-1m. The main generator exciter is protected by a $C0_2$ system which is activated by a thermal detector. An automatic preaction sprinkler system is provided in the area of the turbine generator bearings and underskirt. Two automatic deluge sprinkler systems are provided in the two turbine-driven reactor feedwater pump rooms. The three sprinkler systems are activated by thermal detectors.

Fire Zone T-1n consists of hydrogen analyzers and a preheat air ejector with a floor area of 338 ft^2. The floor is 12-inch concrete. The walls are 18-inch minimum concrete, and the roof is 12-inch concrete. There are three 4-inch floor drains. Combustible material located throughout this zone consists of cable insulation and HVAC materials. This results in a low fire loading.

Portable fire extinguishers and hose stations are provided outside the zone door for manual firefighting as shown on the referenced drawings for Fire Zone T-1n.

The turbine building is classified as a non-safety-related nonseismic building, although it does house some Class 1E electrical cables (in conduits) as well as instrumentation devices and BOP safe shutdown cables which are associated with the Motor Driven Feedwater Pump automatic start logic and the pump circuit breaker. The Class 1E cables and devices provide inputs to the solid-state protection system for reactor trip or perform functions initiated by the protection system. The principal function of these devices is to provide anticipatory trip for the reactor based upon secondary system parameters. If these cables and/or devices failed, other parameters not measured in the turbine building would provide the necessary signal to shut down the reactor. Fire damage to the BOP cables resulting from a fire in the Turbine Building will not prevent accomplishing a safe shutdown. Thus, no credit has been taken in the Safe Shutdown Analysis for the parameter measurements taken in the turbine building, since the loss of these cables and/or devices will not inhibit safe shutdown of the plant.

On this basis, any fire damage to the turbine building and all equipment and systems in the building are considered will not preclude safe shutdown of the plant. Because of this and the fire detection and suppression systems provided for Fire Area T-1, complete fire detection is not required for Fire Area T-1.

4.2.3.1.12 Fire Area D-10

Description of Deviation

Complete area fire detection is not provided in Fire Area D-10.

Reference

10 CFR 50, Appendix R, Section III.F references that automatic fire detection systems shall be installed in all areas of the plant that contain or present an exposure fire hazard to safe shutdown or safety-related systems or components.

Fire Area Involved

Fire Area D-10 Elevation 762 feet 0 inch (see Figures FP-12a and 12b and Cable Tray Figure 10).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

Fire Area	Safe Shutdown Equipment and/or Cables	Safety-Related Equipment and/or Cables
D-10	Yes	Yes

Engineering Justification

Complete area fire detection is not provided in Fire Area D-10. Complete area ionization fire detection is provided throughout the zone with the exception of the three rooms that were intended for the Unit 2 diesel-generator ventilation air intake rooms.

The floor is 12-inch-minimum reinforced concrete and is 3-hour fire rated. The walls adjacent to Fire Areas D-7, D-8, and D-9, and Fire Zone CB-1f have a 3-hour fire rating. The exterior walls and ceiling are not fire rated (see Figure FP-12b).

These rooms are used to perform toolbox maintenance activities and contain low amounts of combustibles. Portable fire extinguishers and hose stations are provided for manual firefighting in the immediate area.

Based on the rooms having negligible of combustibles and not containing any permanent plant equipment or cables, fire detection is not necessary in the Unit 2 portion of Fire Area D-10.

4.2.3.2 Fire Detection by Water Flow or Carbon Dioxide

This section has been intentionally deleted.

4.2.3.3 Diesel Air Intake Structures (D-7, D-8, D-9)

Description of Deviation

Fire Areas D-7 and D-9 do not have a fire detection system. Fire Area D-8 does not have a complete fire detection system.

Security - Related Information Figure Withheld Under 10 CFR 2.390

insulation in cabinets, HVAC duct insulation materials, and lubricants, resulting in a low combustible loading. Based on the partial fire detection provided, low combustible loading, and the ability to support Method 2 safe shutdown equipment using offsite power, additional fire detection is not necessary in Fire Area D-8.

TABLE 4.2.3.1.2-1
CABLE ANALYSIS OF
FIRE ZONE A-2e

Fire Zone A-2e

Cable From and Through	Cable To	Type of Cable	Equipment Served By Cables	Affects Safe Shutdown Method	Comments
1RH21A 1RH21B		P1E C1E	1E12-F023	2	Valve located in A-3a. See spurious ops. analysis page 23. Does not affect Method 2 safe shutdown.
1RI17A 1RH17B		P2E C2E	1E51-F078	1	RCIC ISO VLV located in A-2b. See spurious ops. analysis page 25. Does not affect Method 2 safe shutdown.
	1RI03A 1RI03B	P1E C1E	1E51-F077	1	RCIC ISO VLV located in A-2e. See spurious ops. analysis page 25. Does not affect Method 2 safe shutdown.
	1RI13H 1RI13A 1RI13B 1RI13F	P1E P1E C1E C1E	1E51-F068	1	RCIC EXH VLV located in A-2e. See spurious ops. analysis page 25. Does not affect Method 2 safe shutdown.

4.2.4 Suppression

4.2.4.1 Drywell Suppression in Fire Area C-1

Description of Deviation

An automatic suppression system is not provided in Fire Area C-1. Cables associated with safe shutdown pass within 20 feet of their redundant counterparts.

A deviation concerning the partial fire detection system for this area is discussed in Subsection 4.2.3.1.

Reference

10 CFR 50, Appendix R, Sections III.G.2.d and e state that cables and equipment of redundant trains must be separated by a horizontal distance of more than 20 feet with no intervening combustibles or the applicant will install fire detectors and an automatic suppression system in the fire area.

Fire Area(s) Involved

Fire Area C-1 - Elevations 723 feet 1-3/4 inch through 776 feet 0 inch (see Figures FP-2a and 2b through FP-5a and 5b and Cable Tray Figures 2 through 6).

Description of Safe Shutdown Equipment and Cables

Cables and equipment required for safe shutdown are shown on Figures 4.2.4.1-1 through 4.2.4.1-3.

Engineering Justification

Separation of safe shutdown conduits is greater than 20 feet except at elevation 764 feet 0 inch, where they cross over each other and run parallel within 1 foot of each other. Each SRV is powered by both Division 1 and 2. A sufficient number of SRVs would be available assuming that all cabling and equipment were disabled within any 20-foot horizontal portion of the drywell. It should be noted that the SRVs also have extensive vertical separation from the only significant fire hazard in this fire area, which is the lubricating oil for the two reactor recirculation pump motors.

The fire hazard associated with the reactor recirculation pump motors is discussed in detail in Subsections 3.2.1.2 and 4.2.5.1. If a fire occurred at the recirculation pump motors, it would be detected by the infrared fire detection systems.

Although most cables in the noninerted drywell are contained in conduit, there is a limited amount of exposed cable insulation from "free-air" instrument cables carrying very low voltages. The majority of these "free-air" cables are associated with the Control Rod Drive and Neutron Monitoring systems, and are located entirely beneath the reactor vessel. These cables are safety-related but are not required for safe shutdown. An exposure fire involving these cables would be contained within the vessel pedestal and would not propagate to any safety-related equipment; therefore, safe shutdown ability is not affected.

The remainder of the exposed cables are small diameter instrumentation cables. These non safety-related cables carry extremely low voltage signals for the Reactor Recirculation Vibration Monitoring system. Approximately 600 feet of vendor-supplied coaxial cable with Tefzel jacketing is exposed in the lower elevation of the drywell. The coaxial cables have not been tested to IEEE-383, and are routed "free-air" from the vibration sensors on each recirculation pump to two junction boxes, one mounted near each pump. Approximately 2700 feet of IEEE-383 qualified cable with Tefzel insulation and jacketing is routed "free-air" from these junction boxes at elevation 737' to a single junction box at elevation 785'.

None of these exposed instrumentation cables represent a significant exposure fire hazard because of the burn characteristics of Tefzel. As documented in GE NEDO-10466A, Revision 1, Tefzel is a thermoplastic material with flash-ignition and auto-ignition temperatures higher than its melting temperature, substantiated by numerous fire tests conducted by General Electric and verified by the Tefzel manufacturer, DuPont. This characteristic of melting before burning ensures that burning can only occur on the cable surface as a liquid, and will prevent a fire from propagating along the exposed Tefzel cable. There are no safe-shutdown cables or equipment below these exposed cables that can be affected by liquefied Tefzel. The limited use of exposed Tefzel insulation does not represent a significant fire hazard, therefore, and is not considered an intervening combustible for any of the safe shutdown cables or equipment in the drywell.

The drywell is inaccessible during operation, and when opened, stringent administrative controls are implemented to monitor personnel and equipment ingress and egress. Therefore, an exposure fire from transient combustibles is not credible.

Based on the minimal combustibles in the area, detection for the reactor recirculation pumps, and spatial separation of safe shutdown cables in conduit, an adequate level of protection is provided to ensure safe shutdown. Therefore, an automatic suppression system in this fire area is not necessary.

4.2.4.2 Control Room Complex (CB-6)

Description of Deviation

Fire Area CB-6 is not provided with a complete automatic fire suppression system.

Reference

10 CFR 50 Appendix R, Section III.G.3 states: Alternative or dedicated shutdown capability and its associated circuits independent of cables, systems or components in the area, room, or zone under consideration, shall be provided. . . In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration.

Fire Area(s) Involved

Fire Area CB-6 - Elevation 800 feet 0 inch (see Figures FP-14a and 14b and Cable Tray Figure 12).

Security - Related Information Figure Withheld Under 10 CFR 2.390

Fire Area Involved

Fire Zone A-1b, A-1c, A-1d, A-1e — Elevation 737 feet 0 inch (see Figures FP-3a and 3b and Cable Tray Figure 3).

Description of Safe Shutdown Equipment and Cables

Fire Area A-1, with the exception of Fire Zone IIA-1a, contains Division 1 and 2 safe shutdown cables and equipment. Division 1 systems are located on the east side of the fire area and Division 2 systems are located on the west side of the fire area (see Cable Tray Figures 2 and 3). Fire Zone A-1a contains only a limited number of Division 1 cables located approximately in the middle of the zone. These cables are not required for safe shutdown method 3. None of the cables and equipment required for method 3 are located in Fire Zone A-1a. Hence, this deviation is not required for Fire Zone A-1a.

Engineering Justification

Fire Zone	Fire Load Classification
A-1b	moderate
A-1c	moderate
A-1d	high
A-1e	low

Fire Zone A-1b, as stated above, contains Division 2 shutdown equipment and cables on the west end; Division 1 systems are contained on the east end. The two divisions are well separated, with the cables being separated by 136 feet and the conduits separated by a distance of 72 feet (see Figure 4.2.4.4-2). Full coverage fire detection is provided. In addition to hose stations, automatic suppression is provided between column rows 114 and 124/S-T, segregating the two shutdown methods and ensuring that a fire originating in either the east or west end does not spread to the other end of the zone by way of the fire retardant IEEE-383 BCP cables. Thus, a fire originating anywhere in Fire Zone A-1b or spreading to Fire Zone A-1b from Fire Zones A-1e or A-2d would be confined to either the Method 1/3 or Method 2 shutdown systems. Method 3 or 2 would be available to safely shut down the plant.

Fire Zone A-1e (elevation 737 feet 0 inch), and the west end of Fire Zone A-1b, contain only Division 2 shutdown cabling and equipment. Thus, a fire originating in Fire Zone A-1e or spreading to Fire Zone A-1e from the western portion of Fire Zone A-1b would disable only Division 2 safe shutdown systems and Method 1 or 3 systems would be used to safely shut down the plant.

Fire Zones A-1c (health physics instrument storage room) and A-1d (anticontamination storage room) house no safe shutdown systems. Additionally, both zones are located on the west end of the floor. In the event of a fire originating in either zone, the fire would be confined to the west end of Fire Area A-1, where Division 2 systems are located. Division 1 systems in the east end of Fire Area A-1 would be protected by the automatic suppression system between column rows 114 and 124. Thus, Method 3 systems would be available to safely shut down the plant.

In summary, Fire Area A-1, with the exception of Fire Zone A-1a, houses all Division 2 systems in the west end and all Division 1 systems in the east end. The spread of a fire from one end to the other is prevented by partial automatic suppression system. Thus, one shutdown method would be available in the event of a fire in Fire Area A-1 and additional suppression systems are unwarranted.

4.2.4.5 Partial Suppression in Fire Area CB-1

Description of Deviation

Fire Area CB-1 is not protected by complete automatic fire suppression (see Subsection 4.2.6.2).

Deviations for partial fire barriers and detection in this fire area are found in Subsections 4.2.2.10 and 4.2.3.1.5 of this analysis, respectively.

References

10 CFR 50, Appendix R, Sections III.G.2.b and III.G.3 state: Separation of cables and equipment and associated non-safety-related circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area; or . . . . Alternative or dedicated shutdown capability and its associated circuits independent of cables, systems, or components in the area, room, or zone under consideration, shall be provided. . . . In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration.

Fire Area Involved

Fire Zone CB-1a - Elevations 712 feet 0 inch, 719 feet 0 inch, and 737 feet 0 inch (see Figures FP-8a, 8b, 9a, 9b, 10a, and 10b and Cable Tray Figures 7, 8, and 9).

Fire Zone CB-1b - Elevations 702 feet 0 inch (see Figures FP-8a and 8b and Cable Tray Figure 7).

Fire Zone CB-1c - Elevation 719 feet 0 inch (see Figures FP-9a and 9b and Cable Tray Figure 8).

Fire Zone CB-1d - Elevation 737 feet 0 inch (see Figures FP-10a and 10b and Cable Tray Figure 9).

Fire Zone CB-1e - Elevations 737 feet 0 inch and 751 feet 0 inch (see Figures FP-10a, 10b, 11a, and 11b and Cable Tray Figure 9).

Fire Zone CB-1f - Elevation 762 feet 0 inch (see Figures FP-12a and 12b and Cable Tray Figure 10).

Fire Zone CB-1g - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-1h - Elevations 702 feet 0 inch through 828 feet 3 inch (see Figures FP-8a and 8b through 15a and 15b and Cable Tray Figures 7 through 13).

Fire Zone CB-1i - Elevation 825 feet 0 inch (see Figures FP-15a and 15b and Cable Tray Figure 13).

Section views of the control building have been provided (see Figures FP-34a and 34b through FP-36a and 36b).

Description of Safe Shutdown Equipment and Cables

Safe shutdown cables and equipment in the zones are shown on Figures 4.2.4.5-1 through 4.2.4.5-6.

Fire Zone CB-1h is a stairwell tower and elevator shaft enclosed by 1.9-hour or 3-hour fire rated walls and does not contain any safety-related or safe shutdown systems. It is not mentioned in the following discussion.

Engineering Justification

An automatic suppression system is not utilized throughout Fire Area CB-1. A combination of partial suppression systems, partial fire detection, and fire-rated barriers are used to provide adequate fire protection to provide an equivalent level of protection to Appendix R requirements. The fire protection provided ensures that a fire cannot propagate horizontally or vertically upward sufficiently to damage redundant safe shutdown trains. This deviation is discussed by starting at the lowest elevation of Fire Area CB-1 and progressing upward. Because it is not likely that a fire will propagate downward since all cable risers are sealed at floor penetrations and there is no other continuity of combustibles, that situation was not analyzed.

Elevation 712 Feet 0 Inch - Fire Zone CB-1a and 702 Feet 0 Inch - Fire Zone CB-1b

All cable tray risers are sealed at the ceiling with a 3-hour fire rated penetration seal.

The walls of Fire Zone CB-1a are 12-inch-minimum reinforced concrete. The west wall and the south corridor wall, common to Fire Areas D-1, D-2, and D-3, are 3-hour fire rated, and the wall common to CB-1h, which is 1.9-hour fire rated. The remaining walls are not fire rated. The ceiling (the floor of elevation 762 feet 0 inch) is 12-inch-minimum reinforced concrete and is 3-hour fire rated. Manual hose stations and portable extinguishers are provided throughout this zone. Fire Zone CB-1a has a low fire loading.

The walls of Fire Zone CB-1b are at least 12-inch reinforced concrete, 11-5/8-inch solid concrete block or 7-5/8-inch hollow concrete block. The north and west walls are 3-hour fire rated. The ceiling is at least 12-inch reinforced concrete and is not fire rated. Manual hose stations and portable extinguishers are provided throughout this zone. Fire Zone CB-1b has an approximately uniform low fire loading.

Fire Zones CB-1a and CB-1b contain no safe shutdown cables or equipment. If a fire were to start at elevation 702 feet 0 inch, no safe shutdown equipment would be affected. Because of the negligible fire loading in Fire Zone CB-1a, it is not credible that a fire started in this zone will propagate upward. A fire starting in Fire Zone CB-1b would be prevented from spreading

upward because of the sealing of the cable risers at the ceiling and the substantial construction of the ceiling.

Elevation 719 Feet 0 Inch - Fire Zone CB-1c

All cable tray risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

This zone is a general access area and a heating, ventilation, and air-conditioning equipment area. Also, the standby gas treatment Systems A and B are located in the zone. The fire load in Fire Zone CB-1c is low.

The walls of Fire Zone CB-1c are 36-inch reinforced concrete, 15-5/8-inch solid concrete block, or 11-5/8-inch hollow concrete block. The north and west walls, including walls and ceiling of the west radwaste pipe tunnel and interior walls and ceiling of the east radwaste pipe tunnel, are 3-hour fire rated, and the remaining walls are not fire rated. The ceiling is 20-inch reinforced concrete and is 3-hour fire rated from columns/rows AC-AE and 124-130, and the under the cable riser area of Zone CB-1d. The remainder of the ceiling is unrated. There are four stairways in this zone: two are open and two are enclosed in 1.9-hour fire rated walls. There are two elevators enclosed in 1.9-hour fire rated wall. Area fire detection and manual hose stations and extinguishers are provided in this zone. An automatic wet-pipe sprinkler system protects the small open pipe hatch at the ceiling of Fire Zone CB-1c.

If a fire were to start in Fire Zone CB-1c, Method 1 and 2 safe shutdown systems could be affected (see Figure 4.2.4.5-1). Fire-induced damage to Division 1 safe shutdown systems would not prevent safe plant shutdown using Method 3 equipment. As a result of the low fire loading, it is unlikely that a fire will propagate up to elevation 737 feet 0 inch.

Elevation 737 Feet 0 Inch - Fire Zone CB-1d Elevations 737 Feet 0 Inch and 751 Feet 0 Inch - Fire Zone CB-1e

All cable tray risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

Cables and equipment are shown on Figures 4.2.4.5-2 and 4.2.4.5-3.

The Fire Zone CB-1d floor is 20-inch reinforced concrete and is not fire rated, except for the floor of the cable riser area which is 3-hour fire rated. The walls in Fire Zone CB-1d are 7-5/8-inch-minimum solid or hollow concrete block or 18-inch-minimum reinforced concrete. The north and west exterior walls have a 3-hour fire rating. The two Radwaste pipe tunnels are 3-hour fire rated. The two enclosed stairways and elevator shaft walls are 1.9-hour fire rated. The south, east and west walls of the cable riser and stairwell room are 1.9-hour fire rated. The remaining walls are not fire rated. The interior walls surrounding the cable riser along the north wall (see Figure FP-10b) have a 1.9-hour fire rating. The ceiling is at least 8-inch reinforced concrete at elevation 751 feet 0 inch and is not fire rated.

Portable extinguishers, manual hose stations, and partial fire detection are provided (see Figure FP-10b).

Fire Zone CB-1e is a general access area at elevation 737 feet 0 inch and it includes a mezzanine (at elevation 751 feet 0 inch) above Fire Zone CB-1d. The floor of the general access area of Fire Zone CB-1e is 20-inch-minimum reinforced concrete and is not fire rated. The floor of the mezzanine level, which is the intermediate roof of Fire Zone CB-1d, is at least

8-inch reinforced concrete and it is not fire rated. The walls of Fire Zone CB-1e are 18-inch reinforced concrete, 15-5/8-inch solid concrete block, or 7-5/8-inch-minimum hollow concrete block. The portion of the south wall adjacent to the diesel-generator rooms (Fire Zones D-4a, D-5a, and D-6a) and the north wall adjacent to the radwaste building above elevation 751 feet 0 inch and the west wall adjacent to the auxiliary building are 3-hour fire rated. The two enclosed stairways and two enclosed elevators are 1.9-hour fire rated. The remaining walls are not fire rated. The ceiling of Fire Zone CB-1e is 12-inch-minimum reinforced concrete with open pipe and equipment removal hatches. The ceiling is not fire rated.

The fire load in Zone CB-1e is low. Cables are concentrated at the west side of Fire Zone CB-1e. The fire load in Fire Zone CB-1d is moderate. Higher cable tray concentrations are located in the riser sections by row S (see Figure 4.5.4.5-2). These risers are sealed at elevations 737 feet 0 inch, 751 feet 0 inch, and 762 feet 0 inch by 3-hour fire rated seals. The only other fixed fire hazards are the gases stored in the compressed gas storage room. The Division 1 and 2 cables in proximity to this room are shown on Cable Tray Figure 9.

If a fire were to start in Fire Zone CB-1d or CB-1e, either Division 1 or Division 2 safe shutdown systems (but not both) could be affected (see Figures 4.2.4.5-2 and 4.2.4.5-3).

Any division 2 safe shutdown systems that pass horizontally within 20 feet of Division 1 safe shutdown systems are also protected by a thermal barrier enclosure that extends 20 feet beyond the closest Division 1 safe shutdown cable tray and riser (see Figure 4.2.4.5-3). All cables installed in this fire zone are qualified to the requirements of IEEE-383. An automatic wet pipe sprinkler system is installed in this portion of the Fire Zone CB-1e, covering the Division 1 and 2 cable trays as well as the Division 1 MCCs (see Figures FP-10b and FP-11b). Automatic detection is installed throughout the routing for the safe shutdown cables over the intermediate roof of CB-1d at elevation 751 feet 0 inch. Hose stations and portable extinguishers are available in CB-1e and in adjacent areas for use by fire fighting personnel. The Thermo-Lag fire wrap used in the separation area has a 1-hour fire rating. Due to the flame spread characteristics of Thermo- Lag, the requirement for a continuous heat source to keep the Thermo-Lag burning, the installed fire protection features of the area, and the response of the plant fire brigade, it is not anticipated that any credible fire occurring on one side of this barrier would propagate across the Thermo-Lag barrier to damage cables supporting the redundant safe shutdown method. This establishes a relatively large horizontal distance with low in-situ fuel loading between unprotected cables that support redundant safe shutdown methods in other portions of the fire zone.

Damage to Division 1 safe shutdown systems would be prevented by the automatic wet-pipe sprinkler system installed in the west portion of Fire Zone CB-1e (see Figures FP-10b and FP-11b).

A wet-pipe sprinkler system protects the small open pipe hatch at the ceiling of Fire Zone CB-1c (located at column row 125/AC, elevation 737 feet 0 inch, see Figure FP-9b), and the equipment hatch at column row 132/AA leading to elevation 762 feet 0 inch.

The Division 2 safe shutdown systems in Fire Zone CB-1c pass no closer than 14 feet from the hatch, which along with the absence of intervening combustibles, limits the chances of vertical fire propagation. In addition, an automatic suppression system is provided over the Division 2 MCCs and the Division 1 safe shutdown systems at elevation 737 feet 0 inch and elevation 751 feet 0 inch over Zone CB-1d (see Figures FP-10b and FP-11b and Cable Tray Figure 9), further preventing fire damage to Division 1 safe shutdown systems from exposure fires from all

directions. The suppression system would also prevent a fire in Division 1 systems from propagating horizontally or vertically upward. The possibility of upward fire propagation is prevented by automatic sprinkler protection that is provided at the ceiling of elevation 737 feet 0 inch around the HVAC shaft at column row 125/AC and the equipment hatch at column row 132/AA. Upward propagation through the unrated ceiling is prevented by the sealing of the primary propagation path, the cable risers penetrating the ceiling.

Safe shutdown can be achieved by Method 2 or 3.

Elevation 762 Feet 0 Inch - Fire Zone CB-1f

All cable tray risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

The floor is 12-inch reinforced concrete with open areas for piping and equipment removal. The floor is not fire rated, except for the floors over the two radwaste pipe tunnels which are 3-hour fire rated.

The zone walls are 24-inch-minimum concrete and are 3-hour fire rated, except for the east wall, which is not fire rated. The two enclosed stairways and the two enclosed elevators are 1.9-hour fire rated. The ceiling is 12-inch-minimum reinforced concrete and is 3-hour fire rated between column rows 124-130 and column lines S-AC. Manual hose stations and portable fire extinguishers are provided as shown on Figure FP-12b.

Area fire detection is provided in this fire zone. The fire load in Fire Zone CB-1f is moderate.

If a fire were to start in Fire Zone CB-1f at elevation 762 feet 0 inch, only Division 1 safe shutdown systems could be affected; all Division 2 safe shutdown systems are protected by a fire rated material (see Figure 4.2.4.5-4). A safe shutdown would be achieved by Method 2 safe shutdown systems. The possibility of upward fire propagation from Fire Zone CB-1f is limited by the automatic sprinkler system that is provided at the ceiling of elevation 762 feet 0 inch over the Division 1 cable trays and around the HVAC shaft at column row 125/AC, the 3-hour fire rated ceiling between column rows 124-130 and column line SAC, and the sealing or cable risers penetrating the ceiling protect one safe shutdown division. Upward fire propagation can occur through the open hatch at column row 135/AC, which communicates with elevation 825 feet 0 inch (Fire Zone CB-1i). The concern is discussed later.

In addition sprinkler protection is provided by an automatic wet pipe sprinkler system at the 762' elevation of the Control Building between columns S-AC/124-130. This system will mitigate the exposure of the wrapped Div. II raceways from a fire in this zone.

Elevation 781 Feet 0 Inch - Fire Zone CB-1g

All cable tray risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

This zone is a general access for the cable spreading rooms. This space was originally intended for the Unit 2 cable spreading rooms. The fire loading in Fire Zone CB-1g is low.

The floor is 12-inch minimum reinforced concrete and is not fire rated. The walls are 24-inch minimum reinforced concrete or 7-5/8-inch hollow concrete block. The north and south walls are 3-hour fire rated, and the west wall and stair/elevator enclosure are 1.9-hour fire rated. The remaining walls are not fire rated. The ceiling is 23-inch minimum reinforced concrete and is

3-hour fire rated. Portable fire extinguishers and manual hose stations are provided as shown on Figure FP-13b. Area fire detection is also provided throughout this fire zone.

If a fire were to start in Fire Zone CB-1g at elevation 781 feet 0 inch, only Division 1 safe shutdown systems could be affected (see Figure 4.4.4.5-5). A safe plant shutdown would be assured by a Method 2 safe shutdown system. A fire cannot propagate upward from Fire Zone CB-1g since the ceiling is 3-hour fire rated. Thus, for a fire in Fire Zone CB-1g at elevation 781 feet 0 inch, the fire would be contained at this elevation and safe shut down could be achieved.

Elevation 825 Feet 0 Inch - Fire Zone CB-1i

All cable tray risers have 3-hour fire rated penetration seals installed in the floor.

This zone contains the air handling equipment for the control room and auxiliary building. The floor is 12-inch-minimum concrete on steel decking and is 3-hour fire rated. The walls are 24-inch reinforced concrete, 11-5/8-inch hollow concrete block, or 7-5/8-inch hollow concrete block. The walls at the stair and elevator enclosures are 1.9-hour fire rated. The walls of the hatch at elevation 800'-0" are 3-hour fire rated. The missile wall and remaining exterior walls are not fire rated. The ceiling is 24-inch concrete on steel decking and is 3-hour fire rated. The dividing wall at column 130 between the missile wall and row AC has a 3-hour fire rating. Portable fire extinguishers and manual hose stations are provided as shown on Figure FP-15b. Fire detection is provided between columns 128 and 133.

Division 1 and 2 cables required for safe shutdown are located in this fire zone and are shown on Figures 4.2.4.5-5 and 4.2.4.5-6.

If a fire were to start in or propagate to Fire Zone CB-1i at elevation 825 feet 0 inch, Division 1 and Division 2 safe shutdown systems could be affected (see Figure 4.2.4.5-6).

If a fire were to start on the east side of Fire Zone CB-1i, only Division 1 safe shutdown systems could be affected, and if a fire had propagated up from Fire Zone CB-1f, the same would hold true. A safe plant shutdown would be assured by a Method 2 safe shutdown system.

If a fire were to start on the west side of Fire Zone CB-1i, it would be detected by the automatic fire detection system, which would alert the fire brigade, who would promptly extinguish the fire. The fire load on elevation 825 feet 0 inch is moderate. Safe shutdown could be provided from the remote shutdown panel if the resultant loss of ventilation to the control room would warrant that action.

In conclusion, complete automatic fire suppression is not necessary in Fire Area CB-1. In all possibilities of fire ignition and propagation, safe shutdown is assured by a combination of passive fire barriers, detection, and partial automatic suppression systems, providing an equivalent level of protection to the referenced requirements.

4.2.4.6 Partial Suppression in Fire Area CB-5

Description of Deviation

A complete fire suppression system is not installed throughout Fire Area CB-5.

Reference

10 CFR 50, Appendix R, Section III.G.3.b references that alternative or dedicated shutdown capability and its associated circuits, independent of cables, systems, or components in the area, room, or zone under consideration shall be provided . . . where redundant trains of systems required for hot shutdown located in the same fire area may be subject to damage from fire suppression activities or from the rupture or inadvertent operation of fire suppression systems. In addition, fire detection and a fixed fire suppression system shall be installed in the area, room, or zone under consideration.

Fire Area Involved

Fire Zone CB-5a - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-5b - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Fire Zone CB-5c - Elevation 781 feet 0 inch (see Figures FP-13a and 13b and Cable Tray Figure 11).

Description of Safe Shutdown Equipment and Cables

Fire Zone CB-5a contains the Division 3 4.16-kV switchgear unit, 480-volt transformer, battery charger for the Division 3 battery, motor control centers, and associated supporting equipment. This equipment is not required for safe shutdown except for a fire in the auxiliary building (see Subsection 3.1.3). Fire Zone CB-5a also contains Division 1 NSPS safe shutdown cables (in conduit) 1RP01C and 1RP01H (see Figure 4.2.4.6-1).

Fire Zone CB-5b contains the Division 3 batteries and battery room exhaust fan. This equipment is not required for safe shutdown except for a fire in the auxiliary building (see Subsection 3.1.3).

Fire Zone CB-5c contains Division 1 and 2 safe shutdown cable risers.

Engineering Justification

In Fire Zone CB-5a, there are no Division 2 safe shutdown cables. Complete fire detection is also provided for the zone. In the event of a fire in this fire zone, Method 2/Division 2 equipment from the main control room can be used to safely shut down the plant. Therefore, a fixed fire suppression system is not necessary in Fire Zone CB-5a.

In Fire Zone CB-5b, complete fire detection is provided for the safety-related Division 3 battery. In the event of a fire in this fire zone, the plant can be safely shut down by Division 2/Method 2 systems. Therefore, a fixed fire suppression system is not necessary in Fire Zone CB-5b.

In the event of fire in Fire Zone CB-5c, the plant can be safely shut down from the remote shutdown panel with Division 1/Method 1 systems. An ionization detection system and an automatic wet-pipe sprinkler system are provided in this zone. Fire Zone CB-5c is separated from Fire Zone CB-5a by a 1.9-hour fire rated barrier. In conclusion, safe shutdown in Fire Area

CB-5 is assured by a combination of passive fire barriers, detection, and partial automatic suppression systems. Therefore, complete automatic fire suppression is not necessary.

4.2.4.7 Suppression Systems in Fire Area F-1

Description of Deviation

Fire Area F-1 is not protected by a complete automatic fire suppression system.

Deviations for partial fire barriers and detection in this fire area are found in Subsections 4.2.2.12 and 4.2.3.1.7 of this analysis, respectively.

Reference

10 CFR 50 Appendix R, Section III.G.2.b. To ensure redundant trains will be free of fire damage, there will be: 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 combustible or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

Fire Area(s) Involved

Elevation 712 Feet 0 Inch

For Fire Zones F-1a, F-1b, F-1c, F-1d, F-1e, F-1f, F-1g, F-1h, F-1p and F-1i, see Figures FP-2a and 2b and Cable Tray Figure 2.

Elevation 737 Feet 0 Inch

For Fires Zones F-1l, F-1k, F-1m, F-1n, F-1p, and F-1o, see Figures FP-3a and 3b and Cable Tray Figure 3.

Elevations 751 Feet 0 Inch Through 781 Feet 0 Inch

For Fire Zone F-1p, see Figures FP-4a, 4b, 5a, and 5b and Cable Tray Figures 4 and 5.

Description of Safe Shutdown Equipment and Cables

Safe shutdown cables and equipment in the zones of interest are shown on Figures 4.2.4.7-1 through 4.2.4.7-4.

Engineering Justification

An automatic suppression system is not utilized throughout Fire Area F-1. A combination of partial suppression, partial fire detection, passive barriers, and low fire loads is used to provide adequate fire protection equivalent to Appendix R requirements.

The fire protection provided ensures that a fire cannot propagate horizontally or vertically upward sufficiently to damage redundant safe shutdown trains. The only intervening combustibles, fire retardant IEEE-383 BOP cables located at ceiling level, do not pass directly over or under redundant safe shutdown cable trays. This discussion begins at the lowest elevation and progresses upward. As it is not likely that a fire will propagate downward since all

cable risers are sealed at each floor/ceiling and there is no other continuity of combustibles between elevations, this situation is not discussed here.

Elevation 712 Feet 0 Inch

In Fire Zone F-1a, the Division 1 safe shutdown cables (in conduit) in the southeast corner of the zone are separated from the Division 2 cable trays by a horizontal distance in excess of 75 feet (see Figure 4.2.4.7-1).

Solid bottom BOP cable trays are routed between the Division 1 and 2 cables such that these trays are horizontally separated from the Division 1 and 2 cables in excess of 15 feet and 6 feet, respectively (see Cable Tray Figure 2). An exposure fire in the vicinity of the Division 1 conduits would have to ignite the BOP cables located a horizontal distance of approximately 15 feet away, propagate at least 75 feet along the BCP cable trays, and then ignite the Division 2 cables located at a horizontal distance of 6 feet. Such a scenario is highly unlikely due to the ignition resistance of the cables (IEEE 383 qualified) in the BOP trays in conjunction with the low heat release and flame spread rates for these cables. Area fire detection will provide early warning detection.

Fire Zone F-1b, contains only one cable and instrument required for Method 2 safe shutdown. As shown on Figure 4.2.4.7-1, the spatial separation of this cable and instrument from its redundant counterpart located in Fire Zone F-1a is sufficient to ensure a safe shutdown.

Fire Zones F-1a and F-1b have a 9-foot 8-inch-minimum concrete floor. The floor is not fire rated. The walls are 24-inch-minimum concrete. The walls adjacent to the containment building, service building, auxiliary building, and diesel-generator building are 3-hour fire rated. The remaining walls are not fire rated. The ceiling is 12-inch minimum concrete with removable slabs in Fire Zone F-1b, and is not fire rated. There are two stair systems in Fire Zone F-1a: one enclosed stair (1.9-hour fire rated) and one open stair up to elevation 737 feet 0 inch.

All cable tray risers are sealed at the ceiling with a 3-hour fire rated penetration seal. An ionization fire detection system is provided throughout Fire Zone F-1a. Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings.

Combustible materials located in Fire Zone F-1b result in a low fire loading.

There is an ionization fire detection system located in the zone. Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone F-1b.

The remaining fire zones on elevation 712 feet 0 inch do not contain systems associated with safe shutdown functions. The floor is 9-foot 8-inch-minimum concrete. Fire Zones F-1c through F-1i contain miscellaneous fuel building support equipment. Walls in these zones are 36-inch-minimum concrete, 24-inch-minimum concrete, 27 5/8-inch-minimum solid concrete block, 19-5/8-inch-minimum solid concrete block or 15-5/8-inch minimum solid concrete block. The ceilings are 24-inch-minimum or 12-inch-minimum reinforced concrete. The ceiling in Fire Zone F-1e contains an open hatch.

The fire loading classifications in these zones are as follows:

Fire Zone	Fire Load Classification
F-1c	low
F-1d	low
F-1e	low
F-1f	low
F-1g	low
F-1h	low
F-1i	low

Portable fire extinguishers and hose stations are provided for manual firefighting in these zones as shown on Figure FP-2b.

Due to the low fire loading of the preceding fire zones, it is not credible that a fire starting on this elevation would propagate upward. Upward propagation would be prevented by the sealing of the cable risers at the ceiling and the substantial construction of the ceiling itself. Because of the inherent fire-retardant nature of the cables, the low fire loading, and the numerous fire zones for this elevation, it is unlikely that a fire would spread horizontally through this elevation. Zones in which fire propagation could be a concern (Fire Zones F-1a and F-1b) have ionization fire detection systems.

Elevation 737 Feet 0 Inch

In Fire Zone F-1m, Division 1 cable trays along the east wall are separated from Division 2 cable risers along the west wall by a distance in excess of 140 feet with no intervening combustibles. The water suppression system provided for the railroad bay (see Figure FP-3b) provides additional protection between the Division 1 and 2 cables. Division 1 cables (in conduit) along the south wall are routed in Fire Zones F-1m (in conduit) (see Figure 4.2.4.7-2) and in excess of 60 feet from the Division 2 cable risers. Based on the cable functions, spatial separation, the railroad bay suppression system, and the absence of intervening combustibles, safe shutdown is assured.

All cable risers have 3-hour fire rated penetration seals installed in the floor and ceiling.

Fire Zone F-1m has a 12-inch-minimum concrete floor with removable concrete slabs and an open stair. The floor is not fire rated. The walls are 15-inch-minimum concrete or 11-5/8-inch-minimum solid concrete block. Walls adjacent to the auxiliary building, containment building, diesel-generator building, and service building are 3-hour fire rated. The remaining walls are not fire rated. The ceiling is 12-inch-minimum concrete with areas of removable concrete slabs and steel grating. The ceiling is not fire rated.

There are two stair systems in this zone: one enclosed stair (1.9-hour fire rated) and one open stair, both going up to elevation 755 feet 0 inch and down to elevation 712 feet 0 inch.

An ionization fire detection system is provided for this zone. The railroad bay is protected by an automatic preaction sprinkler system for protection of transient combustibles and has its own detection systems. Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone F-1m.

Fire Zone F-1n has a 24-inch-minimum concrete floor that is not fire rated. There is one 4-inch floor drain. The walls are 24-inch-minimum concrete or 23-5/8-inch-minimum solid concrete block. The walls are not fire rated. The ceiling is 24-inch-minimum concrete and is not fire rated.

Fire Zones F-1m and F-1n each contain low fire loadings.

Portable fire extinguishers and hose stations are provided in an adjacent zone for manual firefighting as shown on Figure FP-3b for Fire Zone F-1n.

Fire Zones F-1j, F-1k, and F-1o on elevation 737 feet 0 inch do not contain equipment associated with safe shutdown functions. The floors are 12-inch-minimum concrete and the floor in Fire Zone F-1k contains hatchways. The walls are 12 or 24-inch-minimum concrete or 11-5/8 or 23-5/8-inch-minimum solid concrete block. The containment wall and walls adjacent to the diesel and auxiliary buildings are 3-hour fire rated. The ceilings are 12-inch minimum concrete.

Fire Zones F-1j, F-1o, and F-1k each have low fire loads. Portable fire extinguishers and hose stations are provided in an adjacent zone for manual fire fighting in these zones as shown on the referenced drawings.

The possibility of upward fire propagation is prevented by the automatic preaction sprinkler protection system that is provided for the entire railroad bay area. Upward propagation through the unrated ceiling is prevented by the sealing of the primary propagation path (the cable tray risers) by 3-hour penetration seals. All fire zones on this elevation have a low fire loading, reducing the possibility of either vertical or horizontal fire propagation. A fire detection system is provided in Fire Zone F-1m.

Elevations 751 Feet 0 Inch Through Elevation 781 Feet 0 Inch

Fire Zone F-1p includes the fuel building at elevations 755 feet 0 inch and 781 feet 0 inch and the fuel cask and storage rack areas at elevations 712 feet 0 inch and 737 feet 0 inch. The floor of this zone at elevation 755 feet and 0 inch is 12-inch-minimum concrete with twenty 4-inch floor drains, four 8-inch by 8-inch by 4-inch box drains, removable concrete slabs, open hatches, steel grating, and open stairwell. The floor is not fire rated. The walls are 24-inch-minimum concrete. The walls adjacent to the containment building, auxiliary building, service building, and diesel-generator building are 3-hour fire rated walls. An enclosed stairwell has 1.9-hour fire rated walls. A portion of the ceiling at elevation 781 feet 0 inch is 8-inch concrete on steel decking. The remainder is the fuel building roof. The combustible loading for elevation 755 feet 0 inch is low.

Fire Zone F-1p also extends up to a partial mezzanine on elevation 781 feet 0 inch. The floor of the mezzanine is 8-inch concrete on steel decking and is not fire rated. There are eight 4-inch floor drains. The walls are 36-inch reinforced concrete. The north wall, including containment, and the walls adjacent to the containment building, auxiliary building, service building, and

diesel-generator building are 3-hour fire rated; the remaining walls are not fire rated. The ceiling is the fuel building roof and is 24-inch-minimum concrete on steel decking and is not fire rated.

The mezzanine at elevation 781 feet 0 inch on the east side of the fuel building does not communicate to the west side of the mezzanine at elevation 781 feet 0 inch.

Diesel-generator cables (Division 1 and 2) are necessary for safe shutdown. These are the power feeds from the Division 1 and 2 diesel generators to the 4.16-kV switchgear. The Division 1 and 2 cables are at least 50 feet apart (see Figure 4.2.4.7-4). Other safe shutdown cables related to the shutdown service water system (power and control for fans, valves, etc.) are routed through areas on the opposite side of the building. Division 1 and 2 cables are separated by at least 50 feet, except for the Division 2 diesel generator power feed conduits that come within 46 feet of some Division 1 cables. These cables are located on the 737 feet 0 inch elevation (see Figure 4.2.4.7-3).

All cable risers have 3-hour fire rated penetration seals installed at each floor elevation in addition to fire stops at 15 feet above the floor in this fire zone.

There is an ionization fire detection system provided throughout the zone at elevations 755 feet 0 inch and 781 feet 0 inch. Portable fire extinguishers and hose stations are provided for manual firefighting as shown on the referenced drawings for Fire Zone F-1p.

Based on the diesel-generator cables in conduit being at least 50 feet apart, an open area for manual fire suppression, an area fire detection system, and a less than 1/2-hour fire load, the previous acceptance by the NRC (Clinton SSER 3, page 9-3, Fire Zone F.3.1) from providing an automatic fire suppression system is acceptable.

In conclusion, complete automatic fire suppression is not necessary in Fire Area F-1. For all possibilities of fire ignition and propagation, safe shutdown is assured through a combination of passive barriers, automatic fire detection, partial automatic suppression, and the lack of both continuity and quantity of combustibles that would allow a fire to propagate (either horizontally or vertically). Therefore, an equivalent level of fire protection, with respect to the referenced requirements, is provided.

4.2.4.8 Partial Suppression in Fire Area D-10

Description of Deviation

Fire Area D-10 is not protected by complete automatic fire suppression. A deviation for not providing fire detection throughout the area is discussed in Subsection 4.2.3.1.12.

Reference

10 CFR 50, Appendix R, Section III.G.2.b states: Separation of cables and equipment and associated non-safety-related circuits of redundant trains by a horizontal distance of more than 20 feet with no intervening combustibles or fire hazards. In addition, fire detectors and an automatic fire suppression system shall be installed in the fire area.

Security - Related Information Figure Withheld Under 10 CFR 2.390

4.2.5 Other Requirements

4.2.5.1 Reactor Recirculation Pump Oil Collection System

Description of Deviation

An oil collection system is not provided in the non-inerted drywell area, Fire Area C-1, for the reactor recirculation pumps.

Reference

10 CFR 50, Appendix R, Section III.0 references that the reactor coolant pump shall be equipped with an oil collection system if the containment is not inerted during normal operation. The oil collection system shall be so designed, engineered, and installed that failure will not lead to fire during normal or design basis accident conditions and that there is reasonable assurance that the system will withstand the Safe Shutdown Earthquake. See Regulatory Guide 1.29 - "Seismic Design Classification" paragraph C.2. Such collection systems shall be capable of collecting lube oil from all potential pressurized and unpressurized leakage sites in the reactor coolant pump lube oil systems. Leakage shall be collected and drained to a vented closed container that can hold the entire lube oil system inventory. A flame arrester is required in the vent if the flash point characteristics of the oil present the hazard of fire flashback. Leakage points to be protected shall include lift pump and piping, overflow lines, lube oil cooler, oil fill and drain lines and plugs, flanged connections on oil lines, and lube oil reservoirs where such features exist on the reactor coolant pumps. The drain line shall be large enough to accommodate the largest potential oil leak.

Fire Area Involved

Fire Area C-1 - Elevation 723 feet 1-3/4 inches (see Figures FP-2a and 2b and Cable Tray Figure 2).

Description of Safe Shutdown or Safety-Related Equipment and/or Cables

The reactor vessel, reactor assembly, vessel and components, control rod drive, nuclear instrumentation, and Division 1, 2, 3, and 4 valves are located in Fire Area C-1.

There are Division 1 and 2 safe shutdown cables equipment in this fire area belonging to both methods of safe shutdown systems. See Figures 4.2.4.1-1 through 3. Cables associated with each method of safe shutdown have been evaluated. The RHR safe shutdown cables (1RH17C and 1RH17D) serve valve 1F12-F009. This valve must be opened to proceed from hot to cold shutdown using RHR in the shutdown cooling mode. An alternate shutdown cooling methods can be used if this valve cannot be operated. Both divisions of nuclear boiler system cables (1NB35D, E, F, G, H, and K and 1 NB37C, D, F, H, K, M, and R) serve the ADS valves and SRVs 1B21-F051C and D. Disabling one electrical division of control to those SRV cables will not disable the other division nor cause spurious operation of these valves. The SRVs are dual power valves. With a disabling of any horizontal 20-foot segment of the drywell, a sufficient number of SRVs will be available to safely shut down the plant. The separation distance between the Division 1 and 2 cables is less than 20 feet.

Engineering Justification

Fire Area C-1 consists of the drywell volume of the containment building at elevation 723 feet 1-3/4 inches and has a low fire load. The reactor vessel is located within the fire area. The principal potential fire hazard in this fire area is the lubricating oil for the two reactor recirculation pump motors. Each motor utilizes self-lubricated bearings with lubricating oil cooled by cooling coils installed within an upper and lower reservoir. The reservoirs are non-pressurized and the lube oil is contained within the motor housing and its connections. This design minimizes piping connections to the oil reservoir. A limited number of threaded connections tap into the reservoirs for vent or fill lines, primarily associated with the constant level oilers added to each motor's lower bearing reservoir. A thread sealant has been used on these joints. The mounting of the motors has been qualified to withstand loading from a safe shutdown earthquake (SSE) concurrent with loading from SRV cycling. The structural and gasket joint integrity of the oilers has also been qualified to withstand concurrent SSE and SRV loading. The heavy construction and the nonpressurized design of this lubricating system minimize susceptibility to leakage. If leakage were to occur, ignition enhancing spray would be unlikely due to the non-pressurized design. The oil has a minimum flash point of 400°F.

An assessment of a potential drywell fire event involving a spill of reactor recirculation pump motor lubricating oil confirmed that the resulting average air temperature in the drywell would remain far below that needed to damage any safety-related cables, assuming all the oil associated with one pump is consumed. This assessment conservatively assumes that the oil burns at its maximum heating rate during the entire fire duration, uses the maximum initial drywell temperature concurrent with station blackout conditions, and includes heat sources such as hot drywell piping and blowdown from unidentified primary system leakage.

An infrared fire detection system has been provided for the reactor recirculation pump motors. RR pump motor bearing temperatures are also continuously monitored to provide alarm to the Main Control Room well below the oil flash point temperature.

The drywell is inaccessible during operation, and when opened, stringent administrative controls are implemented to monitor personnel and equipment ingress and egress. Therefore, an exposure fire from transient combustibles is not credible.

The performance goals for the safe shutdown functions are assured by the availability of both methods of safe shutdown systems.

Based on the continuous monitoring provided by infrared fire detectors and bearing temperature sensors, the seismic non-pressurized design of the motors and their oil reservoirs, the minimal susceptibility to lube oil leakage, and the minor amount of oil external to the motor reservoirs themselves, addition of an oil collection system for the RR pumps as required per 10CFR50 Appendix R, Section III.O would have very little benefit and is therefore unnecessary.

4.2.6 Previous Deviations

Deviations from providing automatic fire suppression systems in Fire Zone A-1b (formerly A.2.1) at elevation 737 feet 0 inch, Fire Zone CB-1e (formerly D.2.1) at elevation 737 feet 0 inch, Fire zone D-10 (formerly D.3.2) at elevation 762 feet 0 inch, and Fire Zone F-1p (formerly F.3.1) at elevations 755 feet 0 inch and 781 feet 0 inch were previously requested and granted in Clinton SSER 3 (NUREG 0853 Supplement No. 3). Deviations requested for Fire Zone F-1p (formerly

F.3.1) remains unchanged (see Subsection 4.2.4.7). Other deviation requests are modified as follows.

4.2.6.1 Fire Zone A-1b

Fire Zone A-1b has a BOP cable tray in the north corridor connecting the Division 1 and Division 2 sides of the auxiliary building. To preclude a fire in one divisional area propagating down the BOP tray to the other divisional area over 100 feet away, a partial automatic wet-pipe sprinkler system is provided in the corridor. This improves the level of protection previously accepted (see Subsection 4.2.4.4).

4.2.6.2 Fire Zone CB-1e

Fire Zone CB-1e has cables associated with both Division 1 and 2 diesel generators. The Division 2 diesel-generator MCC has been relocated so it is more than 50 feet from the Division 1 diesel-generator MCC. It was not practical to install pervasively described barriers (walls and suspended ceiling). A partial wet-pipe automatic sprinkler system and cable wraps was provided in this zone as described in the FPER/SSA. This improves the level of protection previously accepted (see Subsection 4.2.4.5).

4.2.6.3 Fire Zone D-10

Division 1 and Division 2 safe shutdown circuits are in conduit and are separated by at least 40 feet. A partial sprinkler system is provided to prevent a fire in the BOP cable trays (located only in the center of the area) from spreading to both Division 1 and 2 conduits. The partial sprinkler protection protects the only in situ hazard in the area. Since the hazard in the area is adequately protected, the partial suppression meets the intent of Appendix R (see Subsection 4.2.4.8).

Security - Related Information Figure Withheld Under 10 CFR 2.390

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
App F. Figure 1.8-1 Page 1 of 2 Method 1 Safe Shutdown Cooling Path

NOTES FOR FIGURE 1.8-1

1. Evolution: Depressurization and cooldown using RHR Pump "A" in suppression pool cooling mode and RCIC for RPV makeup. SRV(s) are used for pressure control.

2. Main condenser is not available.

3. Operations are from the main control room or the remote shutdown panel.

4. All valves shown except check valves are motor operated with local manual operation capability unless otherwise stated.

5. Plant mode of operation: Hot shutdown >200°F.*

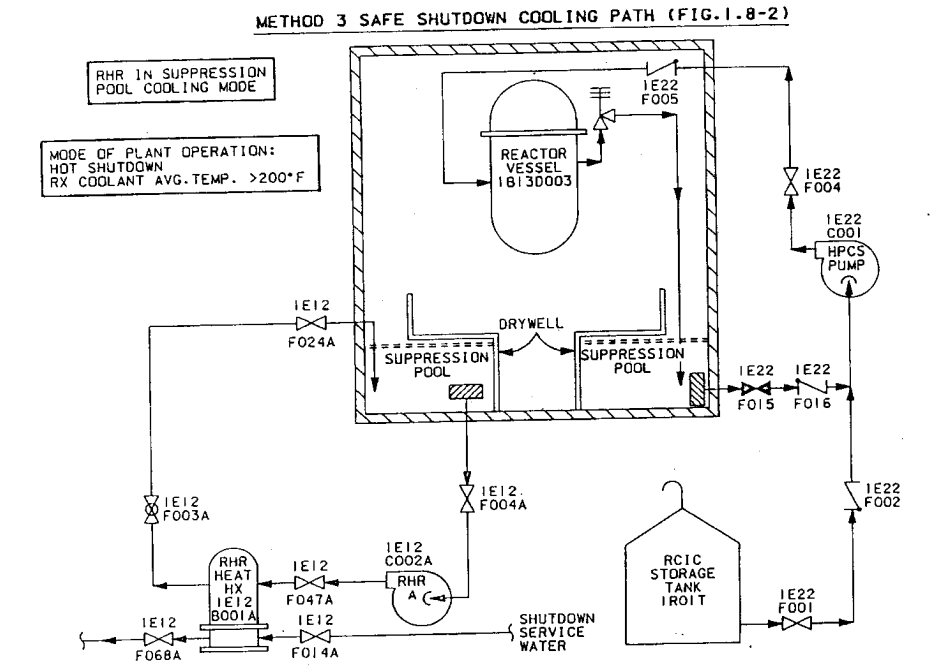
6. Division 2 components unreliable due to fire in Division 2 area.

7. Offsite Power is assumed not available, except for areas where both of the following have been demonstrated:

   (1) Analysis has shown that the fire will not cause a loss of offsite power, and

   (2) Dedicated or alternate shutdown capability (per 10CFR50 Appendix R, section III.G.3 and III.L) is not required for safe shutdown.

* Reactor coolant average temperature



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT
App F. Figure 1.8-2
Page 1 of 2
Method 3 Safe Shutdown Cooling Path

NOTES FOR FIGURE 1.8-2

1. Evolution: Depressurization and cooldown using RHR Pump "A" suppression pool cooling mode and HPCS for RPV makeup. SRV(s) are used for pressure control.

2. Main condenser is not available.

3. Operations are from the main control room.

4. All valves shown except check valves are motor operated with local manual operation capability unless otherwise stated.

5. Plant mode of operation: Hot shutdown >200°F.*

6. Division 2 components unreliable due to fire in Division 2 area.

7. RCIC not available.

8. Offsite Power is assumed not available, except for areas where both of the following have been demonstrated:

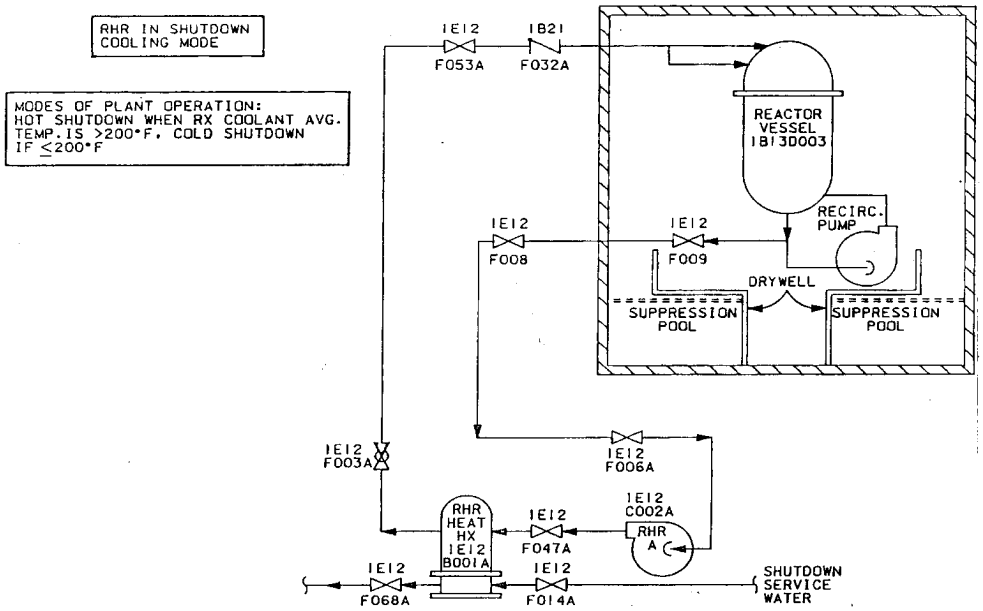
   (1) Analysis has shown that the fire will not cause a loss of offsite power, and

   (2) Dedicated or alternate shutdown capability (per 10CFR50 Appendix R, section III.G.3 and III.L) is not required for safe shutdown.

* Reactor coolant average temperature

CLINTON POWER STATION UPDATED SAFETY ANALYSIS REPORT
App F. Figure 1.8-2 Page 2 of 2 Method 3 Safe Shutdown Cooling Path

METHOD 1 OR 3 SAFE SHUTDOWN COOLING PATH (FIG.1.8-3)



NOTES FOR FIGURE 1.8-3

1. Evolution: RHR Pump "A" in shutdown cooling mode.

2. Operations are from the main control room or remote shutdown panel.

3. Main condenser is not available.

4. All valves shown except check valves are motor operated with local manual capability unless otherwise shown.

5. Division 2 components unreliable due to fire in Division 2 area.

6. Plant mode of operation:

   Hot shutdown >200°F.*

   Cold shutdown ≤200°F.*

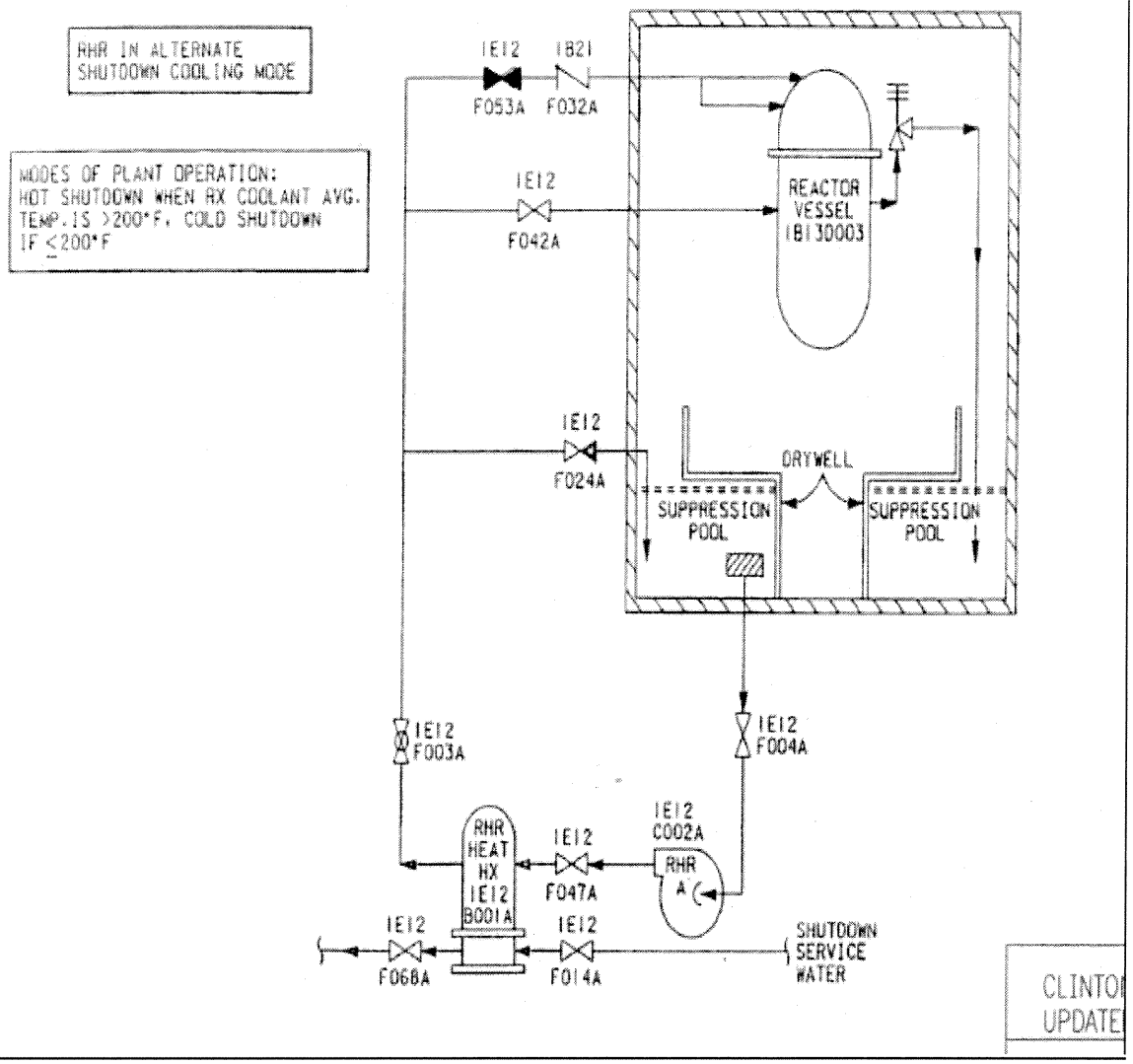
7. Offsite Power is assumed not available, except for areas where both of the following have been demonstrated:

   (1) Analysis has shown that the fire will not cause a loss of offsite power, and

   (2) Dedicated or alternate shutdown capability (per 10CFR50 Appendix R, section III.G.3 and III.L) is not required for safe shutdown.

* Reactor coolant average temperature

METHOD 1 OR 3 SAFE SHUTDOWN COOLING PATH (FIG.1.8-4)



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT
App F. Figure 1.8-4 Page 1 of 2 Method 1 or 3 Safe Shutdown Cooling Path

REV. 13, JANUARY 2009

NOTES FOR FIGURE 1.8-4

1. Evolution: RHR Pump "A" pump in alternate shutdown cooling mode. In this mode the suppression pool and RPV are tied together through a constantly open SRV. This method would only be used if the normal shutdown cooling suction flowpath was unavailable.

2. Main condenser is not available.

3. Operations from main control room or remote shutdown panel.

4. All valves shown except check valves are motor operated with local manual capability unless otherwise stated.

5. Division 2 components unreliable due to fire in Division 2 area.

6. Plant mode of operation:

   Hot shutdown >200°F.*

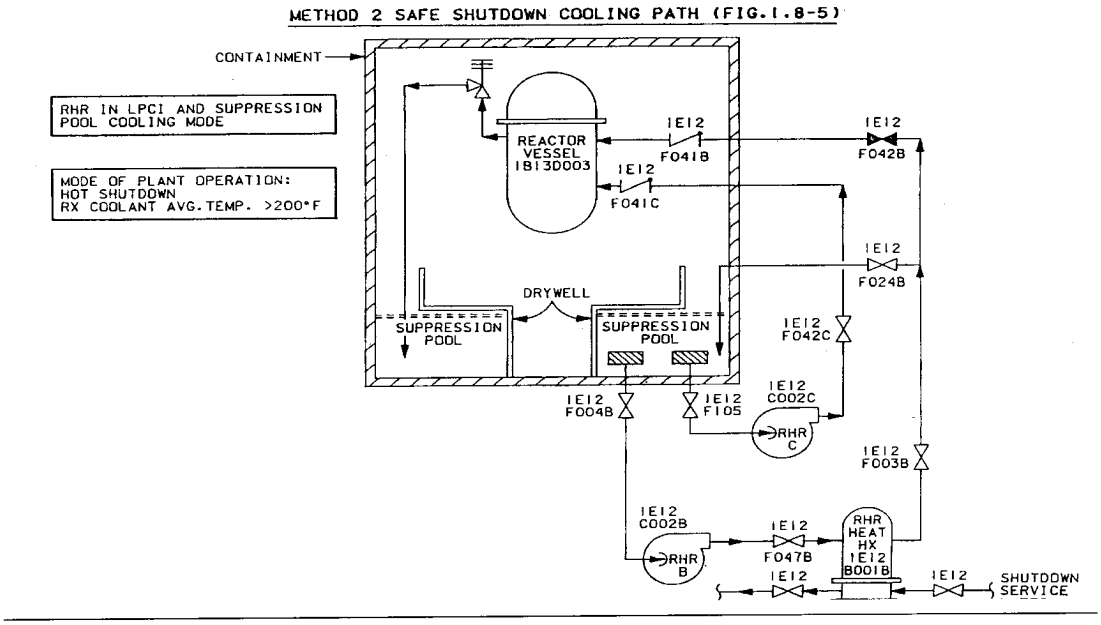
   Cold shutdown ≤200°F.*

7. Offsite Power is assumed not available, except for areas where both of the following have been demonstrated:

   (1) Analysis has shown that the fire will not cause a loss of offsite power, and

   (2) Dedicated or alternate shutdown capability (per 10CFR50 Appendix R, section III.G.3 and III.L) is not required for safe shutdown.

* Reactor coolant average temperature



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT
App F. Figure 1.8-5 Page 1 of 2 Method 2 Safe Shutdown Cooling Path

NOTES FOR FIGURE 1.8-5

1. Evolution: Rapid depressurization and cooldown with RHR Pump "B" shown in suppression pool cooling mode and RHR Pump "C" shown in LPCI mode.

2. Operation is from main control room.

3. Main condenser is not available.

4. No high-pressure RPV makeup available.

5. All valves shown except check valves are motor operated with local manual operation capability unless otherwise stated.

6. Division 1 components unreliable due to fire in Division 1 area.

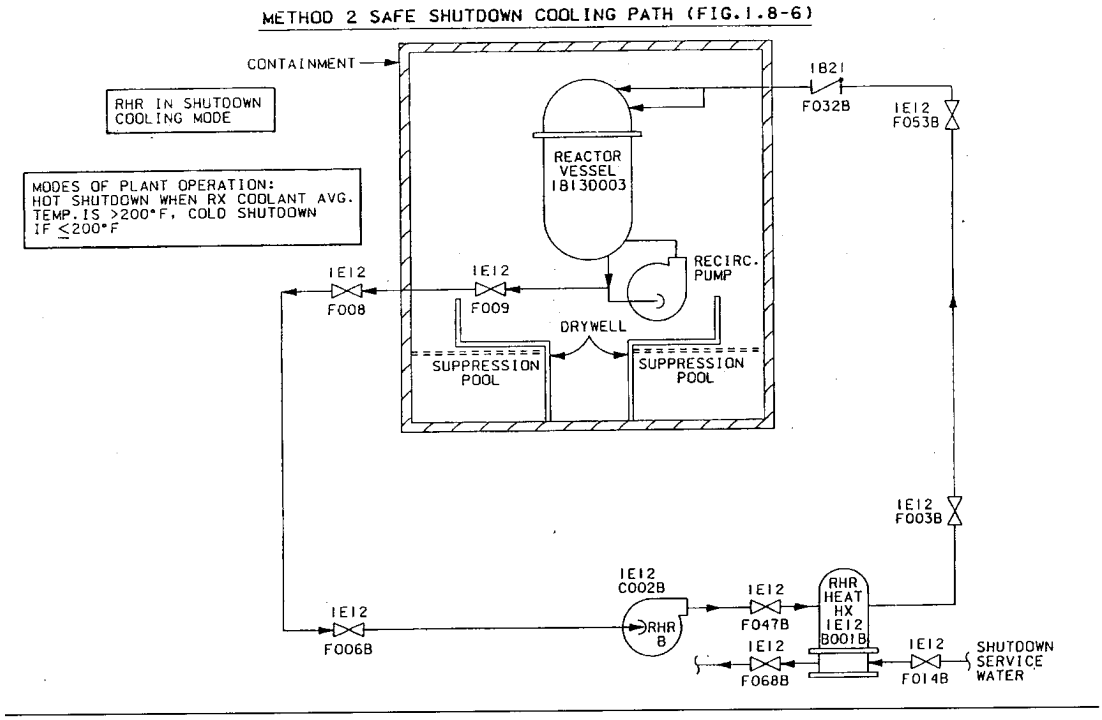
7. Plant mode of operation: Hot shutdown >200°F.*

8. Offsite Power is assumed not available, except for areas where both of the following have been demonstrated:

   (1) Analysis has shown that the fire will not cause a loss of offsite power, and

   (2) Dedicated or alternate shutdown capability (per 10CFR50 Appendix R, section III.G.3 and III.L) is not required for safe shutdown.

* Reactor coolant average temperature



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT
App F. Figure 1.8-6 Page 1 of 2 Method 2 Safe Shutdown Cooling Path

NOTES FOR FIGURE 1.8-6

1. Evolution: RHR Pump "B" operating in shutdown cooling mode.
2. Operation is from main control room.
3. Main condenser is not available.
4. No high-pressure RPV makeup available.
5. RHR Pump "C" (not shown) is available for additional makeup to RPV.
6. All valves shown except check valves are motor operated with local manual operation capability unless otherwise stated.
7. Division 1 components unreliable due to fire in Division 1 area.
8. Plant mode of operation:

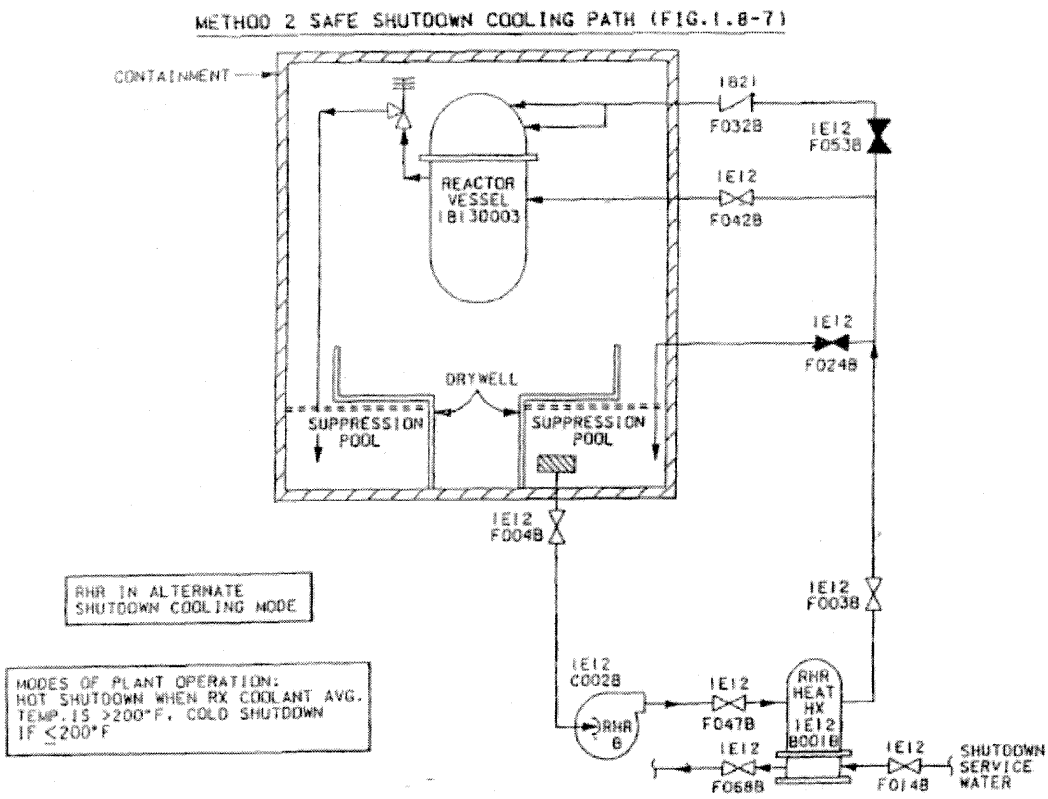
   Hot shutdown >200°F.*

   Cold shutdown ≤200°F.*
9. Offsite Power is assumed not available, except for areas where both of the following have been demonstrated:

   (1) Analysis has shown that the fire will not cause a loss of offsite power, and

   (2) Dedicated or alternate shutdown capability (per 10CFR50 Appendix R, section III.G.3 and III.L) is not required for safe shutdown.

* Reactor coolant average temperature



CLINTON POWER STATION
UPDATED SAFETY ANALYSIS REPORT
App F. Figure 1.8-7 Page 1 of 2 Method 2 Safe Shutdown Cooling Path

Security - Related Information Figure Withheld Under 10 CFR 2.390

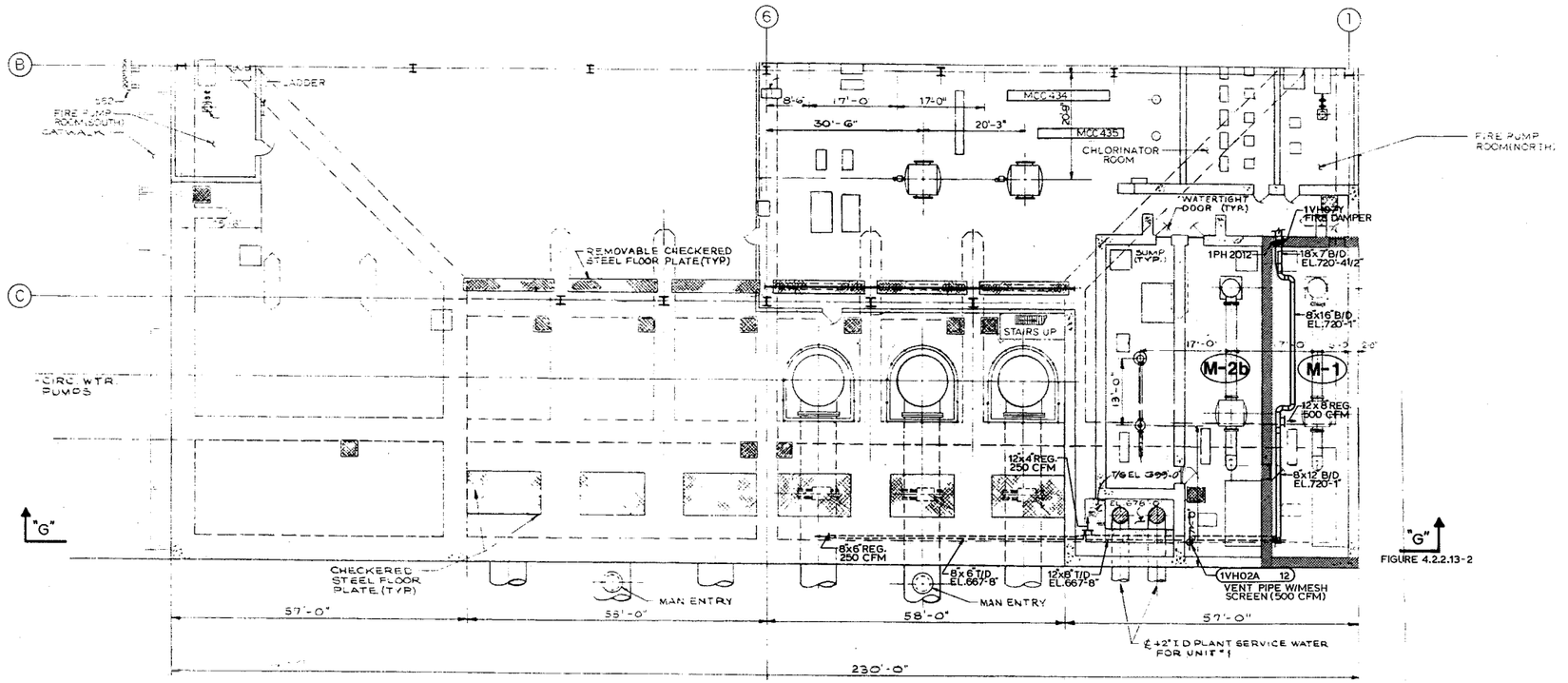
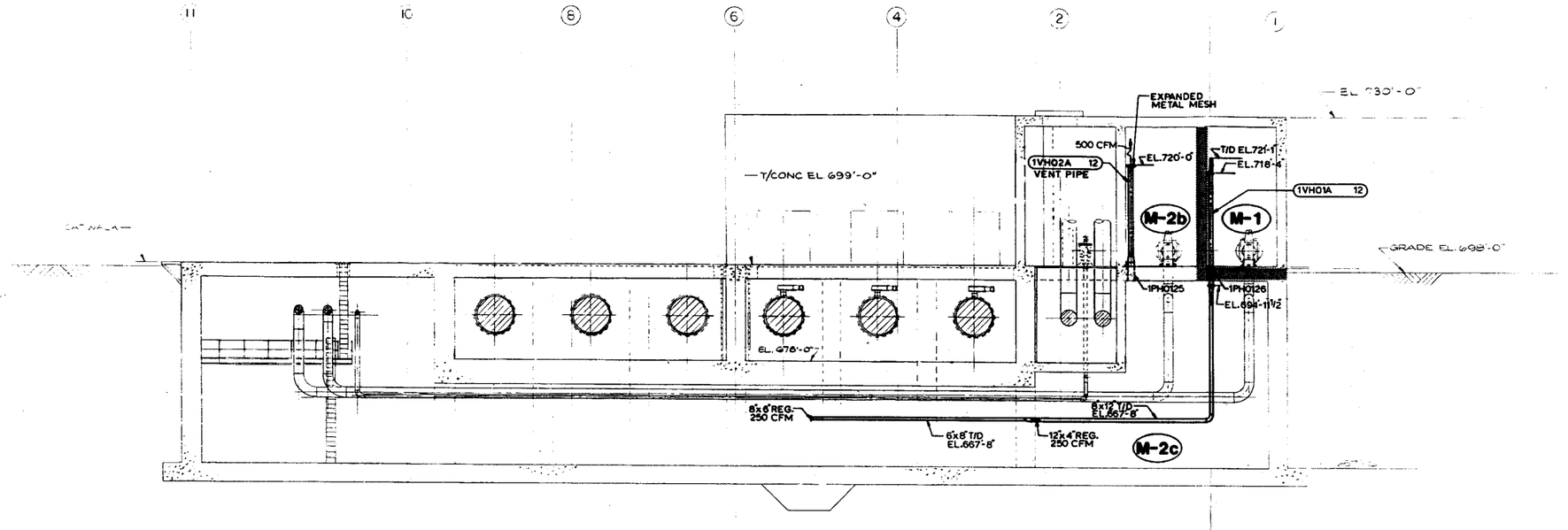


FIGURE 4.2.2.13-2

PLAN

FIGURE 4.2.2.13-1
FIRE PROTECTION DEVIATION
CIRCULATING WATER/SCREEN HOUSE
MAIN FLOOR EL. 699'-0"
FIRE AREA S M-1 & M-2

SARGENT & LUNDY
CHICAGO



SECTION "G-G"

NORTH

FIGURE 4.2.2.13-2
FIRE PROTECTION DEVIATION
CIRCULATING WATER / SCREEN HOUSE
SECTION VIEW "G-G"
FIRE AREA'S M-1 & M-2

SARGENT & LUNDY
CHICAGO

FIGURE 4.2.2.14.3-1

TYPICAL PENETRATION HEADFITTING ASSEMBLY

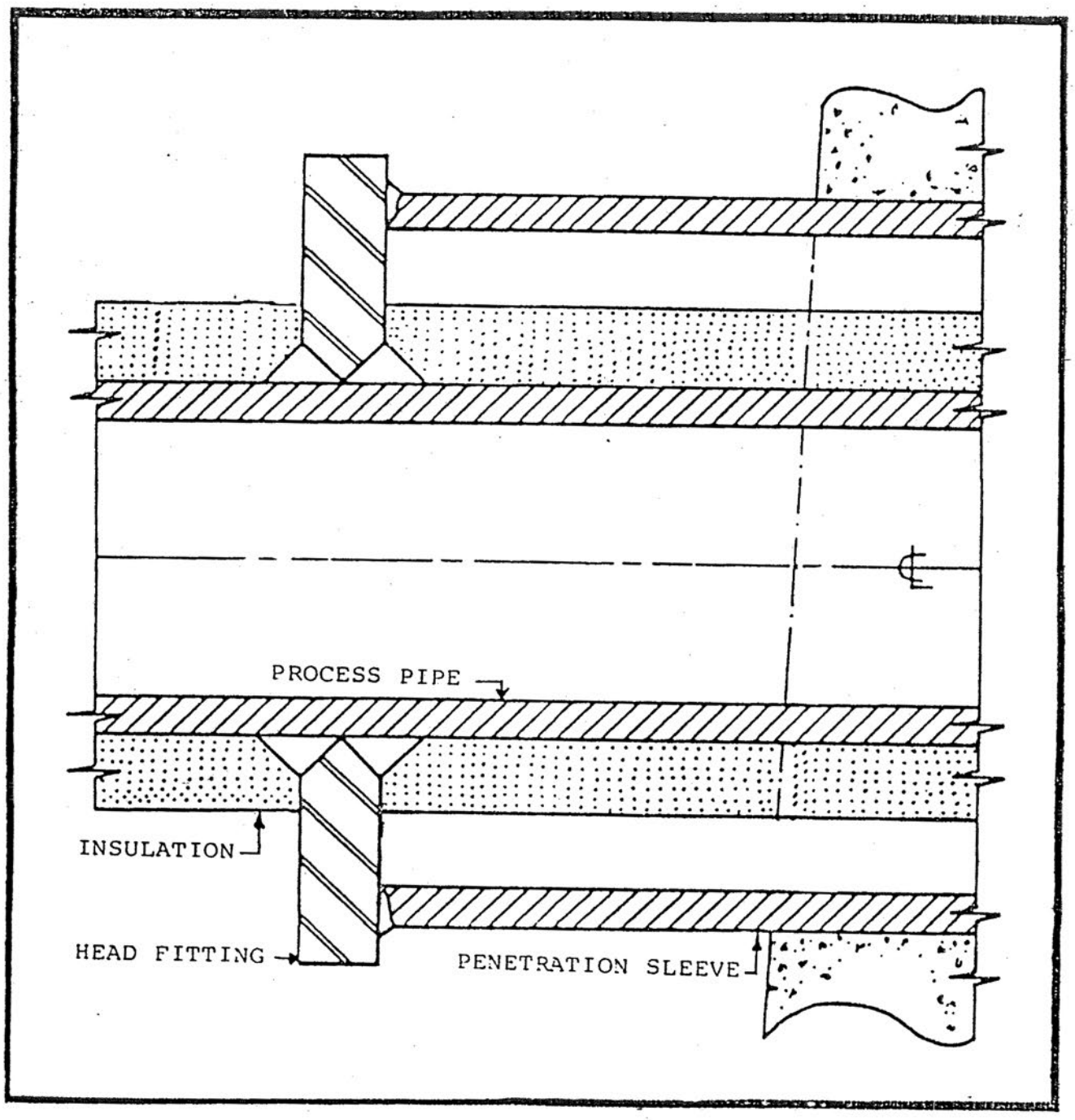
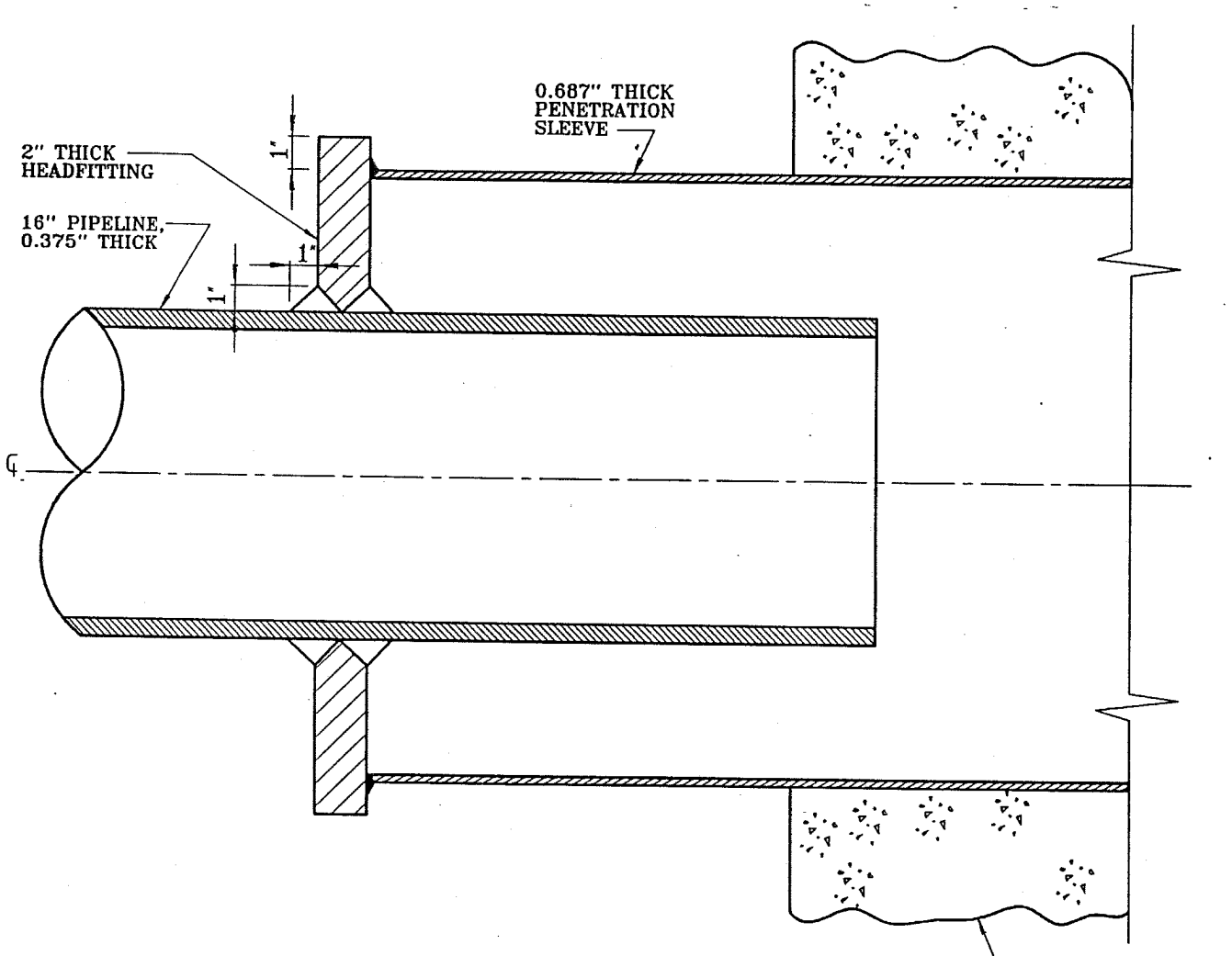


FIGURE 4.2.2.18–1



PIPELINE OCA03B–16
HEADFITTING DETAIL

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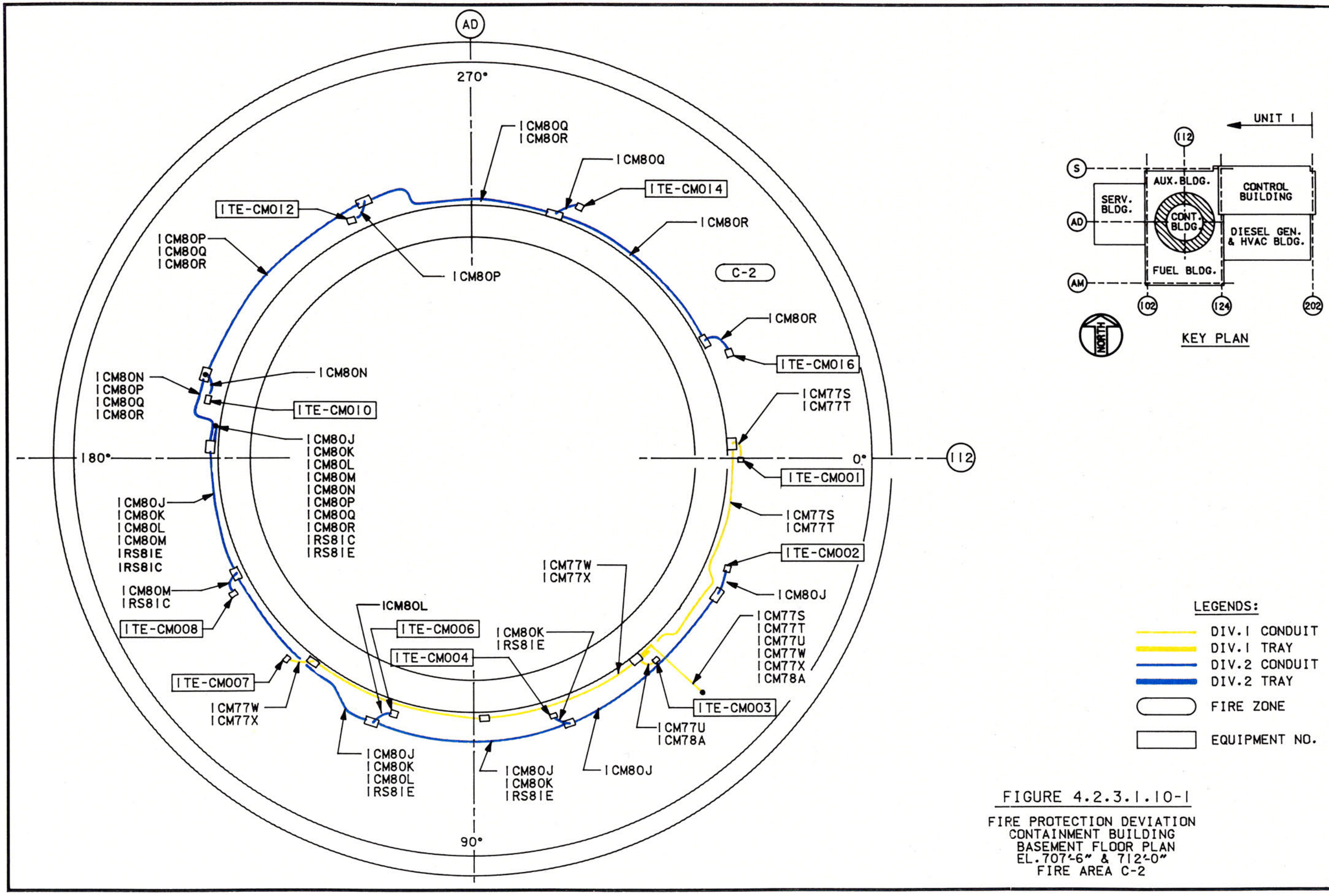


FIGURE 4.2.3.1.10-1

FIRE PROTECTION DEVIATION
CONTAINMENT BUILDING
BASEMENT FLOOR PLAN
EL.707'-6" & 712'-0"
FIRE AREA C-2

S&L ECAD FILE: CLIETI.8

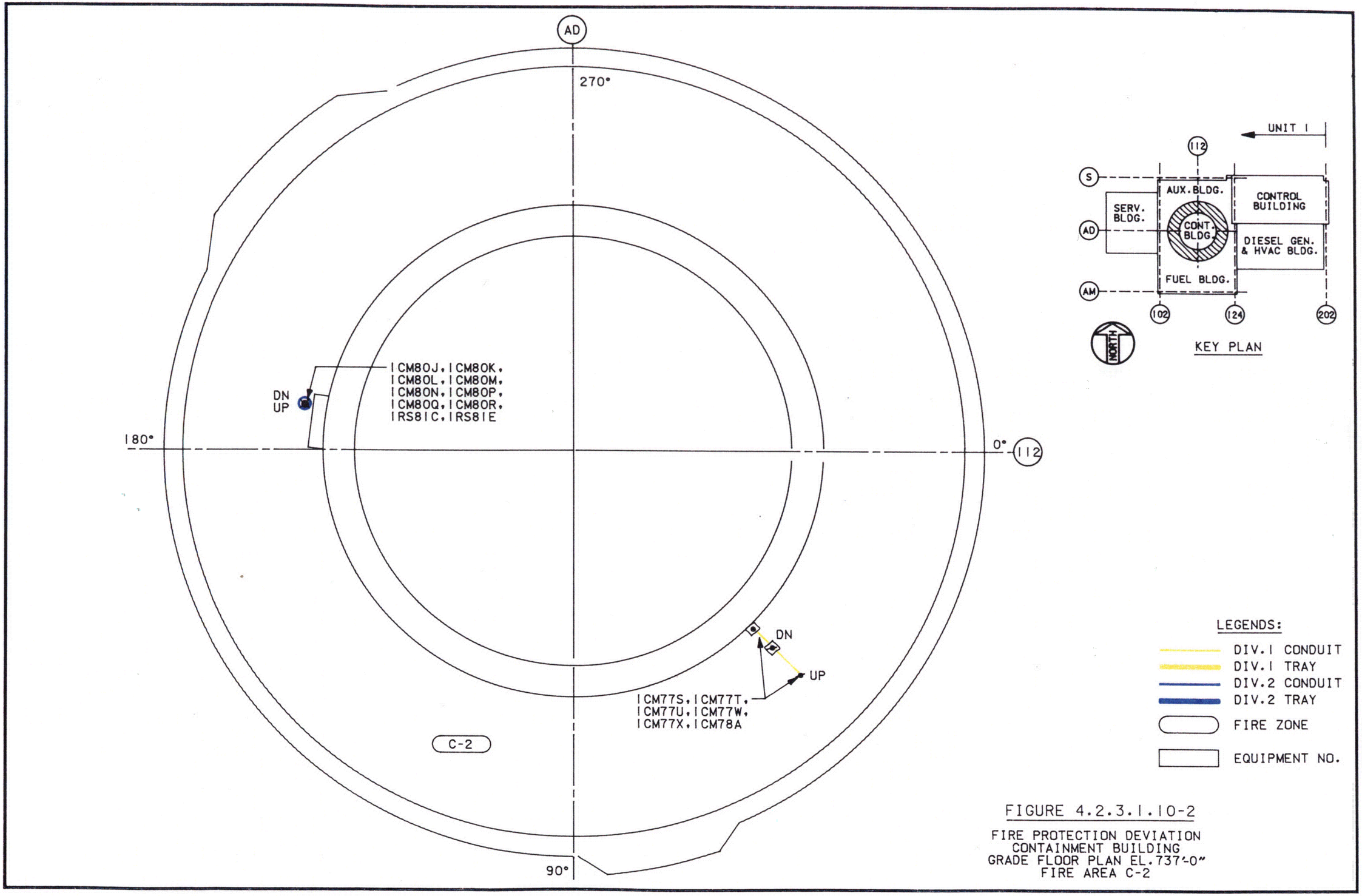
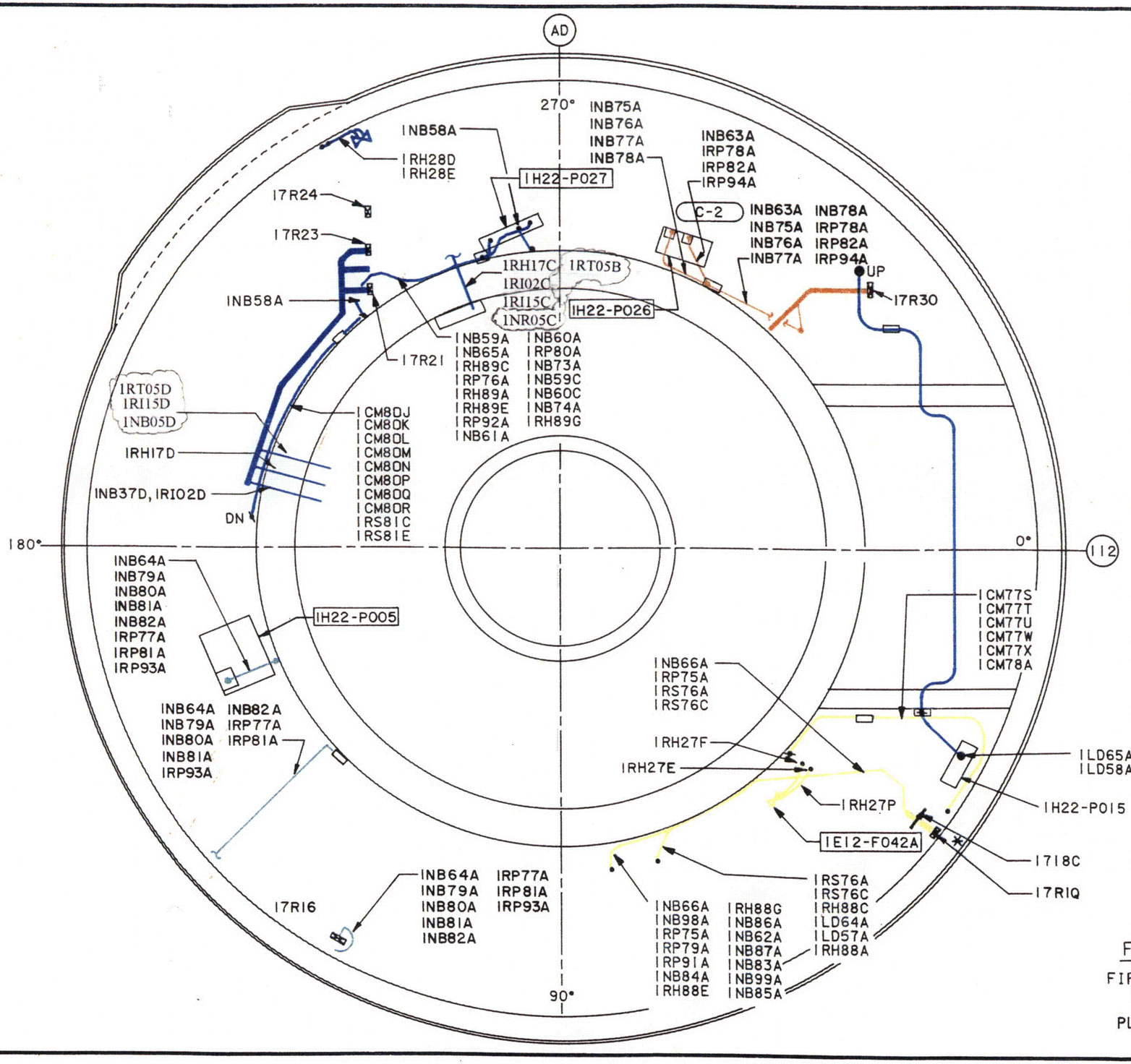


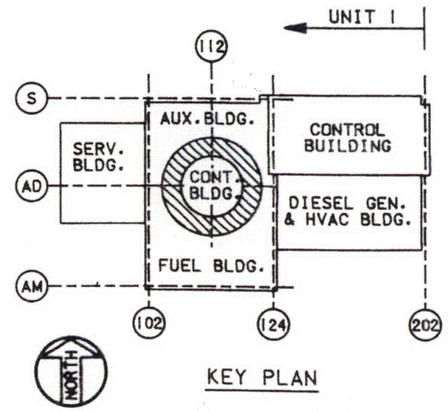
FIGURE 4.2.3.1.10-2

FIRE PROTECTION DEVIATION
CONTAINMENT BUILDING
GRADE FLOOR PLAN EL.737'-0"
FIRE AREA C-2

S&L ECAD FILE: CLIETI.11

REVISION 8
FEB. 1999





* PENETRATION 1EE28E (1KIE-2)

LEGENDS:

- DIV. 1 CONDUIT
- DIV. 1 TRAY
- DIV. 2 CONDUIT
- DIV. 2 TRAY
- DIV. 3 CONDUIT
- DIV. 3 TRAY
- DIV. 4 CONDUIT
- DIV. 4 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.3.1.10-3

FIRE PROTECTION DEVIATION
CONTAINMENT BUILDING
MEZZANINE FLOOR
PLAN EL. 755'-0" & 762'-0"
FIRE AREA C-2

S&L ECAD FILE: CLIETI.2

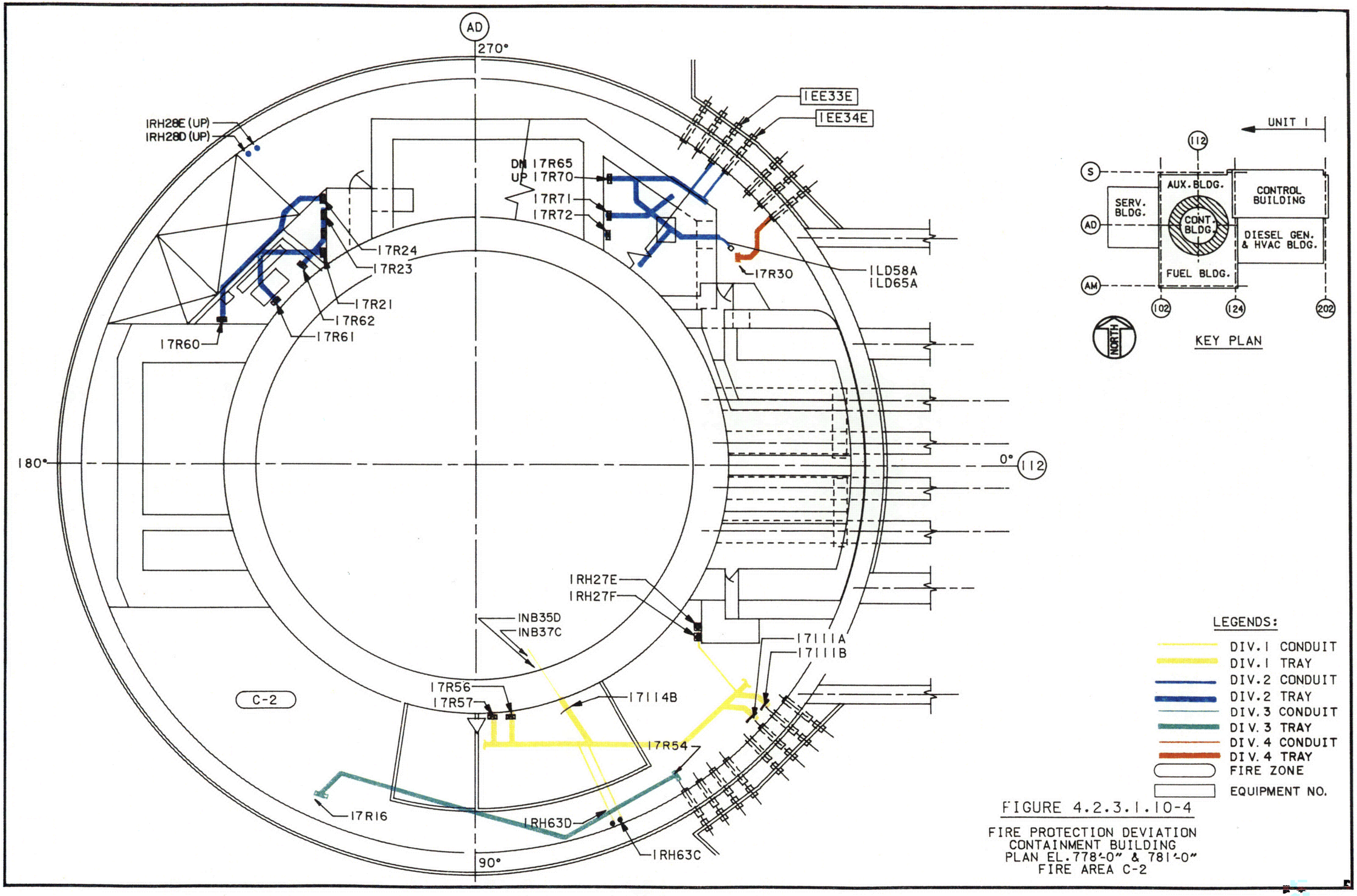
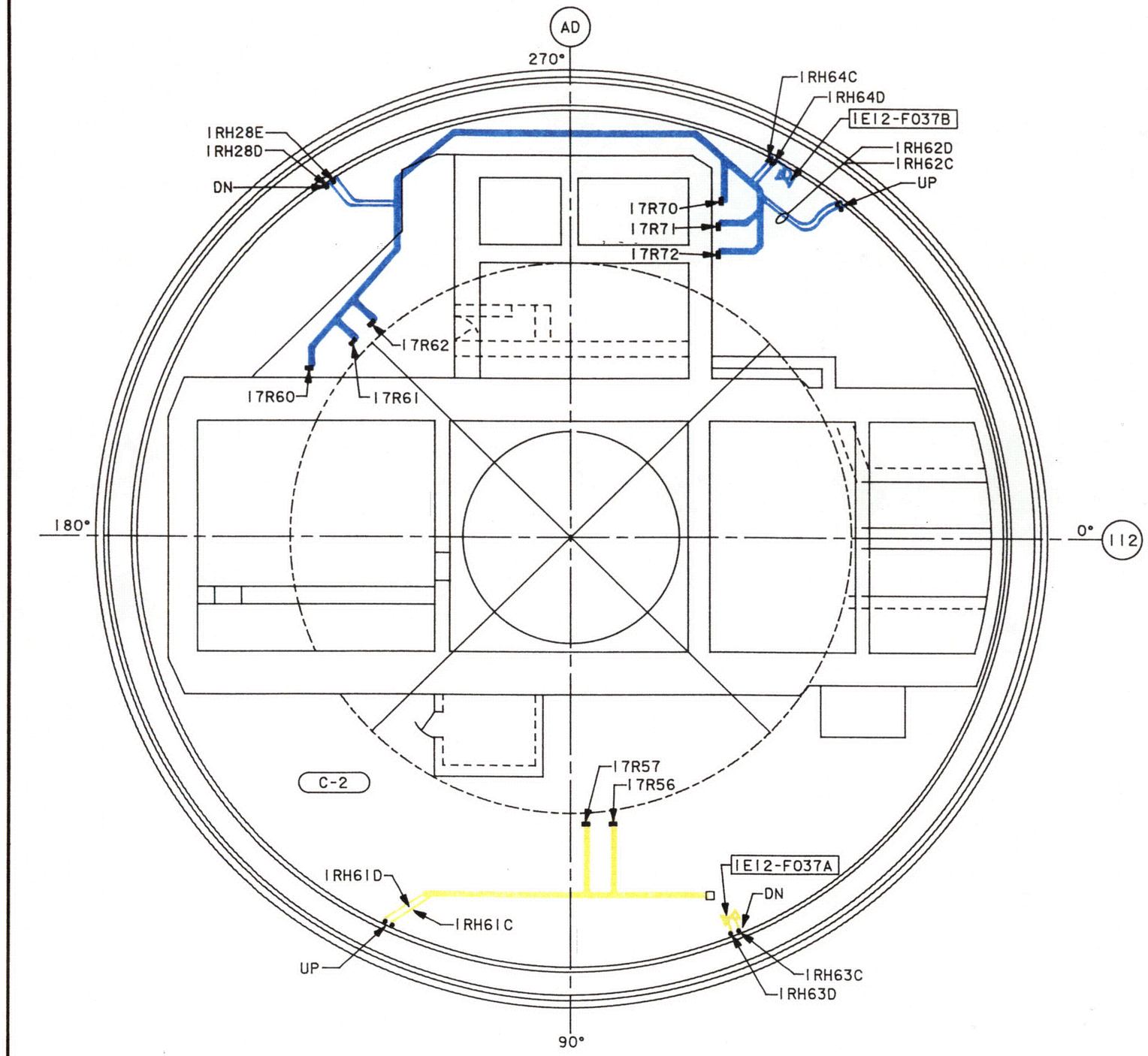
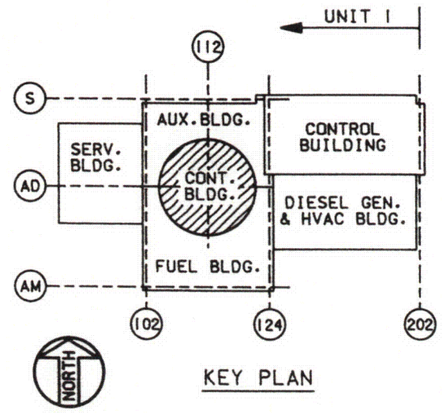


FIGURE 4.2.3.1.10-4

FIRE PROTECTION DEVIATION
CONTAINMENT BUILDING
PLAN EL. 778'-0" & 781'-0"
FIRE AREA C-2

S&L ECAD FILE: CLIET1.9





KEY PLAN

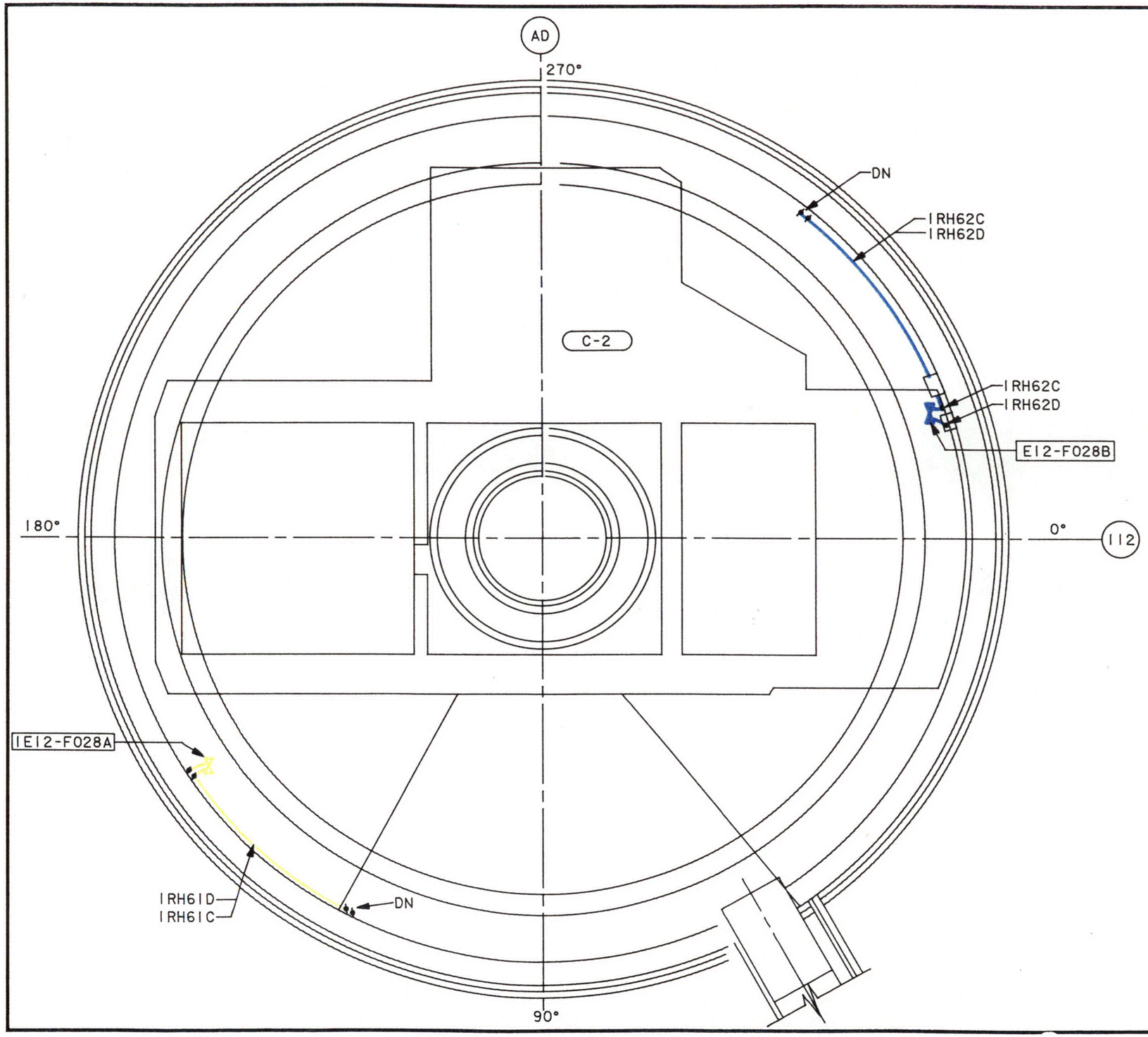
LEGENDS:

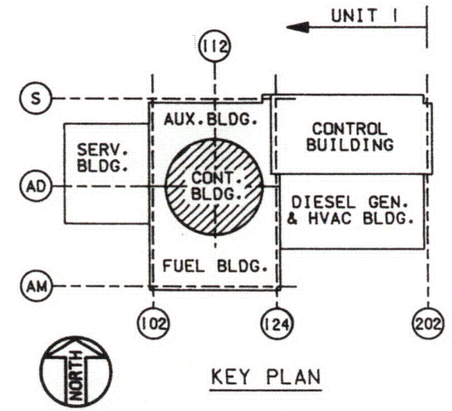
- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.3.1.10-5

FIRE PROTECTION DEVIATION
CONTAINMENT
FLOOR PLAN EL.803'-3"
FIRE AREA C-2

S&L ECAD FILE: CLIETI.3





KEY PLAN

LEGENDS:

- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.3.1.10-6

FIRE PROTECTION DEVIATION
CONTAINMENT REFUELING
FLOOR EL. 828'-3"
FIRE AREA C-2

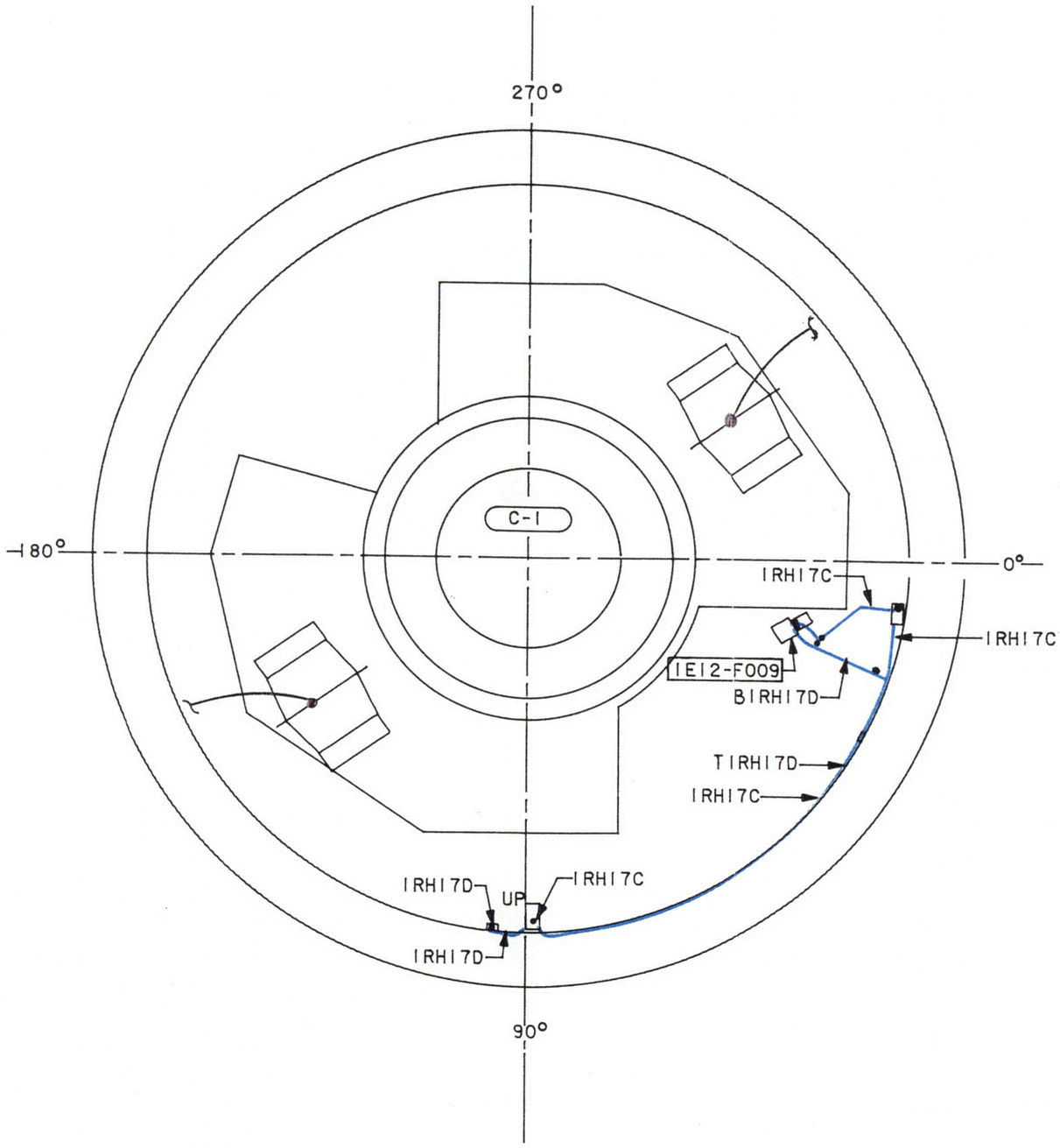
S&L ECAD FILE: CLIETI.3

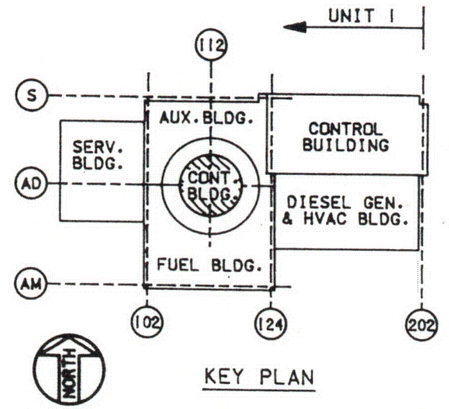
Security - Related Information Figure Withheld Under 10 CFR 2.390

FIGURE 4.2.3.3-1

FIRE PROTECTION DEVIATION
DIESEL GENERATOR BLDG.
MEZZANINE FLOOR PLAN EL. 762'-0"
FIRE AREA D-8

REVISION 7
JUNE 1997





KEY PLAN

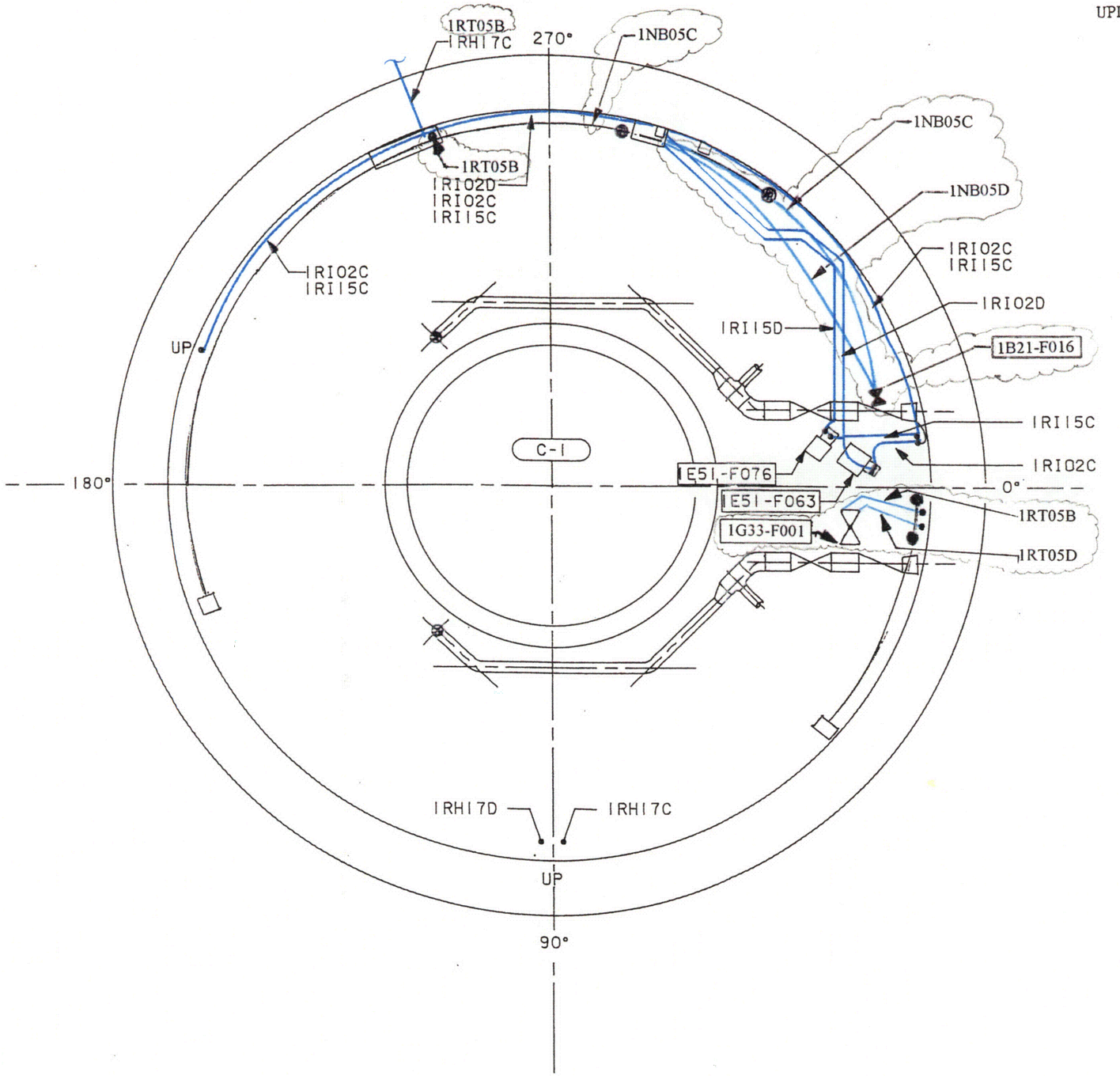
LEGENDS:

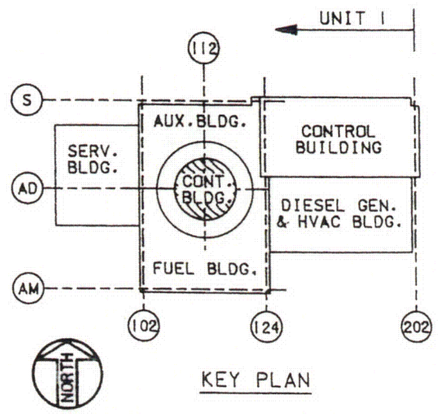
- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.
- FREE AIR CABLE

FIGURE 4.2.4.1-1

FIRE PROTECTION DEVIATION
CONTAINMENT BUILDING
GRADE FLOOR PLAN EL.737'-0"
FIRE AREA C-1

S&L ECAD FILE: CLIET1.11





KEY PLAN

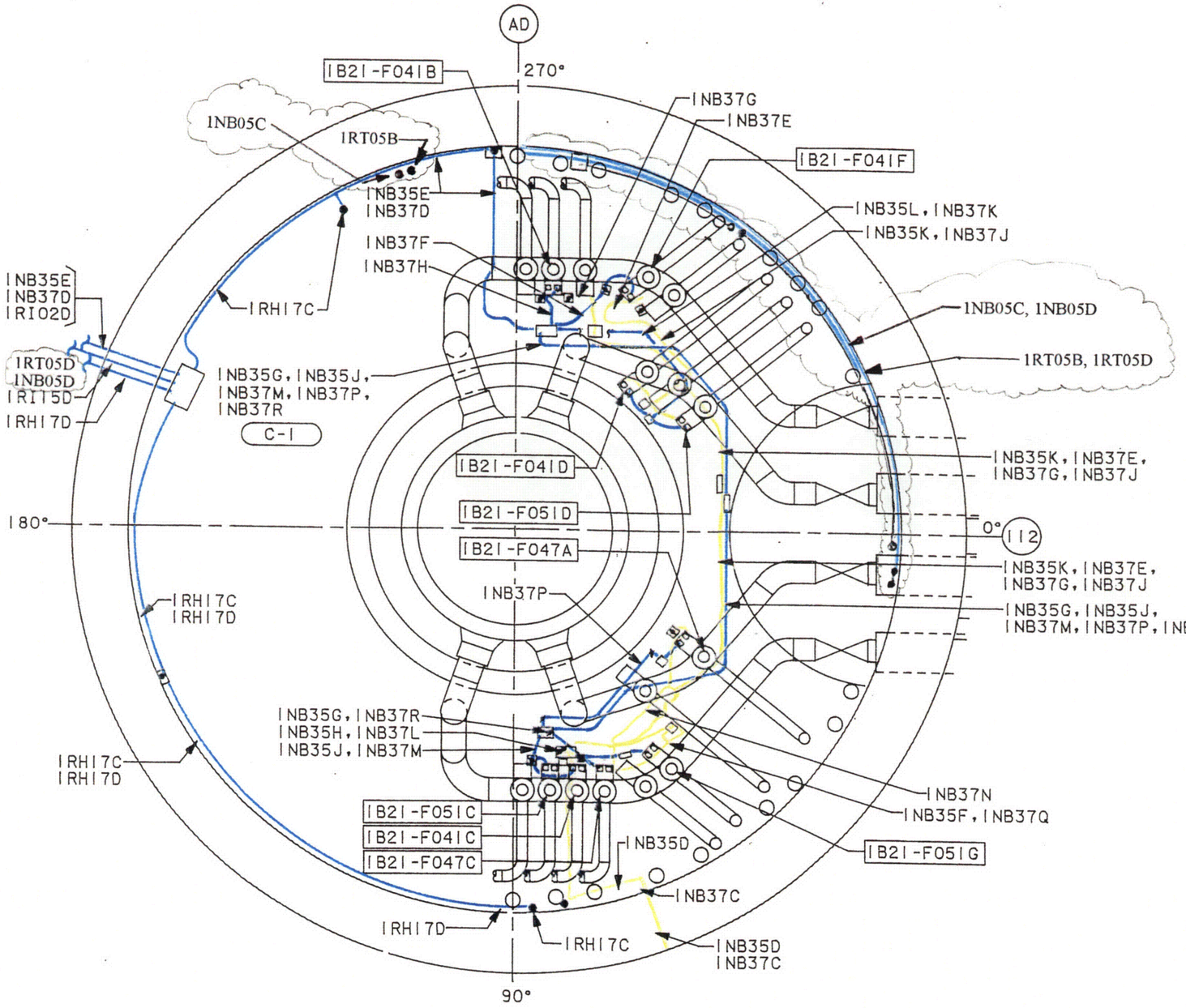
LEGENDS:

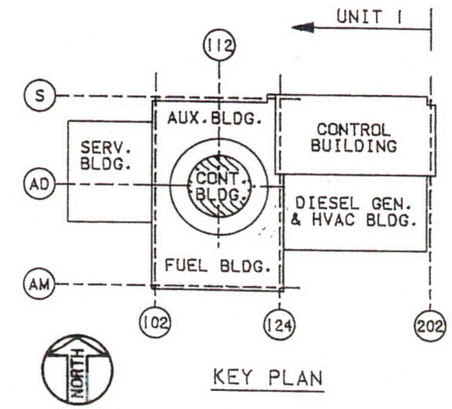
- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.
- FREE AIR CABLE

FIGURE 4.2.4.1-2

FIRE PROTECTION DEVIATION
CONTAINMENT BUILDING
MEZZANINE FLOOR
PLAN EL. 755'-0" & 762'-0"
FIRE AREA C-1

S&L ECAD FILE: CLIETI.2





LEGENDS:

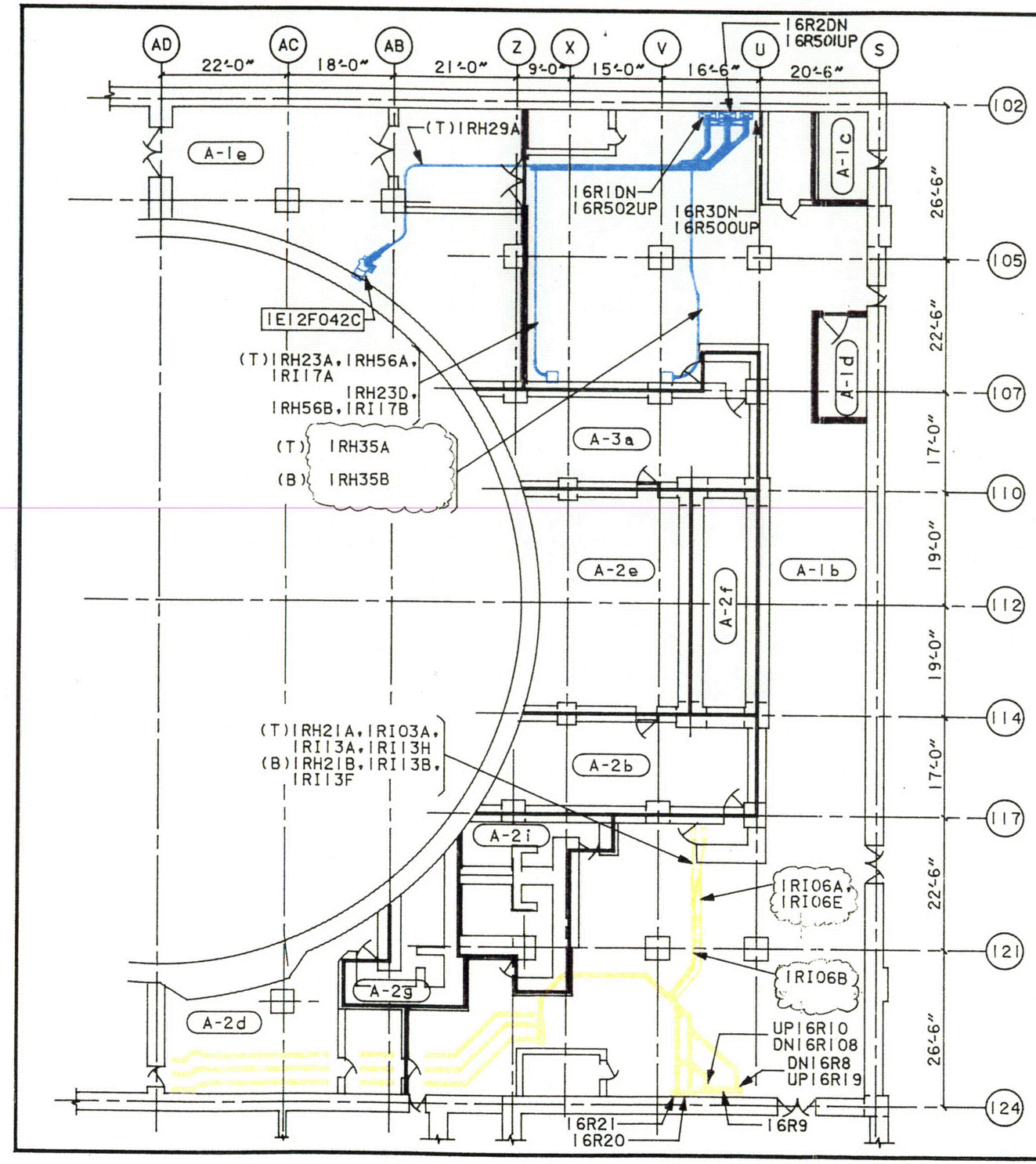
- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.
- FREE AIR CABLE

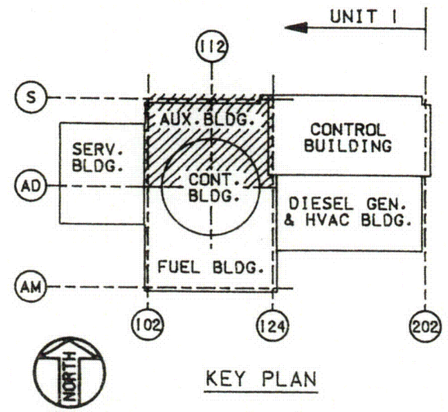
FIGURE 4.2.4.1-3

FIRE PROTECTION DEVIATION
CONTAINMENT BUILDING
PLAN EL. 778'-0" & 781'-0"
FIRE AREA C-1

S&L ECAD FILE: CLIETI.9

REVISION 7
MAY 1997





KEY PLAN

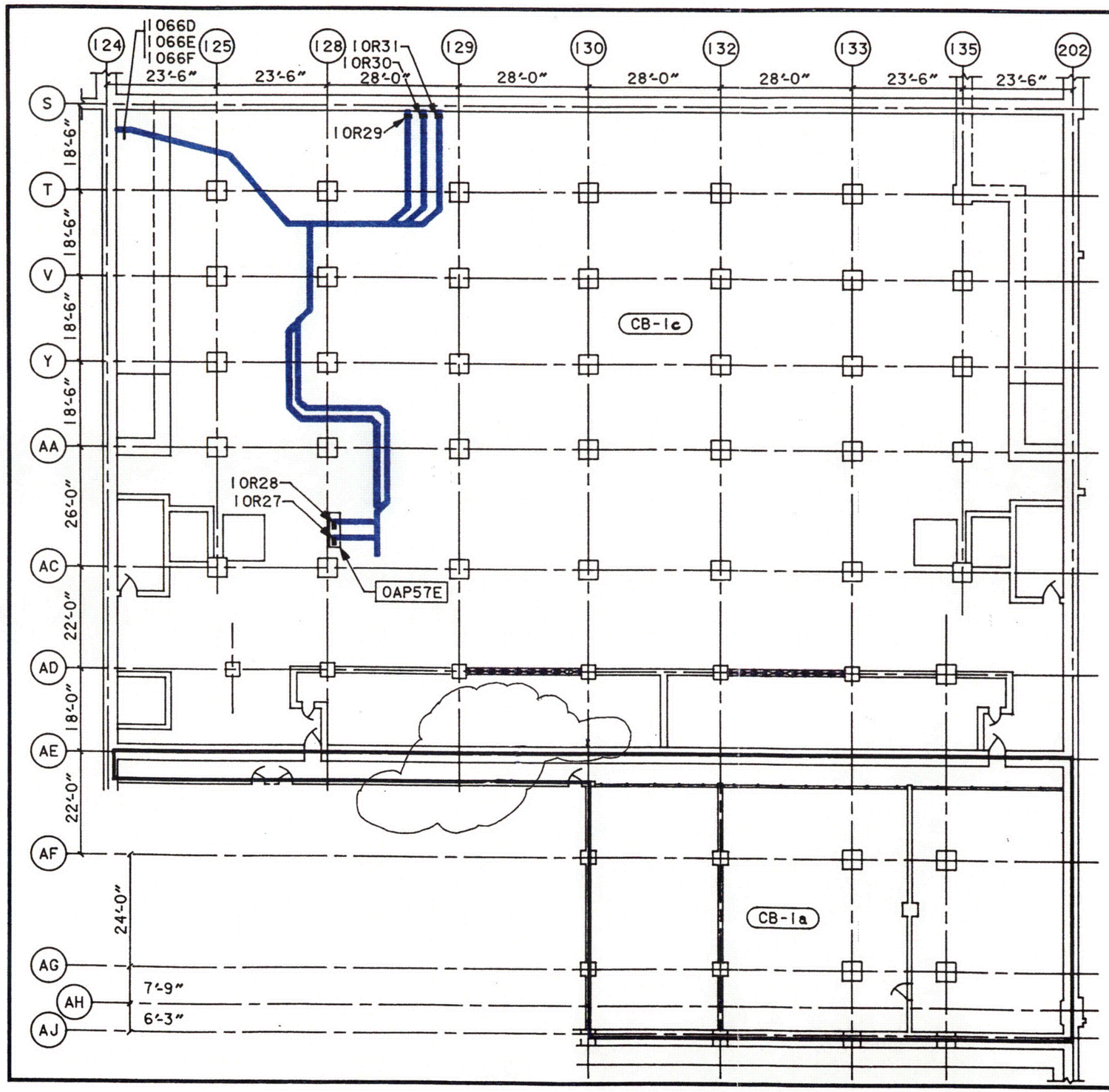
LEGENDS:

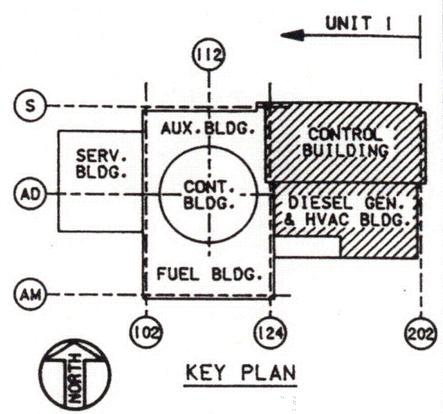
- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.4.4-2

FIRE PROTECTION DEVIATION
AUXILIARY BUILDING
GRADE FLOOR PLAN EL. 737'-0"
FIRE AREA A-1

S&L ECAD FILE: CLIETI.11





KEY PLAN

LEGENDS:

- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.4.5-1

FIRE PROTECTION DEVIATION
CONTROL & DIESEL GEN. BLDG.
FLOOR PLAN EL. 719'-0"
FIRE AREA CB-1

S&L ECAD FILE: CLIETI.7

REVISION 6
DECEMBER 28, 1994

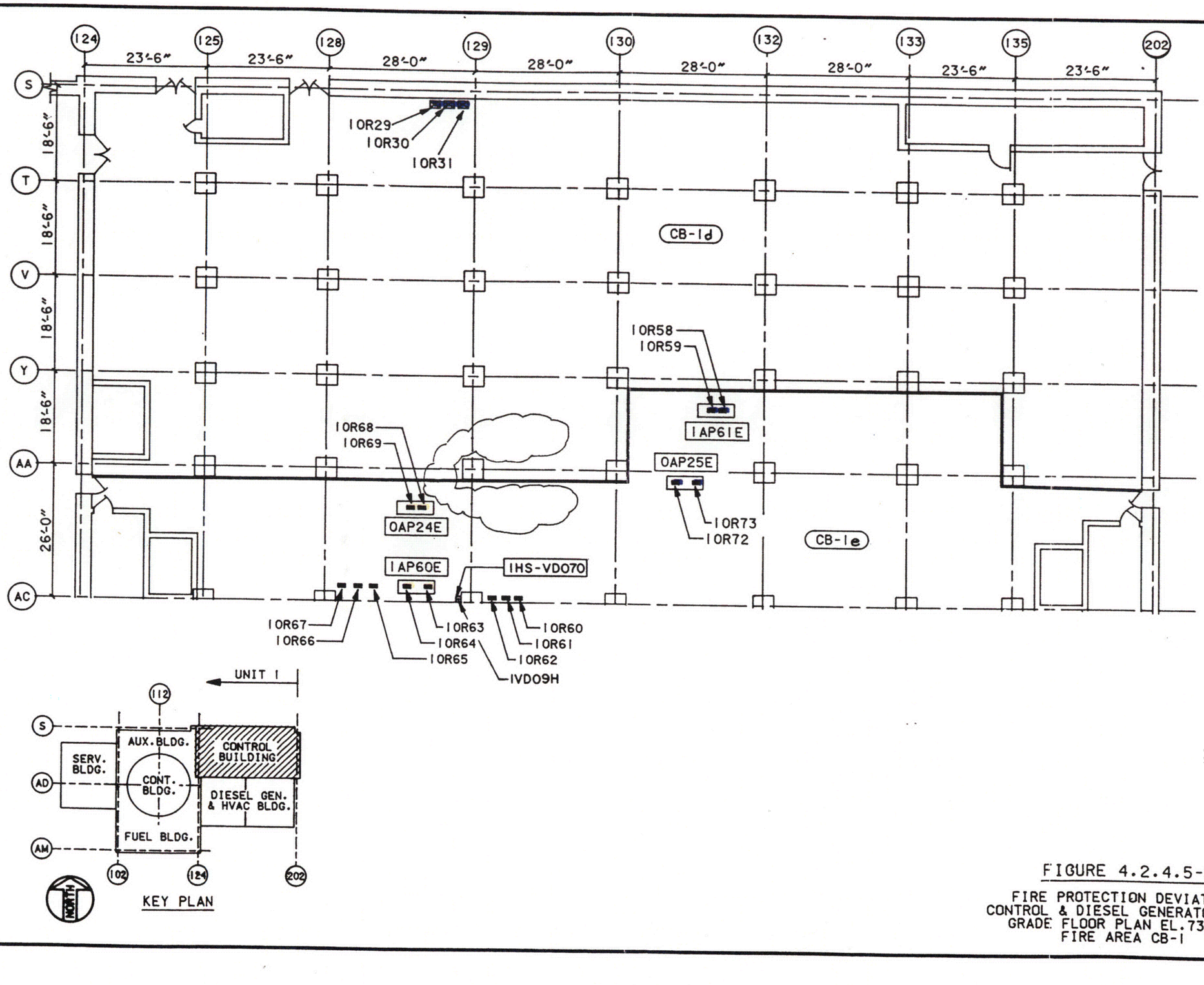


FIGURE 4.2.4.5-2

FIRE PROTECTION DEVIATION
CONTROL & DIESEL GENERATOR BLDG.
GRADE FLOOR PLAN EL.737'-0"
FIRE AREA CB-1

S&L ECAD FILE: CLIET1.6

REVISION 15
)13

Security - Related Information Figure Withheld Under 10 CFR 2.390

S&L ECAD FILE: CLIETI.4

FIGURE 4.2.4.5-3

FIRE PROTECTION DEVIATION
CONTROL BLDG. INTERMEDIATE
ROOF PLAN EL. 751'-0"
FIRE AREA CB-1

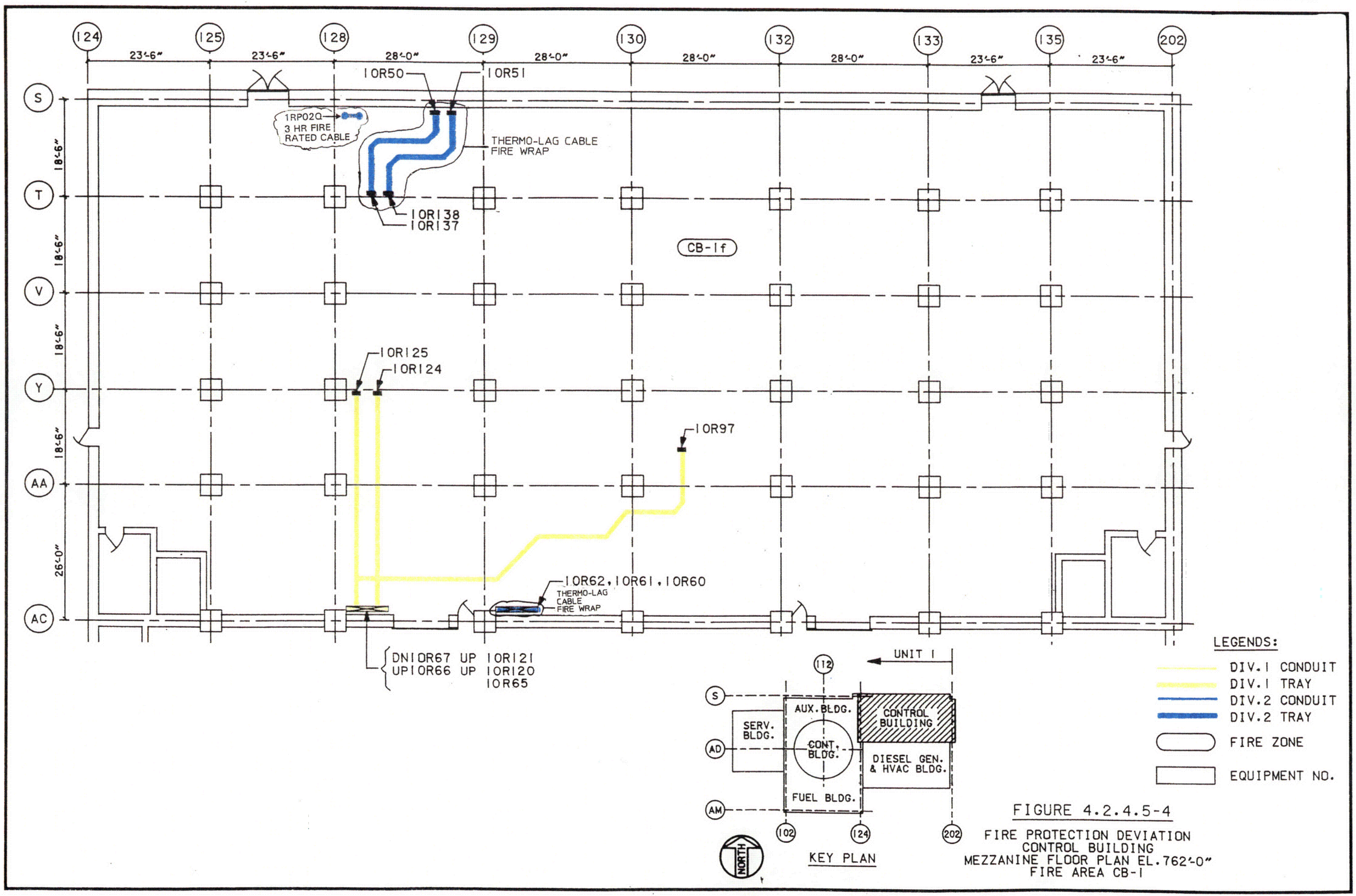


FIGURE 4.2.4.5-4

FIRE PROTECTION DEVIATION
CONTROL BUILDING
MEZZANINE FLOOR PLAN EL.762'-0"
FIRE AREA CB-1

S&L ECAD FILE: CLIETI.1

REVISION 8
AUGUST 1999

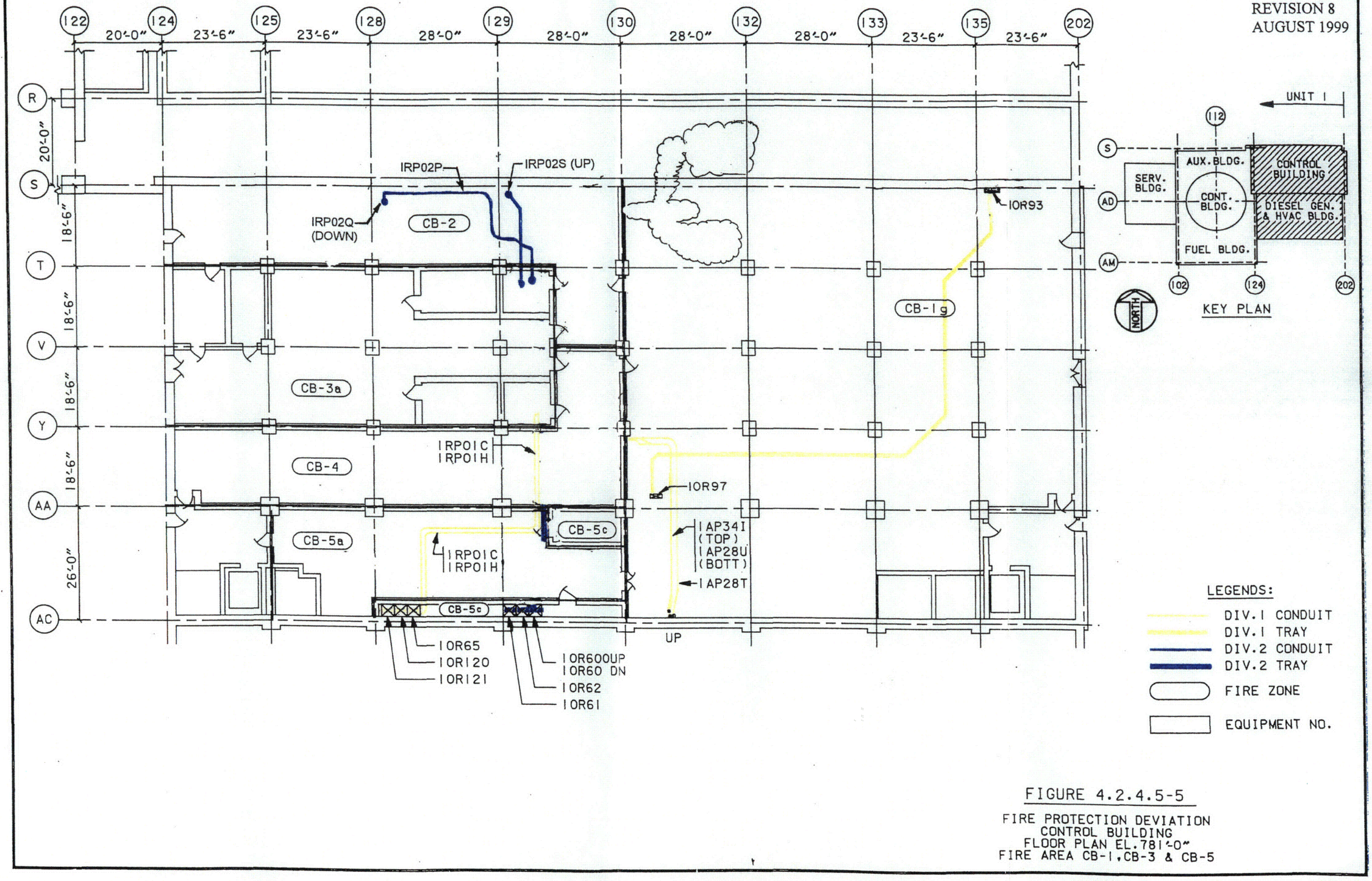


FIGURE 4.2.4.5-5

FIRE PROTECTION DEVIATION
CONTROL BUILDING
FLOOR PLAN EL.781'-0"
FIRE AREA CB-1,CB-3 & CB-5

S&L ECAD FILE: CLIETI.10

REVISION 7
JUNE 1997

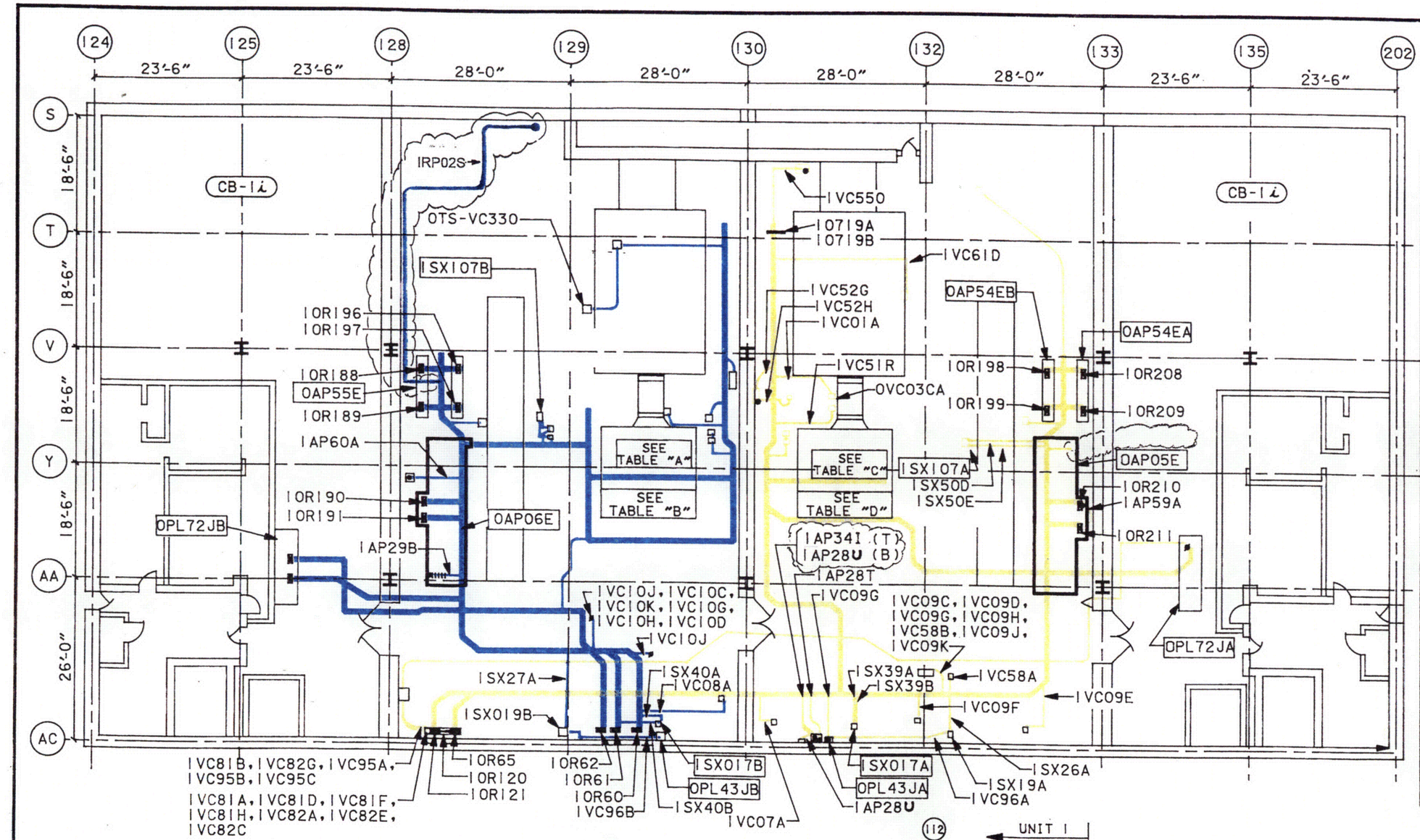


TABLE "C"

EQUIPT. NO.	PIE CABLE	KIE CABLE
OVC012YA	IVC20D	IVC81E
OVC012YA	IVC20D	IVC81E
OVC013YA	IVC20C	IVC81G
	IVC20C	
OVC014YA	IVC20B	IVC81J
	IVC20B	
OVC015YA	IVC22D	IVC81C
	IVC22D	
OVC016YA	IVC22C	IVC82B
	IVC22C	
OVC017YA	IVC22B	IVC82D
	IVC22B	
OVC018YA	IVC22F	IVC82F
	IVC22F	

TABLE "A"

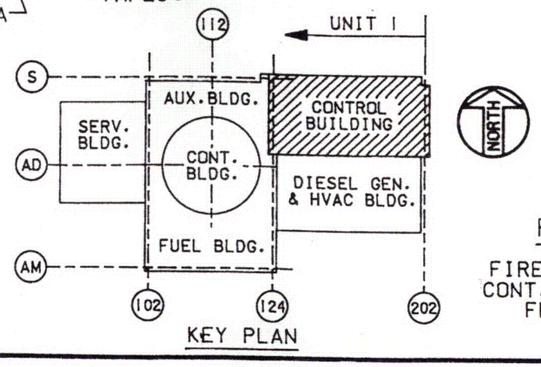
EQUIPT. NO.	P2E CABLE	K2E CABLE
OVC012YB	IVC26D	IVC91D
OVC013YB	IVC26C	IVC91F
OVC014YB	IVC26B	IVC91H
OVC015YB	IVC28D	IVC91B
OVC016YB	IVC28C	IVC91K
OVC017YB	IVC28B	IVC91M
OVC018YB	IVC28F	IVC91P

TABLE "B"

EQUIPT. NO.	P2E CABLE	C2E CABLE
OVC021YB	IVC25B	IVC25D
OVC024YB	IVC25C	IVC25P
OVC027YB	IVC25D	IVC25Q
OVC030YB	IVC27B	IVC27D
OVC033YB	IVC27C	IVC27P
OVC036YB	IVC27D	IVC27Q
OVC039YB	IVC56B	IVC56N

TABLE "D"

EQUIPT. NO.	PIE CABLE	CIE CABLE
OVC021YA	IVC48B	IVC48N
OVC024YA	IVC48C	IVC48O
OVC027YA	IVC48D	IVC48P
OVC030YA	IVC21B	IVC21O
OVC033YA	IVC21C	IVC21P
OVC036YA	IVC21D	IVC21Q
OVC039YA	IVC55B	IVC55N



LEGENDS:

- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.4.5-6

FIRE PROTECTION DEVIATION
CONT.BLDG.VENTILATION ROOM
FLOOR PLAN EL.825'-0"
FIRE AREA CB-1

S&L ECAD FILE: CLIETI.5

REVISION 8
AUGUST 1999

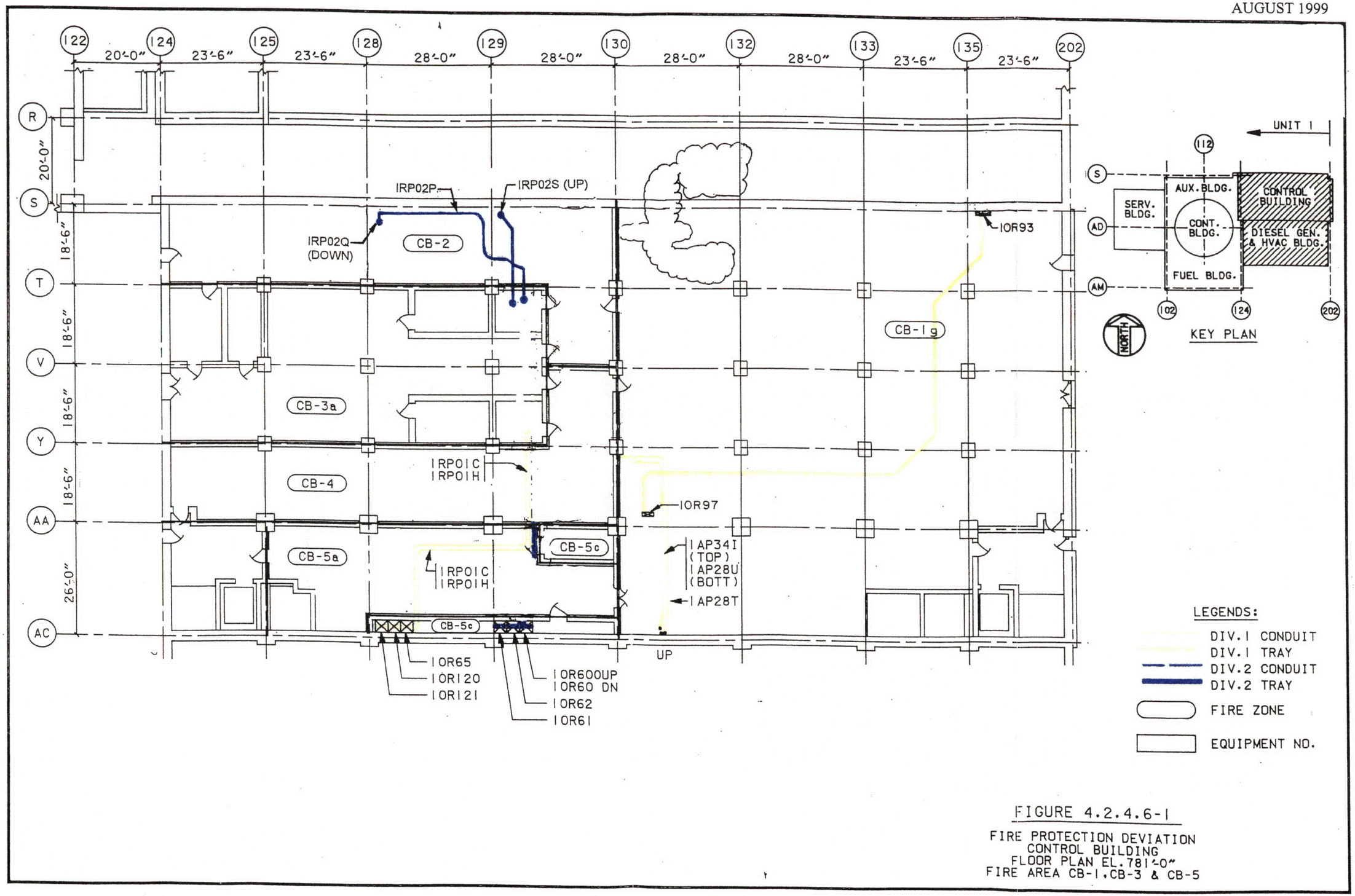


FIGURE 4.2.4.6-1

FIRE PROTECTION DEVIATION
CONTROL BUILDING
FLOOR PLAN EL. 781'-0"
FIRE AREA CB-1, CB-3 & CB-5

S&L ECAD FILE: CLIETI.10

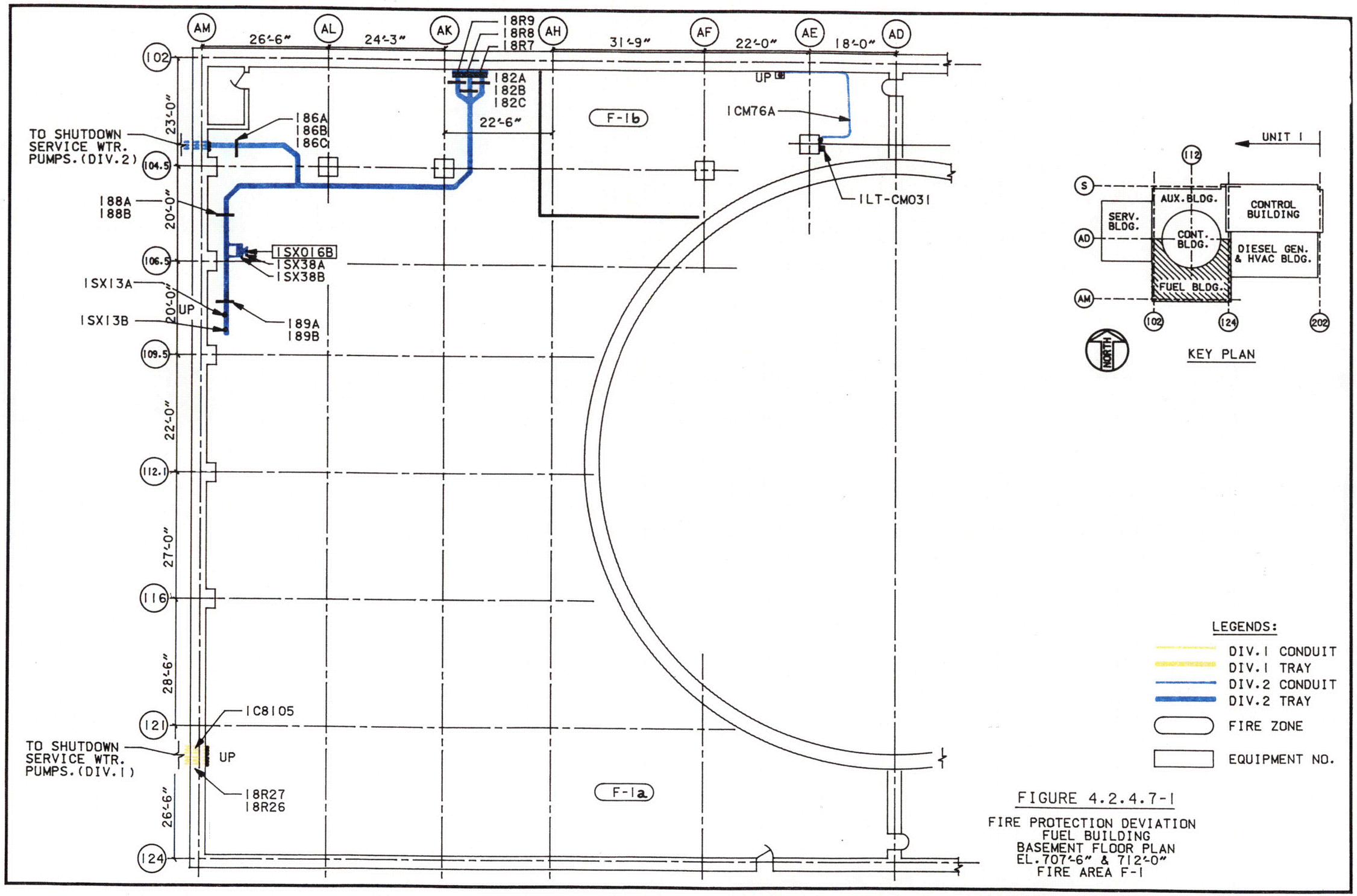
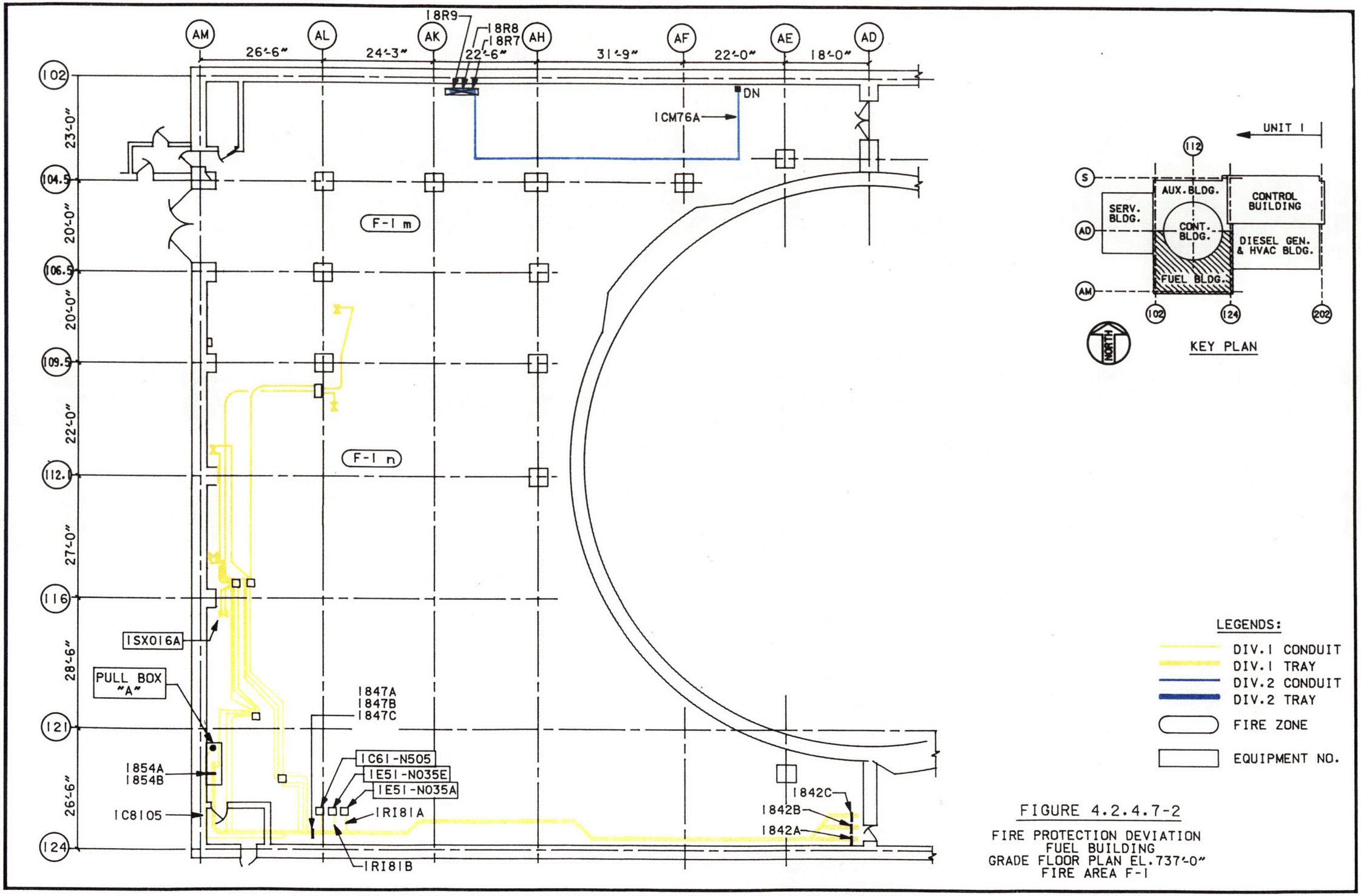


FIGURE 4.2.4.7-1

FIRE PROTECTION DEVIATION
FUEL BUILDING
BASEMENT FLOOR PLAN
EL.707'-6" & 712'-0"
FIRE AREA F-1

S&L ECAD FILE: CLIET1.8



KEY PLAN

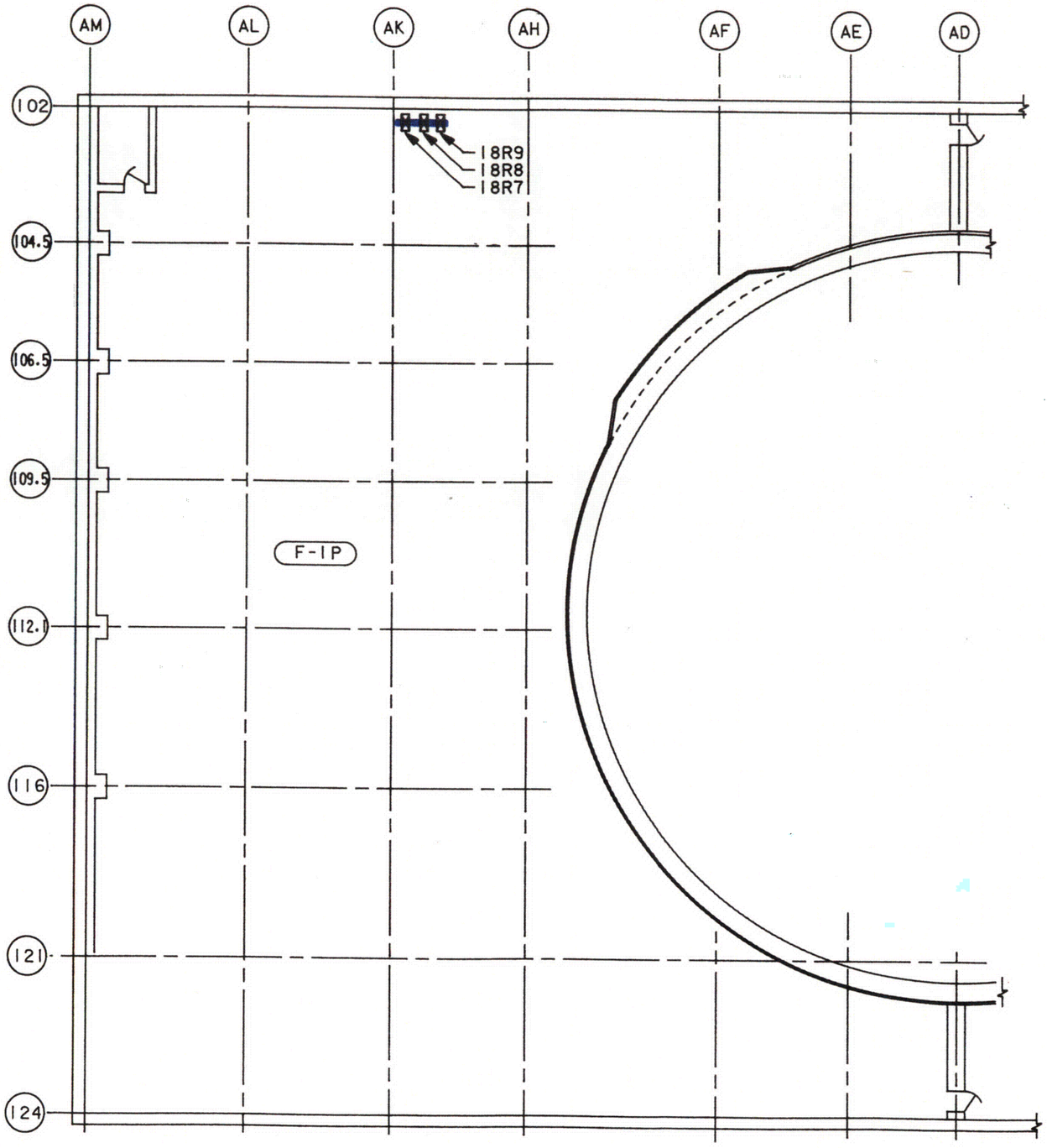
LEGENDS:

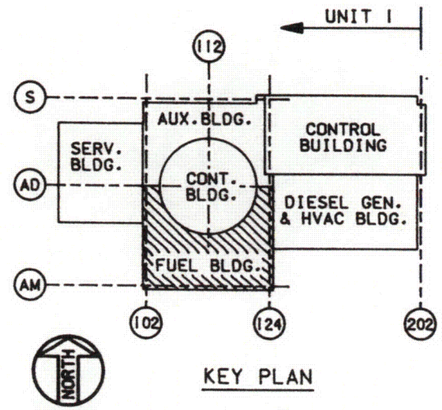
- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.4.7-2

FIRE PROTECTION DEVIATION
FUEL BUILDING
GRADE FLOOR PLAN EL.737'-0"
FIRE AREA F-1

S&L ECAD FILE: CLIETI.11





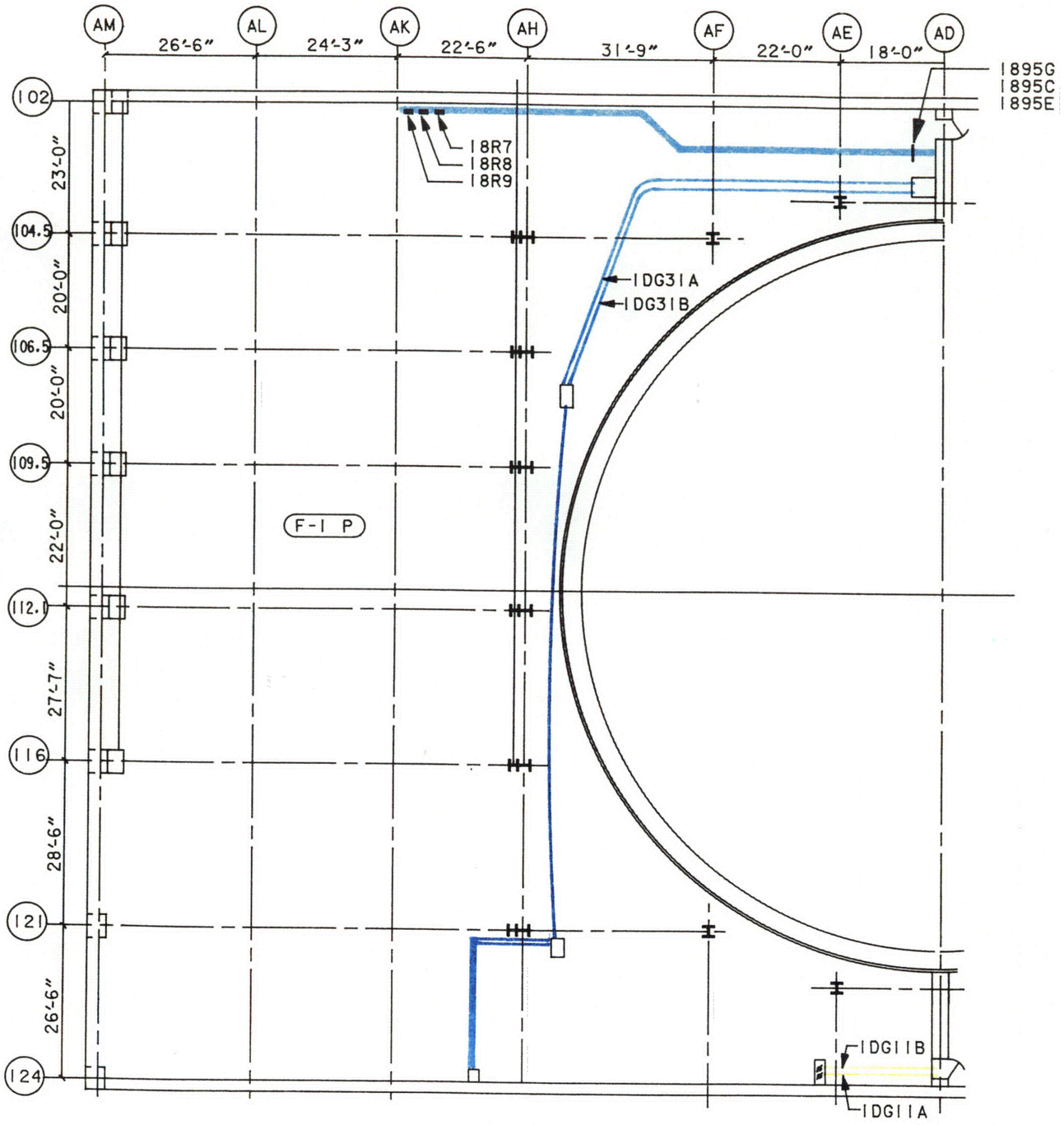
KEY PLAN

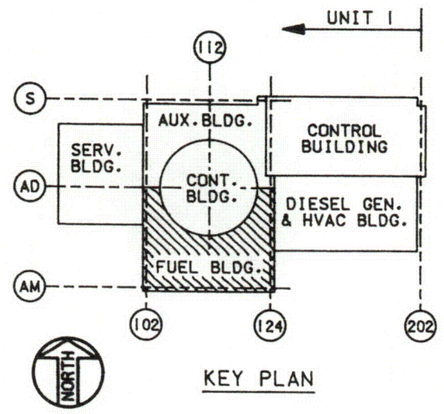
LEGENDS:

- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.4.7-3

FIRE PROTECTION DEVIATION
FUEL BUILDING
MEZZANINE FLOOR
PLAN EL. 755'-0" & 762'-0"
FIRE AREA F-1





KEY PLAN

LEGENDS:

- DIV.1 CONDUIT
- DIV.1 TRAY
- DIV.2 CONDUIT
- DIV.2 TRAY
- FIRE ZONE
- EQUIPMENT NO.

FIGURE 4.2.4.7-4

FIRE PROTECTION DEVIATION
FUEL BUILDING
PLAN EL.778'-0" & 781'-0"
FIRE AREA F-1

S&L ECAD FILE: CLIETI.9

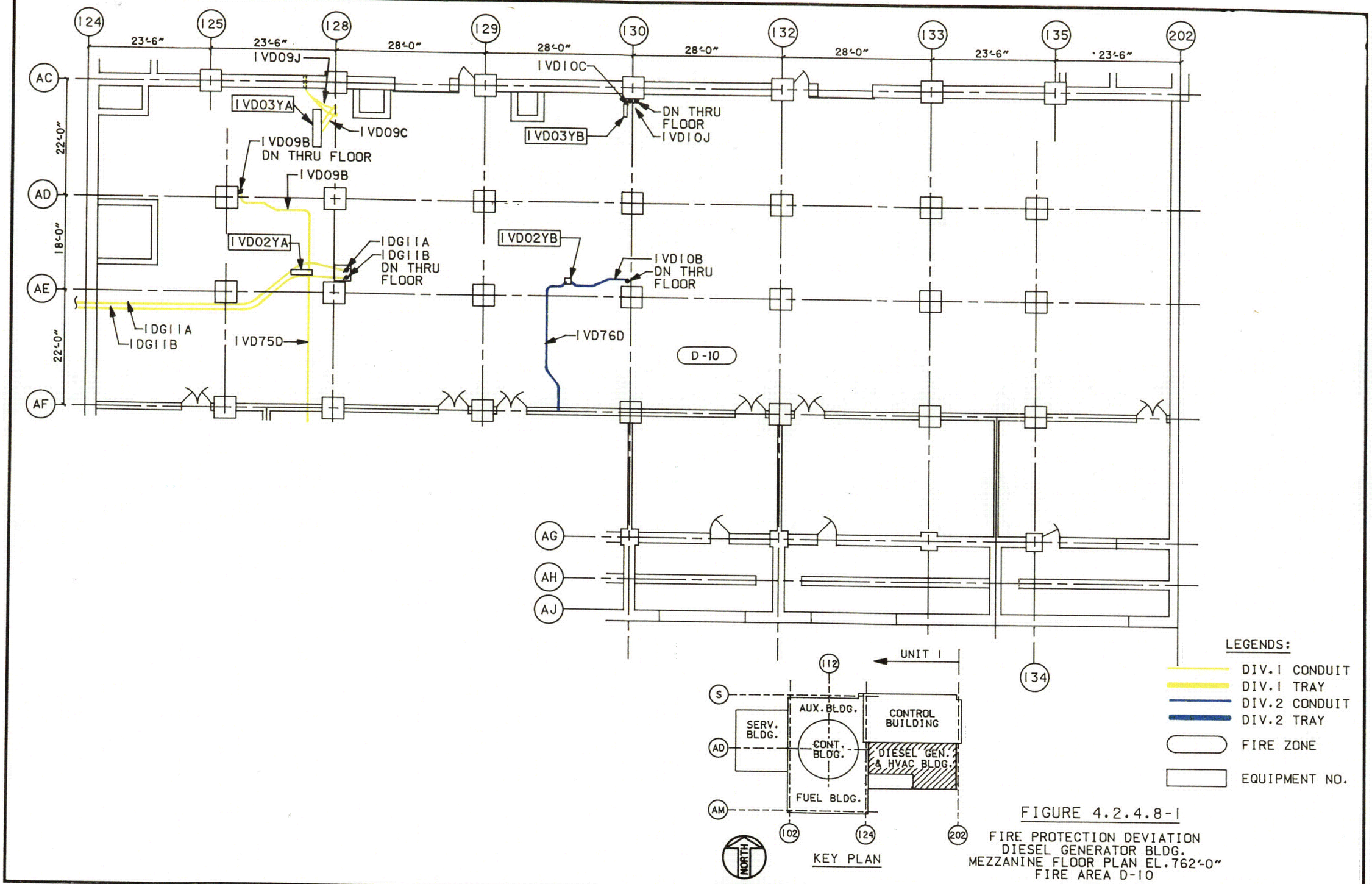


FIGURE 4.2.4.8-1

FIRE PROTECTION DEVIATION
DIESEL GENERATOR BLDG.
MEZZANINE FLOOR PLAN EL.762'-0"
FIRE AREA D-10

S&L ECAD FILE: CLIETI.I